

OVERCOMING GRAVITY

SECOND EDITION



A SYSTEMATIC APPROACH TO GYMNASTICS AND BODYWEIGHT STRENGTH

STEVEN LOW

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STEVEN LOW, DPT

Overcoming Gravity: *A Systematic Approach to Gymnastics and Bodyweight Strength*
Second Edition

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INTRODUCTION

I never imagined that *The Fundamentals of Bodyweight Strength Training*, the article I wrote for *Eat. Move. Improve.* in March of 2010 would become so popular. After publishing my first book, *Overcoming Gravity: A Systematic Approach to Gymnastics and Bodyweight Strength* in November of 2011, I was overwhelmed by how much support it received. I knew I had to release a second edition, because the first edition did not fully accomplish what I had set out to accomplish. My primary goal for the first edition was to create a comprehensive resource for beginners to learn how the human body works, and to aid the reader as they construct their own workout routines. You have certainly heard the axiom "Give a man a fish and feed him for a day; teach a man to fish and feed him for a lifetime." I wanted to build the information base to feed the aspiring athlete for a lifetime. As is often the way with a work, once published, use of the book brought about many helpful questions. I published several articles on *Eat. Move. Improve.* to clarify content from the book. This edition—not unlike strength training—is built on examination of the successes and the aspects in need of focused work.

Since the release of the first edition, I have learned a lot about simplicity and teaching methods. I hope this second edition will guide you toward learning all you need to meet your own goals.

Mastering your body requires a lot of hard work and persistence, but the potential for overall results is astounding. Bodyweight exercises can be performed almost anywhere with minimal equipment, are fun to play around with, and it doesn't hurt that they can be visually impressive. Strength levels acquired from proper bodyweight training transfers over to all other forms of strength, including weight training. Bodyweight strength training is thus extremely rewarding.

Nothing worthwhile comes without hard work and a fair share of frustration. Bodyweight strength training is no exception. Unlike with barbells there are very few gauges for progress. Athletes may become stuck on certain strength progressions for weeks or even months at a time with little clue how to push beyond plateaus. Stagnation is a very real problem, but with good programming we can fight this tendency. Programming is all about planning, and a good plan will help minimize the plateaus and keep us moving to our individual pinnacle.

Strength and conditioning has been constantly refined and modified in most of the major sports such as track and field, football, basketball, swimming, and many others. However, there are few people who know how to effectively implement progressions and programming in the context of bodyweight strength. Gymnastics gyms simply do not have the monetary resources or consumer demand to hire strength and conditioning professionals to help refine the physical preparation that is required. Likewise, there are no requirements for coaches to know much about strength and conditioning. Thus, there are limited sources of true bodyweight strength programming available. Most of the information is in the heads of high-level gymnastics coaches who do not have the time or inclination to record their expertise. Similarly, knowing progressions for exercises alone does not necessarily mean that one has enough knowledge to implement effective programming.

One such consideration is the importance of *populations*. The way you train a gymnast will not be the way you train a recreational adult interested in the same material.

Overcoming Gravity is an attempt to change that. The primary goal of this book is to allow beginner and intermediate athletes to delve into the world of bodyweight strength training and progress effectively and safely. This book will equip you with the knowledge to build safe and effective workouts and progress in your bodyweight strength movements. Additionally, there will be condensed exploration on subjects that relate to general movement such as endurance, metabolic conditioning, cardio, nutrition, and the like, to add support and stability to the programming and subsequent training.

To equip you with the right tools, I have distilled it in what I call the f*undamental knowledge base*. If you are a personal trainer or a coach this book will serve as a good knowledge base for working with your clients.

Fundamental Knowledge Base

The purpose of the fundamental knowledge base is threefold:

- To provide general training knowledge.
- To emphasize the differences between various populations.
- To combine general training knowledge and the differences in specific populations into examples of training routines at various levels of ability.

The information in the first two categories is broken down into distinct sections:

General Training Knowledge

- Physiological concepts behind strength and hypertrophy training.
- How to set the right goals.
- How to structure routines.
- The methods for programming/planning a routine.

Differences in Various Populations

Training for different skill levels—beginners, intermediates, advanced, and beyond. Training between the sedentary and the active. Training between the young and the old. Training between those who are using exercises for their sport and for those who train for other reasons. Considerations for those who are injured or recovering from an injury.

Section three will integrate the first two categories. If you are confused on the importance of specific information in a chapter, the chapter summaries will have each of these sections broken down into three main aspects. This will enable you to learn to apply concepts correctly within the framework of a routine.

- Knowledge Base
- Application

Part One

FUNDAMENTAL KNOWLEDGE BASE

- CHAPTER 1 -

PRINCIPLES OF BODYWEIGHT TRAINING

SAID PRINCIPLE AND PROGRESSIVE OVERLOAD

In the body, the SAID principle rules all. The SAID principle is simple: **S**pecific **A**daptation to **I**mposed **D**emands. Franklin Henry proposed this concept in his hypothesis on motor learning. However, it applies to all of the systems in the body, including the muscles, nervous system, and connective tissues. The concept is straightforward—if you can apply enough stress to the muscles and the nervous system through intense exercise, the body will adapt to this stress by improving strength and muscular hypertrophy—an increase in size of the muscles. Over time, the application of additional stress to these systems of the body will result in large-scale adaptations in strength, hypertrophy, and connective tissue integrity. This is called *progressive overload.*

Thomas Delorme pioneered the concept of progressive overload while rehabilitating soldiers after World War II. Progressive overload is the key concept behind all strength and hypertrophy training, including both barbell and bodyweight training. Generally speaking, you must progressively add more weight to the barbell in order to increase strength and hypertrophy. Likewise, with bodyweight exercises you must find a way to make the exercises more difficult in order to progressively overload the body and gain strength and hypertrophy. In bodyweight exercises this is executed through manipulating leverage.

There are some differences between barbells and bodyweight exercises. However, muscular force is force on a basic level. Thus, you can see increases in both strength and muscle mass by utilizing progressive bodyweight exercises to overload the muscles and nervous system. Correctly applied bodyweight exercises are comparable to weights for strength and hypertrophy in the upper body. On the other hand, bodyweight exercises are slightly inferior to weights for strength and hypertrophy in the lower body. This is another key concept to keep in mind when assessing and constructing a routine toward your goals.

LEVERAGE

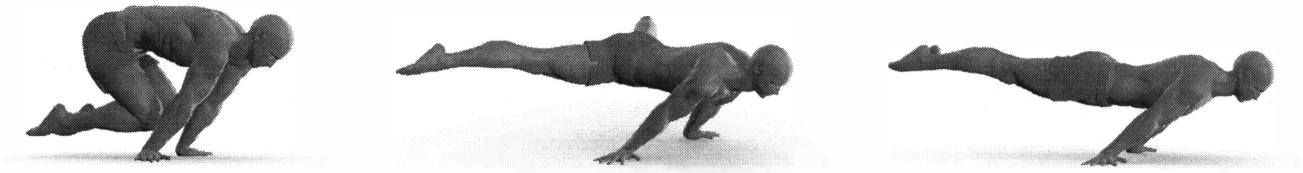
Leverage is a mechanical advantage gained by using a lever. For instance, a see-saw is a simple form of a lever. If you place an adult on one end of the see-saw and a child on the other end, the see-saw will inevitably tilt toward the adult. However, as the adult moves toward the middle of the see-saw—in effect decreasing the mechanical advantage of the weight difference—the see-saw may begin to move up and down. The goal

of advanced bodyweight strength training is to decrease leverage, which reduces the mechanical advantage that muscles have during an exercise, thus increasing the demand of force on the muscles to execute certain positions or movements. This is how astounding strength can be built without the use of external weight.

Decreasing leverage in progressive bodyweight exercises is primarily employed through two different methods: changing the body position and changing the muscle length.

1. Changing the body position decreases leverage.

For instance, both planche and front lever have changes in body position to make the exercise more difficult. Some of the planche progressions are seen in this illustration sequence.



As the body is extended—from the tuck position, to the straddle position, to the straight body position—the exercise becomes progressively harder. Your bones are the levers, your joints act as fulcrums, and your muscles act to apply force. The muscles apply forces to the bones (levers) that rotate around the joints (fulcrums) to move weight against gravity and to manipulate external objects in your environment.

In the case of the planche progression above, the center of mass of the body is shifted further away from the shoulder by straightening the body. This increases the torque on the shoulder, which is the force applied around an axis of rotation. In physics, Torque = Force * Distance. Thus, moving the distance of the center of the mass away from the shoulder will increase the torque. Since our bodies are built on these leverage methods, all forces on the muscles can be thought of in terms of torque on the muscles at certain joint angles. This is the basis of biomechanics.

2. Muscles are strongest at their resting length.

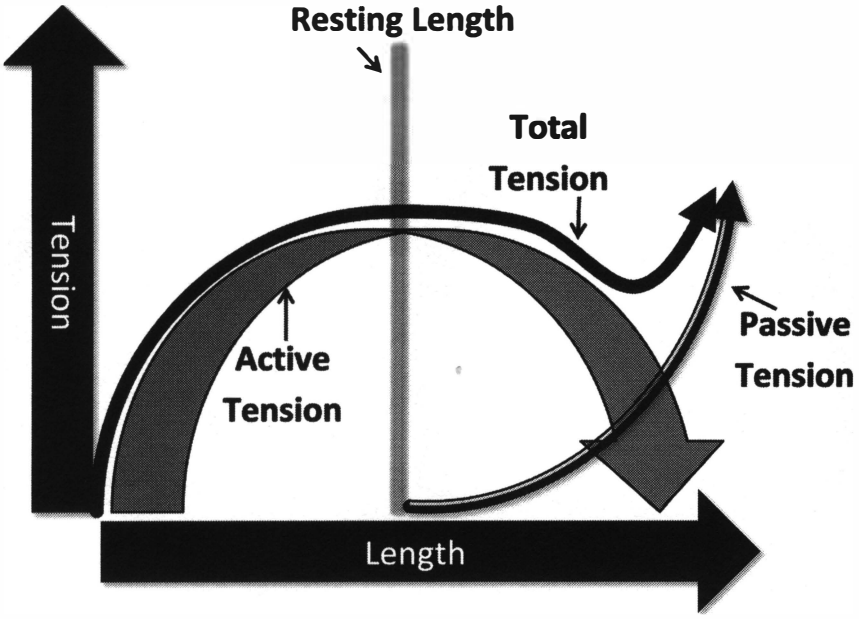
Muscles are strongest at their resting length because that is the point where the maximum number of cross bridges can be formed. A very basic explanation is that cross bridges are formed when the contractile components of the muscle—myosin and actin—overlap, and the myosin mechanically pulls against the actin, which contracts the muscle. Thus, if we shorten or lengthen muscles and then place a lighter load on the body, we stimulate an adaptation as if we were using a heavier weight.

The reason why this works is because maximal or near-maximal contractions stimulate similar neural and muscular adaptations, regardless of the force that is being placed on the muscles. For example, performing decline bicep curls while laying back is much more difficult than regular standing bicep curls or preacher curls. In decline

bicep curls, the arm is moved slightly behind the body, which places the biceps into a lengthened position. The lengthened position ensures that there is less overlap between the contractile fibers within the muscles, which means you are unable to use the same amount of weight as the other curl variations. However, the strength and mass adaptations that are gained are similar, even though you are using less weight in that movement.

Similar phenomena occur in many bodyweight exercises. For instance, pull-ups are a prime example. There are many videos of people performing pull-ups without utilizing full range of motion; they barely get their chin over the bar and they do not fully reach to a straight-arm hang position at the completion of the movement. The reason why people shorten the range of motion is because the exercise often becomes more difficult at the edges of the range of the exercise. Hence, shortening the range of motion allows them to perform more repetitions, which appears more impressive. However, there is some truth to the notion that people who shorten range of motion are cheating themselves out of the full benefit of performance, strength, and hypertrophy.

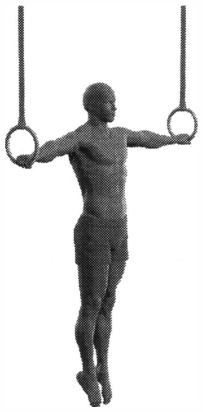
The phenomenon of placing muscles into short or lengthened states at the edge of their range of motion is termed *active insufficiency* or *passive insufficiency*, respectively. This is illustrated in the muscle length-tension curve below.



Active tension is the force you generate by *voluntarily* contracting a muscle. Passive tension is what occurs when you stretch a muscle out really far, to the edge of its range of motion. At this point, connective tissues such as ligaments and joint capsules have tension applied to them. Receptors within the muscle (called *muscle spindles*) provide feedback to the nervous system, telling it that the muscle is lengthening too much. This alerts the nervous system to activate the muscles, which causes the body to contract the muscle *involuntarily*. This is why your muscles contract when you move them toward end range in flexibility work such as stretching.

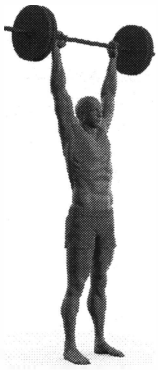
Placing a muscle in the short range or at long range—where the active force you can generate is the lowest—allows us to generate a strength training stimulus without the use of additional weight. Advanced strength movements on rings where the arms are held perfectly straight (such as in the iron cross) is a perfect

example. The straight-arm position places the biceps at near maximal length and thus requires significant amounts of strength and mass to perform the movement safely.



In the planche, the anterior deltoid (the primary shoulder muscle) is placed in a more extended position, compared to exercises such as an overhead press. There is less mechanical advantage and the body adapts to this stress by increasing strength and muscle mass. Hence, gymnasts who can perform the planche typically have large shoulder muscles and exceptionally high strength. There are several anecdotes of gymnasts capable of bench-pressing twice their bodyweight when they can perform the planche having never bench-pressed in their lives!







COMMON TRAINING CONCEPTS

A strong familiarity of common training concepts will be important to subsequent chapters. The following are some of the common concepts most important to building a routine.

- **Repetitions (or reps)** – The amount of repetitions you perform in a single set. For example, if you perform 10 pushups in a row before resting, that is 10 *repetitions* in a single set.
- **Sets** – The number of repetitions you perform of a single exercise. For example, you may perform 3 sets of 10 pushups with a period of rest between each set. Sets are usually characterized by a non-arbitrary amount of rest time between them.
- **Rests** – The amount of time you take to rest between each set of an exercise. Shorter *rest* periods are typically better for endurance, while longer *rest* periods are typically better for strength. Rest times for muscular hypertrophy overlap with endurance and strength.

- **Tempo** – The speed at which you execute repetitions. This may influence strength and hypertrophy. Typically, *tempo* is referred to in an XXXX format such as 10x0. Each "X" is a number of seconds per phase of the exercise.
    - First X – Seconds in the initial movement;
    - Second X – Seconds held at the terminal position; (Sometimes there are only two numbers)
    - Third X – Seconds in the counter movement;
    - Fourth X– Seconds held at the initial position before the next repetition.
- **Intensity/Load** – The percentage of 1 repetition maximum (RM) that you use during a set. In other words, it tells you the difficulty of the exercise. Repetitions in a set are performed at a certain intensity or load. For example, a set with 90% 1 RM intensity may allow you to perform 3-4 repetitions to failure. This will only be referred to as *intensity* from here out.
- **Volume** – The total amount of exercises performed in a workout. This can refer to the specific amount of total work on particular muscle groups, such as the pulling muscles (forearms, biceps, and back), or the total amount of work in a workout. Both are important in terms of programming for different populations.
- **Frequency** – How often a workout or exercise is performed.
- **Attribute** – A particular quality that is being trained. The primary attributes, which I have already discussed, are strength, hypertrophy, and endurance. However, there are other attributes, including flexibility, mobility, skill work, cardiovascular, stamina, and more. It is important to understand that different attributes can be trained at different frequencies.
- **Failure** – The point at which you cannot perform another repetition. This book refers to *failure* in the context of *technical failure*, which is the inability to perform another repetition with good form.
- **Work Capacity** – The ability to perform more exercise after adapting to a training program.
- **Deload** – A planned period where various factors of a routine are reduced in order to allow the body to recover and increase work capacity, strength, hypertrophy, or other attributes. This may include one or all of the following reductions to the above factors: repetitions, sets, rests, tempo, intensity, volume, frequency, failure, and work capacity.
- **Plateau** – A *plateau* or *stagnation* in progress is when an athlete on a specific routine has stopped improving their performance—whether in strength, endurance, hypertrophy, or other factors.

THE REPETITION CONTINUUM

The repetition continuum has strength at one end and endurance at the other. The strength side is attained through low repetitions and heavier weight or higher intensity where a 1 repetition maximum (1 RM) elicits the most strength. Endurance occurs with less weight or less intensity and more repetitions. There are three very important points to take away from the repetition continuum:

1. Strength and endurance cannot be optimally developed at the same time, since they are at opposite ends of the spectrum. However, a fair amount can be developed at the same time if you want to work on both.
2. Developing maximal strength increases the potential for maximum endurance. The way strength modulates greater endurance is through greater efficiency in contraction of the muscles during

exercise. For example, fatigue occurs much more slowly in endurance runners if they have increased strength because they are using a lower percentage of their strength with each stride. This is why strength training for endurance runners can improve their performance.

3. Strength takes *longer* to develop than endurance and conditioning.

Thus, we come to a couple of conclusions. For a strength-biased sport, you want to prioritize strength training over metabolic or endurance training. For endurance sports, you want to concurrently train strength and endurance. For sports with a mix of strength and endurance, you want to concurrently train in both areas but the proportion of each may vary. However, this does not mean that if you want to maximize your training you should only perform 100% of one particular area. Too much specialization is inefficient.

In general, if you are going to cross-train strength and endurance, but have a focus on one portion over another, an 80/20 split tends to work very well. This means that 80% of your training should be dedicated toward the particular area that you want to develop the most, and 20% of your training can be devoted to the other parts. For strength athletes, this means there should be an 80:20 or 4:1 ratio of strength workouts to endurance workouts. For endurance athletes, this means there should be a 4:1 ratio of endurance workouts to strength workouts.

What you may often find from a split of this ratio is that the effect may be more beneficial than just 100% focus on one particular area of training. For example, some low-level aerobic work for a strength athlete can help increase recovery for strength training, thus allowing you to train harder. Likewise, strength work for an endurance athlete increases efficiency, which tends to lead toward increases in performance. These concepts will be further explored in the cross-training chapter.

CHAPTER 1 SUMMARY

PRINCIPLES OF BODYWEIGHT TRAINING

Knowledge Base

- The SAID principle—Specific Adaptation to Imposed Demands—governs all of the changes that occur within the body in training.
- Progressive Overload is the way to apply the SAID principle to training in order to constantly progress.
- Bodyweight exercises are progressively overloaded by two main factors: Changing the body position for a movement and lengthening or shortening the muscles to put them at a disadvantage.
- Common training concepts include knowledge of how to apply repetitions, sets, rests, tempo, intensity/load, volume, frequency, attributes, failure, work capacity, deloads, and plateaus.
- It is important to understand the repetition continuum from a training perspective, due to the inability to optimally train strength and endurance at the same time, and the fact that strength has more applicability and takes longer to develop than endurance training.
- The focus of training does not need to be optimized to 100% in every area, as that may not always lead to the best results.

Application

The knowledge behind the construction of exercise routines in subsequent chapters will rely heavily on understanding these basic concepts. You can consider the construction of a routine a "puzzle," made up of many different pieces. Your specific goals provide an outline for the puzzle, and the pieces are put together within that framework.

- CHAPTER 2 -

PHYSIOLOGY OF STRENGTH AND HYPERTROPHY

WHAT IS STRENGTH?

Let's assume that you are reading this book because you want to know how to train bodyweight strength rather than endurance. At the very least, your goals are to increase your strength to work on the gymnastic isometric exercises such as the planche or front lever, or you want to be able to use your bodyweight strength for various disciplines such as gymnastics, parkour, wrestling, martial arts, MMA, and the like. These goals are important because knowing how your body will respond to the stress will be advantageous when you start to construct your routines. Overall, strength is predicated on a simple equation:

Strength = Neural adaptations * Muscle cross sectional area.

The force output of a muscle is based on the cross-sectional area of the muscle, angle of attack on the joint, individual limb length, and, most importantly, neural factors. Unfortunately, we cannot control the angle of muscle insertions or limb length, which is why they are excluded in the above equation. Developing strength with focus on these neural factors in conjunction with muscle mass gains will provide faster results. In the following sections, we will go through some of the basic physiology and principles that underlie this equation. *Neural adaptations* are what the majority of strength training is about. However, there is some overlap between developing neural adaptations and *muscle cross-sectional area.* This is essentially a fancy term for *hypertrophy* (increases in muscle size). The bigger a muscle is, the stronger it will be.

One of the main questions brought up by those beginning bodyweight training is the intuitive sense that excessive weight will negatively affect their ability. In particular, extra muscle weight seems to be detrimental to bodyweight to strength ratio. This fear—for the most part—is unfounded. Most of the strength athletes—such as gymnasts—and sports with weight classes have athletes with large amounts of muscle mass comparative to their size. Excessive muscle mass tends to have a net negative effect only when you start to become extremely large; bodybuilder size. This usually means, unless you are taking performance-enhancing drugs, you can never have too much muscle mass. Even in weight-class sports you will see that athletes tend to be shorter and have more muscle mass than taller, with more muscle mass. Thus, training toward both strength and hypertrophy is a non-issue in the long run, as both of these attributes will overlap with each other to develop maximal strength and bodyweight to strength ratio.

THE CENTRAL NERVOUS SYSTEM, MOTOR UNITS, AND MUSCLE FIBER TYPES

Motor units are composed of a motor neuron and all of the muscle fibers it innervates. Innervation is the pathway from the motor neurons in the brain to the muscle fibers. The signals are sent to the muscles via electrical impulses. A single motor unit may innervate many different fibers within a muscle, but only innervates muscle fibers of one of the three types.

Motor units are categorized into a continuum that is similar to the muscle fiber types. At one end, you have low threshold motor units (LTMUs); at the other, you have high threshold motor units (HTMUs). LTMUs correspond to the motor units that innervate the Type I slow-twitch fibers and HTMUs correspond to motor units that innervate Type IIx fast twitch fibers. Between those are medium threshold motor units (MTMUs) that innervate Type IIa muscle fibers. The reason why they are termed low versus high threshold is the amount of activation potential (the electrochemical signal in the brain) it takes to make them activate. The easiest way to conceptually understand this is by the strength-endurance continuum from the previous chapter. LTMUs are more *endurance*-geared, and HTMUs are more *strength*-geared.

LTMUs innervate Type I fibers, which are your *slow-twitch* fibers, and are red in color because of the enormous quantity of mitochondria within them. They have a high capacity for endurance and are the primary muscle fiber type that endurance sports develop. These fibers have the least potential for hypertrophy.

MTMUs innervate Type IIa fibers, which are your *adaptable* fibers, are pink in color. They have characteristics of each of the Type I and Type IIx fibers. Therefore, the type of training can bias these fibers toward either strength and power or endurance. This is why training must be specific to your sport. For example, doing high repetition endurance work when your sport is sprinting (which requires a high power output) will adapt your muscles toward endurance. Incorrect training toward the wrong attribute will make you perform more poorly than your competitors. Specificity in sport is king.

HTMUs innervate Type IIx fibers, which are your *fast-twitch* fibers, and are white in color. They fatigue very rapidly because they can only use anaerobic metabolism to supply their energy, but they also contract very rapidly and are the main type of fiber developed in strength and power sports. These fibers have the most potential for hypertrophy.

The fibers are termed *slow-twitch* and *fast-twitch* because of the rate that they produce force when they contract, not solely because of their energy sources. The fast twitch fibers have the greatest potential for hypertrophy, and they also have the greatest potential for strength and power output.

The Henneman's size principle states that motor units are recruited from the smallest to largest. The LTMUs are considered the smallest and the HTMUs are considered the largest because of their physical size. Additionally, due to the size difference, it takes a lower activation potential to activate LTMUs compared to HTMUs. LTMUs are composed of motor units that activate when the required force to move an object is small. Conversely, HTMUs are only activated when the force requirement is high. For example, LTMUs are activated when we want to lift a small object such as a cup, but HTMUs are only activated when we need to use most of our strength, such as in a near-max effort movement such as lifting heavy furniture. Note that during near-max effort or max effort movements the LTMUs are activated along with the HTMUs.

What this means is, when training for strength and hypertrophy, you generally want to use weights that are heavy or bodyweight exercises that are intense and difficult. We want to preferentially increase the rate of growth and development of HTMUs because they have the greatest capacity for the qualities of power, strength, and hypertrophy, as mentioned earlier. Likewise, we want the MTMUs to be mainly trained toward power, strength, and hypertrophy, since they will take on the qualities of the type of training that is imposed on them, which makes them adapt to express HTMU qualities.

This type of training is performed by moving weights or your bodyweight close to maximal intensity, or with lower-intensity exercises performed rapidly with acceleration. This is the importance of the tempo of the exercise. If the weight is heavy or your bodyweight movement is tough and you can only move slowly, you want to focus on performing the repetitions with good form and technique, as fast as possible. Under higher-intensity movements it is your intent to exert maximal force, even if you are moving slowly. This is the reason why I recommend a fast or accelerating tempo in the concentric phase of the movements, in order to ensure that HTMUs are being fatigued and the MTMUs are being trained to be like HTMUs—to induce gains in power, strength, and hypertrophy. If the intensity is light, then you want to perform the exercise with the intent to accelerate your body or weight through the movement, in order to optimally increase strength and power. This will be explored more in-depth in the section about tempo when constructing a workout routine.

There is some new evidence coming out that training with high repetitions may also confer solid strength gains as long as you train with high intensity every other week. This may be useful for those who are having issues with overuse injuries or want to work with high repetitions more than low repetitions.

NEURAL ADAPTATIONS FOR STRENGTH

There are six primary ways that the nervous system increases strength, aside from the hypertrophy of muscles. These will be the primary adaptations in any strength program, so it is important to understand how they work.

- ***Recruitment*** is an increase in the number of motor units being activated for a specific movement.
- ***Rate Coding*** or ***Firing Rate*** is a decrease in the time between each electrochemical signal sent to the corresponding musculature, which increases rate of contraction.
- ***Synchronization*** or ***Intra-muscular Coordination*** is a decrease in the amount of time between motor units firing and working together.
- ***Contribution*** or ***Inter-muscular Coordination*** is how effectively timed the different contributing muscles to a movement are fired.
- ***Antagonist Inhibition*** or ***Reciprocal Inhibition*** is a reduction of resistance from the muscles opposite of those performing the movement.
- ***Motor Learning*** refers to the neural connections and programs within the brain that will affect your development of learning movements.

We will discuss each of these and their implications for training. You may have heard the term "strength is a skill"—all of these components make up the neural adaptations by which strength is a skill. Some of these components have broad range specificity whereas some do not.

Recruitment increases as force requirements increase. The nervous system has limiters on the amount of force we can produce. Specific structures called Golgi tendon organs in our musculotendinous junctions

(where the muscle starts to become tendon) provide feedback to the brain, which decreases muscle forces to prevent injury in untrained people. Fortunately, with training, the inhibitory effect on force development can be reduced which increases recruitment of muscle fibers. This effect is greatly enhanced and maximized around 85-90% 1 repetition maximum (RM) threshold or approximately 3 RM. Thus, if your primary aim is to gain strength on an advanced program, you will often be programming in exercises in the 1-3 RM range (or close to that repetition range).

Rate Coding or ***Firing Rate*** increases begin to occur after all motor units in a muscle are recruited due to maximal recruitment or fatigue. When the nervous system senses the recruitment of all available motor units, it further increases strength by sending more rapid electrical signals to the muscles to tell them to contract faster. For most large muscles, such as those used mainly for locomotion, this occurs at approximately 90-92% of 1RM (or 3 RM). In many of the finer motor muscles located in the forearm, rate coding may start to occur as low as 50% of 1RM. Postural muscles—which work constantly in the core and support muscles such as the calves—also rely highly on rate coding for improvements in performance.

Rate Coding matters very little for a strength-based program, but is useful to note for those seeking hypertrophy. Muscles that rely more on rate coding tend to be composed of a greater percentage of slow-twitch fibers. Therefore, they respond better to higher repetitions. Thus, the forearms, calves, core, and other highly-rated coded muscles tend to respond better to higher repetitions when you are seeking hypertrophy. On the other hand, two-joint muscles such as the hamstrings, biceps, and many of the larger muscles, such as the glutes, tend to respond best to more difficult exercises with fewer repetitions because of the preponderance of fast-twitch fibers. Ultimately, if your goal is massive amounts of hypertrophy you may need to alternate your repetition range, rest times, and other factors if one style of training does not seem to be working effectively.

Synchronization or ***Intra-muscular Coordination*** refers to the nervous system's ability to organize the muscle fiber contractions to make the system more efficient. In untrained individuals, the nervous system recruits motor units in a random or staccato pattern in order to provide the force necessary for a movement. As we further train a movement the motor cortex is able to synchronize the firing of motor units. Imagine a game of tug-of-war. When a team pulls together in synchronization the force is much greater than each person pulling by himself, out of sync with everyone else. This is how the body becomes more efficient when trained. Skills and exercises that are repeated often show the greatest increases in recruitment and synchronization. This is consistent with practicing skills many times throughout the week and repeating exercises multiple times a week over the course of a program.

For example, in the book *Starting Strength*, Mark Rippetoe suggests that beginners perform the squat three times per week. More advanced strength programs, such as Bulgarian Weightlifting Protocol, may have their athletes performing the Olympic lifts as many as two to three times per day, six to seven days a week. Many other sports, including gymnastics, running, swimming, and the like, benefit from massive amounts of technical practice because they require optimal recruitment and synchronization to perform at the highest level. This is true for every sport. Michael Phelps swims miles every day, even though his events are only about 400m in length. Simply put, if we want to get really good at something we have to do it a lot. This will be an important thing to remember when we start to construct routines.

Contribution or ***Inter-muscular Coordination*** is essentially how effectively you correctly perform a technique. This is the practice part of training that is specific to the movement you are working. For example,

when performing a pull-up you may start the movement with relaxed shoulders. Contribution or inter-muscular coordination is what the body uses to sequence all of the scapular muscles to tighten, which provides a stable base for the shoulders to tighten and then move upward, out of the bottom position. When you are fairly new to exercise your brain may do this quite inefficiently, which is why it is important to learn proper technique in exercises in order to progress safely and effectively.

Antagonist Inhibition or ***Reciprocal Inhibition*** can improve contraction of the muscle. This is usually performed by extensively stretching the opposing muscle you are planning to work beforehand. The reflexes operate similarly. For example, when the doctor hits your patellar tendon with a reflex hammer, the leg kicks out. This is called *reciprocal inhibition*—where the nervous system activates the quadriceps to fire while simultaneously inhibiting the hamstrings from firing. Thus, you can harness this phenomenon to increase contractions in particular muscles. In particular, paired sets—where you alternate between a pushing movement and a pulling movement—are effective at eliciting this response because of the natural relaxation of the muscle after it has been fatigued.

Motor Learning occurs automatically in the brain and is mostly active for movements that are practiced repeatedly. It occurs all over the cortex in motor planning, the primary motor cortex, cerebellum, and other parts of the brain that are involved in performing movement. This is a primary adaptation of skill work, but it is arguably impossible for one to consciously train it, as the body automatically performs in adaptation to your conscious training. Therefore, we need not go into detail about it. What is important to know, to obtain the benefits of this process, is that you should concentrate 100% while practicing your movements. This will ensure that you are performing them correctly, thus teaching your body the correct movement patterns. If you mess around instead of concentrating with your training, your body will automatically learn sloppy techniques and movement patterns. It has been said "practice makes perfect." However, it is more accurately stated "*perfect* practice makes perfect."

THE ROLE OF THE CENTRAL NERVOUS SYSTEM

The central nervous system (CNS) governs the activation of motor units through a variety of systems that are involved with motor planning, activation, and proprioception—the feedback from the body to the brain about where the body parts are in space and the body's control of them. Since we are not going to look at this in detail, I will say that the CNS, like the muscles, has a set point at which it must be stressed in order to bring about adaptations.

The CNS has a set amount of recovery time that it needs to operate at full capacity. Think of it like a swimming pool. Every time you exercise, you take out some water. Conversely, every time you sleep, take a rest day, eat well, and engage in relaxation or recovery methods not only do you put a little water back in, but you also make it a little deeper and a little further across. Over time, the size of your pool and, therefore, your capacity for water will increase. This is the origin of the term *work capacity*. When you take out too much without replacing it, bad things start to happen. This would be where an athlete starts delving into the overreaching/overtraining realm, which is where progress and performance may plateau or possibly even decline.

Well-structured programs for more advanced athletes have overreaching built into them. Overreaching is planned training beyond a plateau that results in a reduction of abilities such that, after a rest period is taken, the body will adapt and come back with improved abilities over the previous baseline. For example, after a program is completed and a deload week (also called a *recovery week*) is taken, an athlete usually comes back stronger and/or faster. This athlete's pool has increased in capacity during the program, but the water inside of it is not fully replaced until the deload week is taken.

This is worth mentioning because some exercises are more taxing than others. For example, in weightlifting, deadlifts are more taxing than many other exercises because of the large amounts of musculature that are activated during the movement. A *deadlift* is an exercise where there is a bar on the ground, you grip it, and then stand up with it in your hands. It causes significantly more fatigue than most other exercises. This is why deadlifts are placed at the end of many beginner-level programs. Performing them near the beginning would significantly detract from the other exercises in the program because of accumulated fatigue.

CNS Fatigue is an ill-defined concept because there have been no overarching physiological explanations. It could be related to willpower, which is a finite resource. It may even be related to neurotransmitter depletion. For example, we know that taking tests for six hours a day is mentally draining and exhausting. The same is potentially true of extremely intense exercise that activates and fatigues large portions of the brain that is involved in performing movement. We know that high-level powerlifters cannot perform heavy deadlifts multiple times a week. High-level sprinters cannot sprint at full intensity multiple times a week. No high-level athlete can give 100% the majority of the time while training. This is why their routines are constructed to peak during competitions.

As more research continues, it is safe to expect the mechanisms to be further clarified. In the meantime, you should take them with a grain of salt, knowing there is still some uncertainty to what CNS Fatigue actually entails—whether it is neurotransmitters, cytokines, or other factors. Despite the lack of science, good conclusions can still be drawn based on what works in practice.

In bodyweight training, this is analogous to working with supramaximal eccentrics and isometrics. Eccentrics refer to the component of an exercise where the muscles are lengthening, and *isometrics* are exercises where the body is held in one position—without movement—while exerting strength. The *supramaximal component* means that these exercises are too difficult for one to perform compared to a typical repetition. For example, if an athlete is too weak to perform a pull-up for a full repetition they may train utilizing eccentrics by jumping up to the bar and lowering down slowly. Likewise, isometrics may be used in any weak point of the exercise, such as holding the position at the top of the bar (if that is a weak point). All of these tend to fatigue the body more than typical concentric repetitions. Thus, when working with many of these types of exercises each week—or even in a single session—one has to be aware that a plateau in progress may indicate that the best way to achieve progress may be more rest instead of more exercise, which is contrary to what beginners often think when they begin working out.

Later on in this book we will explore constructing programs and how to build in deload periods every four to eight weeks so that you can fully recover from fatigue. These deload periods will double as rest periods, which will allow connective tissues (tendons, ligaments, etc.) some time to heal, as they are typically the first types of tissues to be affected by overuse. When you begin working toward advanced bodyweight movements, two of the most important factors you will need to take into account will be fatigue recovery and connective tissue recovery.

MECHANISMS OF HYPERTROPHY

In the human body, there are three different primary pathways that lead to hypertrophy. The first is mechanical tension. The second is eccentric damage via the popping sarcomere theory and microtrauma. The third is metabolic accumulation, local growth factors, hypoxia, and glycogen depletion based hypertrophy.

Mechanical Tension-based hypertrophy tends to be activated via high intensity exercises like heavy weights and fast movements. This is sometimes referred to as HTMU or fast-twitch fatigue hypertrophy. When there is enough high-intensity mechanical tension on the muscles, the body adds muscle mass in order to compensate. The opposite of this can be seen in the case of a broken bone in a cast: non-movement and non-loading of the nervous system and associated muscle leads to rapid atrophy.

Eccentric Damage **and** ***Microtrauma***. The intensity of an exercise is heavy enough to create damage to the muscles, but also light enough to perform for enough repetitions to create the damage. The accumulation of repetitions at a certain weight takes a certain amount of time to perform. Many trainers have specified this type of hypertrophy stimulus as *time under tension*—the total amount of time that the muscle needs to be under to adapt by hypertrophy. This is what we discuss as an overall factor for hypertrophy when we talk about "volume" of the total exercises, sets, and repetitions for a particular muscle group.

The damage sets various physiological processes in motion, including satellite cell donation and repair. Satellite cells can be thought of as "muscle stem cells," which can fuse with damaged muscles in order to help them repair. These are also what contribute to "muscle memory," where an athlete makes a comeback after taking several years off from training. When they begin training again, they rapidly regain the muscles acquired during their previous period of training. The science behind this shows that the muscles still contain previously fused satellite cells nuclei that aid in rapidly producing the contractile components of the muscle cells again.

Metabolite Accumulation, Local Growth Factors, Hypoxia, **and the like.** This can be thought of as low-intensity exercise with high amount of repetitions and volume. An example of this type of hypertrophy would be sports that have long, sustained endurance intensity with speed components. For example, cyclists have large quadriceps and rowers have large backs. Another example would be manual labor where one performs a large quantity of light lifting that adds up over the course of a day to create a hypertrophy stimulus. People who work with hammers or plumbers who work with pipes tend to have massive forearms due to low-intensity work they perform consistently over a long period of time.

There are some big misconceptions when it comes to hypertrophy. Specifically, one of the big myths that pervaded the bodybuilding and athletic community for decades is that there was a distinction in the types of hypertrophy that you could build, namely *sarcoplasmic* and *myofibrillar* hypertrophy. *Sarcoplasmic hypertrophy* was thought to occur through utilizing higher repetition ranges such as 8-20 repetitions per set to failure. The specific mechanism of adaptation for this hypertrophy was the metabolic accumulation in the muscle cells. This was exemplified by bodybuilders who tended to have large, but less dense muscles. Conversely, *myofibrillar hypertrophy* was thought to occur through utilizing lower repetitions (such as 1-8) and working more toward strength. The specific mechanism of adaptation for this hypertrophy was the increased accumulation of myofibrillar components of the muscles (such as actin and myosin), which are utilized by the muscles to contract. This was exemplified by strength athletes with muscles that appeared to be very dense, such as olympic weightlifters and gymnasts.

If you are an avid member of the fitness community, you may know that recent research has shown myofibrillar and sarcoplasmic hypertrophy are likely to be a misnomer. There is little if any distinction between them. The main difference would be the strength from those who train with higher repetition ranges and those who train with lower repetition ranges. Likewise, muscle biopsies of the different athletes show that the cellular components of muscle cells will increase proportionally, even in different types of training. Thus, the differences in appearance could be caused by one's hydration level, amount of subcutaneous body fat, intramuscular fat accumulation, or similar factors. For instance, when bodybuilders cut down their body fat for their shows, they certainly have a very dense muscular look, like strength athletes. This is useful information for us because it tells us that the body responds to stress by adding muscle, which can be used effectively regardless of how it was obtained.

One must still consider the importance of the divergent nature of training utilized by strength athletes and those who want to maximize hypertrophy. This involves changing up the programming in regard to frequency of exercise and progressive overload on the muscles. Generally, as you become more experienced, your exercises become more intense. Thus, you may have to increase or decrease frequency based on the particular discipline that you are involved in and the type of practice. In the case of gymnasts, this may be training multiple sessions a day for six or perhaps even seven days per week. However, much of this will be skill work rather than strength work. You may experience positive gains in strength because strength is also a skill. Alternatively, if your goal is maximal hypertrophy, you may want to utilize split routines that put high amounts of volume onto the muscles, thus forcing them to adapt.

Eccentrics and isometrics are of particular importance when discussing bodyweight programming. An example of isometric exercises are the back lever, front lever, and planches. An example of eccentric exercises would be slowly lowering from the top of a pull-up or starting in the top position of a dip and slowly going down. Isometrics are particularly interesting because they branch over multiple pathways toward hypertrophy. In fact, many methods of exercise combine one or two of the different pathways we have discussed. Isometrics are biased toward mechanical tension and metabolic adaptations, while eccentrics are biased toward mechanical tension and eccentric damage hypertrophy the most.

Studies indicate that isometrics and eccentrics tend to recruit HTMUs right off the bat to sustain their contractions. This makes sense, as they are very difficult movements. The irony of eccentrics is that the studies on eccentric training seem to indicate that one-second eccentric movements are better at stimulating hypertrophy and strength adaptations than longer eccentrics, such as six seconds. This means that fast eccentrics preferentially activate the HTMUs, which have the greatest potential for power, strength, and hypertrophy. This understanding is accentuated by one's understanding of physiology. In longer eccentrics, the occluded blood flow to the muscle and greater time under tension also means they are biasing toward metabolic slow twitch adaptations. Likewise, isometric holds that are too short will not give one enough volume to force adaptations. However, isometrics held too long may bias one's adaptations toward higher levels of endurance. What this means for training is that one needs to perform their isometrics in the "sweet spot" ranges in order to maximize strength and hypertrophy benefits. This will be explored at length in later chapters on routine construction.

As research continues these mechanisms without a doubt will be further clarified; so one should take them with a grain of salt. There is still some uncertainty surrounding the factors that lead to muscular hypertrophy.

Here is one of the primary concepts for you to take away from this section: While it is important to know that certain adaptations and differences in hypertrophy mechanisms may occur, there is really no such thing as unwanted hypertrophy—unless it makes one too heavy for their sport or weight class.

The second primary concept you should take away from this section is the fact that overall volume in the context of frequency means the most in regard to hypertrophy. The volume of the exercise on particular muscles must exceed a certain threshold for hypertrophy, which in effect will increase as your muscles get bigger. This is easily seen in the difference between beginners and bodybuilders. Beginners can have significant hypertrophy with relatively few exercises while bodybuilders have tons of volume in their routines. Likewise, frequency plays a role as there are many occupations—such as in construction and furniture movers—where one's work is their only "workout" for the day, but their body will add hypertrophy in response to the muscle stress that comes from repeatedly moving heavy objects.

The concept of ensuring enough volume for hypertrophy in your exercise routine will also be explored as you learn to construct your own custom routine. We will outline some simple concepts on how to work with certain repetition ranges and sets to obtain the right amount of volume. This is why there is no discussion specifically on the "best" repetition ranges in this section, though generally 5-15 repetitions tend to give beginners an adequate amount of volume to achieve hypertrophy.

If you are interested in studying this topic further, Brad Schoenfeld and Mike Zourdos have published some excellent research on hypertrophy and overall volume.

OPEN AND CLOSED CHAIN EXERCISES

Open Kinetic Chain (OKC) exercises are performed in a manner that leaves one's limbs free to move. These exercises involve movements of the limbs in space, weighted or unweighted. The weighted versions of these are isolation exercises (such as leg extensions and hamstring curls on machines). Some examples of OKC upper-body movements are biceps curls and triceps extensions.

Closed Kinetic Chain (CKC) exercises are performed in a manner where one's limbs are not free to move. Typically, these movements are performed with barbells or bodyweight. Weighted versions of these exercises include squats, deadlifts, and the Olympic lifts, where one's feet are fixed against the ground and the body is moved against it. Likewise, almost all bodyweight movements are closed chain—the hands or feet are fixed against the ground or other implements. Single leg squats, dips, pull-ups, pushups, and handstand pushups, are all performed with one's hands fixed against the ground, bars, or rings.

Bench and press are barbell exercises that are stabilized in space; this represents somewhat of a hybrid between OKC and CKC exercises, as you stabilize the weight (like many OKC exercises) but your hands are fixed while doing so (like CKC exercises). When you take a look at the strength difference between semi-OKC exercises—such as the press/military press—and a pure CKC exercise—such as the handstand pushup—you will see that the CKC exercise tends to be stronger than the semi-OKC exercise. For example, if you subtract the arm weight from the handstand pushups, you will likely find that you can perform more handstand pushups comparable to the weight you can press. This is likely due to internal factors that result from co-contraction and increases in kinesthetic feedback to the body.

The main thing to keep in mind is that CKC exercises are more applicable for building strength in the upper body. However, it is more difficult to track your progress as it is not easy to reliably measure incremental improvements like adding weights to a barbell. If your goal is hypertrophy, CKC and semi-CKC exercises typically work best. These could include compound barbell exercises (squat, deadlift, bench press, etc.). One interesting phenomena is that the overhead barbell press tends to be a better muscle mass builder than the handstand pushup, which requires significantly more body stabilization, thus limiting the amount of force that can be used in performing the movement. This slightly decreases the amount of hypertrophy gained from the movement due to less mechanical tension.

If your ultimate goal is purely hypertrophy, it is generally a good idea to perform primarily barbell-type exercises. This is not to say you cannot gain an impressive physique with bodyweight exercises, it will just take longer.

For rehabilitation, you will primarily use OKC exercises because they allow you to easily isolate specific weaknesses, target specific structures that need to be strengthened, or improve certain movement patterns. The goal of therapy is to work your way back to gross motor CKC movements. For example, if you are undergoing therapy for an ankle sprain, you will begin by performing mostly OKC exercises, which will help strengthen the muscles in the leg and prevent them from atrophying. However, as you improve range of motion, strength, and other factors you will begin performing more gross movement patterns—such as squats and standing drills—to strengthen the ankle so it can perform athletic movements again. Likewise, with something like elbow tendonitis, you would begin with isolation exercises to rehabilitate the injured area and eventually progress to function-based movement such as pull-ups or other compound exercises. We will discuss this more in the injury sections of this book.

To summarize, closed chain exercises emphasize stabilization in the core and extremities because body position plays a role in its interaction with the ground, parallettes, or rings. This means that bodyweight exercises tend to rely more on progressions rather than adding weight. They work extremely well in the development of strength, proprioception, and kinesthetic awareness. When you can add weight to them—such as with a weighted vest—it makes progressions much easier to handle. The benefit of performing more open kinetic chain exercises is that they can be regulated easier with weights. This is especially true if you have an injury or weakness that may benefit from exercise that is focused on certain muscles, tendons, or other structures.

All these movements are useful in their unique contexts. If you are reading this book you probably have an interest in bodyweight strength, including the various isometric hold positions that gymnastics is known for. Additionally, most people have some aesthetic goals, such as looking good naked. If these are your goals, this book is a good fit for you.

CHAPTER 2 SUMMARY

PHYSIOLOGY OF STRENGTH AND HYPERTROPHY

Knowledge Base

- Strength = Neural adaptations * Muscle cross sectional area.
- Neural adaptations are enhanced when working with the intensity of exercises. These include increased neurological efficiency in motor recruitment, rate coding, synchronization, contribution, reciprocal inhibition, and growth and pruning.
- Muscle cross sectional area is the increase in muscle hypertrophy (muscle growth).
- If your goal is strength *and* hypertrophy, you will want to execute movements as explosively as possible with good technique. This will help recruit and stimulate the HTMUs, which are composed of fast-twitch fibers that carry the greatest potential for strength and hypertrophy.
- Practice does not make perfect; *perfect* practice makes perfect.
- Work capacity is naturally increased as you train. You can think of it as building a larger sized pool to replace a smaller pool. Thus, training and recovery are equally important as training takes away water from the pool and recovery expands the pool and puts water back into it. Training programs should include planned deloads to allow for proper recovery.
- Eccentrics and isometrics can be used extremely effectively in a training program, but they should not make up the majority of your program because they are extremely taxing on the central nervous system.
- Hypertrophy tends to occur through three mechanisms: mechanical tension, eccentric damage and microtrauma, and local metabolic and hypoxic factors.
- There is no such thing as myofibrillar or sacroplasmic hypertrophy, just hypertrophy.
- Beginners tend to do best with a 5-15 repetition range. For maximal hypertrophy, you will want to work in the 5-20 range and even outside of it, with all sorts of different modifications to your program.
- CKC movements are typically better for generating strength and muscle mass. Specifically, CKC bodyweight movements are better at generating strength, while CKC barbell exercises are better at generating hypertrophy. They do overlap some.
- OKC exercises are good for targeting specific weaknesses or rehabilitating injuries.

Application

It is important to know how the physiological concepts play a role in constructing a workout routine. These will be helpful once you start implementing your routine, because you will be able to use your knowledge of body physiology to problem-solve your routine on your own. For example, if your goal is maximum hypertrophy, you will want to alter the tempo, rest times, exercises, and other factors in your routine to ensure that you continually progress. In the following quote, consider "knowing yourself" to be your body's physiology and your workout routine to be your enemy.

If you know the enemy and know yourself, you need not fear the result of a hundred battles.
If you know yourself but not the enemy, for every victory gained you will also suffer a defeat.
If you know neither the enemy nor yourself, you will succumb in every battle.
~ Sun Tzu

- CHAPTER 3 -

PROGRESSION CHARTS AND GOAL SETTING

Now that we have learned how bodyweight exercise and the concepts that underlie strength and hypertrophy work, let us start putting together pieces that will help us properly construct a routine toward specific goals. If you already have goals, excellent—we will work to construct a routine toward them. If you do not yet have goals, this chapter will help you figure out what you want to achieve and how to construct a routine focusing on relevant goals.

PROGRESSION CHARTS AND HOW TO USE THEM

Information on bodyweight training can be found scattered throughout the Internet. Fortunately, there are now some resources available on many of the progressions used in training, though there is virtually no way to ascertain levels of skill and strength progression. That is why this book includes some strength and progression charts that will hopefully change the way you think about bodyweight exercises. These "skill and strength progression charts" are much like the "skill charts" that you would see in a Role Playing Game (RPG). You level your character by training and then using your "skill points" to raise various stats and abilities. This is similar to the bodyweight skill and strength progressions.

In bodyweight strength training, there is a wide range of pulling, pressing, isometric strength elements, and handstands that can be learned. Each of these require specific training and much effort to effectively learn them. Like with RPG's, once you learn a skill or attack there are certain new progressions that are available for you to start learning. One of the great qualities about training is, like RPG's, there is often some overlap in the qualities. For example, if you put a lot of training energy into handstands and handstand pushups, there will also be carryover to strength in other pressing movements like pushups or dips. Like an RPG, various skills draw from multiple attributes at once.

The one thing that is novel about the charts in this book is that many of the elements are based on the Federation International of Gymnastics (FIG) level of difficulty for skills. In the code of points (COP), there is a difficulty scale that ranks from A to G, from easiest to hardest, respectively. FIG regulates the COP and standardizes the basic difficulty level of all gymnastics movements allowed on each apparatus—swinging, strength, and dismount elements. This book will not discuss the merits of swinging elements or dismounts, but it will focus on the various technical and strength progressions that are used by bodyweight practitioners to develop insane amounts of strength, flexibility, and a muscular physique.

The goal here is to categorize and give you an idea of the difficulty level of each bodyweight strength progression. Therefore, you will have a much easier time of choosing particular skill sets and chaining progressions together. The charts provided offer an approximate knowledge of where each skill and strength elements lie on the continuum. The charts are broken down into four specific categories—Basic Skills, A-level Skills, B-level Skills, and C-level skills. Each of these skill levels has four subcategories with the difficulty of the exercises increasing from level to level.

The ability to progress consistently is the focus of any sport and any weight lifting program. The same is true for gymnastics and bodyweight strength training. This is worth the repetition because we can learn from this concept that gymnastics and bodyweight training are not so different from other sports and barbell training. As you look at the charts and track your abilities it may be noted that you are advanced in one area or lagging in another. This is common. We each have our own strengths and weaknesses depending on our genetics, limb lengths, training schedules, sleep schedules, nutritional factors, stress levels, and similar factors.

It is more beneficial to focus on weaknesses and bringing deficient skills and strength progressions up to the level of your more advanced abilities. Shoring up your weaknesses will keep you healthier than if you solely pursue one set of strength or skill progressions. This is especially important if there is a vast difference in pulling versus pushing or a lack of development, especially in regards to the L-sit, V-sit, and manna progression. For instance, even if your goal is planche alone and you do not care about front lever, back lever, manna, and other exercises, you still have to build strength in your posterior shoulder in order to attain the necessary muscle mass and strength to achieve the planche progressions. Subsequently, it is necessary to work to shore up your weaknesses as much as possible. This will allow you to facilitate optimal progress and prevent injury.

Making a copy of these exercise charts is strongly recommended because it will be awkward to continually flip back to the exercise section located at the end of the book. These copies will be a good comparison to mark down your goals, cross off exercises as you complete them, and track your progress. If you are unable to make copies of the charts, they are available on the *Eat. Move. Improve.* website at eatmoveimprove.com.

While those who have been in the gymnastics and bodyweight strength communities for some time may know the common abbreviations and technical terms of the skill and strength progressions on this chart fairly well, many of you will have to refer to the chart and then look at the progression to see what they are. There is an abbreviation list at the beginning of Chapter 23.

THE LEVEL SYSTEM

The charts are categorized in sixteen different levels of strength and skills. When you look at each of the levels, they show a similar level of ability horizontally. Each of these sixteen levels are divided into four groups of four. As you can see from the left hand side, each quartile is categorized into the four categories I mentioned previously—Basic Skills, A-level Skills, B-level Skills, and C-level skills; each broken down into four distinct categories of programming based primarily on athletic skill standards.

- Beginner: Levels 1-5
- Intermediate: Levels 6-9
- Advanced: Levels 10-13
- Elite: Levels 14-16

It should be noted that some of the movements considered here as advanced—such as the iron cross, full planche, and other isometrics—are actually considered to be intermediate level moves in gymnastics. The concepts for attaining strength, in themselves, are the same. Gymnastics coaches will simply be taking their gymnasts past the abilities on these charts as they progress. There is a consistently higher level of volume of skill work in gymnastics, so that may take away from specific strength training. However, since gymnastics is a lifetime sport where the strongest gymnasts will have at least ten to fifteen years of training or more under their belt, this is fine. Your aim should be toward consistent progress based on the programming measures delineated in this book or other resources.

CLASSIFICATION OF DIFFERENCES IN THE LEVEL SYSTEM

What constitutes a *beginner* from an *intermediate* or *advanced* athlete? This is the first question we want to answer because it tells us how to implement programming for each of these various populations. The length of time spent training matters little when considering if someone is a beginner or a different skill level. For example, we all know people who have been hitting up the gym for several years, but rarely make any noticeable progress because their training is stagnated. Thus, length of time spent training plays almost no consideration in determining if an athlete is a beginner, intermediate, or beyond.

Instead, it is better to think of skill level in terms of ability level. How well can one perform a handstand? Can they execute a muscle-up or back lever with solid technique? Can they squat twice their bodyweight? The primary reason to use ability level as the basis for categorizing athletes is that it's a measurable standard. If you have the strength to execute a certain bodyweight or barbell movement then you have a proficiency to be able to exert force under control with your central nervous system (CNS), and you tend to have the physiological adaptations required to handle certain amounts of training.

Knowledge of overall ability level is important because the body will progress much faster at lower levels than it will if you already have higher levels of strength. Similarly, if you can execute a certain movement safely and effectively then your muscular and connective tissue strength will be built up to a certain level to handle a certain amount of training. These are important factors to know, as programming will differ between populations based on your strength level. Programming is formulating the knowledge you have on training to build yourself an effective exercise plan to progress in your abilities over a number of weeks or months.

The programming needs for the beginner are different than those with intermediate, advanced, or elite strength. The level of programming will vary between the levels of strength, because you cannot expect to train similarly to someone who is stronger or weaker than you.

For example, classic barbell beginner programs have a very basic level of complexity. They focus on the major compound lifts, such as the squat, deadlift, and bench press. This is ideal for those just starting out because they can progress very quickly, often from session to session. As you improve your abilities in strength and hypertrophy, it takes a progressively greater stress to cause similar adaptations to occur. Thus, the complexity of your programming must increase through changing the structure of the workouts to adjust intensity, volume, repetitions, and frequency. Depending on your individual training history, modifiable factors—such as stress, sleep, and nutrition—and unmodifiable factors—such as genetics and limb lengths—a training program may need to be specifically tailored from one individual to another, even if they are on the same strength level.

It's not necessarily the case that changes must be made when transitioning between levels, because everyone is different. However, training programs may need to be modified if your progress starts to plateau. There will always be those few who can ignore this because they are already strong. There will also be those who will have to start using more complex programming techniques before they transition from one level to the next.

The vast majority of beginner programs focus on full-body workouts performed three times per week. On the other hand, an Olympic weightlifter may visit the gym as often as three to five times in a single day, with only one or no days off each week. A gymnast training for the Olympics may be in the gym to practice movements forty hours per week, not including strength training performed on the side. Contrasting beginners and elite athletes is an obvious way to see the differences between those who have little exposure to training from those who have years of training experience. You would not want to throw a beginner into the volume of training that an elite gymnast performs, because the beginner would likely get injured within a few weeks.

It seems like common sense for most people, but often people who are sedentary come into the gym and attempt to learn everything at once. The Internet is full of videos of people trying to run, lift, and play a sport at the same time, after being sedentary for years. Their enthusiasm is to be commended, but it would be irresponsible to recommend large amounts of volume to them as they beginning their training as there is a much higher propensity for injury.

Action Steps for Untrained Beginners:

- Introduce fundamental exercises and become proficient in them.
- Utilize higher repetitions to solidify movement patterns and build connective tissue strength.
- Focus heavily on individual weaknesses. For example, a desk job often creates or perpetuates poor posture or alignment that can increase risk of injury if not addressed. Similarly, a sedentary lifestyle tends to create or perpetuate poor mobility and flexibility, which may need to be directly addressed with additional effort focused on those attributes.
- Begin a generalized, balanced routine that starts with high repetitions and then transitions to traditional strength training.

Action Steps for Trained Beginners:

- Emphasize consistency in training. Discipline is the most important factor in making progress. Skipping workouts is bad, unless you are facing an overuse injuries or there is a personal emergency. There is merit to the common saying, "*The best program is the one you stick to.*"
- Place an emphasis on training in the five to fifteen repetition range, in order to ensure good muscular development and strength.
- Keep your routine balanced in terms of pushing and pulling exercises.
- Add in exercises to maintain structural balance if imbalances start to develop. Typically, this will mean something like adding more horizontal pulling if you trained in mostly pushing exercises before beginning bodyweight training. Pull heavy sports such as climbing may require additional pushing exercises.
- Allow your body to adapt to strength training, especially in the connective tissues and underlying structures, such as bones and joints.

Action Steps for Intermediate:

As you move into the intermediate range, your training needs will begin to diversify based on your goals. Because your needs will become more specific, a full-body routine will be less effective. Training will need to become more specific in nearly every area, including skill work, sport-specific skills, flexibility, mobility, prehabilitation, and rehabilitation. Ask yourself if the primary reason for your training is strength, endurance, or hypertrophy and tailor your workout accordingly. Here are a few examples:

- Strength – increase the amount of frequency as much as possible without overtraining or developing overuse injuries. Endurance – start to work strength at lower volumes in order to keep efficiency of exercises high and work the specific endurance exercises with high repetitions. Hypertrophy – start splitting from a full-body routine into various splits. This will be addressed in Chapter 5.
- Adapting frequency, volume, and intensity of training in order to maintain progress must occur at the intermediate range. Also learn to use more complex training programming.

Action Steps for Advanced:

- Training becomes even more specific and geared toward your sport or primary reason for training.
- Shoring up weak links becomes vastly more important if you desire to progress in your training. For example, when training with one-arm pull-ups, the back tends to be much stronger than the arms, due to the amounts of straight-arm work done in gymnastics. In this situation, bicep curls or other bicep exercises may be useful in addressing the weak link, which will improve strength overall. Likewise, the same is true for barbell lifts such as the deadlift, which uses the legs, hips, and back extensively. Many people who are posterior chain dominant will have a weak link in the back or quads. In this case, specific isolation work may be effective.
- While sleep, nutrition, and eliminating stress are important for beginners and intermediates, dialing in further in these areas will help increase progress vastly. Even small improvements will add up when improving strength and/or muscle mass starts to become notably difficult.
- Understanding how your body responds to training is important. In this stage, keeping a training log can be quite beneficial because you can review how your body responds to certain rests, deloads, and intensity/volume of exercises. This makes planning your weekly workout routines much easier.

These are some of the main ideas that you want to keep in mind as you progress with your training, in order to ensure that there is always a purpose for your training beyond your goals. This is especially true for trainers coaching multiple athletes. When training, it is easy to get sidetracked into minutia, and the experience of a veteran coach can help cut through the things that matter less in the big picture of training. Your emphasis should be on the things that will maximize your improvement (or the improvement of the athletes you are coaching), while staying injury-free and on track to reach your goals.

Let us check out the charts and then move on to setting and achieving goals.

SETTING AND ACHIEVING GOALS

The first step you want to take with goals is to select a direction for your training—for strength, endurance, hypertrophy, or other attributes. Let us recall some basic facts. The repetition continuum has strength on

one end and endurance on the other, and you cannot optimally train strength and endurance at the same time. Since this book is based on strength progressions, the assumption is that you are training for strength. However, we will first look at a couple of other points in regards to endurance and training.

If training for bodyweight endurance, you would focus primarily on increasing the repetitions or density/volume of work in a set amount of time, which would be consistent with your goals. It is not recommended that you train for both strength and endurance simultaneously. However, for some athletes it is necessary for their sport or other competitions. In these cases, setting both strength and endurance goals can be helpful. You should recognize that strength goals tend to include movements with high weight or difficult progressions and low repetitions. Endurance exercises, on other hand, will tend to include movements with low weight and high repetitions, which results in a "burning" feeling in your muscles.

SELECTING GOALS

A frequent problem for those who want to workout either do not know how to set goals or simply do not care about setting goals. This is a mistake. Goals are an integral component of an effective program, as they give guidance in structuring a workout plan. Sure, one can make progress without goals, but by setting high quality goals your performance increases will skyrocket.

Goals are commonly defined as"the end toward which effort is directed." Within the context of training, *high quality* goals are tangible feats that can be measured by numbers. Here are some examples of high quality goals:

1. Perform 10 dips on parallel bars with good form.
2. Run 400 meters in 60 seconds.
3. Reduce body fat to 15%.
4. Put on 10 pounds of muscle.
5. Lose 10 pounds of fat.

When most people set their goals for the first time it is common to see very low quality goals. Low quality goals are ill-defined and/or not based on numbers that can be accomplished. Here are some examples of low quality goals:

1. Improve on dips.
2. Run without getting winded.
3. Lose weight.
4. Gain muscle mass.
5. Get fit.

As previously stated, routines are constructed around high quality goals. If you have a goal to perform ten dips, it is logical that you need to first build up the capacity to perform a single dip, then two dips, then three dips, and so on until you meet your goal. Another way to understand how to set high quality goals is to utilize the SMART model of goal-setting:

- Specific
- Measurable

- Action-Oriented
- Realistic
- Time-Bound

You will want to make sure your goals are in line with your overarching objective. Let us use John and Alice as examples. John wants to "get stronger," but has set a goal of 150 pushups in a single set. This is somewhat lackluster since 150 pushups in a row is a feat of endurance, not a feat of strength. In another example, Alice wants to "have great handstands," so a goal of performing thirty pull-ups will not actually move her closer to her goal.

To ensure that your SMART goals are in line with your overarching objectives, break down your desired movements into separate, distinct components. Going back to John, he may want to consider pursuing high-strength gymnastics techniques like the planche or perhaps set a goal of performing a squat with two times his body weight on his back. Alice, by contrast, may want to break down the handstand into two separate SMART goals of holding a handstand for two minutes against the wall and performing a thirty-second free-standing handstand.

One caveat is that many athletes feel they can improve their performance by sticking to low-intensity bodyweight exercises. An example of this is John's initial goal; he wants to "get strong" by doing 150 pushups in a single set. Let us be clear, though, performing 150 pushups in a row does not mean you are strong, it simply means you have good endurance at performing pushups. If you wish to gain strength through bodyweight training, you must get creative and broaden your horizons. If you are serious about increasing endurance, it is much easier to see endurance gains when you are already strong and powerful.

A lack of strength will always limit you in other domains—technique, endurance, skill, balance, flexibility—both active and passive—agility, coordination, etc. You must be strong in order to excel in all of these other domains. The converse is typically not true. It is important to keep this in mind as you set your goals.

One last thing to discuss is unrealistic goals. It is easy to say "I want to be able to do one pull-up" because with enough training it is relatively easy to perform one pull-up. However, people also set goals where they state that they want to be able to do ten planche pushups. Since the planche is a difficult movement in the advanced strength range, it is an unrealistic goal to be able to perform ten of those. It is comparable to wanting to be able to perform ten repetitions of a 500-lb. bench press. You can say you want to do it, but it is not realistic for the vast majority of people. Achieving basic competency in any advanced or elite movement will likely require years of work. This is not to discourage you, but to encourage you to set reasonable goals that you can actually attain. Accomplishing your goals is a great feeling that will give you momentum as you set new ones. If you never reach them, then it can be a net detractor from training.

GOALS AND EXERCISE SELECTION

First, it is important to categorize goals based on how many you can work at a time. In general, you will want one to two goals from each category for skill, pushing, pulling, legs, core, and flexibility. For the most part, the only skill goals we will discuss in this book, aside from sport-specific technique, will be handstands. Pushing is straightforward: pushup variations, dip variations, handstand pushup variations, and planche. Pulling is straightforward: back lever, front lever, iron cross, pull-up variations and row variations. Legs are also straightforward, as are core and flexibility.

You may have multiple goals from a single category. For example, from the pull category you may want to obtain: back lever, front lever, iron cross, pull-ups with +100% bodyweight, and front lever rows. That is too many goals to work on simultaneously. You will also be unable to work them optimally. Thus, choose one or two goals from each category to train toward first.

There are some caveats with bodyweight training that require coaching in order to make good progress or avoid injuries. For example, for connective tissue integrity, it is generally best to work toward back lever before working toward front lever. It is also best to work both of those levers before you work one-arm chin-ups or iron cross. Hence, there is some "ordering" that you may have to do given each of these movements. In the exercise section, there are descriptions of useful goal progressions. Most of the time, this recommendation is for training of the connective tissue sequentially so that you do not jump into something exceptionally difficult and injure yourself. However, you may decide to bypass these recommendations at your own risk.

Once you have chosen one or two goals to focus on, exercise selection is simple when you utilize the progression charts. As you look at the exercise technique section, you can see that there are progressions to help you advance toward your goals. You will base your primary movements on working up the line of progressions toward your desired skills. Do not over think this. For example, if your ultimate goal is a planche pushup, but you cannot yet perform it, you should consult the charts for the planche pushup progression you can perform. If you can perform tuck planche progression pushup, then put it in your routine!

If you cannot work any of the exercises in your chosen progression, then work a similar exercise progression until you have enough strength to switch over to your progression of choice. For example, if your goal is planche pushups and you cannot perform the tuck planche progression, start with the pushup progression. Planche pushups are a horizontal pushing exercise, and the pushup progression is also a horizontal pushing exercise. Therefore, there is a solid amount of carryover strength from the pushing progression as you become stronger and more muscular. Progressing with the pushup progression will enable you to gain the strength needed to start working the planche pushup progression.

It is easy to select goals from the charts for your exercise routine. Overthinking it only leads to more confusion. Select an exercise you can perform in your goal progression, or select a similar movement exercise in the same category. For pushing this may be vertical or horizontal pushing. For pulling that may be vertical or horizontal pulling.

Hold on to all of these goals and exercises. In the next few chapters you will learn to consolidate them into a routine.

COMMITMENT TO ACHIEVEMENT

Set your goals on paper. Declaring your goals in this manner is an act of commitment. Psychologically, you are more likely to follow through on things to which you have committed. This concept is well-proven through psychological research, and has been used by sales teams for decades.

The Harvard Business School Class of 1963 compiled a book of advice on careers, finance, and life. Lifetime secretary Artie Buerk contributed a great piece on setting goals: *Several years ago, a graduating class from a large, well-known business school was asked whether they had written goals, unwritten goals, or no goals. It*

turned out that 3 percent of the class had written goals, 13 percent had goals they had not written down, and 84 percent had no goals. At the 10th reunion, the class was asked again about their goals and accomplishments. The results showed that the 3 percent who had written goals did 10 times as well as the others, and the 13 percent who had unwritten goals did twice as well as the other 84 percent.

While it is better to *have* goals than not have any at all, you will be infinitely more successful if you write these goals down. Once written down, look at them regularly and work toward them. Checking things off of a physical list is powerful positive reinforcement that will give your training *drive*.

It cannot be emphasized enough: keep your goals written in a training journal. This can be a physical notebook or on your computer. Either will elevate progress. You may want to keep your log in front of you—by the fridge, near your computer, or minimized on your desktop so you see it throughout your day. If you forget to do your workout, this will be a reminder to get it in before you eat dinner or get sucked into wasting time online. Making your workout routine a habit can be quite difficult, but these methods make it easier. Once you find your groove, the benefits will be undeniable. Success is built through discipline, and discipline is built through tangible work, and tangible work starts with writing down your goals on paper.

STOP READING. TAKE ACTION.

1. Grab four or five sheets of blank paper. We are going to walk through the process of building a series of goals and constructing them into a well-developed exercise routine.
2. Write down all of the goals you want to accomplish in regards to bodyweight training. If you do not know what type of goals you want to accomplish, take a look through the charts and the exercises section in the back of this book. It shows many of the different skills and exercise progressions that you can learn. That may help you decide what you want to accomplish.
3. Refine your goals and turn them into SMART goals.
4. Print out the progression charts in the middle of this chapter. Two copies will suffice.
5. Find the progressions on the chart for each of the goals you have. Make note of the progressions grouped to the right or left of your target goal. Skills that have good carryover are grouped close together. These can be supplements in progressions along with your primary exercises. You already have an idea of your capabilities. If you have a couple of highlighters, highlight where you want to be in one color, and your current abilities in another color across all of the charts. If you are unfamiliar with any of the exercises, refer to the exercise section at the back of the book.
6. These steps give you the baseline of where you are and where you want to be. We will use the exercises in-between to bridge the gap, which will be explored in the next section.

Handstand Chart – Muscles Emphasized: Anterior Deltoids, Traps, Triceps, Body + Core; L-sit to Manna Emphasizes Posterior Deltoids and Back											
Column #			1	2	3	4	5	6	7	8	9
Book Page #			318	336	341	349	352	353	360	369	379
	FIG	Level	Handstands	Rings HS	Handstand Pushups	Rings HSPU	Press	Press Handstands	Rings Press HS	Straight-Arm Press HS	L, Str-L, V, Manna
Beginner	Basic Skills	1	Wall HS		Pike HeSPU						Tuck L-Sit
		2	Wall HS		Box HeSPU		.3x BW				1 Leg Bent L-Sit
		3	Wall HS		Wall HeSPU Ecc		.43x BW				L-Sit
		4	Free HS		Wall HeSPU		.55x BW				Straddle L-Sit
	A-Level Skills	5	Free HS	R Shld Std	Wall HSPU		.68x BW	BA BB Press		Wall Str Press Ecc	RTO L-Sit
Intermediate		6	Different Progressions for One-Arm Handstand	R Strap HS	Free HeSPU		.8x BW	L-Sit BA BB Press	Chair Press	Ele Str Std Str Press	45 deg V-Sit
		7		R HS	Free HSPU	R Wide HSPU	.9x BW	CR SB Press	Chair Illusion	Str / Pike Std Press	75 deg V-Sit
		8				R Strap HSPU	1x BW	BA SB Press	R BA BB Press	L-Sit / Str-L Str Press	100 deg V-Sit
Advanced	B-Level Skills	9				R Free HSPU	1.08x BW	HS EL HS	R Dip to HS	L-Sit / Str-L Pike Press	120 deg V-Sit
		10	One-Arm HS				1.15x BW	PB Dip SB to HS	R BA SB Press	R SA L-Sit Str Press	140 deg V-Sit
		11					1.2x BW		R HS EL HS	R SA Str-L Str Press	155 deg V-Sit
		12							R Dip SB to HS	R SA Pike Press	170 deg V-Sit
Elite	C-Level Skills	13									Manna
		14									
		15									
		16									

Pulling Chart – Muscles Emphasized: Posterior Deltoids, Back and Scapular Muscles, Biceps, and Forearms. Chest depending on the progression.											
Column #			1	2	3	4	5	6	7	8	9
Book Page #			390	402	410	416	423	428	436	437	447
	FIG	Level	Back Lever	Front Lever	FL Rows	Rows	Pull-ups	R Pull-ups + OAC	Weighted Pull-Ups	Explosive Pull-ups	Iron Cross
Beginner	Basic Skills	1	German Hang			Row Ecc	Jump Pull-ups				Rec PRE-REQs in Gray
		2	Skin the Cat			Ring Rows	Bar Pull-up Ecc		Assisted Pull-ups	Kip Pull-ups	
		3	Tuck BL			Wide Rows	Bar Pull-ups		1x Bodyweight	Bar Pull-ups	
		4	Adv Tuck BL	Tuck FL		Archer Rows	L-Pull-ups	R L-Pull-ups	1.18x Bodyweight	Kip Clap Pull-ups	
Intermediate	A-Level Skills	5	Straddle BL	Adv Tuck FL	Tuck FL	Archer-in-Rows	Pullover	R Wide Pull-ups	1.35x Bodyweight	Non-Kip Clapping	
		6	Half Lay / 1 Leg BL	Straddle FL	Adv Tuck FL	Str OA Rows		R Wide L-Pull-ups	1.50x Bodyweight	L-Clap Pull-ups	
		7	Full BL	Half lay / 1 Leg FL	Adv Tuck RC	OA Rows		R Archer Pull-ups	1.65x Bodyweight	Kip BTB Clap	
		8	BL Pullout	Full FL	Straddle FL			OAC Eccentric	1.78x Bodyweight	L-Slap Abs	
Advanced	B-Level Skills	9	GH Pullout	FL to Inverted	Str FL RC			OAC	1.9x Bodyweight	L-Slap Thighs	Cross Progressions
		10	BA Pull-up to BL	Hang Pull to Inv	Full FL			OAC+15 lbs	2x Bodyweight	Reg Slap Thighs	Iron Cross Hold
		11	HS Lower to BL	Circle FL	FL RC			OAC+25 lbs	2.1x Bodyweight	Non-Kip BTB Clap	Cross to Back Lever
		12									
Elite	C-Level Skills	13									Iron Cross Pullouts
		14									Hang Pull to BL
		15									Butterfly Mount
		16									Sup to Hang to Cross

Pushing Chart – Muscles Emphasized: Anterior Deltoids, Chest, Scapular muscles, and Triceps. Some Back depending on the progression.											
Column #			1	2	3	4	5	6	7	8	9
Book Page #			457	472	478	483	485	499	505	512	521
	FIG	Level	PB/FL Planche	Rings Planche	PB/FL Planche PU	Rings PL Pushups	Pushups	One-Arm PU	Dips	Ring Dips	Weighted Dips
Beginner	Basic Skills	1					Regular Pushups		PB Jump Dips	Support Hold	
		2					Diamond Pushups		PB Dips Ecc	RTO Support	Assisted Dips
		3	Frog Stand				Ring Wide PU		PB Dips	R Dips Ecc	Dips
		4	SA Frog Stand	Frog Stand			Ring PU		L-Dips	R Dips	1.2x BW
	A-Level Skills	5	Tuck PL	SA Frog Stand			RTO Pushups	Elevated OA PU	45 Deg Dips	R L-Dips	1.38x BW
Intermediate		6	Adv Tuck PL	Tuck PL	Tuck PL PU		RTO Archer PU	Straddle OA PU		R Wide Dips	1.55x BW
		7					RTO 40 Deg PPPU	Rings Str OA PU		RTO 45 Deg Dips	1.7x BW
		8	Straddle PL	Adv Tuck PL	Adv Tuck PL PU	Tuck PL PU	RTO 60 Deg PPPU	SB OA PU	One-Arm Dips	RTO 75 Deg Dips	1.85x BW
Advanced	B-Level Skills	9	Half Lay / 1 Leg				RTO Maltese PU	Rings SB OA PU	One-Arm Dips	RTO 90 Deg Dips	2x BW
		10		Straddle PL	Straddle PL PU	Adv Tuck PL PU	Wall PPPU			RTO 90 + 30 Dips	2.13x BW
		11	Full PL				R Wall PPPU			RTO 90 + 50 Dips	2.25x BW
		12	SA Str PL to HS	Half Lay / 1 Leg	Half Lay / 1 Leg	Straddle PL PU	Wall Maltese PU			RTO 90 + 65 Dips	
	C-Level Skills	13					R Wall Maltese PU			RTO 90 + 75 Dips	
Elite		14	SA PL to HS	Full PL	Full PL PU	Half Lay / 1 Leg				RTO 90 + 82 Dips	
		15	SA SB to HS							RTO 90 + 86 Dips	
		16	SA PL to HS			Full PL PU				RTO 90 + 88 Dips	Maltese (L17)

Miscellaneous Chart – Push and Pull Combo: Muscle-ups, Elbow Levers, Flags; Core; Squat and Legs works the Quads, Glutes, and Hamstrings.										
Column #			1	2	3	4	5	6	7	8
Book Page #			523	539	543	545	549	551	560	569
	FIG	Level	Muscle-ups / Inv MUs	Elbow Levers	Flag	Ab Wheel	Rings Statics	Rings Kip Skills	Rings Felge Skills	Squats
Beginner	Basic Skills	1							(Forward = Fwd)	Parallel Squat
		2				25s Plank			(Backward = Bwd)	Full Squat
		3	MU Negatives			60s Plank				Side to Side Squat
		4	Kipping MU			1 Arm 1 Leg Plank				Pistol
	A-Level Skills	5	Muscle-ups	Two-Arm EL	Tuck Flag	Knees Ab Wheel	RTO L-Sit		Felge Fwd Tuck to Sup	1.2x BW Pistol
Intermediate		6	Wide / No FG MU	R Two-Arm EL	Adv Tuck Flag	Ab Wheel Ramp	RTO Str-L	Kip to Support	Felge Fwd Pike / Bwd Tuck	1.35x BW Pistol
		7	Strict Bar MU	OA Straddle EL	Straddle Flag	Ab Wheel Ecc	Back Lever	Back Kip to Sup	Felge Bwd Pike to Sup	1.5x BW Pistol
		8	SFL MU ATPL / L-Sit MU	OA SB EL	Full Flag	Full Ab Wheel	Front Lever			1.65x BW Pistol
	B-Level Skills	9	OA Straight MU			Ab Wheel + 20 lbs	R 90 Deg V-Sit	SA Kip to L-Sit		1.8x BW Pistol
Advanced		10	Felge Bwd SB to Sup			OA Ab Wheel	Cross / Str PL	SA Back Kip to Sup	Felge Fwd SB to Sup	1.9x BW Pistol
		11	FL MU Str PL					Back Kip to HS	Felge Bwd SB to Sup	2x BW Pistol
		12	Felge Bwd SB to HS						Felge Bwd SB to HS	
	C-Level Skills	13						SA Kip to V-Sit/Cross	Felge Fwd SA to Cross	
Elite		14	SB Rotation to HS				Full Planche	Back Kip to Cross	Felge Fwd SA to Str PL	
		15	Butterfly Mount					Back Kip to Str PL	Felge Fwd SA SB to HS	
		16	(L17) Elevator				Inv Cross			

CHAPTER 3 SUMMARY

PROGRESSION CHARTS AND GOAL SETTING

Knowledge Base

You may want to print out the exercise progression charts or obtain them off the Eat. Move. Improve. website so you can follow along without turning back to this chapter as you read through the rest of the book. These charts have many benefits:

- They show the relationships between balanced levels of skill work and strength;
- Give different progressions and prerequisites on how to progress toward your goals;
- Illustrate the breadth of skill and strength training beyond just the common goals of the common isometrics—back lever, front lever, planche, and cross.

The programming needs of the various populations will differ depending on whether you are a beginner, intermediate, advanced, or elite. The difference in concepts will vary between these populations, so this must be taken into account when building a workout routine based on your goals. It is also an important idea to consider if you are plateauing.

Goals should follow a progression. You want your goals to be both quantitative and qualitative. They should focus on your overarching aim: development of strength. Make a commitment to achieve these goals no matter what. Write them down and keep them in front of you, so that you will continually think about achieving them. Also keep a workout log, which is invaluable when you desire to look back and see how far you've progressed toward your fitness goals, as well as discovering what works well for you and what doesn't.

When setting goals utilize the SMART model:

- **S**pecific
- **M**easurable
- **A**ction-Oriented
- **R**ealistic
- **T**ime-Bound

Application

Perform all of the steps in the stop sections prior to the end of this chapter. Write down all of your goals and categorize them respectively. You will use these in the next section of this book as you form a workout routine.

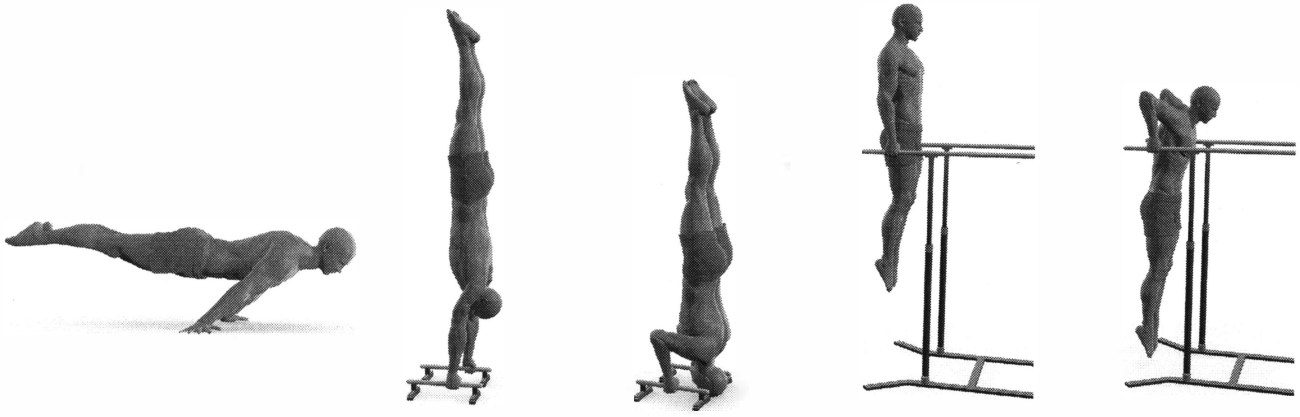
- CHAPTER 4 -

STRUCTURAL BALANCE CONSIDERATIONS

OVERVIEW OF SHOULDER HEALTH

Before you consider selecting exercises to form into a routine that compliments your goals, it is important to consider how certain exercises will affect your body. The most absurd example, of course, is when we look into a typical commercial gym, where you will see many guys performing exercises focused on increasing the aesthetics of their "beach muscles." The exercises that are most often abused are the bench press and bicep curls. Since this focuses only on the muscles in the front of the body, it may lead to imbalances, which can cause frustration, pain, and injury.

A similar experience from my own training stimulated me into thinking about the issue of structural balance. Back in college, I was training using many pushing exercises, such as planche, dips, and handstand pushups, with only a negligible amount of pulling exercises, such as pull-ups. This caused me to develop pain in the front portion of my shoulder, and also provoked my interest in physical therapy and injury prevention. After researching my injury, I saw that there were errors in my training, which I corrected by over exaggeration of pulling exercises and other rehabilitative work until my shoulders were healthy. As such, this has always been at the forefront of my mind in my own training and in those I coach. I have been informed that there are many other coaches, such as Charles Poliquin, that have talked extensively about this topic, but I am going to share my unique approach to it. If you are interested in some of the other approaches to structural balance, I would encourage you to do your own research.



The shoulder is unique because the small surface area of the joint allows for more range of motion than any other joint in the body. This means it has the capacity for the greatest amount of movement in all directions. However, the small amount of joint contact space also means that any sort of imbalance puts the shoulder at risk for pain and injuries. Thus, it is extremely important to build a routine focused on optimal, balanced shoulder health. After all, how can you train effectively if you are in pain or injured?

In the context of the shoulder, it is important to talk about many of the concepts that I will discuss in regard to injury prevention in later chapters. These concepts are as follows:

- **Range of Motion** – How much movement can be performed at a particular joint.
- **Flexibility** – Best understood as increasing the range of motion by stretching the muscles through relaxation of the nervous system. The most easily understood example of flexibility to increase range of motion is working to obtain the splits.
- **Passive Mobility** – Taking a joint through its range of motion, but without the aim to increase the range of motion, as is the case in flexibility training. Passive mobility is a good way to begin to warm up your joints for a workout. For instance, put your wrists on the floor and move your body over them. This will take your wrists to the edge of the range of motion without contracting the wrist muscles and is a great example of passive mobility.
- **Active Mobility/Flexibility** – These two terms are often used interchangeably, but I typically use the term active flexibility. In reality, it's mostly active mobility, since range of motion must be gained through flexibility training prior to actual use. Once this is accomplished, using the new range would be called mobility training. An example of this would be using something like a pike or straddle stretch to improve compression, where you are actively engaging your abdominals and hip flexors to move your face close to your knees or the ground. Likewise, working a standing split or kick with your leg above your head is an example of active mobility or flexibility.
- **Stability** – A type of training that focuses primarily on neuromuscular re-education, which entails teaching the body to re-learn how to move itself properly. For example, when recovering from an ankle sprain, one of the primary methods of regaining body awareness (proprioception) in the foot and ankle is to work on single leg balances. This activates the muscles around the ankle to stabilize it from wobbling and retraining your balance. Another example would be using planks as a core stability exercise, in order to train the body to keep tension in the core, which will result in the ability to hold itself still against gravity.

My first axiom in bodyweight training is as follows: *Keeping the shoulders and shoulder blades operating optimally is the key to bodyweight strength success.*

Anatomically, the shoulder is composed of the *glenohumeral joint* and the *scapulothoracic joints.* (The layman's terms of which are the *shoulder* and *shoulder blades*, respectively.) Shoulder strength can be thought of as a combination of the stability of the shoulder blade against the body and the movement of the shoulder to exert force. The muscles surrounding the scapula keep it stabilized against the body, which provides a solid foundation for the shoulder to exert force. The muscles around the shoulder then provide the force to execute exercises. If you throw any of these out of whack through training that does not promote proper balance of the shoulder blade muscles and the shoulder itself, you may incur pain, injury, and plateaus in your training.

This is not to say we are going to ignore the elbows, wrists, and rest of the joints in the upper body. Rather, focusing on the shoulder will allow us to correctly select exercises that will build a properly balanced routine. The elbows, wrists, and rest of the arm will naturally flow from this.

My second axiom of bodyweight training builds off of this point: *The shoulder is the lynchpin of the upper body, just as the hip is for the lower body.*

All upper-body movements go through the shoulder. For this reason alone, I believe most of the exercise selection of a routine should be based upon the different movements that occur at the shoulder. Bodyweight movements have a unique quality that sets them apart from typical barbell exercises. This unique quality is that many of them require excellent upper-body flexibility and mobility to perform. For example, proper handstands require the overhead 180 degree shoulder mobility and strength in that position.

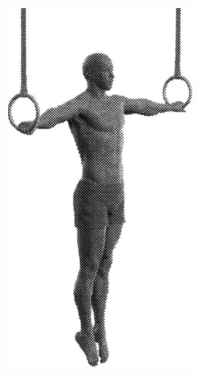
MAINTAINING STRUCTURAL BALANCE

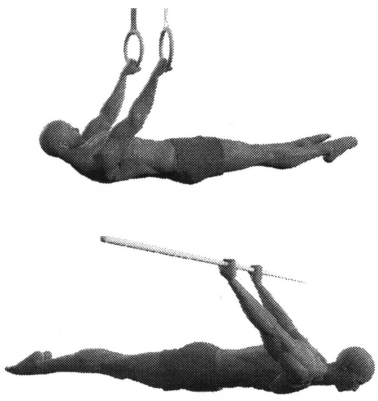
In the first edition of *Overcoming Gravity*, I talked about a simple method of maintaining structural balance and a complex classification of exercises to maintain structural balance. However, this led to mass confusion about what exactly fit in particular categories. Unfortunately, the complex method relied on a good understanding of anatomical joint motion. This turned out to be extremely ineffective for teaching beginners, and made construction of a routine unnecessarily complicated in light of the vast amount of information already in the book. Therefore, I have decided to eliminate the complex method, and revise the simple method in order to make the concepts clearer and simpler to understand.

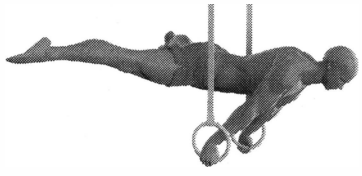
The simplest method to maintain shoulder structural balance involves utilizing pull and push exercises, which will offset one another. This will allow you to maintain a healthy balance of strength and hypertrophy at the shoulder. This system works for bodyweight exercises in the vast majority of cases. Pulling and pushing exercises are defined below.

- A *pulling exercise* is any exercise in which the center of mass of the body and the hands are moving or pulling *toward* each other.
- A *pushing exercise* is any exercise in which the center of mass of the body and the hands are moving or pushing *away* from each other.

The primary isometric pulling positions that most bodyweight athletes desire to learn include the back lever, front lever, and iron cross. The primary static pushing positions include the planches and inverted cross. The maltese and victorian make up the borderline between pushing and pulling. This is fitting because they are full-body tension exercises to the highest degree, requiring both pushing and pulling muscles to be activated simultaneously.







These positions are illustrated from 12:00 with the front lever, 3:00 with the straddle planche, 6:00 with the back lever, and 9:00 with the iron cross. In the front lever, you can see that the hands will be pulling down toward the center of the range of motion of the body. This indicates a pulling exercise. We can also confirm this by the fact that it primarily works the pulling muscles of the body—such as the latissimus dosri, teres major, and pectoralis major (lats, teres major, pecs). Likewise, in the back lever and iron cross, the arms are pulling down toward the center of mass the entire time. Conversely, in the planche, the hands are pushing down and away from the body in order to hold it above the rings.

Furthermore, pushing and pulling exercises can be distinguished into two separate categories: vertical/horizontal pushing and vertical/horizontal pulling.

- **Vertical Pushing** – This includes two sets of movements, each at the opposite end of the range of motion—such as handstands, overhead presses, handstand presses and dips.
- **Horizontal Pushing** – This includes several different types of pushup variations and planche variations.
- **Vertical Pulling** – This includes pull-ups and inverted pull-up variations, as well as isometrics—such as iron crosses.
- **Horizontal Pulling** – This includes any and all rowing variations, as well as isometrics—such as back lever and front lever.

Generally, most people will see there are two types of vertical pushing exercises and be confused about which one they should choose: dips or handstand pushup variations. For most new athletes, I suggest beginning with dips, until a greater level of proficiency in strength is attained. Fundamentally, dips are one of the best upper-body pushing exercises for brute strength, and an excellent comparison would be that they are similar to an upper-body squat. Dips will help to build primary pushing strength and overall muscle volume, which ensures a good base for further exercise. Since handstands are usually included as skill work in most beginner routines (in order to familiarize athletes with upside-down and inverted motions), handstands are not neglected from training entirely. Thus, the routine is still balanced, while providing experience for the new athletes in all ranges of motion of the shoulder.

One exception is that there are a fair amount of straight-arm techniques in bodyweight strength training over barbells. I want to clarify the methods of integrating these different planes of motion when choosing exercises for certain goals. First, there is very little "elbows out" in bodyweight strength training, unlike what you typically see with barbell and dumbbell pressing. The reason for this is that flaring the elbows leads to a lack of control in many of the movements. For example, if you flare the elbows out in handstands or handstand pushups, you will fall over almost immediately during the exercises. The elbows need to be tucked in because the body is the lever that needs to be balanced.



Most people who perform handstand pushups (HSPUs) against a wall—or add them as supplementary barbell work—do them with elbows flared out. While this is a bit stronger (because of the added trapezius involvement at a good angle of contraction) it does not allow proper development of strength and control required to learn a freestanding handstand pushup. "Elbows in" allows the body to struggle to balance the freestanding handstand pushup, as opposed to just falling over.

Additionally, there are some exceptions within certain progressions, such as wide-arm pull-ups, wide-arm rows, wide-arm dips, and the iron cross—where the elbows or arms will go out wide. These are important to note in exercise only, as they represent stepping stones to higher progressions in most cases, with the exception of the iron cross. (The iron cross can be thought of as a whole different progression and needs to have specific training for it, which I have highlighted on the chart. Arms wide requires rigorous training of the connective tissue, as the potential for injury is higher without said training.)

THE WHY OF STRUCTURAL BALANCE

As you may know, in typical routine construction for beginners, there is often a focus on the "beach muscles." For example, five different variations of bench press and curls may dominate a routine. This is poorly constructed routine because it is composed primarily of pushing exercises. The bench press will add strength and hypertrophy to the chest and anterior shoulder, but this routine fails to strengthen the back of the shoulder, which is critical to maintaining structural balance.

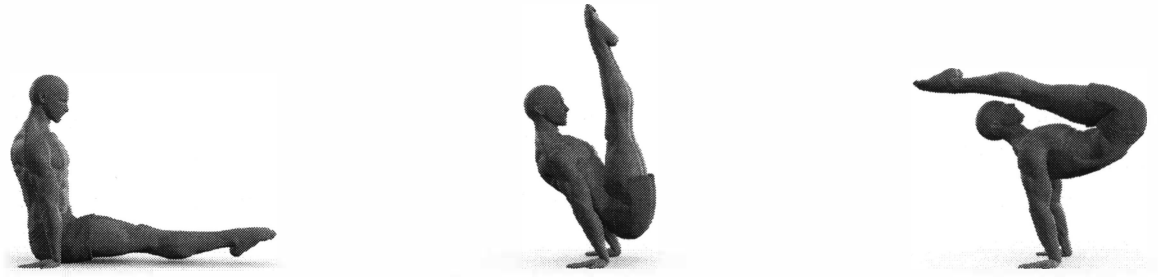
If an athlete persists in this type of poorly-constructed routine for long, they will end up with poor posture, tightness in the front of their chest, and injuries to their rotator cuff or other structures within the anterior shoulder. In bodyweight and barbell training, most routines lack a proper amount of pulling exercises. Pulling movements, particularly horizontal pulling, requires the development of three areas of the back, which are often overlooked. These areas are the scapular retractors, posterior deltoids, and external rotators. These muscles help stabilize the back of the shoulder blades and shoulder, respectively, and are heavily worked in horizontal pulling (rowing) motions.

Poorly constructed barbell routines will lead to improperly developed posterior strength of the shoulder, which can result in pain or injury. If you are experiencing an onset of clicking, popping, or cracking in your joints (where there was none previously), this may indicate that your structural balance is not correctly maintained, especially if your routine has inconsistent amounts of pulling or pressing, resulting in uneven shoulder muscle distribution. For example, if the anterior shoulder becomes too strong, the head of the humerus may start impinging (strongly rubbing or pinching against) and clicking across the anterior portion of the shoulder socket. In this case, the anterior portion of the shoulder labrum may be the part of the shoulder that is clicking or popping.

The shoulder labrum is a piece of cartilage that functions similar to the meniscus (in the knee), so it should be obvious why you do not want to construct a routine that has a high potential for injury in that area. Further imbalances may start to wear down the labrum, leading to potential tears or intractable damage. However, clicking or popping sounds may not always indicate such a problem. If you have always had clicking, it is likely nothing to worry about, though it may be an issue if it becomes louder or there is an onset of pain that develops simultaneously to performing an imbalanced routine.

It is not good for the muscles or joints of the body to get out of balance. Your body is much more intelligent than you may realize, as your nervous system is constantly aware of sensation and proprioception feedback, which causes the body to limit force development and compensate as necessary. In other words, if your body senses there is an imbalance that could result in injury, it will limit strength and musculature development in the surrounding areas, and may begin compensation patterns to prevent injury. This is easily avoided by keeping your exercise routine properly balanced.

I talk about potential injury issues, not to scare you away from exercising or performing bodyweight exercises, but to help you work toward your goals both *safely* and effectively. Exercising and becoming stronger is critical to developing a healthy body, but there is no point in getting strong if you are injured. You must take this into account when constructing a routine, especially one that is based in bodyweight exercises that are tough on your joints and connective tissues.



Pictured is the manna. In my opinion, the reason why the L-sit/V-sit manna progression is so important is because it effectively counteracts the effect of a heavy pushing routine with one simple series of exercises. This set of progressions works the scapular retractors, posterior deltoids, and external rotators without having to do two or three different exercises, thus saving much time and effort. Plus, you get to work toward an awesome skill.

GENERAL RECOMMENDATIONS

There are a diverse amount of exercises in bodyweight training—the only limits are your individual creativity. That being said, there is a small selection of exercises that I highly recommend for your training program. You should know that these exercises are recommended for important reasons.

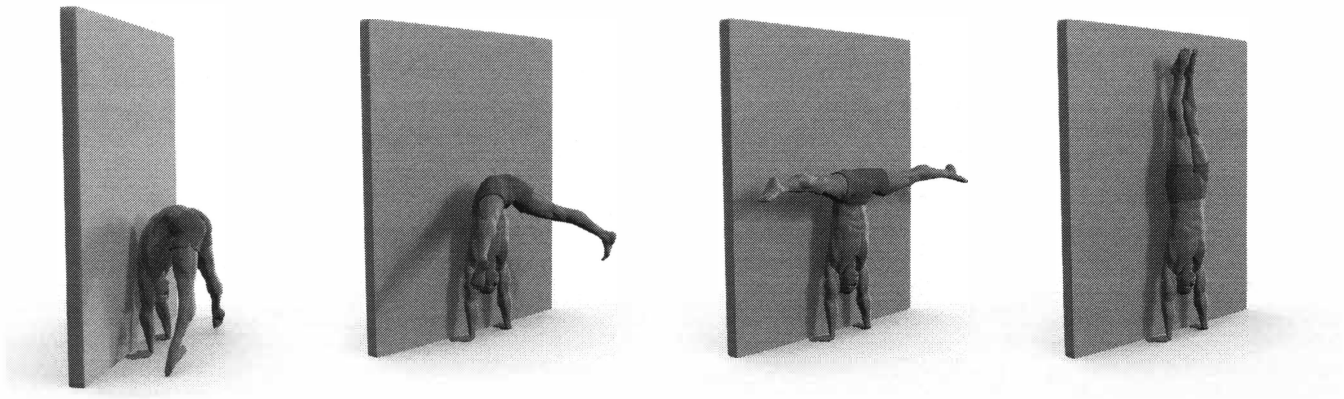


Coupling Handstands and the L-Sit/V-Sit Manna Progression

In a perfect world, everyone would work both handstands and the manna as coupled skills. I like this for multiple reasons:

- Development of strength in active flexibility positions is the key to dominating bodyweight movements. These will drastically increase your body awareness and ability to control your muscles through all ranges of motion.
- Handstands work the overhead range of motion of the shoulders, and manna works the limit of the backward range of motion of the shoulders. Working stability and balance at the ends of the range reinforces strength within the rest of the range and protects the joint from injury.
- Training for the manna progressions requires more-than-adequate flexibility to be developed in the shoulder girdle and legs.
- Both handstands and manna have built-in core control and strength work. Thus, less time needs to be spent on core conditioning, and more emphasis can be placed on skill and strength development.
- As previously mentioned, developing these skills simultaneously will ensure that imbalances of the shoulder will be less likely to develop.

The alternative is additional scapular retraction work or horizontal pulling exercises that focus on pulling the elbows back, in order to squeeze the shoulder blades together, which keeps the pulling and pushing exercises balanced. However, this is extra work compared to the benefits of utilizing this coupled progression.



Straight-Arm Press Handstands

These are at the core of gymnastics. They require incredible upper body and core control, which will greatly benefit your training as you learn them and in the intermediate phase. They will also help as you move into the more advanced stages.

Straight-arm press handstands from support are actually a very good supplemental exercise for planche training because they require very solid amounts of shoulder girdle strength moving through a large range of motion. They extensively work the scapular stabilizers—especially the upper trapezius, lower trapezius, and serratus anterior—when going overhead. While this means nothing to the layperson, the triangle of forces that these three muscles exert on the scapula are key in both overhead pressing and the maintenance of proper scapular stability against the thoracic cage in posture and movement.

Straight-arm press handstands are an extension that will help you master the handstand, as you can easily hold handstands once you can control them from a straight-arm press. Plus, they look cool. This principle also applies to specific bent-arm pressing. Once you master straight-arm press handstands (straddle press at the very least), most athletes will be able to do a bent-arm press as well. The same is not true in the opposite direction, which is why this skill must be developed first or concurrently.

Handstand pushups, rope climbing (if available), and full back lever development are very important to the process of developing high-level strength, though not required. The reasoning behind this is they not only help with the development of strength, but also with joint integrity and building up connective tissue. Thus, they are likely to help significantly in the development of high-level skills. Indeed, I have some of these exercises as prerequisites to other high-level strength progressions on the charts and in the exercise section. I only have a small section on rope climbing in the exercise section, but if you have access to a rope you should definitely utilize it.

Just remember to organize your workouts so that you can keep your body structurally balanced and injury free. The rest is really up to you and what you want to accomplish. Most importantly, have fun!

STOP READING. TAKE ACTION.

1. Organize your goals into categories of push and pull. I have already significantly helped you in this process by placing exercises on the particular charts.
2. Break down the push and pull exercises into categories of horizontal and vertical for each.
3. If there is a disparity in goals between any of the categories, I would suggest that you either supplement with barbell work in that area (which I will not cover in this book), train the progressions that I recommend, or selecting exercises to shore up those weak points.

CHAPTER 4 SUMMARY

STRUCTURAL BALANCE CONSIDERATIONS

Knowledge Base

It is important to keep structural balance considerations in mind, in order to keep your shoulders healthy. The shoulders are the lynchpin for the upper body in terms of strength development. Therefore, it is of utmost important to construct your entire routine around maintaining healthy shoulders.

Application

I prefer the push and pull system for classifying different types of bodyweight exercises, as it is simple and effective. The basics of this system can be summarized as:

- Pick horizontal and vertical pushing exercises. For newbies, the handstand covers vertical pushing upward, so choose a vertical pushing downward.
- Pick a vertical pulling exercise and one horizontal pulling exercise.
- Put the L-sit progression to manna and handstand in your routine.

The handstand will be included as skill work and overhead facilitation. The L-sit will be included as core work and opposition to the handstand, in order to progress toward manna. The other pushing and pulling movements in the main exercises are going to be balanced. Add in at least two leg exercises, either barbell or bodyweight.

It is best if your vertical upward pushing starts out as handstand work, as handstands are critical for the development of body proprioception and control. Progression in this skill signifies the level of ability of the user. Very few people develop strong bodyweight abilities without proper handstand work.

- CHAPTER 5 -

INTRO TO PROGRAMMING, ATTRIBUTES, AND THE HIERARCHY OF A ROUTINE

In terms of training, the simplest definition of programming is *scheduling*. You are setting an order and time for planned workouts that will help you progress toward your goals. Thus, programming means having a plan for our workouts. The type of plan depends on the type of goals you have, as well as your current abilities. Previously, we discussed the mechanisms of strength and hypertrophy. To pull those concepts into focus, think of programming as how all of that information fits together on a large scale. This will be the information that is important when designing a workout program for you or your clients, if you are a trainer.

For example: You plan your exercise routine with repetitions at certain intensities, over certain numbers of sets, for a total volume of work. This volume of work is alternated or spread over a period of time, perhaps daily, weekly, biweekly, or monthly. In the case of elite athletes, the schedule of planning may be yearly, or on a quadrennial scale for Olympic athletes. Long-term planning allows your body to constantly progress. If you have competitions, you can target specific times that your body will be at its peak performance level.

The main concepts discussed in this chapter are the basics of programming and how they can be applied to bodyweight training.

INTRA-WORKOUT PROGRAMMING AND LINEAR PROGRESSION

Referring back to Chapter 1, we know that progressive overload is the key to consistent progression. Thus, the question is, "How do we implement progressive overload?" Let's go back to the basic unit of programming, a single workout, and build from there.

The key of any single workout is to have a high enough amount of intensity and enough volume to stress the body so it will adapt to increase strength and hypertrophy. This is especially true if you are a beginner. Following the workout, it is important to rest for a certain amount of time, so that your body can recover and become stronger, more muscular, or both. There are multiple aspects of modifying workouts, which integrate the concepts that we learned about already—repetitions, sets, rests, tempo, intensity, volume, frequency, attributes, failure, work capacity, deloading, and plateaus. Of these, the most important factors in structuring a single workout are the intensity and volume.

- **Intensity** can be modified by increasing the difficulty of an exercise according to the amount of repetitions you can perform. This can be done through increasing the progression, utilizing a weight vest, or other methods.
- Volume can be modified in three different ways:
    - The amount of repetitions per set.
    - The amount of sets per exercise performed.
    - The total amount of exercises performed.

The body regulates itself through *homeostasis*, a concept that tells us there tends to be tightly maintained state in regard to body processes. When sufficient stress is placed on your body during exercise, it will adapt given sufficient recovery time. However, since the body has been forced to adapt to this change, it has already become somewhat resistant to the initial stress of the workout. Therefore, to continually grow stronger, it is illogical to repeat the same workout over and over again. What is the point of doing a workout repeatedly? If your body is already adapted to the stress, is repeating the same routine going to make you bigger or stronger? Surely not. Likewise, if you continually perform the same workout—or even perform a workout that causes adaptations but fail to progress after you have adapted—you may undertrain.

Undertraining is in most cases overhyped. As long as there is step-by-step progression—utilizing the concept of progressive overload—within workouts for your main exercises, then it is difficult to undertrain. However, there may be a point where there is not enough intensity or volume in a routine, which leads to undertraining. Undertraining may be the reason you are not progressing toward your goals, especially if you are only focusing on a few exercises.

One of the premier examples of intensity progression for beginners—linear progression via weights—is found in *Starting Strength* by Mark Rippetoe. This program works the core compound lifts—namely squats, deadlifts, power cleans, press, and bench press—for a fixed number of sets and repetitions in each workout. Linear progression increases the intensity of the exercises relative to the number of repetitions by adding weight. This process of adding weight to the lifts with each new workout—usually five or ten pounds per lift—forces constant adaptations with every workout, so that both strength and muscle mass can be drastically increased. This type of progressive overload is one of the most effective ways for beginners to progress.

- Monday: Squat 3x5 – 45 pounds
- Wednesday: Squat 3x5 – 55 pounds
- Friday: Squat 3x5 – 65 pounds
- Monday: Squat 3x5 – 75 pounds
- Wednesday: Squat 3x5 – 85 pounds
- Friday: Squat 3x5 – 95 pounds

For obvious reasons, with bodyweight exercises, you cannot effectively increase the intensity of an exercise by adjusting your weight, unless you have a weight vest or ankle weights. However, many people do not have access to these types of implements due to financial reasons. Beginner level adaptations will still occur quickly, but not quickly enough that one can move up a full progression level with every workout. For this reason, the best way to progress will be primarily through the aforementioned volume modifications:

1. Increasing repetitions.
2. Increasing sets.
3. Increasing the total amount of exercises performed.

If you have access to a weight vest or pulley system to use when exercising, it is often more effective to use those to make your bodyweight exercises more intense. This is because volume modification tends to be slightly slower with strength progression than intensity modification. Since your goal is primarily strength increases, you have constraints that you need to adhere to—such as not changing the speed of repetitions or changing the amount of rest between sets. Another constraint is to stick with exercises in the 5-15 repetition range if you are solely using weighted progressions. Additional constraints may be performing too many sets or exercises.

For beginners, there are a number of reasons why you should not increase exercises. First, more advanced bodyweight exercises are often vastly different than anything that most people have trained in before. Through these exercises the body is subjected to many movement patterns. Too many movement patterns make it difficult for the body to effectively learn. Imagine trying to learn ten songs at once on the piano, instead of just one or two at a time—it will not be very effective. Typically, you want to focus on learning a few at a time, so that you can practice them to efficiency before learning more.

Second, adding additional exercises often adds an additional two to three sets or more to a workout. While it is true that additional stress is needed to elicit continual adaptations, it is unlikely that you need that much additional overall volume. Adding the intensity of additional repetitions and sets by adding an additional exercise may be too much for your body to handle, which can lead to overuse injuries. For beginners, less is often more. An increase in one set or multiple repetitions is enough for beginners to progress well from one workout to the next.

Third, spreading out exercises between too many goals often leads to stagnation. Remember, you cannot optimally gain both strength and endurance at the same time, due to the adaptations that occur at the different ends of the repetition spectrum. Spreading yourself out between too many exercises and goals especially (which in the context of adding exercises is often the case) can lead to decreases in the overall quality of improvement in the areas that you are trying to improve.

STRESS, ADAPTATION, SUPERCOMPENSATION, FITNESS, AND FATIGUE

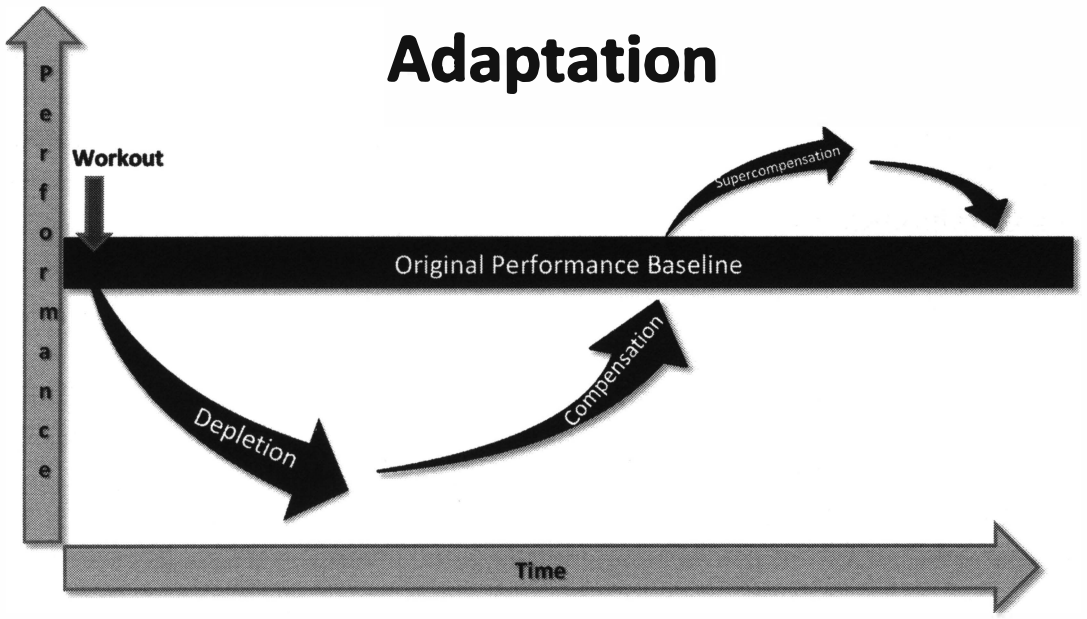
The first concept is understanding the nature of recovery. The easiest way to think of workouts versus recovery is the concept of the sympathetic nervous system versus the parasympathetic nervous system. In layman's terms, the sympathetic nervous system is termed the *fight or flight system*, whereas the parasympathetic nervous system is termed the *rest and digest system*. Workouts bring the nervous system into a state of arousal that is similar to fight or flight, where the body is being stressed in order to cause adaptations that will improve physiological attributes for subsequent training. On the other hand, the parasympathetic system is composed of all of the activities that promote recovery. These consist of, but are not limited to: sleep, diet and nutrition, de-stressing options (massage, saunas, and light activity like walking), mobility work, meditation, deep breathing, supplements, and the like.

Once you stop progressing from workout to workout, consider more advanced concepts if you want to increase your capacity to grow stronger. Thus, it is important to look beyond a single workout when planning

and structuring workouts. After a single workout, your capacity to perform additional work will decrease, typically within the next 24-48 hours. However, as your body heals with rest and proper nutrition, it will supercompensate, allowing it to come back stronger and better. *Supercompensation* is the concept that the combination of a few workouts that depress abilities more than normal will result in a rebound effect, which results in improvement that might not be seen from a single workout.

The training stimulus must pass a certain threshold to force good adaptations. This means you do enough to avoid undertraining, but not too much, which can actually cause so much damage that you do not gain any supercompensatory effect at all. Again, less is often more. Properly manipulating workouts, in order to avoid undertraining and overtraining, requires practice, time and observation.

Initially, a workout will produce both a positive effect, which is termed *fitness*, and a negative effect, which is termed *fatigue*. The latter results in depressed abilities. As you can see from the illustration, training too early after the first workout means that you will train again when you are under the initial baseline. This means that your abilities in the subsequent workout will be decreased compared to the first one. Training within this period of decreased abilities will result in a greater level of fatigue. This fitness increase is immediate in terms of strength, just like you can improve in other neurological based abilities such as balance within the same session; however, fatigue masks this increase in fitness. In terms of muscular hypertrophy, the adaptations occur slightly slower over time, because protein synthesis, which adds muscle mass, takes place over a 48-72 hour period following a workout.



On some level, once you increase the frequency or overall volume load of your workouts beyond a certain point, you will reach a stage at which your fatigue has not yet dissipated before you perform your next workout. This will often reoccur with the workouts that follow. An interesting thing is that you can still see progress—even significant progress—in strength and/or muscle gain, even with fatigue accumulating. However, it is inevitable that you will eventually "stall out," resulting in a plateau. Accumulation of fatigue that is equal to your gains equals reaching a plateau in your training. The point at which gains stall is a good

measurement of when fatigue has overtaken fitness or supercompensatory adaptations, which allows continuous progress in spite of fatigue.

To counteract the fatigue buildup, you should do exactly what you would expect to do when fatigued—rest. A rest period between workouts for a beginner will typically be one day. Rest comes in many forms, ranging from taking a break from training, to working on skill work, to simply deloading total intensity, repetitions, sets, and the like. Fitness and fatigue are an alternative visualization of the traditional model, and are termed in "dual factor" theory. Let us discuss other factors involved before we can see why it makes a difference.

For beginners, 48-72 hours is the optimal time for recovery after a workout if you want to see enough supercompensatory effects that your performance is greater in your next workout. As previously mentioned, many beginner programs are initially based on the three times per week model, which allows 48 hour between two of the workouts and a 72-hour break after the third.

This, however, is not the fastest way to gain strength. If you recall, strength has two components—neurological adaptations and muscular adaptations. The body can build up a resistance to stress from both of these by repeatedly forcing it to adapt with workouts. This is why professional athletes often workout nearly every day of the week—sometimes multiple times a day—without getting sore. At the highest levels, the frequency of workouts will matter the most in gaining strength. You may have heard it said that strength is a skill. Repeating a certain movement over and over with progressive overload will lead to strength gains, which is why doing too many different exercises should be avoided if you want to gain strength.

The body has an abnormal capacity for increasing neurological strength, even at certain muscle sizes. For example, Olympic weightlifters from the 69 kg. (151.8 lbs.) weight class can put up amazingly heavy weights. The current world records in this weight class for the snatch is 165 kg (363 lbs.), and the clean and jerk is an impressive 198 kg. (435.6 lbs.). These movements entail taking a barbell that weighs the amounts listed from ground to overhead in one and two movements, respectively. This shows us that it is not neccessary to be heavy to be incredibly strong.

The greatest capacity for strength gains comes from increases in neurological adaptations, but it is also the neurological system that adapts much slower relative to its potential compared to muscle mass. If you remember the pool analogy, the nervous system's "pool" will tend to fill up slower than the muscles. The reason for this is that you can literally "force" the body to put on muscle mass if you lift heavy weights and eat like there is a famine coming. To overcome this neurological bottleneck, it is often advisable to train more than three times a week. For more advanced athletes, this may entail a few of these sessions being lower intensity, as opposed to pushing yourself every time. This will allow you to improve in your abilities more rapidly, but you may be more likely to burn out if the intensity of your workouts is too high and not balanced with decreases in volume.

This interplay between fitness and fatigue when training for strength is the reason why periodization is necessary after you reach intermediate and advanced levels.

BASIC PERIODIZATION AND INTER-WORKOUT STRUCTURE

The concept of *periodization* was pioneered by the Soviet Union scientists in the 1950-70s. Their goal was to dominate athletics, and this was the method they chose in which to do so. Periodization in sports is a way to

organize training by progressively alternating various aspects such as frequency, intensity, volume, repetitions, etc., in order to increase physical capacity. It is a plan that encompasses multiple workouts over a set amount of time. In typical Soviet periodization structure there are three components: the microcycle, the mesocycle, and the macrocycle.

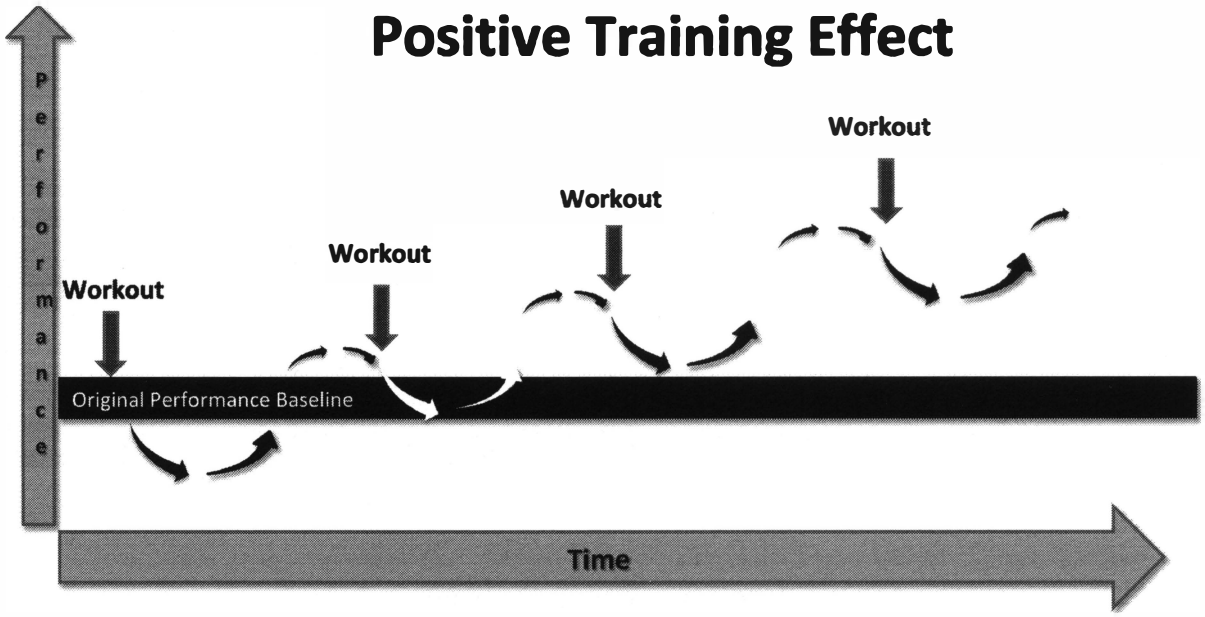
The microcycle is typically based around one week of training. It is generally organized into a specific attribute that one desires to focus on. In the old Soviet model there were generally four microcycles that were used: a preparatory phase, hypertrophy phase, strength phase, and a power phase.

A mesocycle is a combination of four to eight microcycles. The amount of microcycles depends on how many phases there are in a program. So in the context of the above types of microcycles, in the archetypal Soviet system there was generally one to two preparatory phase microcycles, one hypertrophy microcycle, one strength microcycle, and one power microcycle. These microcycles were often followed by a deload or rest week, in order to dissipate fatigue. Therefore, a typical mesocycle was six weeks long.

A macrocycle is simply a combination of mesocycles, which is often planned so that an athlete will finish their final mesocycle close to their competition date. Because an athlete will still be training hard toward the date of their competition, they will be strong, but this approach will allow enough rest to dissipate excess fatigue, thus allowing them to peak during the competition so they can lift weights well above their previous personal records, hopefully allowing them to win their competition. One "macrocycle" that covers 24 weeks may look like this:

	Microcycle – 1 Week (Preparatory)
	Microcycle – 1 Week (Preparatory)
Mesocycle	Microcycle – 1 Week (Hypertrophy)
	Microcycle – 1 Week (Hypertrophy)
	Microcycle – 1 Week (Strength)
	Deload / Rest Week
	Microcycle – 1 Week (Preparatory)
	Microcycle – 1 Week (Hypertrophy)
Mesocycle	Microcycle – 1 Week (Hypertrophy)
	Microcycle – 1 Week (Strength)
	Microcycle – 1 Week (Strength)
	Deload / Rest Week
	Microcycle – 1 Week (Preparatory)
	Microcycle – 1 Week (Hypertrophy)
Mesocycle	Microcycle – 1 Week (Strength)
	Microcycle – 1 Week (Strength)
	Microcycle – 1 Week (Power)
	Deload / Rest Week

	Microcycle – 1 Week (Preparatory)
	Microcycle – 1 Week (Hypertrophy)
Mesocycle	Microcycle – 1 Week (Strength)
	Microcycle – 1 Week (Power)
	Microcycle – 1 Week (Power)
	Deload / Rest Week



Notice how there may be a different emphasis in each mesocycle, depending on your particular goals. In particular, the first mesocycle in this example focuses more on preparation, hypertrophy, and strength, while the latter mesocycles ultimately focus more on strength and power. The different phases mean variations in the intensity of the exercise. In terms of the specific "attributes" within a cycle, the typical Soviet structure was described like this:

- A preparatory phase tends to be a slow increase in volume and intensity coming up from an off week. It was basically a "ramp in" for a serious workout directly after a deload week.
- A hypertrophy phase tends to range in about 60-85% 1 RM (about 5-12 repetitions).
- A strength phase tends to range around about 80-100% 1 RM (about 1-8 repetitions).
- A power phase tends to utilize lighter weights around 40-60% 1 RM (about 3-6 repetitions) and focuses on pure acceleration.

There are other types of workouts that focus on specific attributes, such as *Dynamic Effort* from Westside Barbell. Dynamic Effort (DE) is also termed *speed work*, where 40-60% 1 RM is used with additional accommodating resistance such as chains, bands, or other implements with about 25-30% 1 RM. Speed work is

about utilizing lighter weights and focusing on accelerating the bar as quickly as possible. The accommodating resistance is used to work on sticking points or easier points in the lift.

How does this structure apply to us? It is extremely convenient for most people to operate on the weekly microcycle schedule because the vast majority of occupations around the world are based on a weekly schedule. Thus, any intermediate or advanced programming will generally be for the seven-day week. Secondly, microcycles teach the valuable lesson that you must consider overall volume on a weekly basis, rather than workout to workout. Remember, as you grow stronger and more muscular, your body becomes more resistant to stress, which makes it more difficult to force the adaptations you desire. Thus, your focus must shift from a workout to workout structure to a weekly model. It may seem counterintuitive, until you realize that it is easy to plateau for long periods of time once you get past the beginner strength level. You probably know someone who has been going to the gym for years, yet is still using the same weights or even looks the same. This person has not yet learned how to structure their workouts to implement progressive overload, which would allow them to continue making gains.

When you become sufficiently strong, your workout schedule may switch to biweekly or monthly scheduling. Pro athletes may get to the point where they utilize yearly scheduling, while Olympic athletes may get to the point of quadrennial scheduling. This is what it means to *increase the complexity of programming,* which takes place as you become stronger and move into the intermediate and advanced ranges. This takes years of consistent work, so the average person who is beginning bodyweight training will not need to worry about it for awhile. Instead, mesocycles will be the primary part of a beginner program. Generally speaking, the mesocycles should be anywhere from four to eight weeks long, depending on when you plateau or feel fatigue sufficiently catching up with you. These mesocycles will be long enough that your body will adapt and become stronger. After you complete a mesocycle, you will often have a rest week, in order to dissipate additional fatigue, allow any aches and pains to go away, plan prehabilitation or rehabilitation to recover fully, evaluate your goals, plan or program, and rest for your next mesocycle.

Rest weeks are extremely critical to your progress. If you have never properly utilized rest weeks, you likely have not progressed very far in your training unless you intuitively know how to train effectively. A safe estimate would be that only ten percent of those who get into bodyweight training know how to do this. Thus, the vast majority of athletes must learn the concept of rest or deload weeks if they desire to make long-term progress.

There are entire books written on periodization. The material covered here is just a quick summary. There are three particularly recommendable books. *Supertraining* by Mel Siff is a very dense read. Two other solid titles are *Science and Practice of Strength Training* by Vladimir Zatsiorsky and *Periodization: Theory and Methodology of Training* by Tudor Bompa.

ATTRIBUTE TRAINING

The notion of "phases" of microcycles is important because they are geared to develop specific attributes. This applies not just for preparation, hypertrophy, strength, power, and endurance, but also to other facets of training as well. Thus, it is important to recognize that routines are made up of multiple parts that all work in conjunction with one another.

Here are the primary questions that this section will address when it comes to constructing a routine:

- Can I do this exercise every day?
- Can I do this exercise on my off days?
- Can I do this exercise with my workouts?

To better understand programming a routine, you must first understand how the different concepts that make up a routine affect your ability to execute that routine. There should be a purpose to every exercise you put into your routine, and that purpose can be categorized into working specific attributes.

For example, a short list of the various attributes that may be trained with exercises in a routine are as follows: strength, hypertrophy, endurance, cardiovascular, mobility, flexibility, stability, skill, endurance, etc. There are more than this, and they can be categorized in a number of ways. Jim Cawley and Bruce Evans of *Dynamax* originally categorized ten physical areas of development that the now ubiquitous CrossFit adopted before it became extremely popular. These are cardiovascular/respiratory endurance, stamina, strength, flexibility, power, speed, coordination, agility, balance, and accuracy.

This book focuses on constructing a routine dedicated to specific increases in strength and hypertrophy. Typical exercises that are used for strength and hypertrophy are any of the progressions that focus on improving strength, such as isometrics (planche, front lever, back lever) and full range of motion exercises (pushups, dips, handstand pushups, rows, pull-ups).

The three primary factors in a workout are strength, hypertrophy, and endurance. The main thing that separates these attributes are the intensity of the repetition in sets and thus how many repetitions of the exercise you perform in a single set.

- **Strength** – Primarily developed in the 1-8 RM range, best executed with close-to-failure (but not-to-failure training) and 3-minute rest times.
- **Hypertrophy** – Primarily developed in the 5-15+ RM range, best executed with failure training and anywhere from 1-3 minute rest times.
- **Endurance** – Primarily developed in the 15-20+ RM range, best executed with failure training and 30 to 90 second rest times.

Most of the other attributes significantly vary in their training. For example, with cardiovascular-specific training the attributes that are trained depend on the intensity of the exercises. The intensity almost always determines the frequency for most non-workout specific attributes. Let's use running as an example, but this also applies for biking, swimming, and other endurance related activities. For example, these are the cardiovascular factors that you may program after strength or hypertrophy work in a workout:

- **Recovery** – If it is light work where you are running simply to get blood flowing and you end a session breaking a slight sweat and feeling better than you started, this can be performed every day.
- **Moderate** – If you are running for moderate intensity cardiovascular work that is not necessarily aimed at training cardiovascular attributes (but instead for general health), it can be added to a rest day.
- **High or Workout-Focused** – If you are actually training to improve your cardiovascular capacity in order to run farther, faster, or longer for a race or competition, this type of training may be its own workout and may replace workouts in your routine geared toward strength, hypertrophy, or endurance.

The main thing to understand here is that almost any type of high-intensity work where you are training specific attributes is only going to detract from your recovery and thus impair other portions of your routines. Thus, the answer to the question *"Can I do this exercise every day?"* will vary. Here are a few more examples to help explain.

Flexibility is a bit of an odd ball in that it can technically be trained everyday, but it can also interfere with your routine. This is because flexibility is an eccentric exercise. As a muscle elongates in the body the passive tension will ramp up in the muscle as it is contracted by the nervous system. This is so the muscle will not move into a dangerous position. Thus, flexibility can be trained frequently, but you have to factor it in to the overall context of your routine. If you have many leg-focused exercises, it may not be a good idea to train many flexibility exercises with the legs, as the soreness or fatigue caused by stretching may impair your ability to perform optimally.

Mobility is one of the attributes that can be trained every day. It involves taking a muscle through its range of motion, either actively or passively, and it is not geared toward improving any specific attribute. If you are looking for optimal health, doing mobility every day will help maintain a good range of motion and ensure that your joints will work correctly and not stiffen up. This is important for older adults as loss of mobility and strength—especially as you age—is correlated to increased mortality.

Skill Work depends on the intensity of the skills. As stated before, handstands may be strength work for beginners at first and thus may be a part of the actual workout. However, once balance becomes the priority of training and strength becomes less of an issue, it can be trained more frequently. Skill work that is focused on balance can be trained every day. Isometrics are not always skill work as planche, back lever, and front lever are never about balance, but training strength.

We are not going to discuss other exercise attributes such as stability on an in-depth level. You should have a strong sense of the approach from the previous examples, but it is up to you to draw conclusions for yourself. Developing critical thinking skills in terms of programming and planning routines is going to be important to learn how to do it effectively. To aid in categorization and classification of specific exercises that train attributes, think of them in the following manner:

- **Workout Factors** – These are generally performed two to four times per week because there needs to be significant recovery between each session due to high intensity, training to failure, or other high volume work. Variation beyond this frequency on a weekly basis is typically reserved for those who have significant experience designing exercise programs.
- **Recovery and Optimization Factors** – These can be performed three to infinite times per week. These factors are aimed at facilitating recovery of the body through movement, soft tissue work, or low-intensity exercise that gets the blood flowing. Most of what falls into this category should leave you feeling significantly better than when you started, and will not impair workout sessions performed later in the day or the day after. This includes lighter-intensity flexibility work, recovery jogs and walks, mobility work, light skill work, and the like.
- **Rehabilitation Factors** – Rehabilitation and prehabilitation factors are specific. The main thing to understand about these is that rehabilitation is not always focused on increasing strength, though that can be a part of it. Typically, when a tissue is injured you will want to go through a phase where you begin with low-intensity workouts and build up to higher intensity workouts. High repetitions at low intensity are typically performed after a routine, where you work on

prehabilitation or rehabilitation of the specific body parts that need extra work. However, these can also be performed on off days.

This was not emphasized in the first edition of this book, but the primary concept to take away from this section is "everything depends." The type of template that you select for a routine does not limit you in the amount of goals that you want to set for training different attributes. In terms of overall goals, the type of template you pick for a routine will only matter when it comes to the main attributes you are working to develop. These attributes are strength, hypertrophy, and/or endurance. Skill work, flexibility, mobility, prehabilitation, rehabilitation, and the like often are easier to train with a routine. However, they can be trained on your off days, which gives you the flexibility to move things around to fit your schedule. Many athletes and coaches feel limited in what they can accomplish when given a certain type of template for a routine that does not allow this much flexibility.

THE BASIC HIERARCHY OF A ROUTINE

When you are constructing a routine, it is important to follow a few simple rules that will maximize the amount of training "ability" you have in a single workout.

If you have a series of tasks to complete, what order would you put them in to maximize your abilities and increase performance for subsequent workouts?

This section aims to answer that question. Let's outline a general structure of a full-body routine that is performed three times per week. Then we will focus on building a routine on this foundation.

1. Warm-Up and Mobility
2. Skill or Technique Work (Handstands, Flips, Gymnastics Tumbling, Breakdancing Work, etc.)
3. Power, Isometrics, Eccentrics, Regular Strength Work
4. Endurance, Metabolic Conditioning, Tabata Method, Interval Training, Specific Exercises, etc.
5. Prehabilitation, Flexibility Work, Cool Down

These are the five main categories that you should construct a workout routine around. The most detailed section will be about strength training since this book is primarily about learning how to become stronger; however, we will also discuss extensively how all of these other categories will interact with the strength category and how they can also be used in the context of your sport (if you have one). This will allow you to learn these principles, implement them into your training, and broadly apply strength and conditioning principles to your athletes if you are a coach. Remember, not all of the items above must be in your routine, nor must they all be performed on the same day.

The best introduction to learning how to construct a routine is through examples. So, here is an example of a basic beginner routine of about Level 3-4 on the bodyweight progression charts. This example is on how to construct a workout routine based on what is effective. It may include concepts from other bodyweight sources, including but not limited to: my gymnastic coaches, Roger Harrell, Blair Lowe, Jim Bathurst, Ido Portal, and others. If you are an avid Reddit user you may realize that this is similar to the */r/bodyweightfitness* beginner routine. Phi helped fill in the content, and I played a role in structure and routine construction. Shout out to all of the mods and contributors, which include: *phi, phrakture, SM, m092, iscg, antranik, kayetech,* and *Solfire*.

Let's use gymnastics for this example because it is the discipline out of which this book is born. However, these concepts have helped thousands of athletes from parkour/free running, climbing, break dancing, martial arts, swimming, and other bodyweight and non-bodyweight sports.

Goals

10 Freestanding Handstands
5 Strict Muscle-ups
5 Planches
5 Front Levers
10 Pistols
10 Vertical V-Sits
5 Iron Cross's
(These are arbitrary goals selected as examples.)

Warm-Up

1. Blood Flow: 10-20 Burpees, 60s Crawling (or variable distance, such as 100 meters)
2. Mobility: 15x Wrist Circles, Shoulder Circles, Bodyweight Squats, and any other body part or joint that needs to be warmed up, 60s of Support Hold Work (parallel bars or rings or chairs/counters), 5x Skin the Cat / German Hangs
3. Positional Drills: 30-60s of Plank, Both Side Planks, Reverse Plank, Hollow, and Arch Holds.

(Organized according to: classification of exercise, amount of repetitions, type of exercise.)

Skill Work

5-10 minutes of Handstand Work, performed against the wall.

Strength Work

Pull-ups: 3x5→15 with 3 minutes of rest at 10x0 tempo
Dips: 3x5→15 with 3 minutes of rest at 10x0 tempo
Wide Ring Rows: 3x5→15 with 3 minutes of rest at 10x0 tempo
Rings Pushups: 3x5→15 with 3 minutes of rest at 10x0 tempo
Squats (pistol progression or barbell): 3x5→15 with 3 minutes of rest at 10x0 tempo
Deep Step-ups: 3x5→15 with 3 minutes of rest at 10x0 tempo
L-sit for 60s total, in as many sets as needed, not to failure
Compression Work for 3x10s
(Organized according to: exercise, exercise order, sets x reps with progressive principle, rest time, tempo.)

Prehabilitation, Isolation Work, Flexibility Work, and Cool Down

3x1 minute sets of Rice Bucket for the wrists
3x10 Biceps Curls
3-5x30s Splits Holds
3-5x30s German Hangs
3-5x20s Back Bridges
1 minute of Deep Breathing (in through the nose, out through the mouth)

STOP READING. TAKE ACTION.

1. Write down any skill work you want to learn. Also, start to think of the types of exercises you desire in your routine and how you would order them based on the information above.
2. Write down any previous injuries you have had or problematic joints, muscles, or tendons that have or may have been bothering you in the past. Also, write down what you have been doing for rehabilitation or prehabilitation to solve these injuries.
3. We will take into account how to integrate all of these factors into a routine and how to avoid any contraindicated movements while continually working toward our goals.
4. Assess your soft tissue structures by using your hands to massage in and check for tightness, trigger points, or other restrictions or chronic problems in your musculature, tendons, or around the joints. Write these down too.
5. In addition, check and evaluate your flexibility and mobility. The main ones we want to check at this point include your wrists, elbows, shoulders, the straddle stretch, and pike stretch.

Next, use your list of refined goals in conjunction with the skill and progression charts. Select exercises that correspond to your goals and take the following into consideration.

- Any of the two to four skill-based exercises that you are working on are at least one or more levels below your competency level, so it would be optimal to practice them without significant fatigue.
- Any of the pushing and pulling goals have exercises selected to progress toward them. Generally, one to two goals with a total of two to three exercises planned for them.
- The exercises you select should work around any injured body parts. For example, you should select exercises that do not aggravate the existing injuries. Likewise, if you are working around any injured areas you should include prehabilitation or rehabilitation work in order to facilitate the healing process so that it does not linger.
- Since a high degree of flexibility is required to optimally progress with many upper-level bodyweight strength skills, it is likely that a lot of hip and shoulder flexibility work will be required for those with non-flexibility athletic backgrounds.
- Group all the warm-up, skill development, and mobility exercises into the beginning, strength work (strength/power) into the middle, and end with cool down, flexibility, and rehab.
- Now, order all of these exercises according to your goals or specific areas you want to work on.

CHAPTER 5 SUMMARY

INTRODUCTION TO PROGRAMMING, ATTRIBUTES, AND THE HIERARCHY OF A ROUTINE

Knowledge Base

Programming is the concept of changing workout routines via intensity, volume, and frequency, which results in progressive overload. For beginners this is often performed by increasing the repetitions, sets, or the amount of exercises performed.

Once you become more advanced it is important to realize that things are going on underneath the surface of a training program. This is why understanding the macro effects of stress and adaptation in the context of weekly programs is important, especially knowing that a program affects fitness and fatigue, which can allow one to plan gains through supercompensation.

Attribute training is the concept of understanding how the parts of a routine work, so you can adjust them on the fly if needed. For example, aside from strength and hypertrophy work, there may also be flexibility, mobility, skill work, and other elements that fit into a workout routine. Attribute training lets you know that some of these components do not necessarily have to be solely in a workout routine, but can be performed many times throughout a week.

Finally, the basic components of a routine are as follows:

- Goals
- Warm-Up – Blood Flow, Mobility, Position Drills
- Skill Development – The development of sport-specific skills or handstands
- Strength Work – Followed by other work, such as endurance or other cross training
- Prehabilitation, Isolation Work, Flexibility Work, and Cool Down

The warm-up tends to consist of lower-intensity exercises. The goal of this is to raise core temperature and get the nervous system and muscles operating at full capacity. In addition, some degree of prehabilitation, mobility work, or stretching may be integrated if it benefits the ensuing workout.

Skill development can be integrated into the warm up if time is a factor. This tends to focus on lower-intensity skills that need a lot of practice to attain.

The strength work of the workout is the power, eccentrics, isometrics, and dynamic movements. These make up the core of the work you will be doing to move toward your goals. This may be followed with other work as necessary.

The cool down period is composed of rehabilitation or prehabilitation work, as well as isolation (to improve specific injury conditions or to stave off ones from development). Likewise, mobility and flexibility work is often better integrated into a routine at this point, as the body is more responsive after the nervous system and muscles are tired from working out.

Application

Look at your categorized goals and use this template for building your workout routine. In this next part, we will go over how to assemble the specific components into the routine you will perform during your first workout.

- CHAPTER 6 -

POPULATION CONSIDERATIONS

UNDERSTANDING POPULATIONS

The differences in populations is an important concept to explore because it affects how you train yourself or your athletes if you are a coach. We have already discussed the difference in populations between beginner, intermediate, and advanced athletes in the section on the progression charts and levels. In this chapter, we are going to explore another four distinct categories of populations that encompass the vast majority of those who desire to pursue bodyweight training. Here are the different types of populations to consider:

- Emphasizing the differences in training between the sedentary and the active.
- Emphasizing the differences in training between the young and the old.
- Emphasizing the differences in training between those who are utilizing exercises for their sport and those who train for other reasons.
- Emphasizing considerations for those who are injured or recovering from an injury.

These categories are not mutually exclusive, so you may find that you or an athlete you train falls into more than one category. Considerations for constructing exercise routines must be made on all accounts to ensure that you safely progress in your training and address any problems that may arise along the way.

SEDENTARY VS. ACTIVE

The way that a sedentary person and the way that an active person approaches bodyweight training will naturally be different. To understand the differences in these two populations, let's further define each into different categories. The *sedentary* can be divided into two categories, while the active can be populations can be divided into five.

Sedentary

- Purely Sedentary
- Previously Athletic Sedentary

Active

- Non-Weight-Lifting Active
- Weight-Lifting Active
- Bodyweight Active
- Bodyweight Prepared
- Sport-Specific

The way in which you would want to introduce each of these populations into specific bodyweight training routines will differ based upon a number of factors. Let's outline some general principles for each of these populations for consideration in constructing your own routine and/or the routines of your clients. This is to ensure a suitable buffer for overuse injuries, and a solid introduction into bodyweight exercises based on previous history relative to training and particularly bodyweight training.

The *purely sedentary* are those who have never exercised in their life. There are a couple of factors to take into consideration with this population. First, you will want to start slowly. Often, the purely sedentary have very poor movement and body awareness, so attempting to progress too quickly could lead to injury. Those who fit into this population should pay special attention to learning correct techniques. This may mean slowing down movements by adjusting the tempo, or even not progressing at all if the movement is even slightly out of alignment.

The second factor with the purely sedentary population is that they have had no previous adaptations to exercise. Their bodies will therefore be adapting to the exercises as they perform them. This means that it is better for the purely sedentary to start with much easier exercises and higher repetitions. This will allow them to attain technical mastery, increase blood flow, and reduce the amount of stress on their slower adapting connective tissues. While higher intensity exercises will provide quick strength and muscle gain, one's joints and connective tissue will not be prepared for it, which can lead to overuse injuries. This will be a common thread you will see as you explore more populations.

Most purely sedentary will start off beginning in the L0-4ish range on the *Overcoming Gravity* charts, although most likely in the L0-2 range. The overall recommendation for this population would be to start with sets of five repetitions and work up to 12-20 repetitions in each set. The primary focus should be on technique, not merely moving fast through the exercises. After a few months of performing higher repetition work, you can progress without utilizing such high repetitions.

If a person is overweight or obese, place them in this category as well. In their case, they should place a priority on a healthy diet and consuming less calories, in order to lose weight. This is in addition to progressing through the charts much more slowly than those who fit in a more advanced population. It is common for those who are overweight or obese to have systemic chronic inflammation within their body, which negatively affects recovery and fat loss. Thus, losing weight in conjunction with taking exercise progression slowly will substantially relive the burden on joints and connective tissue, which will ultimately decrease the potential for overuse injury.

The *previously athletic sedentary* are those who are former athletes or exercised regularly in the past. This category encompasses a wide range of athletes from different sports, both competitive and recreational. Previously athletic but sedentary would mean at least a three-month period or longer of inactivity. Attributes such

as endurance tend to start to degrade after three to five days of inactivity, whereas strength starts to degrade after about five to seven days. Of course, these numbers depend on various factors, such as the duration of training and if there is any overreaching or overtraining involved, which may elicit supercompensation. However, after three months it would be fair to say that there are significant decreases in overall ability from the athlete's previous performance level.

The first factor to keep in mind with the previously athletic sedentary is their minds are conditioned to hard work. Their work ethic is commendable and will be good for training in the long run; however, the first couple months back are the most dangerous for them. Because they are used to working intensely and their bodies previously made adaptations to exercise they will begin to progress extremely quickly. If too much exercise is performed too soon they can become exceedingly sore or potentially develop *rhabdomyolysis* (if the intensity is ramped up too quickly with certain types of exercises). You may see this occasionally in populations with intense exercise such as CrossFit, and even in bodyweight training if too much volume is introduced right away. If there is ever a massive amount of soreness coupled with increased localized swelling or edema, decreased ability to move through your range of motion, and your urine is brown, you should definitely go straight to the emergency room, as rhabdomyolysis is a life-threatening condition. Soreness with significant swelling and decreased movement through the range of motion without the brown urine indicates that a workout was severe, but not enough to elicit rhabdomyolysis. If any of this occurs, talk to a qualified medical professional. You may experience strength loss following any of these bouts, which will require you to ease into your routine very slowly. It is best to hold back for the first three to four weeks of the program for this population.

The second factor to keep in mind is your connective tissue integrity. The previously athletic sedentary population is the most at-risk for tendonitis and other connective tissue injuries because their strength and muscle mass will come back rapidly. This will lead to quick progress, but connective tissue strength and integrity will lag. It is imperative for this population to watch for signs of connective tissue compromise, such as twinges of pain, achiness, and generalized discomfort on the tendons, bones, and joints. When such symptoms occur, it is best to back off of the offending exercise(s) to a lower progression and work higher repetitions into the 15-20 (if not higher) range of not-to-failure exercise. The higher repetition work helps to push blood into the area for healing of the connective tissue. On the off chance that higher repetition work at a lower progression aggravates the situation, your best bet is to back off exercising that progression entirely and add in prehabiliation work (along the lines of isolation exercises and non-painful mobility work) to keep the affected areas moving and active. If the athlete is listening to their body correctly the vast majority of cases should resolve within a week or two, and then the athlete can slowly work their way back into exercise focusing on at least 12-15 repetitions to move to the next progression instead of lower amounts.

The *non-weight-lifting active* tend to be those in sports or recreational activities such as running, swimming, biking, and those who play sports recreationally without lifting weights or performing bodyweight exercises. For the most part, the same considerations for the previous athletic sedentary also apply to the non-weight-lifting active. In this population, there is also the illusion of the ability to progress quickly without incident because of the activity level. However, because this population is not accustomed to any type of strength training and has the drive to push themselves to be active, they may incur connective tissue injuries more rapidly than the purely sedentary. The same recommendation to remain aware of how the body is responding applies to this population.

For this population, another consideration may be the frequency of activity. If a person in this population is accustomed to running six times a week or playing their sport three to four times a week, this may have an impact on workouts. For example, their body is used to a high level of activity, which it can recover from at the present point in time. When an additional bodyweight routine of three times a week is added, their body may not respond as it should, especially if their recovery time is already stretched to the limit. This is the first population where there may have to be a balancing trade-off between how many sessions per week of sports and bodyweight workouts can be performed. The recommendation for a person in this population with a full schedule of activity is to start with two workouts a week and potentially reduce one to two days of other activities. Then, re-evaluate your level of fatigue and/or progress after two weeks. If you think your body can handle it, you can then add in another workout at this point or a bit later on.

The good thing about this population is that they will typically be both motivated and disciplined. Coaches can use this to teach proper technique and utilize higher repetitions if necessary in order to facilitate the movement patterns and ensure that strength is good. Strength training in this population can also be used to correct imbalances that may develop from training. For example, in climbers there is a tendency to have overdeveloped pulling muscles and backs compared to anterior muscles, such as the chest. Hence, balancing this out with additional pushing exercises, such as pushups and dips, will be effective in making sure one progresses quickly and safely with their discipline. This is true for any sport that may overemphasize strength, endurance, mobility, or flexibility in particular areas, at the expense of others.

The weight-lifting active are those who have experience lifting weights in a gym. There is a considerable difference between those who have lifted for one month, one year, and ten years. The more you have trained, the more structural adaptations your body has, which will have some transfer over to bodyweight exercises. For our purposes, if you have consistently trained for at least six months to a year, you fall into this category.

The weight-lifting active will transfer very well into most bodyweight exercise without any incident. The main categories of exercises that this population needs to worry about are the straight-arm strength exercises. These include isometrics, such as the planche, front lever, back lever, and the like, as well as straight-arm press handstands. Since this population tends to come in with a decent amount of applicable strength to bodyweight movements, the vast majority of exercises will come easily to them. Connective tissue strength with most of these will not be an issue. However, with the straight-arm exercises this strength is going to be detrimental to an extent because progression will happen much too quickly. Thus, one should continually monitor their body while performing exercises, particularly for signs of achiness, soreness, dullness, pinching, or stinging—especially around the joints, tendons, and ligaments.

Depending on how this population has trained before, they may have some imbalance issues if they primarily trained beach muscles. Thus, identifying and correcting any imbalances is important. For the most part, pushing tends to be approximately the same level or one grade higher than pulling on the *Overcoming Gravity* charts. If there are discrepancies in two or more levels it may indicate weaknesses that need to be shored up.

The *bodyweight active* are those who have experience with bodyweight exercises. For example, those who have trained with generalized bodyweight exercises such as pushups, dips, handstand pushups, pull-ups, rows, squats, pistols, and the like for at least six months. This population may have even experimented with more advanced exercises, such as one arm variations of pushups, pull-ups, or squats.

The main issue that the bodyweight active will run into is that they will have difficulty sticking to an organized strength routine. The vast major of athletes in this category are those who have previously focused on endurance or are haphazard in their training, randomly doing whatever they feel like. Their training is based on high repetitions and going to failure with many sets which is not how strength training should be structured. They will have difficulty staying consistent with a bodyweight strength routine because they feel like it is not doing much for them.

The *bodyweight prepared* are those who have experience with most of the straight-arm isometric strength exercises. Typically, this population will include those who are already engaging in structured bodyweight strength training. This includes gymnasts, b-boys, some parkour athletes, and others.

The main issue that this population has is their consistency, which is actually a good thing. However, if any overuse injuries do occur it can be a bad thing because they often do not want to reduce training in order to take care of their own bodies. In particular, those who are in competitive sports with bodyweight strength training will have the similar drive to ignore their injuries and continue training, lest they fall behind. Ignoring injuries or pre-injury conditions where there is achiness, tingling, and joint or connective tissue soreness is a recipe for developing long-term injuries. With this population, proper future time orientation and planning is important, so that they can rehabilitate themselves fully back to health and continue training at a high level.

In general, the bodyweight active and bodyweight prepared will already have adaptations to bodyweight exercise. The main concern with these populations is staying consistent with strength training and identifying any issues as they appear.

The *sport-specific* are those who play a sport competitively. They may or may not already have strength training based on bodyweight exercises or weights involved with their training regimen. This population is best dealt with on a case-by-case basis; it is always best to consult your coach if you have one to see what type of strength exercises, conditioning exercises, or other additional activity they recommend (if any at all).

Some programs—such as football and basketball—are more inclined toward lifting weights. In this case, refer to the *weight-lifting active* sports section for more details on what you should expect. In other cases, programs such as wrestling, gymnastics, or the military may use bodyweight exercises more extensively. If this is the case, refer to the *bodyweight active* section. The concept that you should take away from this section is not that there is a large difference in this population from the weight lifting active or the bodyweight active, but that these populations need to be more aware of how they use their time in training and recovery. If an athlete is training for and playing a sport, there needs to be an awareness of balance between strength and conditioning and the sport-specific training. This will be discussed later in the cross-training chapter.

YOUNG VS. OLD

The main difference between the young and the old populations is the decreased resiliency of the older population, which may be dealing with long-term issues such as decreased flexibility and mobility, previous chronic injuries, being overweight or obese, disease conditions such as diabetes or hypertension, decreased movement quality or inability to perform particular movements, and other functional limitations. For this population, it will be key to prepare the body before working out, especially if one cannot properly perform the techniques. In this case, modifications in workout structure will need to be made.

One phenomena that has been sweeping through the fitness world over the past decade is the awareness that, in general, static stretching should not be used prior to a workout, as it may decrease the ability to maximally contract muscles during strength workouts. However, there may be cases when static stretching prior to a workout may be beneficial if a gain in mobility is needed. This would be true if an athlete is having trouble moving into the right position or correctly performing a technique. Generally speaking, it is a good idea to place an emphasis on safety over performance when constructing a workout routine.

Naturally, the bodies of older folks are going to be less efficient overall in all phases of working out. This can be mitigated to an extent by a good warm-up. Spend ten to fifteen minutes warming up, and if you need extra time add your age divided by four. This will ensure sufficient time to allow the body to become more acclimated to your exercises, which will decrease your risk of injury. Warm-ups for various age groups may look something like this:

- 20-year-old: 10 minutes + (20/4) = 15 minutes
- 40-year-old: 10 minutes + (40/4) = 20 minutes
- 60-year-old: 10 minutes + (60/4) = 25 minutes

For younger athletes—especially those in the single digit ages—a primary concern will be decreased coordination, as the neurological pathways are not fully developed. This population also has the tendency to cheat their technique to pump out more repetitions. They think that more is better and that they are invincible. Clearly, this is unsafe when performing more advanced bodyweight movements where technique is paramount. If you are coaching or supervising younger children it would be a good idea to make a game out of exercise. Pair up the younger children and tell them what not to do. Children like to point out what other children do wrong and keep them in line, so it is basically a double-check structure for you. Use your resources to your advantage.

Older populations with limitations in flexibility and mobility will often have to add more of this type of training while simultaneously decreasing the amount of strength work due to their decreased capacity for training. The mobility and flexibility sections may start to look longer than the strength section. This is to be expected. A foundation of good movement and range of motion needs to be built before adding strength on top of it. Failing to do this is one of the easiest ways to get injured. Additionally, a full-body routine at a frequency of 3x per week may not be ideal for those who are older. They may need to work a split routine instead if they simply cannot recover from a large workout. For those who are older it is better to spread out a lot of work between various days of the week. Otherwise, an intense workout with everything in one day may rapidly lead to excessive fatigue and injury.

SPORT-SPECIFIC VS. RECREATIONAL TRAINING

The major difference between sport-specific and recreational training is the emphasis of the training. In sport-specific training, strength and conditioning and workout routines are only a means to an end. In other words, the primary goal is on-field performance and the strength and conditioning is supplemental to help improve on-field performance. This is different from training for recreational or other reasons, where the emphasis could be equally split between recreational sports and training, or there could be a greater emphasis on training and not as much for on-field performance.

In the previous chapter, we discussed attribute training. Sport-specific strength and conditioning is always going to be focused on attribute training, which will vary based on the sport you are playing. For instance, if you are a long-distance runner, much of your in-gym strength and conditioning will focus on endurance work, with a bit of power, strength, and plyometrics. On the other hand, if you are a sprinter for track and field, much of your in-gym strength and conditioning will be focused toward maximal strength, power, and plyometrics, with very little endurance training. This is where energy systems need to be taken into account.

Here are a few examples. One of the big differences between gymnastics and parkour is a lack of competition, although that may be slowly changing. In gymnastics, there is a defined season where you are competing and where you are not competing. This means that there are phases of in-season training and phases of off-season training. The vast majority of sports are seasonal—football, basketball, soccer, track and field, and the like. In-season training is typically approached differently than off-season training in that in-season training is meant to prepare the athlete to compete and maintain abilities. On the other hand, off-season training is typically used to increase the various abilities of the athlete so that they will come back harder, better, faster, stronger. *Daft Punk* reference intended.

The other major difference between sport-specific and recreational training is exercise selection. In sport-specific training, you rarely choose exercises you enjoy doing. You are required to perform the most effective exercises that help with the particular attributes needed for your sport. For example, squatting and deadlifting with free weights are typically used by athletic programs for strengthening an athlete. Exercises that would probably not be used are other variations of squatting, such as leg press machines and sissy squats (heels come off the ground, knees far forward). Some programs do not even like athletes who are making millions of dollars doing any explosive exercises such as power cleans (where the bar is pulled from the ground to chest level in one movement) because of the risk of injury. Basically, if you are the strength and conditioning coach and you injure a million-dollar athlete, you are probably going to get fired. Effectiveness of exercises is often mixed with safety of exercises to ensure that athletes are actually going to make it to the field on game day.

If the focus of your training is geared toward random recreational activities, developing awesome movements, or simply becoming strong, you can basically pick and choose what you want to learn and develop. This book lays out some general principles—such as structural balance guidelines—which will help you avoid paths that lead to injury. However, the rest of your fitness journey is up to you as you determine your unique goals and move toward them.

UNINJURED VS. INJURED

This population focuses on considerations for those who are injured vs. those who are coming back from an injury. There are two main distinctions here: 1)Those who are currently injured; 2)Those who have previously been injured, but have completed rehabilitation. Those who are injured will need to structure their workouts differently than those who are not injured. Some allusions to this concept have already been made in the attribute training section of Chapter 5, but we will expound heavily on this concept in the health and injury management chapter. Essentially, with injuries the goal is mixed between ensuring that the injured body part(s) are healing and becoming stronger again and ensuring safety in the programming and consideration to the surrounding areas.

There are also work-around methods to continue training while injured, so an injury should never stop you from training. One thing that keeps athletes sidelined is the belief that they cannot workout while they are injured. That is far from the case, and this mindset often leads to an athlete ceasing to workout altogether, which causes them to become sedentary. In this case, their diet typically will not change, which can cause them to become overweight or even obese. So you have someone who was physically active and in good shape who goes to sedentary and obese, and they look back and wondered how it happened. The injury was only a catalyst to a chain of poor decision-making. This is something that must be addressed with those who are injured. They must understand that even though something bad may happen during training, it is not a good reason to start making additional poor decisions that lead to slacking off from training.

For those who are rehabilitated from an injury, a generally good rule of thumb is to continue to do rehabilitation exercises at the end of a routine. This ensures continued activity to the body part in question, which will help build resilience against further or additional injury. It also keeps one aware that this body part was injured in the past, so special care for it should be taken in the future. The number one predictor of your next injury is a previous injury. You are much more likely to re-injure a body part than you are to develop a new injury altogether.

A special focus on prehabilitation after rehabilitation will potentially limit the amount of compensation patterns that can develop from an injury that appears to be fully healed. Compensation patterns often lead to overuse of other body parts. For example, if you suffer a knee injury in your right leg, you may start to favor more toward your left leg when squatting. Favoring the left leg may lead to a muscle imbalance or tendonitis of the hip or knee.

For those coming back from an injury, prehabilitation *after* rehabilitation for a certain amount of time is recommended. At minimum, it should be half as long as the period of rehabilitation; at maximum, it should be the full length of the rehabilitation, unless miscellaneous issues begin to arise and the period needs to be extended. Therefore, if it took two months to come back from tendonitis, you should be doing prehabilitation for 4-8 weeks after your rehabilitation period has ended. This will typically look like a couple of additional exercises at the end of your routine. While it is not much, it helps keep you focused on the reality that you were injured, so that you proceed with caution and avoid another injury from overuse. If miscellaneous issues (such as compensation patterns or other injuries) begin to occur, you may need to continue prehabilitation indefinitely. As always, if you are confused or have any specific questions regarding the implementation or rehabilitative or prehabilitative measures into your routine, you should talk to your orthopedic doctor or physical therapist.

CHAPTER 6 SUMMARY

POPULATION CONSIDERATIONS

Knowledge Base

Modifications based on various populations are important because these differences may drastically affect how you train. It is important to realize where you are and adapt your workouts accordingly, in order to prevent potential overuse injuries. Consult a medical professional before implementing a workout routine.

Here are the different populations we discussed:

Sedentary

- Purely Sedentary
- Previously Athletic Sedentary

Active

- Non-Weight-Lifting Active
- Weight-Lifting Active
- Bodyweight Active
- Bodyweight Prepared
- Sport-Specific

Application

If you fall into any of these categories, pay attention to the details that have been laid out in this chapter, as each group of individuals responds to bodyweight training differently. One group may have certain issues that require modifications, while another group may not. This must be taken into account when constructing a workout routine.

Part Two

CONSTRUCTING YOUR ROUTINE

- CHAPTER 7 -

CONSTRUCTING YOUR WORKOUT ROUTINE

FREQUENCY IN FULL-BODY ROUTINES AND SPLIT ROUTINES

There are three general types of routine structures used when training: full-body routines, splits, and body part splits. There is vibrant debate about which type of routine is most effective. The fact of the matter is that the best type of routine depends entirely on your goals. Full-body routines are the fastest and most effective way to build overall strength for beginners, but it is important to recognize the pros and cons of the other templates as well, so we will examine each one for its advantages and disadvantages and to see if there are any cases in which they might be useful.

In the full-body routine template, the athlete performs more compound exercises and eliminates isolation exercises. This allows you to work more muscles in gross pattern movements than in a split routine, which typically has a mixed bag of compound and isolation exercises. The full-body routine is also highly recommended for beginners because of the non-specific neurological components of strength, such as recruitment, synchronization, and rate coding. With full-body routines, the net gain of working compound exercises with higher frequency is enhanced, and as a result, full-body routines which are performed two to three times per week tend to be more effective than split routines for gaining strength.

If your goal is hypertrophy, then full-body and split routines provide essentially the same result if the overall volume on muscle groups is similar.

The full-body routine allows for a higher frequency of use of each exercised muscle group. A typical split routine divides a workout to focus on a single group of muscles: biceps/back, triceps/chest, or legs "split" across the different workout days. This hits each muscle group approximately once to twice each week. In comparison, with the same number of training sessions, a full-body routine would work each one of these groups of muscles three to five times a week.

It is a simple truth that the more often you work the movements you want to master, the faster you will improve. One part of developing muscular strength is predicated on repeating the same exercise and improving upon it. Some of the neural adaptations for strength, such as contribution and motor learning, are movement specific. Performing a variety of exercises will not build strength as effectively as executing the same exercise repeatedly and progressing in it. If you establish a split routine such as push/pull/legs with a rest

day in between, you would perform each exercise approximately twice a week. But if you were to use a full-body routine, you would increase your frequency of each pushing, pulling, and legs exercise to three times a week. These extra exercises add up over time.

Let's look at a real-world example: a beginner athlete wants to significantly improve in the planche, a pushing-type exercise. In a typical push/pull split routine, this athlete would perform pushing exercises one day, pulling exercises the next, then take a day to rest. Therefore, if our athlete adheres to the normal four times per week schedule, they would perform the planche twice a week—their other two weekly workouts would feature pulling exercises. However, with the full-body routine, our athlete would practice performing the planche three times per week. This may not seem like a significant difference, but over the course of one year, this athlete will perform 50 more planche workouts than they would with a split routine.

- 52 weeks * 2 workouts per week = ~100 workouts with the planche in a year.
- 52 weeks * 3 workouts per week = ~150 workouts with the planche in a year.

The athlete who chose a split routine with two pushing workouts per week is behind our athlete by 50 planche workouts. It will take them six months to finally reach the 150 total planche workouts the full-body workout would have given them in only a year.

- 50 workouts/2 days per week = 25 weeks (4 weeks per month = ~6 months)

To reiterate: over the course of a year, the person choosing the traditional split routine is *six months behind* the person who performs the full-body routine!

The math sounds sensational, and any athlete can tell you that training effects from workouts are not linearly cumulative. Yet even the most conservative estimate would show that the athlete performing the split routine is easily three to four months behind on planche than the one who trains with a full-body routine, and an extra three months of training on a planche at the earliest stages can be almost another progression level. This vast strength difference occurs by simply increasing the frequency of an exercise one additional time per week.

Full-body routines add up over the course of a year and are therefore more effective compared to splits for beginner and intermediate level athletes.

It is beneficial to give the muscles a rest between workouts. Traditionally, beginners are given full-body routines at a workout frequency of three times per week. If the workouts are structured on a typical Monday/Wednesday/Friday (MWF) schedule, this spaces the workouts by approximately forty-eight hours. Optimal rest times will vary based upon the type of sport one is pursuing, as well as the general health of the athlete embarking on the routine. While there is no solid research to suggest that forty-eight hours is the optimal amount of rest time for most beginners, it is a good general guideline.

This is not to disparage a push/pull routine or other various splits. Push/pull, straight-arm/bent-arm, and upper/lower splits can be used quite effectively with bodyweight routines. Types of routines should always be relative to overall workout volume and recovery factors. For higher-level athletes, body-part split routines are occasionally vital. Training that requires heavy skill work such as in football, where twice-daily practices are common, may necessitate splitting up that volume with a push and pull system or upper and lower splits depending on recovery factors.

Isolation work is best utilized at opposite ends of the fitness spectrum: for injured or for elite athletes. If you are a beginner or intermediate athlete—as indicated by the strength progression charts—you should utilize a full-body routine with few exceptions.

In general, full-body routine practitioners who are just starting out should schedule three workouts per week, spaced to allow for recovery. The first table below denotes the abbreviations for different days of the week used throughout this book in relation to routine scheduling. Other abbreviations may also be used, as in the second table below:

- Monday, Wednesday, Friday (M/W/F)
- Tuesday, Thursday, Saturday (Tue/Thur/Sat)
- Monday, Wednesday, Saturday (M/W/Sat)
- Tuesday, Thursday, Sunday (Tue/Thur/Sun)

Example 1	Example 2	Example 3	Example 4
Mon: Full-Body	Mon: Rest	Mon: Full-Body	Mon: Rest
Tue: Rest	Tue: Full-Body	Tue: Rest	Tue: Full-Body
Wed: Full-Body	Wed: Rest	Wed: Full-Body	Wed: Rest
Thur: Rest	Thur: Full-Body	Thur: Rest	Thur: Full-Body
Fri: Full-Body	Fri: Rest	Fri: Rest	Fri: Rest
Sat: Rest	Sat: Full-Body	Sat: Full-Body	Sat: Rest
Sun: Rest	Sun: Rest	Sun: Rest	Sun: Full-Body

These are just a few of the variations possible with a three times per week full-body workout routine schedule. Space your workouts 48 hours apart, with a 72-hour rest after every third workout. Choose a schedule that fits with your own life needs. Be creative: you could make your full-body routine run on a bi-weekly schedule instead of a weekly schedule. Over a two-week period, a bi-weekly schedule will allow you to train seven times per two weeks, whereas the weekly schedule would allow only six times per two weeks.

Example 1		Example 2	
Week 1	*Week 2*	*Week 1*	*Week 2*
Mon: Full-Body	Mon: Rest	Mon: Rest	Mon: Full-Body
Tue: Rest	Tue: Full-Body	Tue: Full-Body	Tue: Rest
Wed: Full-Body	Wed: Rest	Wed: Rest	Weds: Full-Body
Thur: Rest	Thur: Full-Body	Thur: Full-Body	Thur: Rest
Fri: Full-Body	Fri: Rest	Fri: Rest	Fri: Full-Body
Sat: Rest	Sat: Full-Body	Sat: Full-Body	Sat: Rest
Sun: Full-Body	Sun: Rest	Sun: Rest	Sun: Full-Body

Some people may have limited access to the gym, or may have work, family, or other obligations. This may force potential alternate full-body schedules such as the following:

- Wed/Sat/Sun for those who have limited time during the week.
- Mon/Tue/Wed or Mon/Tue/Thur or Mon/Wed/Thur for those on a shift work schedule.

FOUR TYPES OF SPLITS

Although full-body training is recommended for beginners, splitting routines can be effective for intermediate and advanced athletes, and when other factors are involved. It is important to explore all the options available. Some athletes will be unable to allocate all of their training resources solely to bodyweight training; a full-body routine may be too strenuous or time consuming. These are the four recommended methods of splitting exercises, each with advantages and disadvantages. There are also splits in which a specific sport is combined with a training routine.

- Push/Pull
- Upper/Lower
- Straight-Arm/Bent-Arm
- Push/Pull/Legs

There is no isometrics/movement day because there are not enough static exercises to perform the full routines necessary to stimulate improvements. Instead, the straight-arm/bent-arm split focuses on the usual gymnastics' straight-arm isometric exercises but also includes movement-based straight-arm exercises. This expands the number of exercises to a large enough volume to allow progression.

The Push/Pull Split

The push/pull split is fairly self-explanatory and will encompass both your legs and upper body into two routines. A common practice is to perform two pushing and two pulling days per week; four days of total volume. When employing this sequence, the overall stress on the body is minimized (since the volume is split up over four days instead of doing a full-body routine three times per week), allowing one to devote more work to other areas. You can also easily integrate bodyweight exercises with those using weights or barbells, as you can always substitute equipment-based pushing exercises (such as bench and overhead press) for any of the bodyweight pushing exercises (such as handstand pushups, planche progressions, and dips). The same is true with pulling exercises.

If you cannot perform a full-body routine, a push/pull split is typically recommended. This split has several benefits, for example, by stacking all of the pushing exercises on one day, overall volume on the muscles is increased (useful when workout goals are strength or hypertrophy). The main disadvantage of this split is that you will typically have two consecutive days of working your legs, as the leg exercises will be split into pushing (squat variations) and pulling (deadlift and hamstring variations). Squatting movements and anterior chain movements that focus primarily on the quadriceps typically align with pushing. Deadlifts and posterior chain movements that work the glutes and hamstrings extensively fall mostly under pulling. Remember, pulling exercises move the weight closer to your center of mass, while pushing exercises move the weight away from your center of mass. If you are playing a sport, consecutive days of legs work may not be an effective solution for you, as it leaves no time for true recovery.

Here are some examples of various weekly schedules utilizing a regular volume of five to six exercises per workout:

Example 1	Example 2
Mon: Push	Mon: Push
Tue: Pull	Tue: Rest
Wed: Rest	Wed: Pull
Thur: Push	Thur: Rest
Fri: Pull	Fri: Push
Sat: Rest	Sat: Pull
Sun: Rest	Sun: Rest

In the first example, the weekend is kept free. In the second example, a bit more recovery time between workouts is offered. However, this means that workouts bleed into the weekend. Over a two-week period, each of these examples include a total of eight workouts split evenly between push and pull, so personal preference can be the deciding factor.

Each push/pull split should have a regular volume of exercises per workout. For each kind of muscular focus, choose five to six exercises of the appropriate type. Each pushing workout could include any of the following exercises: the two variations of squats, dips, pushups, and handstand pushups. If you prefer to try for six exercises, add another upper-body exercise, such as the planche.

Loading this kind of volume into a single workout can be effective for athletes whose bodies have become resistant to doing only two or three upper-body exercises per workout, but for most beginners it would be too much volume.

For beginners who have the need to use a split routine, a lighter routine with only three to four exercises per workout is a better choice. Ideally, based on your own stamina and goals, this would include two legs and two upper-body exercises, one leg and three upper-body exercises, or one leg and two upper-body exercises. See the two examples below:

Example 3	Example 4, *Week 1*	*Week 2*
Mon: Push	Mon: Push	Mon: Pull
Tue: Pull	Tue: Pull	Tue: Push
Wed: Push	Wed: Push	Wed: Pull
Thur: Pull	Thur: Rest	Thur: Rest
Fri: Push	Fri: Pull	Fri: Push
Sat: Pull	Sat: Push	Sat: Pull
Sun: Rest	Sun: Rest	Sun: Rest

In Example 3, the first column shows a 6/1 pattern (six workouts over a seven-day period with one rest day at the end). The second column shows the following week, with a 3/1/2/1 pattern (three workouts in a

row, one rest day, two workouts, and one rest day). This can of course be structured as a 2/1/3/1 as they are functionally equivalent. This will give you five workouts in a week, which results in one muscle group working one extra day. It is easy to offset this by reversing the order of the second week to start with the opposite workout, so that over the two-week period you get five workouts each of pushing and pulling exercises. The first example gives you twelve workouts (six push, six pull) over a two-week period, whereas the second example runs ten workouts (five push, five pull) over the same time period. It is up to you how quickly you would like to reach your workout goals.

The charts above show that a lighter split workout structure can lead to an increase in frequency. This is because of the rests between muscle groups. In the above examples, the resting gap between each pushing workout is still 48-72 hours, since the pulling exercises work entirely different muscle groups.

Remember: When you compare frequency in a full-body workout to the traditional push/pull split, the full-body workout wins handily. Each muscle group gets six workouts with the full-body workout to every five or four workouts depending on which schedule of push/pull split workouts you choose. The full-body routine allows rest days between workouts by condensing everything into a single day and therefore the athlete sees progression more quickly. However, with the split routine, you perform fewer exercises in each workout, making each workout shorter. Many people choose between these two options based on their schedule.

The Upper/Lower Split

An upper/lower split divides exercises into those done by the upper-body (torso, arms, chest) and the lower-body (legs, core). This split is often chosen if the athlete's other activities or sport entails heavy lower-body work or running. In that case it is possible to section off any lower-body lifting to days where you have no other activity, which will limit fatigue and speed up recovery.

The main disadvantage of upper/lower splits is there is a significant difference in the amount of work that must be performed on upper days versus on lower days. Your upper body has more planes of motion than your lower body, so bodyweight training routines require a higher number of upper-body exercises in order to engage them all. If you choose the upper/lower split routine, you will typically need to increase the volume of exercises in each workout to compensate for performing an exercise less frequently. For example, if your full-body routine incorporates two pushing and two pulling exercises, an equivalent upper/lower routine would need to include three to four pushing and pulling exercises to have the same overall effect. You may not have enough energy to perform all of the repetitions required to address all the planes of motion in your upper body if you choose this routine. Additionally, the effectiveness of a workout sometimes decreases when too many exercises are stacked on the same day.

Upper/lower split weekly routines are directly comparable to the push/pull split examples. Since exercises are split into two different workouts, you can structure upper/lower split routines the same way you would a push/pull split. The examples in the first table below would necessitate a regular volume of five to six or more exercises per workout. For a lighter volume of three to four exercises per workout, see the second table. Again, always consider your life schedule as well as the workout goals you are trying to achieve when choosing a workout routine.

Example 1	Example 2
Mon: Upper	Mon: Upper
Tue: Lower	Tue: Rest
Wed: Rest	Wed: Lower
Thur: Upper	Thur: Rest
Fri: Lower	Fri: Upper
Sat: Rest	Sat: Lower
Sun: Rest	Sun: Rest

Example 3	Example 4, *Week 1*	*Week 2*
Mon: Upper	Mon: Upper	Mon: Lower
Tue: Lower	Tue: Lower	Tue: Upper
Wed: Upper	Wed: Upper	Wed: Lower
Thur: Lower	Thur: Rest	Thur: Rest
Fri: Upper	Fri: Upper	Fri: Upper
Sat: Lower	Sat: Lower	Sat: Lower
Sun: Rest	Sun: Rest	Sun: Rest

If you practice a leg-intensive sport or discipline (such as parkour, football, basketball, track and field, etc.), an upper/lower routine offers a complementary structure, as examined in the following, real-world situation:

A parkour athlete, using the routine suggested in Example 1, sees that the lower-body routines are scheduled for Tuesday and Friday, therefore the actual, sport-specific training for parkour should occur on the days just prior to the lower-body workout, which would be Monday and Thursday. This ensures that any Parkour training is performed fresh (having just had a rest day), and the lower-body workouts on Tuesdays and Fridays can be enhanced by the identification of lower-body work that is still needed. This also provides a rest day after these specific leg workouts for full recovery.

While it is possible to schedule running-intensive sport-specific training on the same day as a leg workout, *the sports-training must be done prior to the workout*. Sport-specific performance when muscles are fatigued is an injury risk. Scheduling workouts right before sport-specific performance is not optimal either. An athlete's muscles must be fresh for optimal technique training within a sport. This may require stacking sports-specific work and upper-body training on the same day, but it keeps the legs fresh for action.

The Straight-Arm/Bent-Arm Split

A straight-arm/bent-arm split focuses primarily on the upper body. On the straight-arm days, static movements and handstands are performed. On the bent-arm days, full range of motion movements such as dips, pull-ups, rows, pushups, and handstand pushups are performed. Legs are incorporated on both days, even though they are not in the name of the split.

By stacking all the straight-arm exercises into one day, the straight-arm/bent-arm split allows for a more focused training of these exercises, which include straight-arm press handstands, front lever, back lever, and the planche. This is an advantage because the athlete has more rest days to recover from the high amount of stress that straight-arm work puts on the connective tissues in the shoulders, elbows, and wrists.

For those who do not like doing the same exercises repeatedly, this split is a good choice. It provides a wide variety of movements for one to work on. However, this is also the main disadvantage of this split. Strength training involves performing the same exercises repeatedly and progressing in them. Adding variety to your strength training—as is the case with this split—decreases your potential for results. Make this trade-off only if you despise a repetitive exercise routine.

Since straight-arm/bent-arm is a two-part split, the same workout pattern structures for push/pull and upper/lower are applicable. Review the previous sections for examples if needed.

The Push/Pull/Legs Split

The push/pull/legs split separates upper-body pushing exercises, upper-body pulling exercises, and leg routines into three different days. This is similar to a true split, much like what you would see in bodybuilding. It is only a good choice if you are not concerned with how fast you progress, are extremely risk-averse to injury, or are older and want to take it slow. This split offers a slower, but potentially steady pace that can work well for people in those categories.

Serious athletes should note that it is very difficult to get enough frequency with the movements in a three-part split to progress well. These splits are effective for hypertrophy, but the progress with each movement may be slow and have a penchant for plateauing. Because of this, I caution beginners and intermediate athletes against choosing any split that has three or more parts.

A three-part split can be structured a number of ways. Here are some examples:

Example 1

(One workout per week of pushing, pulling, and legs routines.)

Mon: Push

Tue: Rest

Wed: Pull

Thur: Rest

Fri: Legs

Sat: Rest

Sun: Rest

Example 2

(Four workouts per week with a frequency of 1.33 workouts of each routine per week over three weeks.)

Week 1	*Week 2*	*Week 3*
Mon: Push	Mon: Pull	Mon: Legs

Tue: Rest	Tue: Rest	Tue: Rest
Wed: Pull	Wed: Legs	Wed: Push
Thur: Rest	Thur: Rest	Thur: Rest
Fri: Legs	Fri: Push	Fri: Pull
Sat: Push	Sat: Pull	Sat: Legs
Sun: Rest	Sun: Rest	Sun: Rest

Example 3

(3/1/2/1 with a frequency of 1.67 workouts of each routine per week over three weeks.)

Week 1	*Week 2*	*Week 3*
Mon: Push	Mon: Legs	Mon: Pull
Tue: Pull	Tue: Push	Tue: Legs
Wed: Legs	Wed: Pull	Wed: Push
Thur: Rest	Thur: Rest	Thur: Rest
Fri: Push	Fri: Legs	Fri: Pull
Sat: Pull	Sat: Push	Sat: Legs
Sun: Rest	Sun: Rest	Sun: Rest

Example 4

(6/1 with two workouts of each routine per week.)

Mon: Push
Tue: Pull
Wed: Legs
Thur: Push
Fri: Pull
Sat: Legs
Sun: Rest

There are more variations if you are creative. For example, you may only want a rest day between upper-body sections of routines. You may also want to make changes based on your work, sport, or school schedule. The important thing is to maintain balance among the three (or more) muscle groups over time.

CHAPTER 7 SUMMARY
CONSTRUCTING A WORKOUT ROUTINE

Knowledge Base

Since frequency is the key to making the fastest progress toward your chosen goals, it is best to select a routine template that allows for the most frequency in the shortest time, as long as there are no injury concerns. If you are a beginner and bodyweight strength is your focus, full-body workouts are the best template for making progress, but it is important to also make sure to select a structure that works with your schedule. There are four split workout routine structure templates in addition to the full-body workout—each with various advantages and disadvantages. The five templates are as follows:

- Full-Body Routine
- Push/Pull Split Routine
- Upper-Body/Lower-Body Split Routine
- Straight-Arm/Bent-Arm Split Routine
- Push/Pull/Legs Split Routine

Application

It is important to factor in everything in your life when scheduling your workouts—work, school, family, friends, recreational activities, leisure time, etc. While this book aims to help you achieve high levels of strength and cool moves, you should not do this at the expense of the other activities you enjoy. Create a workout routine that works with your own life.

- CHAPTER 8 -

WARM-UP AND SKILL WORK

CLASSIFICATION OF WARM-UP EXERCISES AND DESCRIPTIONS

The goal of a warm-up is to prime the body into an optimal state for your workout and address any deficiencies in movement. Constructing a universal warm-up is difficult since every athlete's body has different needs. The three essential components of a warm-up involve blood flow, mobility, and drilling good body positioning—how long you will spend on each component will vary according to your own body's needs.

Sample Warm-Up Routine

(Will take approximately 15-20 minutes to complete.)

Blood Flow

- 10-20 Burpees
- 60s of Crawling

Mobility

- 10x Wrist Circles
- 10x Shoulder Circles
- 10x Bodyweight Squats
- Any other body part or joint that needs to be warmed up
- 60s of Support Hold Work (using parallel bars/rings or chairs/counters)
- 5x German Hangs / Skin the Cat

Positional (Bodyline/Body Tension) Drills

- 30-60s of Plank, both Side Planks, Reverse Plank, Hollow, Arch Holds

Skill Work: Time of skill work, type of skill work, and qualities

- 5-10m of Handstand Work (against the wall)

Blood Flow

A few key physiological changes must happen in the body to ensure a good warm-up. You must raise core temperature so the chemical reactions in your muscles take place faster, leading to better contractile function

and activation of the nervous system. Additionally, your heart rate and blood flow to the muscles should be elevated, in order to provide oxygen and nutrients and export waste. Other physiological changes that must take place include: increasing blood perfusion to the muscles, tendons, and other connective tissue, priming the brain and nervous system for exercise, and ensuring that the cartilage in the joints saturates with synovial fluid.

Here is an example of a set of exercises that would constitute a good *blood-flow* warm-up portion of a typical workout:

- 10-20 Burpees
- 60s of Crawling (or crawling for a specific distance, such as 100 meters)

Burpees are an excellent choice because they are a full-body exercise that rapidly increases your heart rate. Additionally, they are easy to perform and carry a low risk of injury.

Burpees are performed as follows in quick sequence: plank position → pushup → plank → move to squat position → stand → jump → squat down → move to plank position and then repeat the entire sequence. Do not pause between motions. The entire exercise should move smoothly. This is a full-body exercise that allows you to practice basic body movements such as lifting yourself up, squatting, and jumping. The fact that burpees are also good for warming up and getting the blood flowing is an added bonus.

The recommendation of sixty seconds of crawling can be broken up into as many sets of sixty seconds as you need. Crawling is performed in the quadruped position with your hands and knees on the ground. You then lift your knees a couple inches off the ground and focus on crawling forward, alternating with opposing limbs. Your left arm and right leg move at the same time and your right arm and left leg move at the same time. Attention should also be given to keeping your back parallel to the ground. Crawling is excellent for activating the core musculature and the scapular stabilizers as well as warming up your entire body. It works a wide range of muscles. To improve rapidly, work on specific distances rather than time—25 meters is enough to make most beginners lightly perspire.

Other types of full-body warm-up exercises to get your blood flowing can include: rolling, squatting, bear walks, crab walks, jumping jacks, jump rope, short jogs, or any other type of movement that is low to moderate intensity, easy to perform, and carries a low risk of injury.

The three main physiological signs that indicate when a person is ready to progress from the blood flow portion of the warm-up to the mobility portion are: 1) a light sweat, 2) moderate increases in heart rate, and 3) a slight to moderate increase in breathing cadence. It is an added bonus when the warm-up exercises lead into mobility work, which is the case with burpees and crawling.

Mobility

The second critical component of a warm-up is *mobility work.* A quick, short circuit of movements that focus on full range of movement to warm up the joints and surrounding tissues is the most useful. In Chapter 4, we covered the difference between flexibility, passive mobility work, and active mobility/flexibility work. For your convenience, the definitions are included again here:

- **Flexibility** – Increasing the range of motion by stretching the muscles through relaxation of the nervous system. The most easily understood example of flexibility to increase range of motion is working to obtain the splits.

- **Passive Mobility** – Taking a joint through its range of motion, but without the aim to increase the range of motion. Passive mobility is a good way to begin to warm up your joints for a workout. For instance, put your wrists on the floor and move your body over them. This will take your wrists to the edge of the range of motion without contracting the wrist muscles and is a great example of passive mobility.
- **Active Mobility/Flexibility** – These two terms are often used interchangeably, with *active flexibility* being the most common. In reality, *active mobility* should be used, since range of motion must be gained through flexibility training prior to actual use. Once this is accomplished, using the new range would be called *mobility training.* An example of this would be using a pike or a straddle stretch to improve compression; actively engaging abdominals and hip flexors to move your face closer to your knees or the ground. Likewise, working a standing split or a kick with your leg above your head is an example of active mobility or flexibility. We will use the term active flexibility as that is the common term.

Here is an example of a standard set of warm-up exercises designed to increase mobility:

- 10x Wrist Circles
- 10x Shoulder Circles
- 10x Bodyweight Squats
- Any other body part or joint that needs to be warmed up
- 60s of Support Hold Work (using parallel bars/rings or chairs/counters)
- 5x German Hangs / Skin the Cat

Most athletes can skip straight to active mobility work, warming up with exercises such as wrist circles, shoulder circles, bodyweight squats, etc. However, if you have particular limitations or stiffness in the joints it may be better to begin with passive mobility before moving into active mobility work. This is also good for older or injured populations. For instance, if your wrists are sore or tight you can move into a quadruped position—on your hands and knees—then move your wrists through various movements, slowly shifting weight back and forth on them to the edge of the range of motion passively. After a couple of minutes of taking the wrist through passive mobility, you may want to start doing active mobility movements such as wrist circles to further warm them up for exercise.

Try a combination of wrist circles (fifteen times each way) and wrist mobility, all ways, on the floor, both flexed and extended. For the shoulders, use a band or stick to do shoulder dislocates. This will help mobilize the scapulae and all of the muscles around the shoulder joint. If you have other methods of mobility or dynamic flexibility work you prefer, feel free to use them instead. This portion of the warm-up should take sixty to ninety seconds. Another facet of mobility work for bodyweight training is the need to warm up the elbows, particularly in the straight-arm position. When progressing from bodyweight exercises into more advanced strength skills the integrity of the elbows is critical. It is necessary to strengthen the biceps to avoid hyperextension.

One to three sets of straight-arm-locked support work is highly recommended. If you are strong enough to do a one-minute hold, that is enough. Try to progress toward turning your palms forward during the hold—what gymnasts call "rings-turned-out" or *RTO* for short. Turning the rings out and performing longer holds in that position is great for your biceps and elbows, as well as warming up the majority of your shoulder muscles.

- If you cannot hold a straight-arm position at all, start on parallettes or parallel bars.
- If you cannot yet hold a straight-arm support on the rings, use a rubber theraband to help you hold the rings together or get someone to spot assist you until you can hold it. This will be necessary for most beginners.
- If you just started training holding a non-RTO support hold, then jump up with straight-arms and try to accumulate between 60-90 seconds total hold time.
- If you are beyond that stage, try to use as few sets as possible to reach the one-minute mark.
- Once you start trying to turn the rings out, be consistent—do not let them come back in.
- Once you have worked your way up to 60-90 seconds with RTO where the rings are in line with your body then set your rings a bit wider—this will make it substantially harder.

The main thing is that not just the muscles are prepared for exercise but also that the tendons, ligaments, cartilage, and joints are as well. This may require more repetitions and/or sets for some people than others. You should stop when your muscles start shaking significantly or when you begin to feel significant pressure in the biceps. Remember, this is a warm-up—taxing yourself now will hinder your workout! Do, however, bear in mind that adding this skill to your warm-up will help you progress more quickly in your strength training. Proficiency on the rings is built by logging a lot of time on the rings.

Once the ring supports are complete, you will want to dynamically stretch your shoulders with some German hangs otherwise known as "skin the cat." If you are a beginner, set your rings low, let yourself into the position, and stretch for five to ten seconds. If you are more experienced, you can pull out in a tuck or pike position to an inverted hang and then back again. The goal here is to take your shoulders to the edge of their range of motion in extension. This helps with flexion as well: German hangs stretch the chest and lats as well as the anterior shoulder girdle.

Never stretch statically for more than fifteen seconds. Stretching for longer than this may decrease your strength output during your workout. Three to four short stretches should take you about a minute.

Earlier we discussed the length of a warm-up in light of the athlete's age. Keep in mind that the number of sets and repetitions in your warm-up is somewhat arbitrary. Generally, those who are older or recovering from an injury will require more time to warm-up. Take your age divided by four to see how many minutes you might need to add to your warm-up routine. Use this chart only as a guideline—modify it depending on your circumstances and your personal preferences.

- 20-year-old: 5-10 minutes + (20/4) = 5-10 + 5 minutes = 10-15 minutes
- 40-year-old: 5-10 minutes + (40/4) = 5-10 + 10 minutes = 15-20 minutes
- 60-year-old: 5-10 minutes + (60/4) = 5-10 + 15 minutes = 20-25 minutes

Remember that your warm-ups should be modified as you get stronger. For example, as dips and pull-ups become less strenuous and more second-nature, you can begin to add them to your warm-up routine if you desire.

To summarize, it is important to spend a few minutes of your warm-up mobilizing your joints. After that, you can begin to work on exercises that are two to three levels below your current level on the progression charts. For example: If you are working the straddle planche as one of your primary exercises, you can warm up with some tuck planche pushups to help prepare your muscles for more intense exercise.

Positional Drills

The third critical component of a warm-up is *positional drills* otherwise known as *bodyline* or *body tension drills.* The most useful positioning drills for bodyweight training are the plank, side planks, reverse plank, arches and hollow holds. However, depending on your sport or discipline, there may be other body positional drills that you may potentially use. Select exercises that will facilitate the skill work you require and help you maintain proper body positions in your strength work. Most of these exercises generally fall under the label of *stability work:*

- **Stability Work** – A type of training that focuses primarily on *neuromuscular re-education,* i.e. making your body re-learn how to move properly. For example, when you are recovering from an ankle sprain, one of the primary methods for regaining body awareness or *proprioception*, in the foot and ankle is to work on single leg balances. This activates the muscles around the ankle, which stabilizes it as you re-train your balance. Another example would be using planks as a core stability exercise to train your body to maintain tension in your core in order to hold itself still against gravity.

Stability or body tension drills are performed to solidify positions you will need to know for many bodyweight exercises, as well as to increase stabilization strength in your core. The more you improve at these drills now, the more proficient you will be with your form and technique in bodyweight exercises. This will allow you to progress faster and have a lower risk of being injured.

Many athletes have their own warm-up routines, tailored to their specific mobility weaknesses. Be aware that all bodyweight training places a high demand on connective tissues. Therefore, if you are importing an existing warm-up routine, make sure to also customize it specifically for bodyweight strength training.

So far we have not addressed the role of *stretching.* This is an important component of a workout, particularly because it increases your range of motion. *Static stretching is most beneficial at the end of a workout.* It is most effective when your body is warmed up and your nervous system is fatigued. However, dynamic stretching is useful in a warm-up, as it takes your muscles through their entire range of motion. Unlike static stretching, you do not hold the position at the edge of your range of motion. When static stretches in a warm-up are held for too long, they can have a negative effect on your ability to exert maximal force during your exercise routine. Prior to working out, stretching should be limited, unless you are struggling with poor flexibility that is inhibiting you from properly executing the skills in your routine.

Warming up does not need to be complicated, but it is important that your choices be well constructed so that your body is prepared to execute your routine. Be sure to select warm-up exercises that increase blood flow, mobility, and facilitate body awareness.

A development since the first edition of *Overcoming Gravity* states that it is more effective to include mobility work in your warm-up instead of putting it at the end with prehabilitation and flexibility. The reason for this change is that mobility exercises prepare your body for high-end skill work and your strength development exercises. This means you can intermix basic warm-up exercises with general mobility. Examples of basic warm-up exercises include support holds, easy versions of pushups, rows, etc. Examples of general mobility include German hangs (for the shoulders), wrist mobility work, and bridges and similar movements (for the back). For specific examples of workout structures, refer to the previous chapter of this book.

SKILL WORK: TIME OF SKILL WORK, TYPE OF SKILL WORK, AND QUALITIES

Skill and Technique Work should always take place after your warm-up. This is the optimal time for your body to learn new skills or new movement patterns.

Example: Five to ten minutes of handstand work against the wall. Rest as much as needed between sets of handstands.

Good skill and technique practice should always be emphasized. If you are practicing a skill poorly, your body will memorize this incorrect pattern. An example would be having loose legs (extraneous movement) while performing a handstand. Once your brain and body have memorized an incorrect pattern, it will be difficult to re-adjust your technique. It is always best to focus on correct form from the beginning. If you become too fatigued to continue, the best course of action is to immediately stop and rest. Never give your technique practice a half-effort, as this is usually where incorrect patterns are memorized and poor movements begin.

The planche, front lever, and back lever are *not* skill work. Although handstands and L-sits are included as skill work and all of these exercises are straight-arm skills, keep in mind that skill work is non-fatiguing movements focused on developing specific attributes, such as balance. Using this terminology, we could say that handstand work is essentially "balancing on your hands" work. The planche, front lever, and back lever are incorporated into a routine in order to develop the strength to effectively perform the movements. The proper place for these exercises is in the strength portion of your routine, not in the skill work portion.

On the other hand, skill work is highly variable. Properly performing handstands and various skills such as elbow levers and even L-sits requires a gymnast to spend significant amounts of time in those movements or positions. These skills tend to focus more on balance, but they also require variable amounts of strength. As you become stronger, they become easier.

A note about L-sits: This exercise has been placed in the endurance, core, and isolation work section because most people use this movement for core work, even if it is paired with handstands. L-sits are incredibly fatiguing for many beginners, which leads to decreased capabilities when placed in the strength work section of a workout routine. However, if you wish to train L-sits as skill work, leave them in this portion of your workout. This would be the best course of action if you want to move toward V-sit and manna, where you are not limited by your core strength.

After you master skills like handstands and progressions like pull-ups, dips, and German hangs and they become less intense on your body, they can be used in lieu of a separate warm-up routine. Incorporate them into your warm-up routine only after these exercises have become low intensity. For example, if you have mastered a freestanding handstand and are beginning to work on freestanding handstand pushups, it may be a good idea to add basic handstand work to your warm-up in order to reinforce proper neural patterns for the movement. You can also utilize dynamic movements, such as *handstand shoulder taps* (wall handstands while lifting a hand to touch an alternating shoulder each time) to help warm up your body while training skills at the same time.

All skills or strength progressions that are two to three levels below your current competency level are appropriate exercises for warm-up or skill work, especially if they have a significant balance component, such as handstands and elbow levers. (Use the progression charts as a point of reference.) For example: add short

tuck front lever holds to your warm-up if you are working the straddle front lever progression in your workout. You might also try warming up with an easier version of a progression to help you maintain the movements patterns in which you have become proficient. To save time, you might replace freestanding handstand pushups with a few wall handstand pushups.

Unlike in barbell training, where you can learn complex movements such as Olympic lifts snatch and the clean and jerk as a beginner and reach a level of proficiency within a few months, this is not possible in bodyweight training. In bodyweight training, the levels of progression are separated based on one's current competency, which takes previous strength and skill development into consideration. For example, the handstand is a basic skill that has a variety of progressions and different levels for one to work through. These include:

- The basic static hold itself, developed from the wall to free standing
- Kicking up and holding a basic handstand
- Handstand walking
- Developing a proper straight-arm press handstand
- Obtaining a freestanding bent-arm handstand pushup
- Obtaining a one-arm handstand
- Controlling various positions in handstands
- One-arm handstands
- One-arm press handstands

Progressing in pure bodyweight work is extremely difficult if you are not under the care of a coach who knows what they are doing and can point you to the correct progressions and offer tips on what you should work on next. Skill development plays a key role in building proper strength. If possible, include skill development in every workout. As an athlete's individual skill, strength, and work capacities improve, exercises previously classified "strength" work may become skill work. If this seems counterintuitive, consider the handstand. Beginners will often have a difficult time holding themselves inverted for five to ten seconds, even with the assistance of a wall. However, as one increases in strength, handstands become an endurance exercise and can be held for sixty seconds or longer. It is important to re-assess your goals and your exercise selections every five to six weeks. You will want to redefine what constitutes skill work and what constitutes strength work on an ongoing basis as your training moves forward.

Skills will not necessarily correlate to level of strength on the progression charts. It is possible to work above or below your strength level when it comes to skill work. Many strong people come into bodyweight training looking only to obtain some of the impressive static positions that are skill-based like the one-arm handstand. With good technique, even relatively weak athletes can work up to one-arm handstands.

Generally speaking, however, the stronger you are, the greater potential you have for skill work. As you get stronger, you will find that your skill work improves, provided that you continue practicing it in conjunction with your strength routine. The key to skill work is the more you practice—leaving adequate time for recovery—the faster your technique will improve. You must find a proper balance that facilitates optimal improvement. For beginners, just getting upside down in a handstand is a difficult feat. But for those who can already hold a freestanding handstand for sixty seconds or more, ten minutes of total work would be possible. Always keep in mind that too much practice can impair recovery, even with skills as simple as handstands.

It is best to approach skill work as you would a warm-up. It should not leave you excessively sweaty or tired when you move into the strength-training portion of your workout. Your goal is to get the highest quality of work without fatigue. For beginners, this may mean your skill work is as light as twenty seconds inverted. On the other hand, those who are more advanced may spend fifteen to twenty minutes practicing difficult skills like the one-arm handstand. Remember, more is not always better. With skill work, err on the side of caution: start with what feels like "too little" and add more if you need it. Those who start with too much skill work will have a difficult time identifying what is wrong if they are not progressing. Put in quality work, but don't be afraid to quit if you are feeling fatigued or having an off day. There is no shame in knowing that you cannot do something every day; we all have days where nothing goes as planned. Do as much *quality* work as you can per day (as your schedule and level of fatigue allows) and you will improve quickly.

Practice does not make perfect; *perfect* practice makes perfect.

CHAPTER 8 SUMMARY
WARM-UP AND SKILL WORK

A proper warm-up should cover three areas:

- Blood Flow
- Mobility
- Positional Drills

Good blood flow exercises include burpees and crawling, but can also include jumping jacks, jump rope exercises, short jogs, or any other type of movement that is low-to-moderate intensity, low skill level, and carries a low risk of injury. Rolling, squatting, and other quadruped movements such as bear-walks and crab-walks are good, too.

For mobility, choose exercises that warm up every joint. Spend more time on areas that are stiff or have previously been injured. The main recommended long term mobility exercises are RTO supports and German hangs/skin the cats.

The purpose of positional drills is to get your body acclimated to correct positions and maintaining core tension while performing bodyweight exercises. Work up to 30-60 seconds. You can eventually eliminate positional drills as your skills improve. Good position drills are plank, both side planks, reverse plank, hollow and arch holds.

Skill work should cover two areas:

- Sport-specific Work
- Handstands (and other skills that are limited by balance, not strength)

Avoid exercises that are extremely fatiguing in the skill work portion of your routine, as they may decrease your abilities in the latter part of your workout. Otherwise, feel free to work any type of sport-specific drills and movements that require mostly balance components, such as handstands.

- CHAPTER 9 -

STRENGTH WORK

The general template for an effective full-body strength routine includes two pushing exercises, two pulling exercises, and two legs.

If you are combining bodyweight and barbells and have other goals—such as hypertrophy and power—then that work goes in this section of the workout as well. Strength and hypertrophy are covered extensively in this chapter, as they play off each other. However, we will not go into power work such as the Olympic lifts (the snatch, clean, and jerk).

Sample Strength Work Routine (with two additional exercises at the end):

- Pull-ups: 3x5→12 with 3 minutes of rest at 10x0 tempo
- Dips: 3x5→12 with 3 minutes of rest at 10x0 temp
- Wide Ring Rows: 3x5→12 with 3 of minutes rest at 10x0 tempo
- Rings Pushups: 3x5→12 with 3 minutes of rest at 10x0 tempo
- Squats (pistol progression or barbell): 3x5→12 with 3 minutes of rest at 10x0 tempo
- Deep Step-ups: 3x5→12 with 3 minutes of rest at 10x0 tempo
- L-Sit for 60s total in as many sets as needed, not to failure
- Compression Work for 3x10s
- Planche Isometrics: 5x12s with 3 minutes of rest
- L-Sit Pull-up Eccentrics: 3x(3 x 7s) or 3x3 with 10s eccentrics

Legend: Exercise, Sets x Reps with Progressive Principle, Exercise Order, Rest Time, and Tempo

TYPES OF EXERCISES AND EXERCISE NOTATION

Strength exercises come in three types: *concentric* (muscle shortening), *isometric* (muscles stay the same length), and *eccentric* (muscle lengthening).

- **Concentric Exercises** – Otherwise known as *dynamic exercises,* concentric exercises have both an eccentric and concentric component. The most difficult part of these exercises is the concentric component. For example, a full range of motion pushup would have the eccentric component of lowering yourself so your chest and stomach brush against the ground, and a concentric component of pushing from the bottom of the movement back to the starting position. In most pushing movements such as dips and handstand pushups, you lower yourself eccentrically and then push

through the concentric to complete the repetition. Pulling movements are this in reverse. They start with the concentric component and end with the eccentric component. For instance, pull-ups start with the difficult part of the movement by concentrically pulling yourself up to the bar, and then eccentrically lowering yourself—under control—to the bottom of the movement.

- **Isometric Exercises** – Otherwise known as *static positions,* isometrics are exercises where the muscles stay the same length during the entire exercise. For example, the static strength positions in gymnastics are all classified as isometric movements. These are your planches, front levers, back levers, and iron crosses. Handstands are also considered isometric positions, though their balance component distinguishes them from raw strength isometric holds. Those who are not yet strong may start out using handstands as a strength isometric, but strength will develop quickly, causing the primary attribute that handstands train to shift to balance. This is why handstands are typically classified as skill work rather than strength work. The use of the term "isometric positions" in this book will only reference those that are training strength attributes. If there is a significant balance component such as handstands or elbow levers then the exercises will be categorized as skill work.
- **Eccentric Exercises** – These exercises typically consist of a slow, controlled movement where muscles lengthen throughout the entire repetition. One example of this would be pull-up eccentrics. This exercise uses a form of assistance, such as a platform or jumping to reach the top of the pull-up position where your chin is above the bar. The exercise is then performed by slowly lowering your body, under control, all the way to the bottom. These are a subset of concentric movements where you may not be able to perform the concentric portion of the movement, but you can train the movement pattern by performing the eccentric portion, which will lead to a gain in strength and hypertrophy.

Here is a sample routine that contains all three types of exercises:

- **Concentric**: Dips: 3x5-12 with 3 minutes of rest at 10x0 tempo
- **Isometric**: Planche Isometrics: 5x12s with 3 minutes of rest
- **Eccentric**: L-pull-up Eccentrics: 3x(3 x 7s) or 3x3 with 10s eccentrics

There are different ways to quantify the intensity and volume of these types of exercises.

- ***Concentric exercises*** are typically expressed as the number of sets performed and the number of repetitions completed in each set. These will be expressed in Sets x Repetitions. Example: 3x5, which is 3 sets of 5 repetitions.
- ***Isometric exercises*** are typically expressed as the number of sets that are held and the amount of time held in each set. These will be expressed in Sets x Time Held. Example: 3x10s, which is 3 sets of 10 second holds.
- ***Eccentric exercises*** are similar to isometric exercises with the extra variable of chaining repetitions. For example, you can perform three 10 second pull-up eccentrics in a row, then do 3 sets of that cluster of repetitions. To keep this as simple as possible, refer to these in terms of Sets x (Cluster repetitions x time of the eccentric). Example: 3x (3 x 10s), which would be 3 sets of 3 repetitions of continuous 10 second eccentrics. If there is a rest period between each of the eccentrics, add a

note to indicate it. Another way you may see this written out in training logs is 3x3 of 10s eccentrics. This means that there are 3 sets of 3 repetitions of 10 second eccentrics.

In weightlifting, the standard way of recording programming on paper is Weight x Repetitions x Sets, so if you were performing weighted dips you could say 190 (pounds) x 5 (repetitions) x 3 (sets) or 190x5x3. However, the format we use in bodyweight training, and the format that will be used from here on out will be Sets x Repetitions or Sets x Amount of Time Held. This format is widely used in common practice.

A relationship exists along the strength continuum for all of these movements. Studies suggest that if we were to compare a concentric contraction to an isometric contraction we would find the isometric contraction to be approximately 100-120% stronger than the concentric contraction. Likewise, when we compare a concentric contraction to an eccentric contraction we would see that the eccentric contraction is approximately 100-150% stronger than the concentric. These percentages vary widely depending on training factors and specific muscles in the body. For the purposes of this book, we are going to assume that isometric contractions are about 100-120% stronger than concentrics, and eccentrics are approximately 120-150% stronger than concentrics because this allows us to draw some general conclusions about how much training volume is needed as a stimulus to elicit muscular strength and/or hypertrophy adaptations.

To put it into everyday terms: even if you cannot perform a pull-up, you can most likely perform a solid eccentric pull-up (where you lower slowly). Once you get stronger with the eccentric pull-up, you would be able to add an isometric hold (a pause) during the eccentric lower. Once you are strong enough to perform multiple eccentric repetitions or long enough isometric holds during any portion of the movement, you should be able to perform at least one concentric movement. Therefore the order of strength is eccentrics > isometrics > concentrics.

CONCENTRIC REPETITIONS

When aiming to build strength, there are two basic rules of thumb to follow when determining the number of repetitions per set for concentric exercises, with an additional rule for those seeking hypertrophy.

The first is: ***Perform your maximum repetitions, minus one. Three sets minimum.***

The reason behind the rule is simple. If you perform the first set of an exercise to failure, there is depreciation in the subsequent sets of an exercise. For example, if you were able to perform ten repetitions to failure on the first set, you would probably only reach eight or nine repetitions on the second set and seven or eight repetitions on the third set. However, if you perform nine repetitions on the first set, over three sets you would often have 9-9-9 repetitions, with consistent work across the board for a total of 27 repetitions. This is an example of not-to-failure volume, which has an advantage over to-failure volume, where you would perform only 25-27 total repetitions.

It is best to consistently train at a not-to-failure volume. Strength work is inherently about maximizing the nervous system adaptations such as recruitment, synchronization, rate coding, and the like. You want to perform as many repetitions as possible with maximum force output. The total volume of your sets should be near-failure as outlined in the 9-9-9 example, and then the last set should be performed near to or to-failure.

Studies suggest that if your primary goal is hypertrophy rather than strength you can perform your sets to failure. The same is true if your primary goal is endurance. The stresses placed on muscles in to-failure volume will fatigue your muscle fibers, do mechanical damage, and stress the metabolic processes within them to stimulate an overall increase in hypertrophy and endurance that not-to-failure training does not provide.

An example of the concentric portion of a standard workout routine:

- Pull-ups: 3x5→12 with 3 minutes of rest at 10x0 tempo
- Dips: 3x5→12 with 3 minutes of rest at 10x0 tempo
- Wide Ring Rows: 3x5→12 with 3 minutes of rest at 10x0 tempo
- Rings Pushups: 3x5→12 with 3 minutes of rest at 10x0 tempo
- Squats (pistol progression or barbell): 3x5→12 with 3 minutes of rest at 10x0 tempo
- Deep Step-ups: 3x5→12 with 3 minutes of rest at 10x0 tempo

The second rule of thumb is called the Rule of Fifteen: ***Aim for a minimum of fifteen total repetitions per exercise.***

When performing concentric exercises, your minimum number of repetitions should be fifteen over all your sets of an exercise. If you perform two exercises per muscle group, this adds up to thirty total repetitions of each pulling, pushing and legs exercise. Performing too few repetitions will lead to a total volume too low to stimulate strength and hypertrophy adaptations. A good guideline for total volume of repetitions per pushing, pulling, and legs exercise is as follows:

- To build strength: 25-50 total repetitions
- To achieve hypertrophy: 40-75+ total repetitions

To find your own "right number" of repetitions per set, remember to begin by knowing your maximum possible repetitions and then subtract one. Next figure out the proper repetition number to allow you to reach fifteen total repetitions. For example: if your maximum repetitions per set is four, you will want to perform five sets of *three* repetitions in order to achieve the desired 15 total repetitions. If your maximum is five, you will want to perform four sets of *four* repetitions resulting in sixteen total repetitions. If your maximum is six repetitions, you will want to perform three sets of *five* repetitions for fifteen total repetitions. Here's a helpful chart:

- Aim for 6-10 sets of 1 repetition
- Aim for 5-8 sets of 2 repetitions
- Aim for 5-6 sets of 3 repetitions
- Aim for 4-5 sets of 4 repetitions
- Aim for 3 sets of 5 repetitions
- Aim for 3 sets of the rest of the repetitions

For anything less than three repetitions per set, you will have to have an enormous increase in the number of sets needed to reach fifteen total repetitions. That can be an issue. If your maximum was three repetitions, do you perform eight sets of two repetitions per set to reach sixteen total repetitions? Or if your maximum was two or even one repetition do you perform fifteen sets of one repetition? At so few repetitions per set the system breaks down. At these lowest levels of repetitions, aim to perform four to ten total repetitions. Supplement these repetitions with extra work such as isometrics, eccentrics, or assisted concentrics until you gain enough strength to raise your maximum repetitions per set.

ASSISTED CONCENTRIC EXERCISES

Assisted concentric exercises involve using a partner, pulley system, band, or machine system to make the exercise easier. For intermediate progression, you can perform the assisted concentric method of an exercise instead of four to ten repetitions.

Take the example of pushups. If you elevate your upper body on a box or stairs, this makes the pushup easier. In an advanced exercise like diamond pushups, you could make them somewhat easier by spacing your hands closer together than a normal pushup, but not as close as a full diamond pushup. It would be much easier as a beginner to place a band underneath your chest and around something higher or to simply have a partner assist you.

The optional rule of thumb (for hypertrophy only): ***Beginners should aim for ten sets of exercises per muscle group.***

The third rule for concentric exercises applies only to pure hypertrophy work. If this is your goal, aim for ten sets for each category—pushing, pulling, legs, and core—no matter what the repetition range. If you are performing five repetitions to failure of both pull-ups and rows, aim for 5x5 on each of these exercises, adding up to about fifty repetitions. If you are performing a pushup variation and dips at a volume of 3x8 each, you want to perform 5x8 for each, which would equate to 40 repetitions times two exercises for a total of eighty repetitions.

This system allows for a potential maximum hypertrophy response for beginners. A side benefit is that this rule allows you to perform ten sets of anything. You may want to work three different pushing exercises, such as pushups, dips, and handstand pushups. Simply split up the ten total sets between each of these exercises. Beginners are advised to focus on the fundamentals, rather than attempting a large number of different types of exercises all at once.

The easiest way to progress with concentric exercises is to remember these three rules when establishing your routine. There may be some cases when modifications outside of the suggested ranges are necessary, such as with prehabilitation, rehabilitation, or too few repetitions per set, but for the most part, these strategies will work for nearly all beginners and intermediates.

ISOMETRIC HOLDS

Isometric holds are exercises in which the muscles neither lengthen nor contract.

An example of isometric exercises as part of a workout routine:

- Planche Isometrics: 5x12s with 3 minutes of rest

Based on extensive practical research, the following effective formula was developed for *Overcoming Gravity* comparing concentric exercises to isometric holds. The formula holds true up to fifteen repetitions or thirty seconds of isometric holds. This is the in-practice end of the optimal hypertrophy range. After this point, repetitions or holds become biased toward endurance, so one will not make good progress on strength or hypertrophy training.

- One repetition of a concentric exercise is equal to about two seconds of isometric hold.
- 60-75% of your maximum hold time is a good addition to the usual amount of sets, volume, and intensity in order to ensure progress. Other coaches may recommend using 50%.

Finding Your Own Sweet Spot

Max Hold	Hold Time	Total Sets	Total Time	Sweet Spot (Sets x Hold)
1	1	7 — 10	7 — 10s	8x1s
2	2	6 — 8	12 — 16s	7x2s
3	3	6 — 8	18 — 24s	7x3s
4	3	6 — 8	18 — 24s	7x3s
5	4	5 — 7	20 — 28s	6x4s
6	5	5 — 6	25 — 30s	6x5s
7	5	5 — 6	25 — 30s	6x5s
8	6	5 — 6	30 — 36s	6x6s
9	6	5 — 6	30 — 36s	6x6s
10	7	5 — 6	35 — 42s	5x7s
11	8	5 — 6	40 — 48s	5x8s
12	8	5 — 6	40 — 48s	5x8s
13	9	5	45s	5x9s
14	10	5	50s	5x10s
15	10	5	50s	5x10s
16	11	5	55s	5x11s
17	12	5	60s	5x12s
18	13	5	65s	5x13s
19	13	5	65s	5x13s
20	14	4	56s	4x14s
21	14	4	56s	4x14s
22	15	4	60s	4x15s
23	16	4	64s	4x16s
24	16	4	64s	4x16s
25	17	4	68s	4x17s
26	17	4	68s	4x17s
27	18	3	54s	3x18s
28	19	3	57s	3x19s
29	20	3	60s	3x20s
30	20	3	60s	3x20s

Beginners are often confused about how to use the Prilepin table (found in the previous edition of *Overcoming Gravity)* to construct an optimal workout routine. The chart above is a simplified version of that table and specifies the exact target hold times and number of sets for those who know their maximum hold. Once you have found your own maximum hold time for any exercise in the first column, then move across the chart horizontally. *Maximum hold* is defined as the amount of time you are able to hold a position performed one second short of failure. Example: If you held a position for eight seconds but stopped one second short of failure, your max hold is nine seconds. Here are the attributes you will find on the chart, with their definitions:

- **Hold Time** – how long an athlete should optimally hold the repetitions in a set. Hold time will vary from athlete to athlete. Example: If your maximum hold is nine seconds, your hold time will be six seconds.

- **Total Sets** – the optimal number of total sets of each exercise an athlete should perform in a workout. Example: If your maximum hold is nine seconds and your hold time is six seconds, your total sets will be five to six. As you can see, total sets could be a range and you can then choose how many you want to perform.
- **Total Time** – total time allows you to track important improvements once you move beyond the beginner's phase; at first too much attention need not be spent on this column. This will illustrate why: If you were able to perform six sets of six-second holds, you have thirty-six seconds of total hold time. If you improved your maximum hold time during your next session but were able to perform only five sets of these seven-second holds then you know that you performed at a slightly less overall volume of thirty-five seconds compared to thirty-six seconds. Do not lose heart: you performed a similar amount of volume in one less set and gained one second of hold time; this is an overall improvement. Total time will feel more significant when you move beyond the beginner's phase.
- **Sweet Spot** – Finally, the sweet spot represents the arbitrary amount of sets and repetitions for the maximum hold time that work best for the general training population. Most athletes fall in this range. If you are in the sweet spot range and are able to make solid improvements in your workouts, great! If you are failing to make improvements and tend to be exhausted, remove a set. If you feel you are undertraining, add a set. The "sweet spot" recommendation will give you a place to begin if you do not want to experiment with different sets and hold times.

Reminder: To determine your maximum hold time, go to failure or stop one second short of failure.

Sixty-Second Method – An Alternative

There are other methods for programming hold times, sets, and total volume for isometric sets. One alternative is the "sixty-second method," where all of your holds and sets add up to sixty seconds. This method uses 50% of your maximum hold time as the volume.

- Maximum hold of 6 seconds: Perform 20 sets of 3-second holds for a total of 60 seconds
- Maximum hold of 8 seconds: Perform 15 sets of 4-second holds for a total of 60 seconds
- Maximum hold of 10 seconds: Perform 12 sets of 5-second holds for a total of 60 seconds
- Maximum hold of 12 seconds: Perform 10 sets of 6-second holds for a total of 60 seconds
- Maximum hold of 20 seconds: Perform 6 sets of 10-second holds for a total of 60 seconds
- Maximum hold of 30 seconds: Perform 4 sets of 14-second holds for a total of 60 seconds
- Maximum hold of 40 seconds: Perform 3 sets of 20-second holds for a total of 60 seconds

This method has both pros and cons. One advantage is that when you are able to move toward three sets of twenty seconds with a maximum hold of forty seconds, you are also already most likely ready to move on to the next progression. This method might also be better at preventing overuse injuries since 50% of the maximum hold time is a slow progression aimed at extensively preparing the connective tissue for the movements. However, due to the significantly shorter hold times, an athlete might have to perform as many as ten to twenty sets to reach a total volume of sixty seconds. This will appreciably extend the length of the workout.

The recommended 60-75% hold time range has an excellent tradeoff between sets, volume, and intensity to set you up to progress well. For example, it allows a significant decrease in the number of sets performed at

lower hold times. This will decrease the propensity for overuse injuries. To compare the two formulas when an athlete has a ten-second maximum hold time, you would have:

- 12 sets of 5-second holds for a total of 60 seconds = 30 repetitions
- 5-6 sets of 7-second holds for a total of 35 seconds = 17-18 repetitions

One should aim for 25-50 total repetitions for strength and 40-75+ total repetitions for hypertrophy. Therefore, if you are aiming for hypertrophy, any additional exercises that work the same muscle groups should go from 30 repetitions to the 40-75 total or 18 repetitions to the 40-75 total. This type of relative comparison should make it easier to program each of the pushing, pulling, leg, and core exercises into a routine to give you the volume needed to progress toward your goals.

This method has worked in coaching athletes to successfully achieve back levers, front levers, planches, iron crosses, and other advanced isometric holds, but of course, individual impact will vary.

If you use the chart and do not make progress, reduce the volume first. This allows additional recovery time, which can allow you to progress. If your progress still plateaus, add volume.

This method of troubleshooting works for all routines, not just isometric holds. If you are not improving, first try reducing volume to determine whether the issue is recovery time. This also lowers the strain on your connective tissues and central nervous system pool.

ECCENTRIC CLUSTER REPETITIONS (CHAINING)

Eccentric exercises typically consist of slow, controlled movements where muscles lengthen throughout the entire exercise.

An example of eccentric exercises as part of a workout routine:

- L-Sit Pull-up Eccentrics: 3x(3 x 7s) or 3x3 with 10s eccentrics

Studies do not show any direct comparisons of the strength and hypertrophy potential of eccentric to concentric exercises. However, based on observations of various athletes, this formula works well in practice:

- One repetition is approximately equal to three seconds of an eccentric movement.
- Cluster repetitions of eccentrics are the most effective way to make progress.

Studies do show that an eccentric exercise will preferentially activate fast-twitch fibers the faster it is performed. In other words, a quick, one-second repetition over a full range of motion will stimulate a greater hypertrophy response than a six-second repetition. The issue that arises when utilizing one-second eccentric repetitions is that the athlete has to perform an excessive number of sets in order to accumulate enough volume for strength and hypertrophy progression. At the other end of the spectrum, performing an eccentric movement for too long (for example, twenty or thirty seconds) is physiologically difficult due to the metabolic acidosis—colloquially "the burn"—and will not optimally improve either strength or hypertrophy.

For a good balance, aim for eccentric movements that are between three to ten seconds. This is where clustering repetitions aka "chaining" comes in. The way to group your exercises was mentioned previously on exercise notation, but here it is again for your convenience:

- 3x(3 x 10s) = three repetitions of three sets of 10-second eccentrics

Eccentric exercises are typically used to break through a plateau or to build strength toward specific unilateral movements, such as one-arm chin-ups. Begin with two to three sets of two or three cluster repetitions and work up from there. As you improve, the progression will systematically decrease the rest times between the cluster repetitions until there is none.

The vast majority of athletes—once they have the strength to perform three chains of seven to ten second eccentrics consecutively with no rest between them—find they can also perform one concentric repetition.

So, if you can...

- perform three consecutive eccentrics
- with uniform speed lowering
- for seven to ten seconds each
- through full range of motion

...you can usually do one full repetition. For example, if you can perform three pull-up eccentrics, slowly lowering for seven to ten seconds each through full range of motion with no rest between them, you can usually perform a single pull-up. This applies even for more advanced movements like the one-arm pushup, one-arm chin-up, and even isometrics like the front lever when utilizing an eccentric (such as inverted hang eccentric lower) to hang. Here is a typical progression you may implement when you begin with eccentrics as a method of progression:

- 2-3 sets of 2-3 cluster repetitions of 3 second eccentrics with 3 minutes of rest

This is a total of between four and nine eccentric movements—two sets of two cluster repetitions is a total of four eccentrics, and three sets of three total cluster repetitions is a total of nine. To progress, you can lower the rest times or increase the eccentric hold time; either works fine. It is advisable to increase the eccentric hold time first—up to the seven to ten range—before adjusting rest times. This allows greater volume and muscular tension, which will increase strength and hypertrophy more quickly. That progression would look like this:

- 2-3 sets of 2-3 cluster repetitions of 4-second eccentrics with 3 minutes of rest
- 2-3 sets of 2-3 cluster repetitions of 5-second eccentrics with 3 minutes of rest
- 2-3 sets of 2-3 cluster repetitions of 6-second eccentrics with 3 minutes of rest
- 2-3 sets of 2-3 cluster repetitions of 7-second eccentrics with 3 minutes of rest
- 2-3 sets of 2-3 cluster repetitions of 8-second eccentrics with 3 minutes of rest

After you make it into the seven to ten-second range, begin to systematically decrease your rest times between sets in increments of ten to thirty seconds. This could, vary depending on your ability to progress. For a relatively lower-level progression such as chin-ups, you may even be able to get away with decreasing the rest time between sets by full minutes. However, for a higher-level progression such as the one-arm chin-up, you may only want to decrease your rest time in ten second increments. Here is an example that uses a twenty-second hold time progression:

- 2-3 sets of 2-3 cluster repetitions of 8-second eccentrics with 3:00 minutes of rest
- 2-3 sets of 2-3 cluster repetitions of 8-second eccentrics with 2:40 minutes of rest

- 2-3 sets of 2-3 cluster repetitions of 8-second eccentrics with 2:20 minutes of rest
- (continue the pattern until...)
- 2-3 sets of 2-3 cluster repetitions of 8-second eccentrics with 1:00 minutes of rest
- 2-3 sets of 2-3 cluster repetitions of 8-second eccentrics with 0:40 minutes of rest
- 2-3 sets of 2-3 cluster repetitions of 8-second eccentrics with 0:20 minutes of rest
- 2-3 sets of 2-3 cluster repetitions of 8-second eccentrics with no rest

The rest between each of the sets stays consistent the entire time. Only the rest between cluster sets repetitions will decrease. For example, the last progression would be performed like this:

- Perform 1 set of 2-3 cluster repetitions of 8s eccentrics with no rest between them. After you finish a repetition, perform another immediately.
- Rest time between sets, 3 minutes.
- Perform 1 set of 2-3 cluster repetitions of 8s eccentrics with no rest between them. After you finish a repetition, perform another immediately.
- Rest time between sets, 3 minutes.
- Repeat until you reach 2-3 total sets.

By this time you will most likely be able to perform at least one concentric of the movement.

A small number of people are not responsive to this method. If you fall into this category, slowly begin to systematically increase the amount of sets. Perform up to 3-5 sets of 2-3 cluster repetitions. If this is insufficient, work up to 3-5 sets of 3-5 cluster repetitions. If you can perform 5 sets of 5 cluster repetitions of a 10-second eccentric with no rest between the cluster repetitions, you will be able to perform at least one repetition of the movement.

It should be noted that eccentric exercises take a bigger toll on recovery than isometric and concentric exercises, and should be used sparingly. They are effective to break through plateaus, but should not be a regular part of your routine. Never use more than one or two eccentrics in a routine, and each eccentric should be in a separate category (pushing, pulling, legs, or core).

Another concern is that unilateral exercises such as the one-arm chin-up will require double volume, so adequate care must be taken to ensure that recovery time is sufficient. When performing a large volume of unilateral exercises, total training stimulus on the nervous system is effectively doubled, which must be taken into consideration. If unilateral exercises are used consistently through a mesocycle, watch out for the plateaus that can develop if your recovery time is insufficient.

EXAMPLES OF REPETITION IN WORKOUT ROUTINES

Exercises can be divided into concentric, isometric, and eccentric. To determine how many repetitions of each you should incorporate into your routine, follow three different formulas:

For Concentric Exercises

- **Repetitions Per Set**: Perform your maximum repetitions, minus one. Three sets minimum.
- **Rule of Fifteen**: Aim for a minimum of fifteen total repetitions per exercise.

- For strength, aim for 25-50 total repetitions; for hypertrophy, aim for 40-75+ total repetitions.
- **Pure Hypertrophy**: Beginners should aim for ten sets of exercises per muscle group.

For Isometric Exercises

Max Hold	Hold Time	Total Sets	Total Time	Sweet Spot (Sets x Hold)
1	1	7 — 10	7 — 10s	8x1s
2	2	6 — 8	12 — 16s	7x2s
3	3	6 — 8	18 — 24s	7x3s
4	3	6 — 8	18 — 24s	7x3s
5	4	5 — 7	20 — 28s	6x4s
6	5	5 — 6	25 — 30s	6x5s
7	5	5 — 6	25 — 30s	6x5s
8	6	5 — 6	30 — 36s	6x6s
9	6	5 — 6	30 — 36s	6x6s
10	7	5 — 6	35 — 42s	5x7s
11	8	5 — 6	40 — 48s	5x8s
12	8	5 — 6	40 — 48s	5x8s
13	9	5	45s	5x9s
14	10	5	50s	5x10s
15	10	5	50s	5x10s
16	11	5	55s	5x11s
17	12	5	60s	5x12s
18	13	5	65s	5x13s
19	13	5	65s	5x13s
20	14	4	56s	4x14s
21	14	4	56s	4x14s
22	15	4	60s	4x15s
23	16	4	64s	4x16s
24	16	4	64s	4x16s
25	17	4	68s	4x17s
26	17	4	68s	4x17s
27	18	3	54s	3x18s
28	19	3	57s	3x19s
29	20	3	60s	3x20s
30	20	3	60s	3x20s

For Eccentric Exercises

- Start with 2-3 sets of 2-3 cluster repetitions of 3-5 second eccentrics with 3 minutes of rest.
- Progress to 2-3 sets of 2-3 cluster repetitions of 7-10 second eccentrics with no rest in the clusters.
- If you need extra volume, first move up to 3-5 sets. When this is mastered, move up to 3-5 cluster repetitions.

A useful formula for practical comparison is 1 concentric repetition = 2 seconds of isometric hold = 3 seconds of eccentric, with the goal of a total workout volume of 25-50 repetitions for strength and 40-75 repetitions for hypertrophy. Here it is in the context of a standard movement-based routine:

- Pull-ups: 3x5-12 with 3 minutes of rest at 10x0 tempo = 3x5→12 = 15-36 repetitions
- Dips: 3x5-12 with 3 minutes of rest at 10x0 tempo = 3x5→12 = 15-36 repetitions

- Wide Ring Rows: 3x5-12 with 3 minutes of rest at 10x0 tempo = 3x5→12 = 15-36 repetitions
- Rings Pushups: 3x5-12 with 3 minutes of rest at 10x0 tempo = 3x5→12 = 15-36 repetitions
- Squats (pistol progression or barbell): 3x5-12 with 3 of minutes rest at 10x0 tempo = 3x5→12 = 15-36 repetitions
- Deep Step-ups: 3x5-12 with 3 minutes of rest at 10x0 tempo = 3x5→12 = 15-36 repetitions

This routine includes two push, two pull, and two leg exercises. The total volume for each set of muscle groups is as follows:

- Push: Dips and Ring Pushups – 15-36 + 15-36 repetitions = 30-72 repetitions
- Pull: Pull-ups and Rows – 15-36 + 15-36 repetitions = 30-72 repetitions
- Legs: Squats and Deep Step-ups – 15-36 + 15-36 repetitions = 30-72 repetitions

If you are working 3x5 repetitions in a difficult exercise your volume will fall solidly within the optimal strength range with 30 total repetitions, but slightly outside of the optimal range for hypertrophy. However, 3x8 will be 24+24=48 total repetitions, which falls within both the strength and hypertrophy ranges. When you start to hit the twelve-repetition range for two exercises, you will reach 36+36=72 total repetitions which still falls solidly within the hypertrophy range.

The working repetition ranges show the amount of volume that you need in order to produce strength and hypertrophy adaptations. If you are on the fringes of the ranges, do not worry. Though it is outside of the potential optimal hypertrophy range, a volume of 3x5 with two exercises will still stimulate a good amount of hypertrophy. The same is true when performing three sets of fifteen repetitions of two different exercises (45+45=90 repetitions), even though you may be outside of the total volume needed for hypertrophy. The number of quality sets close to or to-failure is what matters most for hypertrophy.

In terms of planche isometrics and L-pull-up eccentrics, here are the conversions of the isometric and eccentric exercises to repetitions. Typically, you would remove one of the pushing movements such as the pushups or dips in your routine and replace it with the planche isometric. Likewise, if you were performing the L-pull-up eccentrics, you would eliminate the pull-ups from your routine to replace the pulling movement.

- Planche Isometrics: 5x12s with 3 minutes of rest = 60 seconds isometric / 2 = 30 repetitions
- L-Pull-up Eccentrics: 3x(3 x 7s) = 3 sets x 3 reps x 7 seconds = 63 / 3 = 21 repetitions

Planche isometrics fall solidly into the range of 3 sets of 10 repetitions at 5 sets of 12 second holds (17-second hold maximum). As stated in the eccentrics section, once you can perform 3 sets of 3 cluster reps of 7-10s eccentrics you can most likely perform at least one concentric repetition. It is similar to being able to perform 3 sets of 20 repetitions, which is starting to move away from strength and hypertrophy and more into endurance training. This would be a good point to transition away from eccentric exercises and replace them with concentric exercises.

Use these ranges to help plan your beginning routine. Once you get a handle on how your body responds to certain exercises, you will be able to establish a more concrete routine. Remember, everything in training lies on some physiological continuum. Some people need more volume and some need less volume. Adjust accordingly as you discover what works best for you.

SETS

- Pull-ups: 3x5-12 with 3 minutes of rest at 10x0 tempo
- Dips: 3x5-12 with 3 minutes of rest at 10x0 tempo
- Wide Ring Rows: 3x5-12 with 3 minutes of rest at 10x0 tempo
- Rings Pushups: 3x5-12 with 3 minutes of rest at 10x0 tempo
- Squats (pistol progression or barbell): 3x5-12 with 3 minutes of rest at 10x0 tempo
- Deep Step-ups: 3x5-12 with 3 minutes of rest at 10x0 tempo

There is nothing special about the number three being used above for the number of sets. The main reason to use workouts composed of three sets is because working with 5-15 repetitions overall creates a good balance to get into the 25-50 repetition strength range or the 40-75 repetition hypertrophy range. You may use more or less than three sets depending on the amount of volume you need.

There are times when more sets are needed. Imagine that most of the exercises in your routine are in the 3-6 range due to your current ability. If you are using three sets for each exercise and perform two exercises for each of the primary categories (push, pull, and legs), you will perform approximately 2 exercises x 3 sets x 3-6 repetitions = 18-36 repetitions for each muscle group. This is decent for strength training, but if you desire a hypertrophy stimulus, you will want to increase the number of sets in your routine from three to four, five, or even six. The classic beginner barbell routine *StrongLifts* uses 5x5. Some intermediate hypertrophy routines call for as many as twelve sets. The 8-10x3 when training for strength and hypertrophy works very well. The only downside to working with lower repetition ranges is you may have to perform an inordinate amount of sets. In strength work, this could mean long workouts if you are taking the necessary three to five minutes to rest between each set. If you have the time, however, it could work very well for you.

The sample routine above is constructed for both strength and hypertrophy. If you are a beginner and desire to maximize the hypertrophy aspects of the sample routine, try adding one to three additional sets to move the number of total repetitions into the hypertrophy range (performing four to six sets of each individual exercise).

If you choose to make these modifications you should pay attention to two things. First, performing additional sets when starting out can lead to overuse injuries. If your joints, ligaments, tendons, or other connective tissues are sore, you should back down a bit. Second, make sure that you are still progressing. Adding extra volume to sets or exercises may lead to stagnation in progress that you cannot recover from. If you recognize this and back down you should begin progressing again.

EXERCISE ORDER

Exercise order is a simple concept, but creating the right order takes thoughtful consideration. Fatigue can accumulate broadly, across a mesocycle, but can also apply to individual workouts. It creates a type of exercise "bottleneck"—where one puts the most effort into the first exercise and the least effort into the last exercise. Due to fatigue over the course of a workout, sets often slowly begin to decrease in quality. Therefore, the exercise an athlete chooses to perform first should relate to their primary goal. For example, if you wish to learn the planche more than anything else, you will want to put the planche isometric or some other related planche work first in your exercise routine.

This can even occur within a single exercise. Most bodyweight trainers are familiar with degradation in exercise performance over the course of a workout. In a 3x5-repetition, you should typically be able to complete the first set one repetition short of failure. However, you may be struggling to complete the fifth repetition by your third set. If you extended the sets indefinitely, you likely would not be able to complete five repetitions by the fourth, fifth, or sixth set. This *accumulated fatigue* applies to all exercises that follow your first exercise. If the second exercise in your routine is the front lever, the quality of your work will slowly decrease as the number of overall sets increases over the course of the workout.

The percentages of maximal possible effort drop off by a couple of points with every additional set of exercises you perform. By the time you do fifteen total sets of exercises—or three sets of five exercises—you will likely only be operating at 90-95% of your capacity level. You will not notice this unless you constantly vary your exercise order.

In light of all of this, you should prioritize the exercises you perform to align with your goals. If you have goals for pushing, pulling, and legs, respectively, you should prioritize the goals you wish to reach first and prioritize those exercises accordingly. Take a look at the order in this sample bodyweight routine:

- Pull-ups: 3x5→12 with 3 minutes of rest at 10x0 tempo
- Dips: 3x5→12 with 3 minutes of rest at 10x0 tempo
- Wide Ring Rows: 3x5→12 with 3 minutes of rest at 10x0 tempo
- Rings Pushups: 3x5→12 with 3 minutes of rest at 10x0 tempo
- Squats (pistol progression or barbell): 3x5→12 with 3 minutes of rest at 10x0 tempo
- Deep Step-ups: 3x5→12 with 3 minutes of rest at 10x0 tempo
- Planche Isometrics: 5 sets of 12 seconds
- L-Pull-up Eccentrics: 2-3x2-3 with 7s eccentrics

If your primary goal is improving planche and L-pull-up progressions, then you will order these first. From there, you might choose leg exercises to be your next priority. Finally, the rest of your upper-body workout may be prioritized last, because you have no particular preference here. In that instance, the order of exercises would look like this:

- Planche Isometrics: 5 sets of 12 seconds
- L-Pull-up Eccentrics: 2-3x2-3 with 7s eccentrics
- Squats (pistol progression or barbell): 3x5→12 with 3 minutes of rest at 10x0 tempo
- Deep Step-ups: 3x5→12 with 3 minutes of rest at 10x0 tempo
- Pull-ups: 3x5→12 with 3 minutes of rest at 10x0 tempo
- Dips: 3x5→12 with 3 minutes of rest at 10x0 tempo
- Wide Ring Rows: 3x5→12 with 3 minutes of rest at 10x0 tempo
- Rings Pushups: 3x5→12 with 3 minutes of rest at 10x0 tempo

If you want to improve on dips and rows more quickly, simply move them to the top of the routine. You will notice that the quality of work for the dips and rows will increase. This is the best way to structure your routine according to your goals. It is impossible to operate at 100% capacity over the duration of every workout. Additionally, changing and modifying your exercise order can be a good way to break out of monotony while still working toward your specific goals.

Exercise order can be adjusted at any point during a microcycle or mesocycle. Sometimes, people get the idea that once they set a routine they must perform it that way every day for six to eight weeks. This is certainly fine, however, it is also acceptable to adjust your exercise order during a cycle. This may even be necessary if you have sudden time constraints on your workout schedule. Simply prioritize the exercises you most want to improve and return to your usual routine as your schedule allows.

INCORPORATING REST TIMES

- Pull-ups: 3x5→12 with 3 minutes of rest at 10x0 tempo
- Dips: 3x5→12 with 3 minutes of rest at 10x0 tempo
- Wide Ring Rows: 3x5→12 with 3 minutes of rest at 10x0 tempo
- Rings Pushups: 3x5→12 with 3 minutes of rest at 10x0 tempo
- Squats (pistol progression or barbell): 3x5→12 with 3 minutes of rest at 10x0 tempo
- Deep Step-ups: 3x5→12 with 3 minutes of rest at 10x0 tempo

The next factor in constructing a workout routine is *rest times per sets.* One of the biggest barriers to bodyweight training is the large amount of time needed to devote to skill work and rest between strength sets. It takes roughly five to twenty minutes to warm up and complete the skill work at the beginning of a workout, so a considerable amount of time can elapse before you even begin your strength work sets.

If your goal is purely strength, you want to rest before the next set of exercises so your body is fresh. On average, this period of rest lasts three to five minutes, but some people's recovery will require up to seven minutes or longer. It is important to understand how rest affects the body, not only to save time in the long run, but to achieve the specific adaptations you desire for strength, hypertrophy, or endurance training.

Adenosine triphosphate (ATP) is the way muscles power their contractions. When ATP is used to power muscle contractions, it is split off to ADP (Adenosine diphosphate) and P (phosphate group). After performing a set to failure or near-failure, a large amount of the ATP is converted to ADP. The muscle cells must then rest to regenerate ATP. If this does not take place, the muscles will not be ready to perform the next set. In other words, optimal muscle use is time-constrained. In less than three minutes, ATP can almost completely replenish itself in muscle cells. The approximate physiological rate of ATP replenishment is as follows:

- 50% in 30 seconds
- 75% in 60 seconds
- 88% in 90 seconds
- 95% in 120 seconds
- 99% in 180 seconds

In light of this, rest periods of at least three minutes between sets when performing *strength* work is strongly recommended. The goal of strength work is to specifically maximize neural factors of strength. When you resume training without adequately resting, muscular fatigue may become a limiting factor to the nervous system. You may not achieve the strength gains you desire because your muscles are limiting the amount of central nervous stimulus. Here are the appropriate rest times for improving endurance, hypertrophy, and strength:

- Endurance: 30-90 seconds between each set
- Hypertrophy: 60-240+ seconds between each set
- Strength: 180-300+ seconds between each set

If your goal is pure hypertrophy, you should eventually vary the rest times between your sets. For example: rest for 60 seconds during a workout that uses easier exercises and lighter weights and rest for 180 seconds during a workout that uses more difficult exercises and heavier weights. Since your ATP is not fully replenished with only a minute of rest, the workouts with shorter periods of rest will bring your muscles to failure more quickly. This stimulates the alternative hypertrophy pathways discussed in previous chapters. If you use shorter rest times, the key is to make sure you eventually get enough volume. To maximize all of the facets of hypertrophy, you must vary your periods of rest while maintaining enough volume as a stimulus.

Endurance and strength work are more straightforward. Endurance work utilizes short rest periods to maximize the ability of the muscle to contract in a fatigued state. This is why the rest times are so short. You intentionally perform another set of exercises while your ATP is depleted from previous sets. On the other hand, you should have a minimum of two minutes between sets when performing strength work to ensure that your performance is not limited by muscular fatigue. Three minutes or more is preferable.

For a combination of strength and hypertrophy, overlap the repetition ranges, cutting off approximately a minute of rest at each end. The recommendation for a solid combination of strength and hypertrophy would be in the 180-240 seconds range. This ensures that your ATP is almost completely replenished, making strength work more effective but allowing for some amounts of hypoxic-induced hypertrophy near the end of the set. Likewise, this allows for more intense exercises in enough volume to ensure gains in both strength and hypertrophy.

PAIRED SETS OF EXERCISES

Let's say you are short of time. You have chosen a minimal full-body routine, such as a two upper-body push, two pull system and two leg exercises. If you perform three sets of each of these exercises, your entire workout will be eighteen sets. If you rest three minutes between each set, your workout is 54 minutes. When you increase the rest times to five minutes each, your workout will be 90 minutes. This does not include your warm-up, skill work, or other added components of your routine, such as additional flexibility/mobility work or any prehabilitation work performed at the end. As you can see, your workout can take upwards of two hours depending on the components you choose. For some this is manageable. However, most people have full-time jobs, family activities, or other obligations that prohibit a two-hour workout on a regular basis. In these instances, the best option is to condense your routine to an hour or under. You can do this by *pairing* exercises.

Paired sets of exercises can be implemented in different ways. One way is to pick two exercises that work opposing muscle groups. For example, the planche and front lever work well as a paired set because the planche is a pushing exercise and the front lever is a pulling exercise. If you were to pick this as your paired set, you would alternate between each of these exercises. First, execute the planche movement. Then, instead of resting the typical three to five minutes between sets, you would cut the rest time in half and perform the opposing exercise, the front lever. Your muscles will recover during the opposing exercise, so it is all right

that the rest period is shorter. Using a five-minute rest interval, a paired set of these two exercises would look like this:

- Planche
- 2.5 Minutes of Rest
- Front Lever
- 2.5 Minutes of Rest
- Repeat 2x

This allows you to execute all three sets of both the planche and front lever in roughly half the usual time. Here is a table that shows how much time it would take to perform these exercises as both normal and paired sets.

Normal Sets

- 3 sets of planche * 5 minutes of rest = ~15 minutes to perform all of the planche sets
- 3 sets of front lever * 5 minutes of rest = ~15 minutes to perform all of the front lever sets
- Total Time = 15 minutes + 15 minutes = 30 minutes

Paired Sets

- 1 set of planche * 2.5 minutes of rest + 1 set of front lever * 2.5 minutes of rest = 5 minutes
- Multiply by 3 rounds
- Total Time = 5 minutes of rest * 3 rounds = 15 minutes

The only major issue with this approach is that it may not provide optimal strength gains. The low rest time may not allow for sufficient muscular and nervous system recovery. However, the strength gains are still very similar, so pairing sets is a good option if you do not like long workouts. The table below shows how to apply paired sets in the sample routine:

Basic Routine

- Pull-ups: 3x5→12 with 3 minutes of rest at 10x0 tempo
- Dips: 3x5→12 with 3 minutes of rest at 10x0 tempo
- Wide Ring Rows: 3x5→12 with 3 minutes of rest at 10x0 tempo
- Rings Pushups: 3x5→12 with 3 minutes of rest at 10x0 tempo
- Squats (pistol progression or barbell): 3x5→12 with 3 minutes of rest at 10x0 tempo
- Deep Step-ups: 3x5→12 with 3 minutes of rest at 10x0 tempo

Basic Routine with Paired Sets

- Pull-ups: 3x5-12 with 1.5 minutes of rest at 10x0 tempo
- Dips: 3x5-12 with 1.5 minutes of rest at 10x0 tempo
- Wide Ring Rows: 3x5-12 with 1.5 minutes of rest at 10x0 tempo
- Squats (pistol progression or barbell): 3x5-12 with 1.5 minutes of rest at 10x0 tempo
- Rings Pushups: 3x5-12 with 1.5 minutes of rest at 10x0 tempo
- Deep Step-ups: 3x5-12 with 1.5 minutes of rest at 10x0 tempo

An athlete once asked, "If paired sets save a lot of time, why not make triple sets or even a circuit routine out of the workout to save even more time?"

The answer is that performing three couplets of two exercises is the same as performing two triplets of three exercises. The rest time between each of the sets does not change from couplets to triplets, it nonetheless taxes the body more and cycling through a greater number of exercises is not beneficial for those who desire strength and hypertrophy. For hypertrophy especially, this is a poor solution.

Another time-saving alternative is a push/pull or upper/lower split. They work if you have serious time constraints. This approach is not recommended unless you are also involved in another sport or have significant skill work that necessitates extra rest time from performing exercises three times per week. The reason for this is the decreased frequency of exercises.

One last note is that paired sets should not be confused with *super sets* or *drop sets*.

- *Paired sets* specifically refer to alternating exercises of opposing muscle groups to condense time and still get the maximum out of strength work.
- *Super sets* involve performing two exercises one right after the other that work the same muscle group and have no rest between them in order to provide a strong hypertrophy stimulus.
- *Drop sets* are a technique where you repeat the same exercise again, with no rest, decreasing the weight when you reach failure to provide a hypertrophy stimulus.

Though they have similar names, they are actually three totally different techniques.

TEMPO

There are many different viewpoints on how to utilize tempo during training. Primarily we will focus on how tempo is used in strength and hypertrophy training. We will also take a look at how it can be used in rehabilitation.

- Pull-ups: 3x5→12 with 3 minutes of rest at 10x0 tempo
- Dips: 3x5→12 with 3 minutes of rest at 10x0 tempo
- Wide Ring Rows: 3x5→12 with 3 minutes of rest at 10x0 tempo
- Rings Pushups: 3x5→12 with 3 minutes of rest at 10x0 tempo
- Squats (pistol progression or barbell): 3x5→12 with 3 minutes of rest at 10x0 tempo
- Deep Step-ups: 3x5→12 with 3 minutes of rest at 10x0 tempo

Tempo is essentially how quickly you move in the concentric (up) and eccentric (down) portion of your repetitions and whether you rest between the repetitions. The preferred nomenclature of tempo is a four-place format. For instance, 10x0 is the standard tempo. Here is an example of tempo for a pushup:

- 1 second – Eccentric phase, lowering to the bottom of the pushup
- 0 second – Pause at bottom of the repetition
- x – Concentric rising off the ground, executed explosively, with good form
- 0 second – Pause at top

You will notice that tempo for pulling exercises (such as pull-ups) is reversed, as you start with the concentric. However, they are still notated in the same way:

- 1 second – Concentric phase, lowering to the bottom of the pull-up
- 0 second – Pause at bottom of the repetition
- x – Eccentric pulling to the bar, executed explosively, with good form
- 0 second – Pause at top

The standard 10x0 tempo is recommended when training for strength and hypertrophy because it maximizes strength adaptations. This plays off Henneman's size principle. Discussed at length in Chapter 2, this principle states that low-threshold motor units (LTMUs) are recruited before medium-threshold motor units (MTMUs) and high-threshold motor units (HTMUs), in increasing order. Slow-twitch fibers are always recruited before fast-twitch fibers, ensuring the body conserves energy, as LTMUs are more resistant to fatigue.

The acceleration of the body, with good technique, at 10x0 tempo maximizes strength training because it will recruit all of the muscle fibers during the repetition. This increases the neural factors of strength, such as recruitment, synchronization, and rate coding. Studies have shown that fast repetitions are superior for strength and power in non-trained subjects. For hypertrophy, there may be a slight bias toward fast-twitch fibers over slow-twitch fibers, but this difference is not significant. The accelerating X tempo may also have a slight—and insignificant—increased hypertrophy effect due to recruitment of HTMUs earlier in the set. This gives them time to recover, be used again, and become a bit more fatigued over the course of performing a set to failure. Even so, beginners should use fast repetitions.

Hypertrophy is relatively similar for all tempos if the total time under tension or volume is the same. Whether you go slowly or fast with a weight, your muscle fibers are going to be fatigued at the end of the set if you perform it to failure. This is true if you do ten repetitions with a 10x0 tempo or five repetitions with a 5050 tempo, because you are still going to failure. Damaged muscles will repair and grow bigger according to the stress that is exerted on them. Beginners may find similar hypertrophy results with 40% 1 RM intensity and 85-90% 1 RM intensity.

The main question that is raised with a 10x0 tempo is what if the movement occurs very slowly, such as when the exercise is intense. Even if the repetitions do not move fast, it is the *intent* to move quickly that recruits your fast-twitch muscle fibers. Therefore, movements close to 1-4 RM are sufficient even if you are moving slowly.

This is not to say that slow repetitions are useless. You may choose to work with slower repetitions for a multitude of reasons including:

- Slow movements can potentially lower your risk of injury.
- In explosive repetitions, slowing down allows you to effectively work through the entire range of motion.
- Slow repetitions can emphasize a greater degree of control.
- If you are recovering from an injury, moving slower can be beneficial while connective tissues are healing.

When first teaching someone a movement, utilizing a slower tempo such as 2020 or 2121 can have particularly good results. The two-second concentric and eccentric components allow time to consider and focus on technique while performing the exercise, and the pause allows the student to catch their breath and re-focus.

If you are injured or undergoing rehabilitation, an initial slower tempo such as 4040 or 4141 may be utilized because you want to focus on good movement patterns rather than pursuing strength or hypertrophy. In this case, a slow movement allows an injured athlete to focus on properly contracting all of their muscle groups in a timing sequence. This is particularly effective with shoulder injuries, where various muscle compensations often occur. Likewise, if you are trying to prevent muscle strains, you may find it beneficial to utilize a slower eccentric phase such as 5120 in order to teach your body to maintain control during the movement. A slower eccentric phase also helps build up muscle resistance to prevent future injuries. If you have muscle strains that occur solely during the eccentric portion of an exercise, it is essential that eccentrics be a part of your rehabilitation work. Slower eccentrics can also be used for those experiencing tendonitis.

Determine the tempo of your exercises based on your overall training needs. For all of the exercises we will construct in subsequent routines throughout this book, we will use a 10x0 tempo. As you get more experienced, you can play around to see how you respond.

GENERAL STRENGTH AND ISOMETRICS

An alternative to consider is choosing a routine with little or no isometric work. Some people, including this author, favor movement-based routines over strict isometric work. You do not *have* to perform isometric exercises to obtain isometric skills. It is possible to build up to crosses, straddle planche, full front lever, and other isometric exercises without performing much isometric work in training.

Some of the benefits of this style of training include a more balanced and overall better strength development for all ranges of motion. In short, this practice contributes to faster progression. It also leads to developing the ability to navigate unexpected movements, such as those that occur in parkour or martial arts, by training in primarily movement-based strength work. If your sport of hobby requires you to perform unexpected movements or quickly adapt to a new situation, it may be advantageous to eliminate isometric exercises from your routine.

Studies have indicated that isometric movements only confer strength within thirty degrees of the range of motion that is being worked. For the shoulder (which is the lynchpin of upper-body strength), thirty degrees is approximately one-tenth of the overall rotary movement it possesses. This is another reason not to focus in on solely perform isometric exercises on a regular basis.

Programming a routine based on the elimination of isometrics is simple. Instead of putting isometric movements such as the planche, front lever, and back lever into your routine; simply replace them with additional concentric exercises. For instance, you can replace the planche with a horizontal pushing movement such as planche progression pushups, pseudo planche pushups, other rings pushup variations, or dips and HSPUs. Eliminating planche isometrics does not mean you have to eliminate planche-focused work. The same is true for front lever, back lever, and other isometric holds. The front lever can be replaced with front lever rows progression, rowing movements, or even barbell and dumbbell work with bent-over rows or one-arm dumbbell rows.

For those of you considering bodyweight strength training for isometrics like the planche, front lever, and back lever, it is strongly recommended that you keep isometric exercises in your routines.

There are three frequent goals in bodyweight training: 1) developing specific skills, such as the planche, 2) achieving specific isometric goals, while also developing all-around straight-arm and bent-arm strength, and 3) building a large amount of strength across a wide variety of exercises.

Those who focus on a specific exercise—in this case, the planche—will realize the most success if they base the majority of their pushing exercises on their specific goal. To achieve the planche, for example, you need to develop the specific isometric strength position in the shoulder, as well as the muscle mass and neurological strength to make it happen. In this particular instance, you would want to train the planche isometric hold as well as some of the alternative planche movement exercises suggested above: planche progression pushups, pseudo planche pushups, other rings pushup variations, or some other variation of movement like dips and HSPUs. In the exercise technique section of the book the most effective accessory movements to help develop certain isometric holds are covered, including suggested alternative routes for athletes who hit a plateau and are unsure of how to progress.

If you have goals for overall straight and bent-arm strength, begin with isometric holds in order to build up your connective tissues. Once you achieve this, place these isometric holds in either the warm-up or cool-down sections of your routine in order to maintain them. This will free up more space for isometrics and new movements.

Finally, those who simply want overall strength need not concern themselves with isometric holds. You will achieve most of them just by getting stronger. One example is achieving the straddle planche on rings solely by working pseudo planche pushups, ring dips progressions, and rings handstand pushups. The strength developed from these movements transfers fairly effectively.

For beginners, the recommendation is: support work, positioning drills, German hangs, and other straight-arm work as part of a warm-up, followed by handstands as skill work. This will build up your connective tissue strength before you begin working isometrics. It is important for beginners to create a strong base by gaining proficiency with dips, rows, pull-ups, and pushups variations (typically to level five or six) before transitioning their routines away from pull-ups and pushups to the back lever and the planche.

CORE WORK

- L-Sit for 60s total in as many sets as needed, not to failure
- Compression work for 3x10s

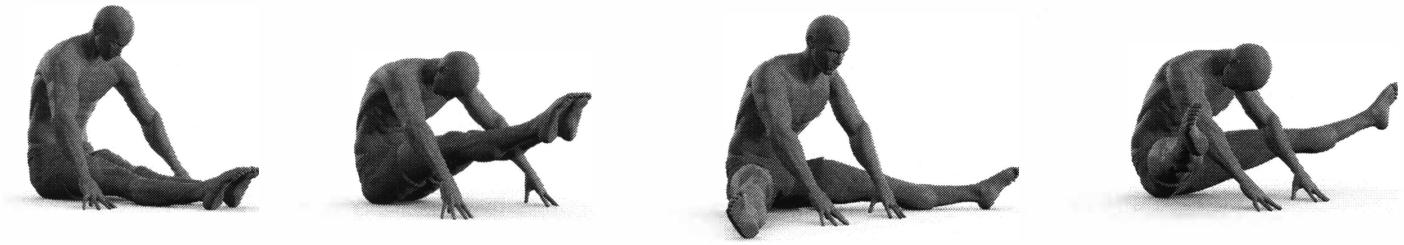
Core work is now included in the strength portion of the *Overcoming Gravity* basic routine, closer to the end. Pairing handstands and manna as opposing shoulder movements is still encouraged; however, they do not need to be paired at the same time in a routine. Having them coupled at the beginning of the workout led to a large amount of unnecessary fatigue, which interfered with the rest of the workout. Pushups, dips, and handstand pushup sets in particular suffered from this fatigue. A solid foundation with these exercises is particularly important, as the technique and strength developed from them lead to nearly every pushing progression in one way or another.

L-sits and compression work are great for developing your core. The L-sit is one of the fundamental positions that tests core strength. It progresses well to the V-sit and manna. It also has good carry-over application to press handstands and other movements that require different body position shapes. Compression work is broadly applicable if you want to master handstand presses and many other types of flexibility. It specifically develops core strength and active flexibility simultaneously.

Compression work follows the same pattern as concentric versus isometric exercises. In most of the upper-body strength exercises, there is a core component of holding and maintaining proper technique during the exercises. For example, front lever progressions effectively work the core.

Here are some guidelines for compression work:

- Stretch your hamstrings for thirty seconds
- Sitting, keep your arms straight and hands by your knees
- With your legs straight, pull your knees up to your face by contracting your core
- Hold for ten seconds. If you start to cramp, you are doing it correctly
- Repeat these steps three to five times
- If your knees easily touch your face for most of your sets, move your hands closer to your toes



Compression work is highly compatible with core work at the end of strength training, or at the end of the workout when you perform flexibility work. Alternatively, you could place it at the beginning when you perform your L-sit straddle-L, and manna work. This may work well if you need to place flexibility work later in your routine in order to perform some particular handstand press technique or related exercises. Other good core exercises include ab wheel, hanging leg raises, V-ups, dragon flags, and weighted decline sit-ups, a good choice for hypertrophy.

You may have noticed that specific core exercises for your back were not included in this section. This is based on the assumption that you are performing adequate lower back work by using weights for your lower body. As mentioned in previous chapters, using weights for your lower body is the most effective way to gain strength and hypertrophy. If you choose not to do this, you can perform bodyweight work such as glute-ham raises, reverse hyperextensions, or other such exercises. It is important that you do something, as most bodyweight leg exercises—such as squats, pistols/single leg squats, lunges, sprinting, and similar exercises—do not adequately exercise your back. *There are many cases where people have spent so much time performing abdominal exercises without strengthening their back that their workouts result in eventual back pain or injury. Be sure to work your core on both sides!*

PERFORMANCE AND TERMINATION OF WORKOUTS

Beginners initially become bigger and stronger by actually performing workouts. This is also where you learn and reinforce correct techniques. It is rarely a good idea to terminate a workout before finishing it. You will have days where you feel terrible as you start your workout. You may have thoughts along the lines of *what's the point? I'm not very good at this, and I really don't feel up for trying today*. However, beginners are often more capable than they believe. Pushing yourself through a workout builds a solid work ethic and helps you become more consistent. Cultivating good habits can result in the pleasant surprise of your body performing above and beyond your expectations. You may even set personal records if you follow through with a workout when you don't feel like it!

As you begin to progress toward higher skill levels, the fatigue you accumulate from stress or other factors may make you want to terminate a workout early or entirely. Most of the time, it is better for your body and psyche to finish the routine and work out your stress. However, there are times when it is better to call it quits for the day—particularly if your technique is terrible.

How do you determine if you *should* terminate your workout? Well, if the quality of your skill work is terrible, at least attempt another exercise or two before calling it a day. If you do not improve, don't feel bad about ending your routine early and taking some time to relax. If you are in the intermediate range, it's important that the quality of your workouts be high, so you may want to consider terminating your workout at this point. It's your call!

Once you reach the advanced skill level, you have a lot more flexibility. By this point you have learned how your body responds to a workout when you are tired and when you are fresh. You have the experience to discern if you will do poorly with certain exercises or skills, perhaps before you even begin your routine. In this instance, you may want to terminate a workout before beginning it. This is along the lines of *instinctive* or *autoregulatory* training. You need experience to use it effectively, but it can work very well if you adapt your workouts. Some people have the ability to do this without any training, but most people would rather do what they *want* and not listen to what their body *needs*. This is why *beginners should push through fatigue* and why intermediate, advanced, and elite athletes should make their own judgment calls.

There are infinite factors that can get you off track: family life, a new baby, college exams, work demands, or just stress in your life in general. It is important to have a plan to keep life and fitness balanced. Remember why you are training and keep your eye on your goals. Hopefully you'll enjoy the process and exercise will not become a chore.

These are guidelines to assist you in using your own expertise as an athlete to make good judgment calls if a workout is not going as expected. Here are three scenarios where it is recommended that you terminate a workout:

- You are sick
- You have been sleep-deprived for multiple days in a row
- Your joints, tendons, or other connective tissues are sore, painful, achy, or twinge in ways that will likely get worse if you continue working out

The first two scenarios are obvious indicators that your workout will not be very high quality and could potentially worsen your condition. Be smart with your body and ensure it gets proper rest. Younger people often do not value rest, but rest is vital to make good progress toward your goals. Get rest when you need it and you'll be amazed at how much better you perform.

In the third scenario, you will generally want to terminate only the parts of your routine that aggravate your soreness or pain. You can switch to rehabilitation exercises for these parts of your routine and continue performing the rest as you usually would.

Total elimination of a workout in this scenario is a bad idea because it can get you in the habit of skipping workouts, when you should be rehabilitating your injury. Skipping workouts is especially prevalent in recreational sports and it can create a negative cascade from not playing the sport, to not working out at all, to sitting around at home "resting." At this point, you are not actually rehabilitating your injury: you are becoming an inactive couch potato! This is why it is *extremely* important to not skip a workout when injured. Instead, modify it!

STOP READING. TAKE ACTION.

- Pull out your notes and look at the exercises you have listed as the core of your routine. Begin to think about the types of repetition/set schemes you can use with them.
- If you are fresh and have time, do a quick warm-up, followed by some maximal repetition and isometric hold testing to determine your maxes and/or competency level for each. Write them down.
- Now figure out the repetition and set structure for each of the exercises that you will begin with in your first cycle.
- If you already have a routine, you should know your current abilities. You may want to wait until the end of your current cycle to begin testing and implementing these protocols. However, if your current sets and repetitions are ineffective or can be improved by using the charts provided, modify your routine.

CHAPTER 9 SUMMARY
STRENGTH WORK

The process of structuring strength work in a routine requires advance planning. Here's a quick recap:

1. There are three types of exercises: concentric, isometric, and eccentric.
2. Exercise notation: sets x repetitions
3. Concentric repetitions: 15 repetitions or more per exercise, stay 1 repetition short of failure, and aim for a chosen amount of repetitions for strength or hypertrophy.
4. Use isometric charts to find your sets and hold times. Stay in the 60-70% range for holds and aim for 40-70 seconds overall.
5. Structure eccentric exercises by systematically increasing hold time and decreasing rest time.
6. 1 Concentric repetition is approximately equivalent to a 2s isometric hold and a 3s eccentric movement.
7. When planning the order of your routine, place the most important exercises first.
8. Rest times per set: 30-90 seconds for endurance; 60-240 seconds for hypertrophy; 120 or 180-300+ seconds for strength.
9. Shorten a workout by pairing exercises that do not use the same muscle groups.
10. Tempo:10x0 tempo is standard. Changing tempo results in a different outcome for endurance, isometric work, and other exercises.
11. In movement vs. isometric work, movement can be superior.
12. Core work (in terms of compression) improves active flexibility. Good core exercises include ab wheel, hanging leg raises, v-ups, dragon flags, and weighted decline sit-ups (a good go-to for hypertrophy). Balance the anterior core and the posterior core.
13. Gauge your workout performance and terminate a workout only if necessary. If it *is* necessary, do not feel guilty; we all have bad days.

- CHAPTER 10 -

METHODS OF PROGRESSION

All athletes want to see results. Nobody hopes to pursue bodyweight strength training for ten years without progressing. You're probably reading this book to progress—or to ensure that the athletes you are training progress. We've covered an overview of the theory behind programming, now let's introduce some concrete methods for programming future workouts to get stronger. These factors can make or break a bodyweight strength routine.

There are two distinct methods of progression with bodyweight exercises: *intra-exercise progression* and *inter-exercise progression*. *Intra-* focuses on improvements within the same exercise, while *inter-* focuses on moving through the various progressions of an exercise.

The first way to improve is within an exercise itself. This would be working with, say a pushup, and improving your ability from five to ten repetitions or from five repetitions with zero pounds to five repetitions with twenty-five pounds.

The second method of improvement involves advancing incrementally from one exercise progression to the next. For example, mastering frog stand and then moving to tuck planche then to advanced tuck planche and finally to straddle planche; or from pull-ups to wide pull-ups to L-pull-ups.

There are various ways to progress using both of these methods. Think of each of these methods as simple "programming" to increase strength and hypertrophy. This "programming" or "progression" is basically a manipulation of the variables that exist within a routine: repetitions, sets, rests, tempo, intensity/load, volume, and frequency. When you manipulate these correctly, you progress.

SIMPLE INTRA-EXERCISE PROGRESSION

Intra-exercise progression is one of the easier concepts to grasp regarding progression and programming in bodyweight training. This is the transition from lower repetitions at higher intensity to higher repetitions at lower intensity within the same exercise. Most people grasp this intuitively when they begin working out: "I used to be able to perform five pull-ups, but after my last workout I can now perform six pull-ups." While this is easy to grasp when you first begin to work out, it can be difficult to figure out if you are plateauing with more advanced exercises later on. So let's walk through several means of progression.

Expect to progress at variable rates in the many different exercises in your routine. You may even progress at different rates for exercises that work the same muscle group. Treat each individual exercise as a completely separate entity when considering intra-exercise progressions.

Linear Progression

Linear progression is perhaps the simplest form of progression. If you have access to a weight vest, backpack, ankle or wrist weights, weight plates, or another way to load weight onto your body, you can use this progression to gain strength. This type of progression originated for use with barbells and dumbbells, but it can be used effectively with bodyweight exercises. You will see this most commonly with weighted pull-ups and dips. These are effective exercises for improving brute strength and muscle mass. You can also perform pushups, rows, and other bodyweight exercises with weights. In the example below, the notation 5-5-5 means three sets of five repetitions.

1. 5-5-5 with 0 pounds
2. 5-5-5 with 10 pounds
3. 5-5-5 with 20 pounds

Linear Repetition Progression

Linear repetition progression is the easiest method for beginners that does not use external weights. This method aims to increase all of the three-set repetitions from five to six to seven in consecutive workouts.

1. 5-5-5
2. 6-6-6
3. 7-7-7

You perform 3x5 in one workout, 3x6 in the next workout, and 3x7 in the workout after that. This is the recommended progression scheme for beginners, as you will be able to progress relatively quickly with basic exercises. This is also the reason that typical beginner bodyweight training routines are noted with a range of repetitions (e.g. 3x5-8 or 3x5-12 or 3x5-15)

1. Pull-ups: 3x5→15 with 3 minutes of rest at 10x0 tempo
2. Dips: 3x5→15 with 3 minutes of rest at 10x0 tempo

Linear repetition progression is what the arrow (→) from the 5→15 repetitions means. You will systematically work your way from five to fifteen repetitions in subsequent workouts in order to progress. If you are focused on hypertrophy the 5→15 repetition range works effectively. The higher repetition range allows more volume, necessary for increased hypertrophy.

You should be able to progress quickly when you first begin training. However, after a few weeks of solid progression, you may find yourself plateauing. This is your body adapting to the method of exercise you are using. You may need to change your programming in order to progress further.

Repetition Addition

Repetition addition is a much slower method of progression that aims to increase the repetitions in all three sets over a period of a week or two. This method assumes you are performing a full-body routine three times per week.

1. 5-5-5
2. 6-5-5
3. 6-6-5
4. 6-6-6
5. 7-6-6

As you can see, your first workout will be 5-5-5, your second workout will be 6-5-5, and your third workout will be 6-6-5. The following week, your first workout will be 6-6-6, which completes the progression from 5-5-5 to 6-6-6. If you cannot improve all of your repetitions in every set, using this method is one way to bridge the gap.

Before moving along, let us note some basic facts about these progressions. Most of them consist of completing three progressions before you reach the next set. However, there is nothing prohibiting you from utilizing progressions between sets. Indeed, with programming, your sets and repetitions do not have to look like nice, rounded numbers. They do not even have to have a certain amount of sets. Here are two examples from actual workouts:

1. 5-5-5
2. 6-6-5-5
3. 6-6-6
4. 7-6-6-6
5. 8-8-8
6. 5-5-5
7. 6-6-5-5
8. 7-6-6
9. 8-8-7-7
10. 9-9-9

You do not have to perform the progressions listed here the exact way in which they are outlined. These are only examples to give you an idea of different methods for progressing. Depending on your body's performance, you may progress faster or slower than the examples given. Knowing your workout ability is important. Use it to make a plan that will help you improve in future workouts.

Last Set to Failure

Last set to failure is an interesting method of progression because it stays short of failure on all of the sets except the last one. This may be one of the more effective ways to progress with strength, as strength can be built effectively by staying short of failure. It is also a good measure of overall fatigue and can help you know when to progress. If you can perform at least two more repetitions on your last set than you did on your first set, you can most likely move forward to the next level.

1. 5-5-5
2. 5-5-6
3. 5-5-7
4. 6-6-6

Another quality of this method is its adaptability; you may be able to progress over a couple repetitions if you can perform 5-5-8 and go straight to 7-7-7 or 7-7-X in your next workout. Basically, if you can make a bigger jump, then the last set to failure will indicate that you can make the bigger jump in progressions. If your last set to failure is limited, you may not be quite ready to progress.

This method is also effective for deloading. Your first few sets will not be to failure; perhaps not even close to failure. However, your last set will show you where your limits are. This will allow you to be sure that your sets will remain short of failure during subsequent deloads.

If you are having a difficult time figuring out how to program a routine or if simpler methods such as linear repetition progression have brought you to a plateau, Last Set to Failure is a good method to try.

Additional Set

The *additional set* method is a straightforward way to add more volume to an exercise. This method is particularly effective for pulling exercises, such as pull-ups and row progressions. For newer athletes or those moving beyond a simple "beach muscle" workout for the first time, the back is usually their weak link. The additional sets help bring more volume to the back, which strengthens the scapular muscles. This often helps restart progress.

1. 6-6-6
2. 6-6-6-6
3. 6-6-6-6-6

The additional set method is also effective for hypertrophy if you need to add volume. To stimulate hypertrophy, extra volume is frequently necessary when repetitions are between one and eight.

Rest Pause

Rest pause is good technique. In this method, you rest for a determined amount of time after going close to or to-failure. The extra rest after a set allows you to perform a few extra repetitions. The rest can be systematically decreased in order to progress effectively. For example,

5-5-4 and the last set was to failure. After the fourth repetition, perform 1 more repetition after a 20 second rest.

5-5-4 and the last set was to failure. After the fourth repetition, perform 1 more repetition after a 10 second rest.

5-5-5 A full three sets of five repetitions. No rest between the 4th and 5th repetitions.

This allows you to hit your target amount of repetitions for the set with a very short rest time. Since you hit the repetitions that were planned, your body will slowly adapt to the load. Eventually you will unify the split repetitions into a single set.

Density

Density is the concept of performing the same amount of work or "volume" [of a single exercise] in a shorter period of time. *Density = Volume/Time* with the time component decreasing.

1. 5-5-5 with 4 minutes of rest
2. 5-5-5 with 3 minutes of rest
3. 5-5-5 with 2 minutes of rest
4. 6-6-6 with 4 minutes of rest
5. 6-6-6 with 3 minutes of rest
6. 6-6-6 with 2 minutes of rest

Initially, the volume of sets and repetitions is kept consistent at 5-5-5. As the workouts progress, the amount of rest time is decreased. Essentially, you are performing the same amount of repetitions in less time, which means your overall capacity has increased.

Technically, a consistent time component with an increasing volume of work is also an increase in density; however, this is not the definition used in workout literature, even though you are still performing more repetitions in a set amount of time. If you want to think of any of the previous methods as an increase in density, that's fine. You will simply have to explain your definition when you are discussing your training.

Tempo Change

1. 5-5-5 with 10x0 tempo
2. 5-5-5 with 20x0 tempo
3. 5-5-5 with 30x0 tempo
4. 6-6-6 with 10x0 tempo
5. 6-6-6 with 20x0 tempo
6. 6-6-6 with 30x0 tempo

Tempo change is another way to progress your workouts. In this example, the eccentric component is lengthened in subsequent workouts. The first workout has a one-second eccentric component for all of the repetitions in the set, the second workout has a two-second eccentric component for all of the repetitions in the set, and the last workout has a three-second eccentric component for all of the repetitions in the set. Lengthening the eccentric component of time under tension is one way to progress. With a one-second eccentric you are spending a total of *15 total reps * 1 second = 15 seconds* of eccentric time under tension. With a 2-second eccentric you are spending a total of *15 total reps * 2 seconds = 30 seconds* of eccentric time under tension, and with the last you are spending *15 total reps * 3 seconds = 45 seconds* of eccentric time under tension. This progress with time under tension allows you to increase the number of repetitions in the next few sets.

There is nothing prohibiting you from changing any of the other components of tempo, aside from the eccentric component. The reason why the X is included in this example is because the X tends to be the most effective tempo for strength training. However, you may change the X component if you desire to train movements that look cool, such as slow muscle-ups.

There might be other reasons to change the tempo during certain exercises. If you are performing pseudo planche pushups in your routine, you may want to pause the movement at the top in order to get a bit more time in the pseudo planche hold position. This would change the tempo from 10x0 to 10x2 if you desire a 2-second hold at the top, between repetitions. This is one of the ways to use rings pseudo planche pushups to work up to the straddle planche on rings. On the other hand, you may decide to eliminate the muscle rebound—the stretch shorten cycle—which seems to make the movements easier through the bottom of the

range of motion. The way to perform this is by eliminating the immediate concentric after the eccentric is finished. This would manifest from a 10x0 to an 11x0 or a 12x0 repetition.

Tempo change is one of many changes you can explore in programming in order to progress toward particular goals. It should always be considered alongside changes in repetitions, sets, rest times, and overall volume.

Frequency Modifications

Frequency modifications are not usually classified as methods of progression, as they typically modify your workouts so you have extra sessions to work on movements. The most common way to implement frequency modifications in your routine is a method called *Grease the Groove* (GTG) outlined in *Power to the People* by Pavel Tsatsouline. The GTG method has been amended by many people over the past decade. Here is the *Overcoming Gravity* version:

The GTG method is typically utilized outside of a workout. With this method, you perform frequent sets of one particular exercise multiple times throughout the day, almost every day during the week. The concept is to apply a very high frequency to a single exercise to "grease" the neurological "groove" of particular neural adaptations (covered in chapter two) to rapidly increase strength or endurance in that specific exercise. Using this method, an athlete can, for example, rapidly increase strength by bringing pull-up numbers up from a small amount to a large amount, or increase endurance by performing many sets of many repetitions of pushups in a day. This is similar to military boot camp, where one is told to perform many pushups or sit-ups in a day. This method will result in increases from low double digits to triple digits of a movement very quickly.

One way to perform GTG is by doing 6-10+ submaximal sets interspersed throughout the day at about 60-80% of your maximal amount of repetitions. Using dips as an example, if your maximum is four dips, you perform two to three dips for one set each. You will then perform dips every hour or two, for a total of six to ten times over the course of a day. This leads to roughly thirty dips per day. Contrast this with only performing dips during your workout, which would likely result in completing no more than five sets of three dips before you become unable to do more. With this method, it may only take a few weeks for you to acquire the skill to perform ten or more. Staying submaximal with your sets will help you avoid overworking your body while still giving you plenty of practice so you become skilled at a movement in a short period of time.

The main limitation of the GTG method is that while using it, you will typically only be able to perform one pushing exercise per day without burning out. It's a good idea to eliminate all other pushing exercises from your workout routine for the duration of GTG, leaving in the pulling exercises and leg workouts.

If you need to gain strength or endurance quickly for a particular exercise, this method may work well for you. As mentioned earlier, the military uses this method effectively for the pushup and sit-up portions of PT conditioning tests. Likewise, it has been used successfully to obtain dips or pull-ups very soon after gaining the ability to do a few concentric exercises. The static movements it works best on are the back lever and front lever. Use this method to build up to about eight to ten repetitions, then work on strength or specific endurance to differentiate toward your goals. Please note that this method *does not work well for the planche*, so do not attempt it on that exercise. The planche has an enormous relative strength component and uses smaller muscles, so it is almost guaranteed that you will burn out before you are able to noticeably increase your abilities. There are some who can do it, but it is not recommended to attempt unless you are at advanced strength levels where your relative work capacity is much higher.

For Isometric Holds and Eccentric Exercises

All of the methods described can be used effectively for *isometric holds* and *eccentric exercises.* For example, a linear repetition progression would look like this:

1. 15s-15s-15s-15s holds – 4 sets of 15s
2. 16s-16s-16s-16s holds – 4 sets of 16s
3. 17s-17s-17s-17s holds – 4 sets of 17s

Any of the other methods can also be used, including but not limited to: repetition addition, last set to failure, additional set, and density. For example, for isometric holds, the last set to failure progression may look like this:

1. 15s-15s-15s-18s holds – Increase to 17s holds in following workout
2. 17s-17s-17s-17s holds – Remain at 17s holds in following workout
3. 17s-17s-17s-19s holds – Increase to 18s holds in following workout
4. 18s-18s-18s-22s holds – Increase to 21s holds in following workout

It is easy to use these progressions for every type of exercise in your routine. There is no shortage of options to consider to help you break through a plateau in your routine.

SIMPLE INTER-EXERCISE PROGRESSION

When it comes to bodyweight training, the process of *inter-exercise progression* is one of the most difficult to master. At low levels of progression, if you can perform ten pull-ups, you will most likely be able to perform at least three to five wide grip pull-ups. There is an easy bridge from one progression to the next because you are already performing enough repetitions of the next exercise. However, once you progress to some of the more difficult variations, the strength gap between one progression and the next can seem enormous. This section aims to give you techniques that will help you handle the bigger leaps as you begin to perform more difficult movements.

Weight Addition

Adding weight while performing an exercise is one of the easiest methods to bridge the gap between one progression and the next. For example, if you can perform ten pull-ups with no weight, you will likely be able to work up to performing ten pull-ups with the addition of fifty pounds. If you can successfully achieve this, you should be able to perform a significant amount of the next progression on the charts, wide grip pull-ups.

1. 4x15s Advanced Tuck with no additional weight
2. 4x15s Advanced Tuck with 1-pound ankle weights on each foot
3. 4x15s Advanced Tuck with 2-pound ankle weights on each foot
4. 4x15s Advanced Tuck with 3-pound ankle weights on each foot
5. 4x15s Advanced Tuck with 4-pound ankle weights on each foot
6. 4x15s Straddle Planche

An athlete having trouble progressing from a tuck planche to an advanced tuck planche could add a few pounds of ankle weights to help improve their strength capability and muscle mass while performing the tuck

planche. After removing the weight, the advanced tuck planche would be much easier than if they had gone directly from the regular to the advanced movement without using weights. An alternative to ankle weights could be a weighted vest. Be creative!

Assistance

Assistance is a method that can help bridge the gap between one progression and the next by making the more advanced movement easier. For example, a long rubber band hung over the pull-up bar can assist you in the advanced tuck planche. This allows you to move from one progression to the next right away, rather than remaining at the lower level.

Be sure your assistance methods are *measurable*. Pulley systems are an excellent method of assistance. They allow you to set how much weight you want on the other end of the pulley, which will tell you how much assistance you are receiving. This can be noted in a workout log, allowing you to systematically decrease the amount of assistance over subsequent workouts, until you are performing the movement without assistance. Methods that are difficult to measure—such as partner assistance, bands, or finger assistance for unilateral exercises—present challenges in evaluating progress and determining future programming and should be avoided if possible.

Eccentric Exercises

As mentioned previously, *eccentric exercises* are one of the most common ways to bridge the gap to the next progression of a concentric exercise. Eccentrics work particularly well for pulling exercises such as pull-ups and one-arm chin-ups. Here is our example again:

1. 3-5 sets of 3 L-Pull-up Eccentrics, 6s each
2. 3-5 sets of 3 L-Pull-up Eccentrics, 7s each
3. 3-5 sets of 3 L-Pull-up Eccentrics, 8s each
4. 3-5 sets of 3 L-Pull-up Eccentrics, 9s each
5. 3-5 sets of 3 L-Pull-up Eccentrics, 10s each

Generally speaking, when you can perform three ten-second eccentrics in a row you can also perform at least one concentric exercise of the same movement. In other words, if you can complete three ten-second L-pull-up eccentrics in a row you can probably do at least one concentric L-pull-up. You may have periods of rest between each of the sets in the beginning, but systematically decrease the rest time while increasing eccentric time as you move forward. Eccentrics of the next progression are an excellent way to bridge the gap from one progression to the next.

Momentum and Extra Range of Motion

One of the common complaints regarding the front lever rows progression is that it can be quite difficult to move from tuck front lever rows to advanced tuck front lever rows or from advanced tuck front lever rows to straddle front lever rows. One of the ways to bridge the progression gap between these movements is to work an intermediate skill between them.

Instead of working the tuck front lever row—pulling up to the bar and then lowering yourself down—try using an extra range of motion along with a bit of momentum. Start in a pull-up position, pull up to the top

of the advanced front lever row position, then lower to the bottom of the pull-up position. This takes your shoulder musculature through a much larger range of motion, and you can use the strength from the pull-up position to assist your muscles to pull up into the top of the advanced tuck front lever row position. Once you are proficient with this, you can start reliably working the advanced tuck front lever position from a static position.

1. 3x8 Tuck Front Lever Row
2. 3x4 Pull-up to Advanced Tuck Front Lever Row Position
3. 3x5 Pull-up to Advanced Tuck Front Lever Row Position
4. 3x6 Pull-up to Advanced Tuck Front Lever Row Position
5. 3x7 Pull-up to Advanced Tuck Front Lever Row Position
6. 3x8 Pull-up to Advanced Tuck Front Lever Row Position
7. 3x4 Advanced Tuck Front Lever Row

You can apply this to planche or handstand pushups by moving in from a dip position. There are multiple ways to take your muscles through an increased range of motion to bridge a progression gap.

Exercise Modification

Exercise modification is an interesting way to bridge the gap between progressions. This technique is commonly applied to make an exercise more difficult in the range of motion that is the easiest. For example, if you are working with planche pushups, the most difficult part of the movement is the top of the motion, where you lock your arms straight to finish the pushup. When you modify this technique, it makes the bottom portion of the exercise more difficult, which will work your muscles harder through the full range of motion. Similarly, if you are performing an advanced tuck planche pushup, you may move into a straddle planche pushup in the bottom of the movement, and then back into an advanced tuck planche pushup at the top of the movement.

1. 3x8 Advanced Tuck Planche Pushups
2. 3x4 Advanced Tuck Planche Pushups to Bottom Straddle Planche Pushup position
3. 3x5 Advanced Tuck Planche Pushups to Bottom Straddle Planche Pushup position
4. 3x6 Advanced Tuck Planche Pushups to Bottom Straddle Planche Pushup position
5. 3x7 Advanced Tuck Planche Pushups to Bottom Straddle Planche Pushup position
6. 3x8 Advanced Tuck Planche Pushups to Bottom Straddle Planche Pushup position
7. 3x3 Straddle Planche Pushups

This type of exercise modification works best if you add on the associated isometric of the movement you're performing. In other words, if you are working tuck planche pushups with the bottom as a straddle planche pushup, you may want to work straddle planche at the same time. Generally, your planche progression pushup will be one level lower than your planche isometric progression, so optimally you'd work the straddle planche isometric along with the advanced tuck planche pushup progression combined with straddle. Ido Portal popularized this one for the planche.

Additional Sets with Decreased Rest Times

This modification aims at making the previous progression extremely easy by adding additional sets to an exercise while slowly decreasing rest times between sets. If you recall, *strength = neural factors * cross sectional*

area of muscle mass. Decreasing rest time aims at landing within hypertrophy range in order to increase cross sectional area of muscle. Additional sets aim to increase the neural factors that elicit strength. This increases the two components that lead to increased strength simultaneously.

Take pushups: While you might be able to perform three sets of ten pushups with three minutes of rest between sets, it is not guaranteed that you can perform three repetitions of diamond pushups. However, if you build up to five or six sets of ten pushups with one minute of rest between sets, two things are likely. First, if you can do that many sets with only a short period of rest, you can likely do more than twenty pushups in a single set. Second, it is likely that pushups have become much easier to perform, which means your muscles are equipped to move on to the next progression.

1. 3 sets of 10 Pushups with 3 minutes of rest between sets
2. 4 sets of 10 Pushups with 3 minutes of rest between sets
3. 5 sets of 10 Pushups with 3 minutes of rest between sets
4. 5 sets of 10 Pushups with 2 minutes of rest between sets
5. 5 sets of 10 Pushups with 1 minutes of rest between sets

This example increases the number of sets before decreasing the length of rest times in subsequent workouts. However, you may choose to decrease the length of rest times first and only then increase the number of sets. You may also choose to increase the number of sets and decrease the length of rest times simultaneously. There are many ways to manipulate the variables in your workout; you just need to know your limits and challenge them.

Here's another example, using the planche. You may be able to perform three sets of twenty-second tuck planche holds with three minutes of rest between sets, but find yourself unable to progress to the advanced tuck planche. If you increase the number of sets from three to five while simultaneously decreasing the rest times between sets to one minute, you will become stronger and better able to perform tuck planche holds. This will make it easier to progress to the next level.

Hybrid Sets

Since *Overcoming Gravity* was originally released in 2011, *hybrid sets* have become a popular way to bridge the inter-exercise progression gap. This method combines the two progressions that you find yourself stuck between. A hybrid set for bodyweight training uses the "drop set" technique to create one "set" of the next progression with follow-up repetition work from the previous progression. This forms a hybrid of the next progression so that you are building strength for it while also increasing volume to stimulate hypertrophy.

You may need to read through this sample progression and the next few paragraphs more than once to gain an understanding of why hybrid sets can be an excellent method to help you progress.

1. 3 sets of 10 Pull-ups
2. 3 sets of (1 Wide Grip Pull-up, followed by 6 Pull-ups)
3. 3 sets of (2 Wide Grip Pull-ups, followed by 4 Pull-ups)
4. 3 sets of (3 Wide Grip Pull-ups, followed by 2 Pull-ups)
5. 3 sets of (4 Wide Grip Pull-ups, followed by 0 Pull-ups)

In the first workout, you will perform three sets of ten pull-ups. In the next workout, you will perform one Wide Grip Pull-up followed immediately by six pull-ups. You then rest and repeat that set three times to complete your workout for the day. Then, in your next workout, you will perform two Wide Grip Pull-ups followed immediately by four pull-ups. Rest and repeat three times. In your next workout, you will perform two Wide Grip Pull-ups followed immediately by four pull-ups. Rest and repeat three times. In your next workout, you may be able to achieve three sets of four Wide Grip Pull-up repetitions.

This method of progression should be performed so that each exercise and drop set of the exercise is slightly short of failure. The last set can be performed to failure so you can learn your limits and can adjust accordingly in the next workout. The progression may not be as smooth as the example given. It could look more like this:

1. 3 sets of 10 Pull-ups
2. 3 sets of 1 Wide Grip (WG) + 7 Pull-ups; 1 WG + 6 Pull-ups, 1 WG + 6 Pull-ups
3. 3 sets of 2 Wide Grip (WG) + 4 Pull-ups; 2 WG + 3 Pull-ups, 1 WG + 6 Pull-ups
4. 3 sets of 2 Wide Grip (WG) + 6 Pull-ups; 2 WG + 6 Pull-ups, 2 WG + 6 Pull-ups
5. 3 sets of 3 Wide Grip (WG) + 5 Pull-ups; 2 WG + 7 Pull-ups, 2 WG + 6 Pull-ups

The main thing to keep in mind is that this doubles the factors that you can progress on. For example, moving up from one Wide Grip Pull-up to two Wide Grip Pull-ups is making progress. However, performing one Wide Grip Pull-up and five pull-ups, moving to one Wide Grip Pull-up to seven pull-ups is also making progress, as long as you are staying short of failure. Progress in the "drop set" portion of the exercise signals that your strength is increasing; it indicates that you have more reserves after the difficult set. As the reserves build up, you will find that you are able to perform more of the primary exercise in subsequent workouts.

This is a great method because it is a tangible way to make progress. Hybrid sets combine the effectiveness of practicing the next progression with the volume of the previous progression, focusing on both strength and hypertrophy at the same time in the same set.

If you ever find yourself stalled on any inter-exercise progressions, utilize bodyweight drop sets to help bridge the gap.

Hybrid Sets with Eccentrics

Hybrid sets with eccentrics are another favorite way to bridge the progression gap. This is an effective method that many people find intuitively. *It is a proven way to progress when you are only able to perform a very low volume of the exercise that you want to improve.* Let's say you want to focus on pull-ups: Simply perform as many full range of motion pull-ups as you can without assistance. Then, to get enough extra volume to obtain both a strength and hypertrophy stimulus, follow those repetitions with a predetermined number of eccentric movements.

1. 3 sets of (1 L-Pull-up, followed by 5 L-Pull-ups Eccentrics for 5s each)
2. 3 sets of (2 L-Pull-ups, followed by 4 L-Pull-ups Eccentrics for 5s each)
3. 3 sets of (3 L-Pull-ups, followed by 3 L-Pull-ups Eccentrics for 5s each)
4. 3 sets of (4 L-Pull-ups, followed by 2 L-Pull-ups Eccentrics for 5s each)
5. 3 sets of (5 L-Pull-ups, followed by 1 L-Pull-ups Eccentrics for 5s each)

In this example, you increase the number of L-pull-ups in each subsequent workout, if you can. In any case, you will finish each set with a predetermined number of eccentrics that decrease in number as you become able to perform increased amounts of the concentric movement. *Note that the numbers of repetitions and sets will probably not look this neat in practice.*

As you can see, hybrid sets can be used effectively with eccentrics. They can be used equally effectively with density and tempo.

These examples of intra-exercise and inter-exercise progressions should give you an idea of how to modify your workouts as needed to make progress using simple methods of progression. Now we will cover more complex methods of progression.

Simple Hybrid Sets

Simple hybrid sets are the easiest method to apply to your training if you do not want to combine the movements from the next progression with those from the previous progression. Here are two sample variations, each containing four workouts. For these examples, let's use a muscle-up.

1. Muscle-up Singles: 1-1-1 + Muscle-up Eccentrics 3x3 for 10s each
2. Muscle-up Singles: 1-1-1-1-1 + Muscle-up Eccentrics 3x3 for 8s each
3. Muscle-up Singles: 1-1-1-1-1-1 + Muscle-up Eccentrics 3x3 for 8s each
4. Muscle-up Singles: 2-1-1-1-1-1 + Muscle-up Eccentrics 2x3 for 8s each
5. Muscle-up Singles: 1-1-1 + Assisted Muscle-ups 3x5
6. Muscle-up Singles: 1-1-1-1-1 + Assisted Muscle-ups 3x4
7. Muscle-up Singles: 1-1-1-1-1-1 + Assisted Muscle-ups 3x3
8. Muscle-up Singles: 2-1-1-1-1-1 + Assisted Muscle-ups 2x3

In this simple hybrid set workout progression you perform as many repetitions of the next progression as you can. As you start to work muscle-ups, your limit may be 3x1 or three sets of one repetition in the first workout. Since this is not enough volume to stimulate strength adaptations after you finish the muscle-up concentrics, follow up with muscle-up eccentrics or assisted concentrics. Since you have already performed some of the exercises of the next progression, you can cut down on the eccentrics or assisted concentrics as you progress. The goal over time is to add singles until you can do doubles and slowly decrease the volume of the eccentrics or assisted concentrics.

If you are having trouble implementing true hybrid sets in a session, this is an easy alternative. This particular inter-exercise progression allows you to maximize the amount of work you perform with the next progression, important for strength gains. The simple hybrid sets method is the best option for gaining strength among the inter-exercise progressions listed. However, it may result in significantly longer workouts. For those without time constraints, it is highly recommended.

COMPLEX METHODS OF PROGRESSION (PERIODIZATION)

Accumulation and Intensification; Light/Heavy Models

Accumulation and *intensification* are ways to say that many factors are changing at the same time. As you recall from chapter five, Russian training programs are structured into microcycles, mescocycles, and macrocycles. Each microcycle focuses on a particular phase of training, such as preparation, hypertrophy, strength, and power. Here is a refresher:

	Microcycle – 1 Week (Preparatory)
	Microcycle – 1 Week (Hypertrophy)
Mesocycle	Microcycle – 1 Week (Hypertrophy)
	Microcycle – 1 Week (Strength)
	Microcycle – 1 Week (Strength)
	Rest/Deload Week
	Microcycle – 1 Week (Preparatory)
	Microcycle – 1 Week (Hypertrophy)
Mesocycle	Microcycle – 1 Week (Strength)
	Microcycle – 1 Week (Strength)
	Microcycle – 1 Week (Power)

Accumulation training happens when multiple factors, such as sets, repetitions, tempo, rest breaks, and volume, are all manipulated at once. During an accumulation phase, the athlete is intentionally overworked by systematically increasing the sets and repetitions while decreasing the rest times and modifying the tempo to make the exercises harder. This takes place all at once. Depending on the coach, the workouts may be modified to the next workout by a number of sets, or by effort level or fatigue. Usually, an accumulation phase means you are modifying at least two factors within a single workout, if not more. This is an advanced training technique.

Intensification is typically described as a reduction in overall repetitions and sets, modifying the tempo and rest breaks toward their strength and hypertrophy ranges, and drastically increasing the intensity or difficulty of the exercise. As with accumulation, multiple factors are modified at once.

The Russian structure of mesocycles into microcycles was one of the precursors to the method of accumulation and intensification protocols. If you are training a specific attribute such as hypertrophy, your routine will follow a predictable pattern. Generally, your intensity will be moderate (60-85% 1 RM), your sets and repetitions volume will be relatively high (4-6+ sets of 8-12 repetitions), your rest times will be moderate (2-4 minutes), and your tempo may be longer, with pauses (51x1). You can see the similarity between accumulation and specific attribute training—such as hypertrophy work—in a typical microcycle.

Now, compare this to an attribute phase geared to develop strength. If you are training a specific attribute such as strength, your routine will also follow a predictable pattern. Your intensity will be higher (80-100% 1 RM), your sets and repetitions volume will be relatively lower (3-8+ sets of 1-6 repetitions), your rest times

will be higher (3-5+ minutes), and your tempo will be shorter (10x0). Did you notice any similarity to an intensification phase?

The example below alternates accumulation and intensification. One way to think of it is that an accumulation phase is modifying your workout for hypertrophy, and an intensification phase is modifying your routine for strength.

	Microcycle – 1 Week (Accumulation: Hypertrophy – 8-10 RM)
	Microcycle – 1 Week (Intensification: Strength – 4-6 RM)
	Microcycle – 1 Week (Accumulation: Hypertrophy – 8-10 RM)
Mesocycle	Microcycle – 1 Week (Intensification: Strength – 4-6 RM)
	Microcycle – 1 Week (Accumulation: Hypertrophy – 8-10 RM)
	Microcycle – 1 Week (Intensification: Strength – 4-6 RM)

If you are having difficulty in your routine, incorporating this method is a good way to implement progress on a week-to-week basis. Train one attribute for a week and then switch to a completely different attribute the next week; this typically works well. Schedule accumulation first, followed by intensification on similar exercises. You should see gains in both strength and hypertrophy from 1 Week to the next.

The *light/heavy* model of progression is basically the same method as accumulation/intensification performed with alternating workouts. On light days, your workout consists of low-intensity (light) exercises, performed for fewer sets and more repetitions. On heavy days, your workout consists of high-intensity (heavy) exercises, performed for more sets and less repetitions. Like accumulation/intensification, this method works very well for intermediates.

Light/heavy differs slightly from accumulation/intensification in that the focus on strength and hypertrophy alternates within the week (intra-weekly), rather than from 1 Week to another (inter-weekly). Most 'modern' periodization structures tend to vary workout factors within the week. For example, you may have workouts that alternate between light and heavy:

First Week

1. Monday: Light (Hypertrophy Focus)
2. Wednesday: Heavy (Strength Focus)
3. Friday: Light (Hypertrophy Focus)

Second Week

1. Monday: Heavy (Strength Focus)
2. Wednesday: Light (Hypertrophy Focus)
3. Friday: Heavy (Strength Focus)

The light/heavy method tends to alternate your focus within a particular week, as opposed to having a weekly block of accumulation or intensification phases. On the hypertrophy days, you aim on increasing the overall volume through the repetitions and sets compared to the previous volume you performed. On the strength days, you focus on either moving up in progression, increasing the weight, or staying within the

strength range and improving there. The specific goal with this method is to improve each routine for both strength and hypertrophy. Here's an example:

1. Monday Hypertrophy – Pull-ups: 3x10 repetitions
2. Wednesday: Strength – Pull-ups: 3x5 with 20 pounds
3. Friday: Hypertrophy – Pull-ups: 3x11 repetitions
4. Monday: Strength – Pull-ups: 3x5 with 25 pounds
5. Wednesday: Hypertrophy – Pull-ups: 3x12 repetitions
6. Friday: Strength – Pull-ups: 3x5 with 30 pounds

There are two lines of progress here. In hypertrophy, you are moving up from 3x10 to 3x11 to 3x12. In strength, you are moving up from +20 pounds to +25 pounds to +30 pounds. These two qualities feed into each other. Recall the strength equation: *strength = neutral adaptations * cross sectional area of muscle*. During your strength-focused workouts, you are addressing neural adaptations. During your hypertrophy-focused workouts, you are working on increasing the cross-sectional area of muscle.

Since working that cross sectional area of muscle also helps increase strength, you can improve on the strength workout by increasing weight in the next workout. Likewise, since strength helps to lower the intensity by which you are performing a single repetition, you can perform more repetitions at a certain bodyweight. The adaptations feed into each other and create a cycle where you can make good progress while alternating between light and heavy workouts.

There need not be two lines of progress in every light/heavy routine. Once you get strong enough, you could work both 3-5x5 and 3x10 days and increase the weight for both of them. Generally, the ten-repetition day will lag about 20-30 pounds behind the five-repetition day. However, you will increase strength as long as you continually increase the weight to obtain a new max.

Over the course of a mesocycle that contains three workouts per week, there are nine total hypertrophy and nine total strength workouts.

	Microcycle – 1 Week (Hypertrophy, Strength, Hypertrophy)
	Microcycle – 1 Week (Strength, Hypertrophy, Strength)
	Microcycle – 1 Week (Hypertrophy, Strength, Hypertrophy)
Mesocycle	Microcycle – 1 Week (Strength, Hypertrophy, Strength)
	Microcycle – 1 Week (Hypertrophy, Strength, Hypertrophy)
	Microcycle – 1 Week (Strength, Hypertrophy, Strength)

If you progress in strength in all nine workouts, you will increase by 40-45 pounds in a single exercise. If you progress in hypertrophy in all nine workouts, you will increase by 9 repetitions in a single exercise. Obviously, this manner of progression may not continue indefinitely, but even half of this over six weeks would be extremely good progress for most athletes. This is an extremely effective intermediate technique.

In reality, "light" can refer to any amount of exercise, whether it be total volume (sets and repetitions), intensity, or frequency. The same is true vice versa for "heavy." Indeed, there is even a "medium" amount of volume, intensity, and frequency that we have not even touched upon! If there are three categories for volume

(light, medium, and heavy), three categories for intensity, and three categories for frequency, that means there are twenty-seven different variations of potential implementation for the same workout! This massive amount of variation in these three categories will be the topic of the next section on *modern periodization*.

Modern Periodization

Periodization refers to any method used to vary the volume, intensity, and frequency of a workout to produce constant gains and avoid plateaus. This includes tempo and rest times, which can also be modified as necessary. Traditional periodization has been deemed inferior to 'modern' methods. However, the concepts that you learn for traditional periodization are the same concepts that underlie much of the more modern periodization principles. Planning your routines becomes less about *hoping it will work and hoping you do not plateau* to *knowing it will work and what to do if something goes awry*.

When you reach an intermediate or advanced level of strength, it's common for your progress to stall. Applying a constant stimulus—similar or same workouts even with improvement in progression or repetitions—may fail to produce resulting gains in strength and hypertrophy. Your progress may taper off from one workout to another for an entire week. Once you reach the upper advanced range, your progress may stall for two weeks or more. You may not see strength or hypertrophy gains until you have completed an entire cycle and fully recover from the fatigue after you deload.

Varying the amounts of sets and repetitions—and therefore intensity and volume—have a number of effects on the body. Training the tougher progressions closer to 1 RM takes more of a toll on the nervous system to produce benefits. Dropping the intensity and working more hypertrophy or endurance tends to work more of the muscular component while not stimulating the nervous system as heavily. Therefore, alternating between these two can allow you to maintain your overall training volume for gaining strength without overtaxing the neuromuscular system. If this sounds similar to accumulation/intensification and light/heavy, it is because the same basic underlying structure spans across all periodization.

The method that works effectively in bodyweight training is called *daily undulated periodization* (DUP). This method is not for beginners; it undermines their ability to make good progress with linear progression, linear repetition progression, or other simpler forms of progression. It is also not for elite athletes; better options for the elite athlete would be either the *conjugate method* or *concurrent models*. DUP is unquestionably good for athletes in the advanced strength range, however. Plus, it is very easy to implement, which makes it a good choice for our purposes.

On a basic level, DUP alternates repetitions and sets from one workout to another. The recommended iteration of DUP is a schedule of three workouts per week, which is basically a light/heavy routine expanded to three days. This is similar to the traditional periodization model where you move from less intense phases to more intense phases (preparatory → hypertrophy → strength → power). However, the training is varied from one workout to another (instead of in weekly microcycles).

Modern periodization—such as intra-weekly variation—is superior to the traditional inter-weekly variation because of the *SAID principle*, covered in chapter one. When you reach the strength or power phases of the traditional periodization model, a few weeks will have passed since you were in the preparatory or hypertrophy phases. Your body has started to lose the specific adaptations that it gained in those phases. Modern periodization models blunt this effect by modulating the variation weekly and repeating the same variation

the next week. This allows you to constantly train hypertrophy, strength, and power, which helps mitigate any loss that may occur in each of those phases. Here's what it looks like:

1. Monday: 3x8-10 with all exercises
2. Wednesday: 3-5x5 with all exercises
3. Friday: 5-8x3 with all exercises

On Monday, you may use exercises with a 3x8-10 repetition scheme; on Wednesday, you may use exercises with a 3-5x5 repetition scheme; on Friday, you may use exercises with a 5-8x3 repetition scheme. As the week goes on, you begin with higher repetitions at easier progressions and then you move toward lower repetitions at harder progressions, with more sets. This works well with exercises where you can add weight, such as barbells; however, now that you have been working out enough to know your abilities, you can readily vary the intensity of the exercise.

For instance, if you are unable to do eight repetitions of a full front lever pull-up on Monday, you may drop down to eight repetitions of a straddle front lever pull-up. Likewise, you may not be able to do five repetitions of a full front lever pull-up on Wednesday, so you have to drop down to a straddle front lever pull-up again and add some weight to increase the difficulty. However, you may be able to do three repetitions of the full front lever pull-up on Friday, so you can do the 4x3 full front lever pull-ups that day. In this instance, your DUP schedule would look something like this:

1. Monday: 3x8 Straddle Front Lever Pull-ups
2. Wednesday: 4x5 Straddle Front Lever Pull-ups + 10 pounds
3. Friday: 4x3 Full Front Lever Pull-ups

Typically, a modern DUP model utilizes a structure of three workouts per week. Performing four workouts per week is unusual, but it is an option. If you were to choose this 4x/week model, you may want to alternate with a double light/heavy structure. Perform 3x8-10 on the first day and 5x5 the second day. This alternates light and heavy. Your other two workouts could either both be the same (3x6-8) or bias more toward strength (6x3). In this instance, your weekly schedule would look like this:

1. Monday: 3x8
2. Tuesday: 5x5
3. Thursday: 3x7
4. Friday: 6x3

Likewise, a modified frequency plan such as a 3/1/2/1 plan (3 days on, 1 day rest, 2 days on, 1 day rest) or a 5/2 plan (5 days on and 2 days off) can be performed: 3x8, 3x5, 5x3, 3x8, and finally 5x3. Your personal preference and the exercises you choose are the deciding factors. If you do not have access to a weighted vest or ankle weights it may be harder to modulate intensity, so you may have to rely on the limitations of the exercises themselves to determine the repetitions.

The recommended workout repetition ranges begin with the hypertrophy range and move to the strength range at the end of the week. The first range chould be 8-10 for the high repetition days, 5-7 for the medium repetition days, and 3-4 for the low repetition days. This allows you to cycle from a musculoskeletal focus in the beginning of the week toward a neural adaptation focus by the end of the week, which is consistent with working both sides of the strength equation mentioned in part one: *strength = neural adaptations * muscle cross sectional area.*

Experiment to discover the type of repetition range that works best for you. Some athletes might do better alternating between the 8-10 range and the 5-7 range, not using the 3-4 at all. Some athletes may need only the 8-10 and 3-4 ranges. You could move from 15 repetitions to 10 repetitions to 5 repetitions. Based on observation, the more genetically gifted athletes tend to work best with the lower repetition ranges. A wide variation in repetition ranges may work well for hypertrophy focus.

The repetition ranges may also vary depending on which muscles are being worked. For example, posture muscle groups such as the core and back—as well as muscles that are used for lower level activity such as the calves and forearms—respond better to higher ranges since they are composed of more slow-twitch fibers. For these muscles it may be best to work with ranges of 15+ on high repetition days and 5-8 on lower repetition days. Based on experience, muscles that cross multiple joints such as the hamstrings, glutes, biceps, and so on respond better to the 8-10 high repetition days and 3-5 low repetition days.

After you have trained for a period time, you tend to have a better idea of what types of ranges your body works best at, so choose accordingly. If you are just starting, use a standard template (such as 3x10, 3x7, 5x3 or 3x12, 3x8, 4x4) and modify as necessary. Experiment with some of these concepts over a few different six-week cycles, followed by a rest break. See what works best for you. If you are confused and do not know what to pick, repetition DUP work M/W/F by itself works well for the iron cross progressions, as well as all of the exercises at that skill level.

As previously stated, *concurrent* and *conjugate systems of periodization* are more advanced than weekly variation systems, such as DUP. An irony of training is that athletes who already have a high amount of strength and muscle mass have trouble getting better at all exercises at the same time.

Concurrent Periodization

Concurrent periodization handles this challenge by managing recovery correctly. For example: when developing a light versus heavy system, place all "heavy" exercises for push, pull, and legs on the same day at first. This means that all of the exercises would be geared toward strength. Granted, this is going to be difficult for the body to recover from, since it is a massive amount of work on the body. It is, however, possible to cycle the intensity of push, pull, and legs so that they are all offset onto different days. Here is a look at the difference between these two examples:

1. Monday: Light Push, Light Pull, Light Legs
2. Wednesday: Medium Push, Medium Pull, Medium Legs
3. Friday: Heavy Push, Heavy Pull, Heavy Legs

1. Monday: Heavy Push, Medium Pull, Light Legs
2. Wednesday: Light Push, Heavy Pull, Medium Legs
3. Friday: Medium Push, Light Pull, Heavy Legs

Structure a routine along these lines and you will be able to manage recovery much more effectively. The light day focuses on the hypertrophy aspect of training, or even endurance. This is coupled with a medium day that is hypertrophy/strength focused or power focused. Finally, a purely strength-focused day completes your week. It is more effective in terms of recovery than just throwing hypertrophy training all on one day, power training all on one day, and strength training all on one day.

Concurrent periodization tends to be most effective working in "blocks"—you cycle exercises in and out of the routine during the mesocycle and provide deloads within the mesocycle to progress. It basically encourages multiple phases of accumulation and intensification within the mesocycle itself. This allows you to progress with multiple exercises while balancing recovery.

Conjugate Periodization

Conjugate periodization is one of the most advanced periodization methods. *Westside Barbell is an example of conjugate periodization.* The conjugate system is geared toward improving one lift at time while maintaining strength on all of the others. At elite levels of strength, you need a massive stimulus on the nervous system and muscles in order to provide enough stress for adaptation to take place. Recovery is usually the limiting factor, as all of your recovery is poured into training one particular lift at high intensity or high volume to give your body the necessary stimulus for adaptation. Your other lifts are maintained with the smallest possible volume to maximize recovery for the main lift. Usually this small volume is achieved by reducing the amount of practice with the main lift while increasing the number of supplemental lifts.

For example, the main lifts (such as deadlifts, squats, and bench press) may be practiced only a few times or even once a week. The weight is extremely heavy, so it literally destroys your recovery capacity for days afterward. Because of this, you will likely only practice your main lifts once a week (with a lot of supplemental work) instead of in every workout. An example using bench press for the main lift would involve working this movement once a week but following it up with specific muscular work (such as dips, tricep press downs, and other isolation work) to ensure that your muscles are prepared to practice the main lift.

Additionally, the main lifts may be trained for more than just strength. Westside employs *dynamic effort* (DE) and *maximal effort* (ME) days. On DE days, you would use a much lighter weight and work on bar speed. This helps train your neurological factors for strength, but is not as taxing on the body as a maximal effort lift. On ME days, you work on maximal strength and grinding out the really heavy lifts.

This model has led many powerlifters to great success, making it worth a mention should you choose to research it further on your own. You can apply this model to bodyweight training by focusing all of your training on one exercise, say advanced rings concepts like the planche or inverted cross. However, with pulling or leg work, seek only to maintain it: perform minimal amounts of isometric holds with back lever, front lever, iron cross and supplement these with considerable scapular strength work. Once you become strong, you cannot continue to optimally train a large number of high-intensity strength movements or holds every day of the week. This model will apply more when you begin to work beyond the C-level, or with elite isometric holds.

Modern periodization is where you start applying concepts of multiplicative variation in training. For example, one choice may be to load a high amount of frequency with a high amount of volume and intensity onto one particular movement. With the other movement there may only be a light or medium frequency with a light or medium volume and a light or medium intensity. At elite levels, you have to make these tradeoffs in order to progress effectively. At that point, it is vital to know when to adjust frequency, volume, and intensity in your training.

By the time you reach this level of training you will likely be familiar with DUP and other advanced periodization methods. Once you reach that level, *Overcoming Gravity* will no longer be able to function as

your coach. You will know more about your body and how it responds to different amounts of frequency, volume, and intensity than anyone else who is not deeply involved in your training. This is why it is strongly recommend that you keep a log of all your workouts and training methods. It will enable you to see how you have progressed with certain routines over the course of weeks: changing the frequency, volume and intensity. Unless you have a coach with significant experience training elite athletes, who has the time and is willing to design a program that is unique to you, you will need this information in order to be able to construct your own routines. (Unfortunately, most coaches of that caliber are busy coaching their athletes in the Olympics—if you can find one who has the time, don't pass them up!)

For additional reading on different periodization methods, this article covers the basics: www.elitefts.com/education/training/powerlifting/overview-of-periodization-methods-for-resistance-training

CHAPTER 10 SUMMARY
METHODS OF PROGRESSION

This is a key chapter to understand. It shows how the method of progressive overload works and how to get unstuck from plateaus.

Simple Intra-Exercise Progressions

- *Linear Progression*: Add weight to each workout.
- *Linear Repetition Progression*: Add repetitions to all sets of the exercise.
- *Repetition Addition*: Add repetitions to single or multiple sets of an exercise.
- *Last Set to Failure*: Once you can perform the last set of an exercise to failure with two more repetitions than the prior sets, add a repetition to all of the sets.
- *Additional Set:* Add an additional set to the exercise.
- *Rest Pause*: Go to failure in your last set and do a repetition after a short rest. Eliminate the rest.
- *Density*: Decrease the rest times between sets.
- *Tempo Change*: Change the tempo from 10x0 to longer concentrics or eccentrics in a movement.
- *Frequency Modifications*: Grease the groove or increase the amount of times per week that you perform an exercise.
- *Transference*: The same information can be applied to isometric and eccentric exercises. All of your exercises do not have to look clean in order to progress.

Simple Inter-Exercise Progressions

- *Weight Addition*: Adding weight to make the previous progression more difficult.
- *Assistance*: Using bands or other methods to make the next progression easier.
- *Eccentrics*: A bridge to perform the next progression easier.
- *Momentum and Extra Range*: Utilizing momentum to perform the next progression with extra range of motion.
- *Exercise Modification*: Changing the previous progression to make it more difficult, usually with different body positions.
- *Additional Sets and Decreased Rest Times*: Adding more sets and decreasing the rest times of the previous progression or next progression.
- *Hybrid Sets*: Combining the minimal next progression work with additional volume from the previous progression, much like a drop set.
- *Simple Hybrid Sets*: Performing as many repetitions of the next progression you can, then filling the rest with volume from the previous progression.

Complex Methods of Progression

- *Accumulation and Intensification*: Weekly ordering of workouts to obtain higher amounts of volume with more repetitions, followed by subsequent workouts where you increase intensity by decreasing the repetitions and performing more difficult exercises.
- *Light/Heavy*: Alternating the repetition scheme and intensity of the workouts on different days within the week.
- *DUP*: A complex form of light/heavy that uses light/medium/heavy days to vary workouts to increase strength and hypertrophy.
- *Concurrent and Conjugate Systems*: Alternative forms of periodization schedules in which different attributes are worked simultaneously. Depending on the system you may just try to maintain some of the attributes while working on others, or you may try to improve many at the same time.

- CHAPTER 11 -

PREHABILITATION, ISOLATION, FLEXIBILITY, AND COOL DOWN

Now that you have learned what composes the core of a workout, we can talk about what comes at the end: prehabilitation work, isolation work, flexibility work, and cool down. It is important to have goals within this category, especially for prehabilitation and flexibility. You should perform these at the end of every workout to help your body relax and prevent overuse injuries.

It is vital to keep your joints, tendons, and muscles moving well. Good quality body tissues should not hurt or feel sore or painful when you apply pressure or massage them. If you place your hands on relaxed muscles or tendons they should be pliable and easy to move. Unfortunately, it is common for them to feel tight, crampy, and bumpy.

Your joints should feel good when you use them. Your muscles should be soft and pliable. Take a moment to close your eyes and move your body. You should feel good and unrestricted in movement. Think of an athlete like Michael Phelps. Before he swims in a competition, he performs many arm circles and throws his arms back and forth to loosen them up. You can see that his muscles are soft and pliable; they move unhindered. That is your goal.

The sample routine example of prehabilitation, Isolation, Flexibility, and Cool Down

- 3x1 minute sets of Rice Bucket for your wrists
- 3x10 Biceps Curls
- 3-5x30s Split Holds
- 3-5x30s German Hangs
- 3-5x20s Back Bridges
- 1 minute of Deep Breathing (in through the nose, out through the mouth)

PREHABILITATION WORK

Prehabilitation work refers to the part of your workout that is focused on injury prevention. Prehabilitation exercises are focused on correcting imbalances and preventing injuries from occurring by performing specific exercises on your weak links. *Rehabilitation work* can be done in either conjunction with prehabilitation work

or in separate sessions. If you are not using the injured body part in your workout, it is a good idea to add your rehabilitation and prehabilitation exercises to the end of your routine. Alternatively, these exercises can be used to warm up your tissues before working out. Consider utilizing prehabilitation if you have had previous injuries to certain joints or if you suspect an injury may be developing due to twinges of pain and/or prolonged soreness of muscles, tendons, or joints.

The best way you can think of prehabilitation is that it is an extension of rehabilitation. Prehabilitation is derived from "pre-rehabilitation," or performing rehabilitative work before you acquire an injury. It is an extension of rehabilitation; both in the context of pre-injury and post-injury rehabilitation state: *There is an awareness of discomfort in certain muscles, connective tissues, or joints that may potentially develop into an issue, so you are heading it off with specific corrective exercises.*

You will pass through a similar stage whether you acquire an injury or not, so it is important to learn to identify the nature of pre-injury vs. post-injury state. It could be a result of imbalance, weakness, overuse, or other factors. After you identify the situation, you need to be proactive in correcting imbalances, strengthening, or resting to bring your tissues, tendons, and joints back into a healthy state.

Prehabilitation is always used in two distinct circumstances. The first is as an extension of rehabilitation where you previously had an injury, such as tendonitis. In this example, the tendonitis is currently rehabilitated to the point where you do not feel pain, but excessive volume or intensity in your workout could re-injure it. In other words, this part of your body is still vulnerable to injury. You may need to program around this area in your general training. The second circumstance where you would use prehabilitation is when you are in a state of pre-injury. It is better to catch an impending injury before it devolves into pain, muscle atrophy, and other negative consequences. In this instance, prehabilitation can help restore your tissues to a normal, healthy state. If you tissues are overworked or "under-recovered," you may feel discomfort, achiness, soreness, tightness, or twinges of pain. You will want to dial down your training, analyze what is taking place, and take the necessary steps to correct it.

The shoulder is a common joint where prehabilitation work may be needed. If your shoulders need additional stabilization exercise, perform exercises for your rotator cuffs or stability exercises such as Turkish get-ups for the glenohumeral joint. Additionally, if there is tightness around your scapulas, you may want to perform specific scapular stabilization exercises like scapular retractions, depressions, elevations, and protractions. Thoracic mobilization may be necessary as well. All of the different parts of your shoulder may play a role in your need for prehabilitation work.

The main reason to place specific prehabilitation work at the *end* of the workout is that performing these exercises before a workout will fatigue you. If you desire to gain strength with an exercise you need to fatigue your primary muscles during a difficult movement. When your stabilizer muscles are fatigued, they will fail much more rapidly during compound exercises, which limits the workload of your primary movers and may increase your chance of muscle strains and other injuries.

One example is biceps curls and pull-ups. If you fatigue your biceps before performing your pull-ups, it is likely that your pull-up numbers will suffer. Performance decreases when you perform prehabilitation work on a certain area of the body prior to trying to use that part to perform compound exercises for strength.

ISOLATION WORK

Isolation work is used for many purposes. It can be used as prehabilitation work in order to strengthen connective tissues, for strength work, for aesthetic hypertrophy, or a combination of both prehabilitation and strength work, where you are simultaneously strengthening your muscles and preventing injury by correcting imbalances and recognizing weak links in your body.

A 3x10 set and repetition scheme is typically used for hypertrophy of the muscle because of the repetition range. In the example routine, we used a set of 3x10 biceps curls. This 3x10 set may also be used for aesthetics—in other words, you might do a bit more isolation work to get bigger biceps. However, if you have been performing pull-ups for a long time and your biceps tend to be your weak link, the 3x10 biceps curls may also be used to bring up biceps strength in order to perform better on pull-ups. In this case, the hypertrophy in the biceps will assist in strength because we know that *strength = neural adaptations * muscle cross sectional area.* In the case of strength without much of an increase in muscle mass, the biceps curls may be adjusted to 5x5 or another lower repetition range with more sets, to bias toward strength.

You can also use an isolation exercise (such as biceps curls) for prehabilitation. Specific strengthening work (such as the back lever or any other rings work) can often put a lot of strain on the biceps tendon, leading to soreness or potentially tendonitis in the biceps tendon. If that is the case, you would use an exercise that trains the biceps tendon in a much higher repetition range to strengthen connective tissues.

The goal is to not increase intensity, as the tissues are already slightly compromised and higher intensity would only make the injury worse. To illustrate: if you have a hamstring strain, performing a high-intensity exercise, like sprinting, is a bad idea. Rather, you should be training not-to-failure in order to avoid potential injury complications. Connective tissues such as tendons, ligaments, and cartilage tend to respond better to higher repetitions because of the increase in blood flow that assists with healing. The mechanical tension is still high enough to stimulate repair and remodeling without the potential forces to further injure it. Utilize not-to-failure training, very light weight, very high repetitions, and a lower number of sets in order to strengthen your connective tissues, for example, do biceps curls with a very low weight (such as five pounds) for three sets of 30-50 repetitions, not to failure.

As you can see, prehabilitation work and isolation work have some overlap. Isolation can be used with prehabilitation to bring up certain weak links or strengthen connective tissues by modifying intensity and volume to match.

COMBINING PREHABILITATION AND ISOLATION WORK

Prehabilitation and isolation work are easy to use in combination. If your wrists are becoming sore from performing too many handstands, regain mobility by using isolation work for your wrists in order to help them withstand the stress of handstands. You may use wrist curls, moving the wrist around in a rice bucket, wrist pushups, or other types of exercises to shore up your wrists against injury. What you *do not* want to do is continue performing handstands through the soreness and pain that follows. This will eventually lead to injury.

Similarly, if you have soreness or pain in your shoulders, you may need some specific prehabilitation-focused isolation work for the scapula and shoulder joint. Earlier, we gave an example of specific rotator cuff work that could be followed up with specific scapular isolation strengthening.

For extremity joints such as the wrists, ankles, elbows, and knees, it is likely that wherever your discomfort or soreness is present, that is where the prehabilitation and isolation work need to be focused. On the other hand, the joints closer to the spine tend to interact with the torso in a way that may confound easy identification. The shoulder is an obvious case. For instance, limitation in scapular mobility may manifest as shoulder pain. The limitation of the scapula to move may cause the shoulder to take up extra effort by compensation or cause specific parts of the shoulder to rub against one another, causing irritation and discomfort. In this case, increasing scapular mobility may be a better solution over rotator cuff work or a combination of the two.

Specific work to the area in question should begin to help within three to five workouts or two weeks. This will give you enough time to remove the aggravating exercises from your routine and begin prehabilitation and isolation work to address the issue at hand. If the issue does not improve, there is likely something else going on that is interfering with improvements, or the fundamental issue itself is not being addressed.

An example of this is a tight back and foam rolling. An athlete may notice they have a tight back and continuously use a foam roller or other massage-like implements to remove the knots and pain. Their back will improve for a period of time, but eventually stop improving. At this point continuing foam rolling will not help; the tightness is actually being caused by something else. The three most common causes of tightness in the back are pain, instability, or weakness. You may have one of these things happening, two of them happening, or all of them happening at once. Pain and forceful movement to the end of your range of motion from spraining an ankle causes the muscles around the ankle to become tight as the body responds to the injury. A person that is double jointed and hypermobile (such as contortionists) will have tight muscles because their body responds to the instability of hypermobile joints by tightening the muscles to prevent injury. If you have a weak back, your muscles may become tight to protect from injury.

Now, in the case of foam rolling, you still have a tight back. This tightness could be caused by lingering pain from a previous injury. People with pain usually have significant tightness, which "magically" clears up as they heal from the injury. Instability could be another reason why your back is tight. Specific stability work for the spine may be the solution, rather than more foam rolling. Alternatively, your back could be weak and your muscles are tightening to protect it from injury. In that case, perform exercises to strengthen your back.

High-repetition kettlebell swings are known to help significantly with back tightness and pain. Why? Because kettlebell swings with light weights force your core muscles to stabilize your spine while simultaneously providing a stimulus for the back to become stronger under load. This corrects both instability and weaknesses at the same time. Over time, the pain will clear up, leaving one with a stronger, pain-free back. Likewise, high repetition reverse hyperextensions tend to be a good exercise as well due to the same benefits. Obviously, you should not attempt to solve your back pain with kettlebell swings or reverse hyperextensions without consulting a medical professional. This should help you understand the concept.

In general, if your injury is getting worse and nothing you are doing to fix it is working, should stop exercising and consult a medical professional immediately!

Here are some general recommendations for prehabilitation and isolation work:

- Isolation work can be performed after a workout for hypertrophy if you are interested in aesthetics. This should utilize standard strength and hypertrophy sets and rest times.
- Prehabilitation, usually in the form of isolation work, is meant to strengthen weaknesses, fix instability, or correct other issues for a particular area. This should use low intensity and high repetitions to prevent re-injury and retrain the particular areas.
- Prehabilitation for your extremities (such as the wrists, elbows, ankles, and knees) tends to be straightforward. More factors may be involved when dealing with the spine, hips, and shoulders. Use moderate to high repetitions.
- Exercise is a potentially dangerous activity. Although this book gives you tools and concepts, you may not be able to use them correctly. If you have any questions or concerns, you should consult the appropriate medical professional before beginning an exercise routine. This could be an orthopedic doctor, sports medicine doctor, and/or physical therapist.

As far as programming for prehabilitation goes, generally aim for:

- Longer rests between sets; 2-3 minutes or more
- Slower tempos for prehabilitation or isolation work, such as 5121
- Higher repetitions, such as 15-40
- Not to failure work

The goal is to not push your connective tissues too much by going to failure, moving quickly, or decreasing rest times. Instead, you should use an exercise to "injury proof" the area. The high-repetition sets mentioned earlier are recommended, but there are exceptions. Higher repetitions for prehabilitation work tend to work well, especially for potential tendonitis or strain issues. However, if you know the issue is a specific weakness you will want to use lower repetitions (such as in the 5-8 range) to increase strength.

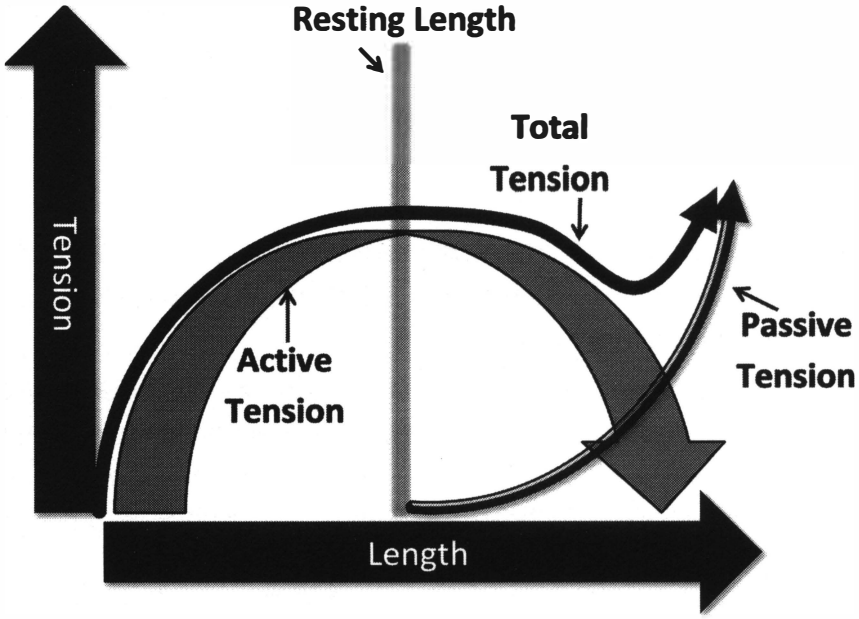
When referring to upper-body training there are five main areas to consider: the hips, spine, shoulders, elbows, and wrists. These joints and their surrounding musculature are the main areas in bodyweight exercises that you need to safeguard. Many specific exercises are located later in this book. There are many others. If you have your own set that you like, by all means, use them.

FLEXIBILITY WORK AND COOL DOWN

Flexibility work and cool down make up the final part of a routine. Generally speaking, flexibility is ideal for the cool down, but the cool down can have additional light activity like jogging, jumping rope, or mobility work. If you have anything that does not fit in your routine because it is oddball, you can place it in this section.

Now let's learn why flexibility exercises work. When you understand how something works on a conceptual level, you can make tweaks to your routine in order to progress.

In the first chapter of this book, we talked about muscle spindles. They are the structures within your muscles that regulate muscle length. If you lengthen a muscle to the limit of your range of motion, your muscle spindles will send feedback to your brain to contract the muscles in order to provide tension. This generates passive tension within the muscles, as seen in the picture below.



The nervous system has *afferent* and *efferent* fibers. *Afferent* fibers are sensor fibers that provide feedback to the nervous system via touch, pressure, or other changes within the body. *Efferent* fibers provide controlling feedback after the brain and/or nervous system has processed it. In conjunction with this are alpha, beta, and gamma afferent and efferent fibers. The Greek-letter-names of the fibers simply tell you their speed of transmission. In the case with muscle spindles there is gamma afferent feedback to the nervous system and brain when a muscle lengthens. After the afferent feedback has been processed there is alpha efferent and gamma efferent control to the muscles. The alpha efferent fiber control increases tension in the muscles and the gamma efferent control ensures that the muscle spindle reacts appropriately to the change in length.

- Gamma afferents → brain → alpha efferent + gamma efferent co-activation = alpha efferent contracting muscle + gamma efferent modulating muscle spindle length.

What occurs in flexibility and plyometric training is fusimotor system activation and modulation. The fusimotor system is composed of gamma and beta afferent and efferent fibers. The same process occurs above with the gamma afferents and processing, but the efferent feedback is slightly different. Stretching sends the gamma afferent feedback. The nervous system via the spinal cord and brain processes it. Alpha, beta, and gamma efferents are then sent back to the muscles.

- Flexibility training or plyometric training → gamma afferents → nervous system via spinal cord or brain → alpha, beta, and gamma efferents → alpha efferent contraction of the muscles + gamma efferent modulating muscle spindle length + beta efferents modulating muscle spindle sensitivity

Flexibility training aims to induce decreased muscle spindle sensitivity. In other words: when you train and your muscles start to lengthen and move to end range, your muscle spindles decrease sensitivity so that they respond later than in a previous stretch. You move further in your range of motion before the passive tension increases. This leads to gains in range of motion.

There is a division of static and dynamic control for beta efferent feedback to muscle spindles.

- Static = Muscle spindle sensitivity in static positions = muscle stretch at end range
- Dynamic = Muscle spindle sensitivity in dynamic movement = stretch shorten cycle = effectiveness in plyometrics

Flexibility training aims to decrease muscle spindle sensitivity to end range in static or slow movements to allow for increases in range of motion, which pushes back the range of passive tension. Plyometric training is targeted at increasing muscle spindle sensitivity in dynamic movements—those used in running and jumping.

It is vital to remember that pain inhibits decreasing muscle spindle sensitivity in flexibility training, and pain also inhibits increasing muscle spindle sensitivity in dynamic or plyometric training. This means that performing flexibility training into the pain range is extremely counterproductive.

To make this clear, let's take the example of a sprained ankle. A sprained ankle brings a joint to the edge of its range of motion very rapidly and often past it. The pain is typically at the joint itself and that is most athletes' biggest concern. However, think back to your last mild sprain. Walking on this mild or moderately sprained ankle is tough at first because it is stiff. This is your body providing feedback from nociceptors (pain receptors), as well as the muscle spindles. The feedback causes your body to stiffen up the muscles surrounding the area to protect it. In these cases, the muscle spindles undergo an immediate sensitization that makes the muscles stiff and resistant to move toward your range of motion. A sprained ankle will often have a severely limited range of motion, due to both pain and muscle stiffness.

A week or two after the injury, if there is no rehabilitation you will likely feel a limitation in moving toward the range of motion, even though the pain may be gone. It is the remnant of sensitization of the muscle spindles that is prohibiting you from moving toward your previous range of motion. If you are going to physical therapy, you are probably performing stretches and strengthening exercises to increase your range of motion and bring your strength level back to normal.

What often takes place during a session of painful stretching is a lower level of muscle spindle sensitization. The reason why general flexibility training does not work for some people is that they are performing it wrong. They are overstretching their muscles to the point of pain, which inhibits their process in the next session. They may be able to increase their range of motion in this first session; however, in the next session, they find during warm-ups that they cannot stretch any further than their previous session. This is because pain inhibited their muscle spindles from desensitizing, leaving them with the same range of motion they had in the previous session with no permanent gains.

Now that you know how the process works, let's go through some of the different methods of flexibility training.

FLEXIBILITY THROUGH STATIC STRETCHING

Standard static stretching works for most people in terms of flexibility, and it is most often performed in a normalized number of sets, with specific time limits.

- 3-6 sets of 30-60s holds for each exercise

Let's use the splits as an example. Move your left leg forward, right leg forward, and middle split each for 3-6 sets of 30-60 seconds. For each stretch, the method that works best is to move into the slight discomfort range and to focus on relaxing. As we discussed, moving into a range where you are experiencing pain is not beneficial. The pain signals to your nervous system to contract the muscles harder, and it does not allow your body to reduce its sensitivity to muscle lengthening. In the range where you experience a stretch and slight discomfort, hold for 30-60 seconds while utilizing deep breathing techniques. Allow your muscles to lengthen by relaxing as you exhale.

This type of generalized stretching tends to work much like linear progression or linear repetition progression works to allow you to progress in both strength and hypertrophy. If you think about it, stretching is like a progressive eccentric exercise. Rather than increasing strength, your goal is to normalize your body to an elongated muscle state when it wants to contract against you. When you allow your body to relax in the state where you are experiencing slight discomfort but not pain, you should progressively improve in your stretching.

It is normal that some people will not improve their stretching using standard static stretching, especially those with high nervous system sensitivity. Most athletes are stretching wrong, so definitely give it a try for a month or two before moving on to other methods. If permanent plateauing happens to you, know that you can change your programming methods for stretching in the same way you can change the programming for strength or hypertrophy training. Let's talk about some of the other techniques beyond simple linear progression that you can use for stretching.

PROPRIOCEPTIVE NEUROMUSCULAR FACILITATION

Proprioceptive neuromuscular facilitation (PNF) is another method that takes aim at the nervous system to relax the muscle. There are many techniques that fall under this umbrella, but the most common by far are the hold/relax and contract/relax methods. In these techniques, the athlete being stretched will contract or hold against another person or implement for a set period of time. After this, they lengthen their muscle and allow it to relax for a set period of time. This helps relax the muscle spindles at the edge of the range of motion, which may help people who are chronically tight.

The goal is to "reset" your muscles spindle sensitivity by application of force and then relaxation at your end range of motion. This will signal to your body that it is safe when you apply end range force, and it utilizes the body's natural reflex to relax muscles after a sustained contraction.

A typical PNF contract-relax cycle looks like this:

- Move the muscle to end range.
- Contract the muscle against light force for about ten seconds. The contraction should be isometric: the light force should equal the amount of force from the muscle so it does not move.
- After letting go of contraction, allow the muscle to relax. The light force should move your limb into a greater amount of stretching for about twenty seconds. Move into discomfort only and not pain.
- Repeat these steps for 2-5 different cycles.

Typically, 2-5 sets of 2-5 cycles of hold/relax or contract/relax are effective. The hold and contract phases can be anywhere from 5-15 seconds, depending on how tight your muscle is. 5-10 seconds for this phase is optimal. Remember, you have to fatigue the muscle to allow it to start releasing from its shortened length. The relax phase can be anywhere from 10-30 seconds, though 10-15 seconds for this phase is ample. Your total stretching time ends up being approximately 80 seconds with a contract phase of 10 seconds and a relax phase of 15 seconds.

Since breathing is intimately coupled with the nervous system and relaxation, deep breathing can also be used during the relaxation phase to allow your muscles to stretch. Remember that pain increases sensitivity in your muscle spindles, so pushing the stretch into painful territory is counterproductive. Instead, it is better to move to the end of the range where discomfort begins, contract the muscle, and relax into the range of the same amount of discomfort. It is inadvisable to start in the range of discomfort, contract your muscles, and then relax into a range where there is potentially more discomfort or pain.

If your muscles are extremely tight, an effective variation is to contract the opposing muscles during the relaxation phase. If you are stretching your hamstrings, contract your hip flexors and quadriceps in the relaxation phase. This is the phase where your hamstrings are lengthening. It is based on the principle of reciprocal inhibition, in which the body will naturally relax the muscles on the opposite side of the joint(s) as one muscle is activated.

A different method that may help with very tight muscles involves utilizing reflex arcs (such as the patellar reflexive arc) to inhibit your hamstrings. Tap your patellar tendon in the same way a doctor would to check your reflexes. Hitting it multiple times will allow the reflexive arc to activate and inhibit your hamstrings. Then you can perform a PNF-type stretch.

LOADED STRETCHING

While the concept of *loaded stretching* has existed for some time in various forms, this concept has gained greater traction in the past few years as a methodology for stretching. The first edition of *Overcoming Gravity* used a different terminology for this concept.

Science has known for some time that movements taken to the edge of their range of motion with weights are as effective or potentially more effective than static stretching. For example, if you are performing weighted squats you will want to descend to the bottom of the squat until you feel a stretch on the hamstrings. If you continue to perform squats this way you will naturally increase your range of motion, especially as the weights get heavier.

One way to implement this is known as the "Asian squat." This involves going into the bottom of the squat position and remaining in that position while holding a weight. This can help you achieve a "deeper" position that ultimately improves flexibility. Along those same lines, preferentially shifting your weight around on your feet can stretch out your calves, hamstrings, glutes, and quadriceps while in the bottom of the squat. This will also increase your flexibility. This method essentially "loads" different muscles at the bottom of the squat to increase flexibility. If you are extremely tight, it can be more effective than PNF-type stretching to remain in the bottom of the squat position. Do it for as long as you can: five minutes or more.

In terms of progression, you can think of loaded stretching along the same lines as simple progression techniques. For example, this is how you may progress with this method of stretching:

- Perform one set of ten toe touches with a ten-second hold at the bottom to work on increasing hamstring and back flexibility.
- Once you stop progressing from session to session, hold two pounds of weights to allow you to be pulled deeper into the stretch. If necessary, stand on a raised surface to allow the hands to drop below the ground.
- After you stop progressing, consider adding more sets, weight, or time spent in the hold.
- Eventually, remove sets, weight, and time in order to obtain the flexibility gains with less loads.

The goal is not to reach a high amount of sets, weight, or time, but to move into a new range of motion and allow it to solidify. This may mean after you have increased your range of motion that you move down in sets, weights, or time spent in the stretch in order to maintain it. This would be analogous to deloading with exercise and beginning another cycle. The repetitions, sets, and load do not *have* to keep increasing to reach a new range of motion. Moving into a new range of motion without increasing these things tremendously is a sign that your overall flexibility has improved.

The only way to move into a new range of motion is to move to the edge of your current range and allow your body to conform to the length increases. You can think of this in terms of hypertrophy and time under tension. The more time you spend in a muscle-lengthened state without pain, the more your body will conform to accommodate that state. Here are the two ways to load stretches to increase flexibility:

- Isometrics at the edge of your range of motion
- Eccentrics through the range of motion to the end range

Isometric holds can be held at end range for sustained lengths of time from 30-60 seconds, increasing the repetitions of end range holds, loaded with incremental one-pound weights, or any combination of the above. Eccentrics can be performed with a uniform lowering through the movement (with or without a hold at the end), with increased repetitions, or loaded incrementally. Each of these will work; the effectiveness depends on how your body responds. Every person is different, so feel free to experiment and figure out what works best for you.

Even beyond PNF or loaded stretching, any type of system where you are practicing a lot of end-range movement will be effective for increasing your range of motion. Yoga is a prime example of this. The goal is working on the poses, not necessarily becoming more flexible, but it just so happens that moving into the poses requires many end-range muscle positions that will help you get more flexible. Active isolated stretching is another example.

When you understand the concept of end-range work, discomfort without pain, and nervous system relaxation, you understand how various systems allow you to make improvements in flexibility. This is why it is so important to understand the physiological processes behind how everything works. When you can troubleshoot your own workouts and flexibility work, you can discover the method that works best for you. You do not have to buy tons of programs, or go to a "guru" to help you make progress. You can learn to rely on your burgeoning experience with your own body.

Stretching too much is akin to programming too many exercises or putting too much volume in a workout. You become sore and may potentially lose any gains you have made. More is not always better. Focus on making small, incremental amounts of progress and maintaining the gains you have made.

Generally speaking, these are the concepts that help improve your overall flexibility:

- Time spent at end range (more time spent = more accommodation).
- Relax your nervous system through deep breathing, contract-relax, etc.
- Avoid pain by stretching only into the range of discomfort (for sensitive nervous systems).
- Increase strength through your range of motion and end range, especially by using a slow, controlled eccentric phase (unloaded or loaded stretching).

MAINTAINING FLEXIBILITY GAINS WITH MOBILITY AND FLEXIBILITY WORK

One of the concepts often left unaddressed is how to maintain a new range of motion once you have obtained it. Generally, you should expect increases in range of motion if you are foam rolling, massaging, or performing joint mobilization or flexibility work. This, of course, does not always happen. Sometimes, particular muscles or joints tighten back up. While the previously mentioned issues of instability, weakness, or pain may inhibit one from decreasing tight musculature, there could be another culprit.

Flexibility and mobility are similar, but not interchangeable. Flexibility is about increasing range of motion or muscle length by means of stretching. It is difficult to move a joint when the muscles surrounding that joint are not able to stretch. If you cannot touch your toes, performing flexibility work will elongate your hamstring muscles until you can.

Mobility is an umbrella term that covers any movement within an existing range of motion. Typically, it is performed at lower intensities with just your bodyweight. Mobility has three specific goals: maintaining existing ranges of motion, improving motor learning, and increasing movement quality. If movement within an existing range of motion is loaded with weight or resistance at a high enough one repetition maximum, it will become strength or hypertrophy work.

Whenever you obtain a new range of motion, you should follow up by performing both passive and active mobility work in the new range. For example, if you stretched your ankle, you will want to follow it up with passive mobility work that consists of moving your ankle in the new range manually, then actively contracting your muscles in the new range. This helps to solidify your gains by providing feedback to the body that the new range of motion is safe and can be used effectively. Once this happens, your body will no longer send mechanoreceptor (pressure/distortion) or nociceptor (pain) feedback to your nervous system that causes your muscle spindles to sensitize and limit range of motion.

Habits are hard to break. If your body has not been flexible for years, it tends to revert to what it knows. Your muscle spindles may start to naturally sensitize even if you have not stretched into pain. This can happen very easily if you do not perform mobility or range of motion work. This is the same as changing your posture. If you have had poor alignment for years, moving into a different alignment is going to be uncomfortable for a few weeks as your body adjusts to the new position. If you are seeking to make your body flexible for the first time in your life, you must get in the habit of stretching and performing mobility work on a daily basis, or

even multiple times a day. This may be difficult at first, but once the new habit is established, you will be able to maintain your gains much more easily.

If you do nothing to maintain your range of motion, your body will tighten back up. This is why mobility and flexibility work outside of a routine is so important. Most people who are flexible and mobile will be training these *every* day, not just on workout days. If you perform mobility work daily and flexibility work every few days, you should be able to maintain your range of motion gains. However, if you want to progress to the next range of motion quicker, performing both mobility and flexibility work on a daily basis is recommended. The phrase *Use it or lose it!* results from the SAID principle. If you do not use your new range of motion, you will likely lose it before your next workout.

It is important to construct your workout routine with *all* your goals in mind, not just the workout itself. A routine designed to increase flexibility may only have you stretching a couple times a week; however, you really need to be performing mobility *and* flexibility work daily to reach your goal of becoming more flexible. This may seem unmanageable, but there are many ways to make mobility and flexibility a part of your daily routine, even if you keep a busy schedule. You can perform a little when you wake up and before you go to bed at night, or as you are preparing a meal. Whether or not you perform both mobility and flexibility daily depends on your goals, but the bottom line is you need to do something every day.

Some people will be able to progress in flexibility while only stretching three times per week. Others may need to stretch multiple times per day, seven days per week. Then there are those who may need to stretch three to five times per week in addition to performing mobility work multiple times per day. If you notice your routine is not working, vary it to figure out what works best for you! Additionally, you can begin using PNF or LS to plan your flexibility workouts.

COMMON AREAS THAT NEED PREHABILITATION AND FLEXIBILITY WORK

- If your joints and connective tissues start to feel stressed, I would dial down on high-difficulty exercises and begin moving toward a greater volume (such as 12-20 repetitions) near the beginning of your routine as a warm-up. Add general ankle and foot mobility and stretching as needed for other sports or strength.
- For hip and leg flexibility, you will want to work on splits, straddle, and pike position with the ability to get your stomach to the floor.
- For your back, you will want to master bridges and mobilization of the thoracic spine if it is tight.
- For your shoulders, you will want to work on lats, chest, and scapular flexibility and mobility so that you can get your arms fully overhead and into hyperextension.
- For your elbows, you simply need a reasonable range of motion: fully straight, 180 degrees. You may need RTO supports or specific biceps work if they hyperextend.
- For your wrists, you want to be mobile in every direction because you will use them for almost everything.

Specific joints have no ideal number of degrees that mobility or flexibility should reach. One person is not as flexible as the next. However, you should be able to move into any of the typical stretching exercises like splits, German hangs, wrist pushups, overhead straight-arms for handstands.

In an exercise such as the German hang (stretching your shoulders far behind you), you want to be able to stay comfortably in that position for at least 20-30 seconds. It doesn't matter if this is at a 160-degree angle beyond neutral or 120-angle; both are fine. What matters is that your range of motion allows you to move in and out of the position comfortably. This means you are both mobile and stable; therefore, you can effectively develop strength.

If your joints are getting sore, you have trouble moving through the full range of motion, or you have difficulty applying strength near the end of the range of motion, you will definitely want to use prehabilitation work to correct the issue. This should be performed at the end of your routine, when your tissues are adequately warmed up, so the stretching and mobility work will be very productive. Do not ignore this, as it is important to stay healthy and this is one of the long-term factors of making progress. You cannot expect to become strong if you continually beat up your body through rigorous exercise without caring for it as well.

CHAPTER 11 SUMMARY
PREHABILITATION, ISOLATION, FLEXIBILITY, AND COOL DOWN

Prehabilitation refers to any work that is focused on injury prevention. Prehabilitation exercises are focused on correcting existing imbalances or preventing injuries from forming with specific exercises that address various weak links. Rehabilitation work can be done at this point in a workout, but it is also viable in separate, stand-alone sessions.

Isolation work is used for multiple purposes: as prehabilitation work to strengthen connective tissues, specifically to strengthen or hypertrophy muscles for aesthetics, or it can be used in combination with prehabilitation and/or strength work to simultaneously strengthen your body and prevent injury by correcting imbalances and bringing up specific weak links. Prehabilitation and isolation work will usually have some overlap and can be used for the same purposes.

Flexibility work and *cool down* are the last part of the routine. While flexibility work is recommended, the cool down can have additional light activity such as jogging, jumping rope, mobility work, or other types of movement. Additionally, if you have an oddball exercise that does not naturally fit into a routine, you can place it here.

There are three different methods to improve flexibility:

- Regular Stretching—standard static stretching; 3 sets of 30-60s holds.
- Proprioceptive Neuromuscular Facilitation—usually contract/relax, hold/relax, or contract/pull. Improves range by relaxing the muscle after sustained contraction and reciprocal inhibition.
- Loaded Stretching—used to progressively pull the body further into a stretch.

Any of these three options should be performed while breathing deeply to relax your body. Ensure that you do not cross from the range of discomfort to the range of pain. Pain sensitizes muscle spindles, which reduces flexibility in the long run. Measure flexibility effectiveness using *time spent at end range*, which is much like *time under tension*, a similar hypertrophy method.

Finally, if you want to maintain and improve the gains you have made within a range of motion, *use it or lose it!* You should be doing mobility and flexibility work every day—multiple times a day if you are looking to break into a new range. The frequency you select should reflect your individual goals.

- CHAPTER 12 -

MESOCYCLE PLANNING

INTRA-MESOCYCLE FACTORS

Intra-mesocycle factors deal with structuring weekly workouts in terms of your ability level. The progression charts in this book specify four distinct levels of ability. This chapter addresses the factors you need to consider at each level.

- Beginner Levels: 1-5
- Intermediate Levels: 6-9
- Advanced Levels: 10-13
- Elite Levels: 14-16

A typical mesocycle restructure may look like this:

	Microcycle – 1 Week
	Microcycle – 1 Week
Mesocycle	Microcycle – 1 Week
	Microcycle – 1 Week
	Microcycle – 1 Week
	Rest/Deload Week

Weekly scheduling is generally the preference since we are conditioned to think in terms of weeks for most things in life. However, you can run a routine on a five-day, six-day, or two-week schedule. It's up to you.

Workout routines are constructed over the course of four to eight weeks, followed by a deload period. Learning how to structure your routine in these periods is going to be critical to avoiding injuries. In addition, it will help you adjust to how your body responds to training in the context of plateauing. You will have to learn to utilize different types of programming as you progress. If you are keeping a training log (which you should be doing), you will be able to figure out what works best for you in terms of programming. This will give you a clearer understanding of how to program your own training, avoid pitfalls along the way, and learn how to be a better coach—even if you are only coaching yourself.

Programming on the elite level is not addressed in this chapter. Once you are that strong, you should know how to apply programming concepts with upper-level strength skills. At that level, strength consists

more of working to overcome specific weaknesses and working combinations or sequences of strength skills. Transitional movements become important as moving in and out of strength skills requires phenomenal body control and works your muscles in ways that they are not usually worked.

BEGINNER LEVEL: EXERCISES AND RECOMMENDATIONS

Most people wanting to learn bodyweight exercises will start in the beginner ability level. The beginner level (levels one through five) covers most of the basic bodyweight exercises from basic wall handstands, pushups, dips, and handstand pushups, to pull-ups, ring rowing, muscle-ups, and some of the basic progressions of isometric holds.

Even if you have an athletic background or have pursued other strength and conditioning endeavors before pursuing bodyweight training, you may fall into this category. It is likely that you still need to train in some of the skills such as handstands and the isometric positions even if you already have the requisite strength to start above this range. These basic skills require lots of practice, and they slowly build up your connective tissues for the exercise progressions themselves. If you are coming in with a decent amount of strength, focus your efforts on mobility work and joint preparation.

Eccentric exercises are not recommended at the beginner level, as they can be tough on joints and connective tissues. There are two exceptions: using eccentric exercises to help gain the strength for pull-ups or dips. There are many different types of simple progressions for concentric and isometric exercises that are better for a beginner's body and strength than eccentrics.

The lowest level of progressions (levels one through three) are best for women, who tend to have a lower strength to bodyweight ratio starting out, and for anyone currently on a weight-loss program. Everyone starts somewhere! Learning and accomplishing these exercises will build a strong foundation, which can be built upon as you reach higher ability levels. You will be surprised at what you will be able to accomplish when you give proper focus to improving and refining your workouts.

After these two big groups, joint and connective tissue preparation and mobility will be the main factors that must be taken into account. Aside from focusing on linear progression or linear repetition progression, flexibility and mobility should be undertaken. As you look at the charts you will notice that the L-sit progression requires an increasing degree of compression (hamstrings/hip flexibility) to move from the L-sit to the V-sit progressions. Other skill-based strength movements will also be critical to the development of strength (such as straight-arm press handstands) and will also require significant amounts of compression. To improve mobility, you should aim to get your chest to your knees in the pike and straddle positions, and your hands to the floor when standing and bending over.

Higher repetitions are initially good for untrained beginners. In the first few months of exercising regularly, it may be a good idea to build up to 15-20 repetitions in your workouts before moving on to the next progression. This ensures that you get enough practice to establish good techniques. The high repetition count will also help keep your connective tissues healthy.

You should focus your mobility and strength work on a few key areas: your shoulders, elbows, wrists, and thoracic spine. Refer to Chapter 11 (where we discussed prehabilitation) if you need advice on how to program these into a routine. Refer to Part 5 for the list of mobility and flexibility exercises.

BEGINNER LEVEL: WEEKLY SCHEDULING

For all beginners (levels one through five), the simple intra- and inter-exercise progressions should be used in order to progress from one workout to the next. There is no better time than as a beginner to use progressions to improve your abilities from workout to workout. Leave the more complex concepts for later. You should begin with linear progressions or linear repetition progressions. These will take you far. Once you begin to plateau with these progressions, you can select a different option. If you begin to regress in your ability level and become lethargic, you may need a deload period to recover from fatigue.

In general, you can expect to progress with most of the exercises every workout. The main thing you need to watch out for is connective tissue integrity. If you are having difficulty, you may want to scale back a bit with your progressions and focus on mobility and prehabilitation work instead. Remember, physical health is more important than progress! If you are unhealthy, you will not be able to make much progress. Rapid progression should never come at the expensive of your health.

As a beginner, the most important key is *consistency*. A lack of consistency would be defined as performing workouts only once or twice a week, or skipping weeks entirely. If you are sporadic in your training, you will likely not progress. It is common to get stuck here for five years or more, but this does not have to happen to you! Starting a routine and being consistent with it, in whatever state, is better than waiting until your routine or circumstances are perfect. Do not allow yourself to get caught up with minor details that may make your programming better, as programming is not complex at this stage. From cycle to cycle, your exercises will not change much. If you start over-thinking everything it can lead to paralysis by analysis.

Jump right in to a full-body program with three workouts per week. This gives you a day or rest and recovery between workouts, with two off days after every three workouts. This structure will typically operate on a M/W/F or Tue/Thur/Sat schedule, but other variations can be used as well.

When constructing your initial routine, start with your goals, then follow the recommendations of the book, be sure to take into consideration which exercises you will do and what your weekly schedule is outside of your workouts.

The needs of a *rank or untrained beginner* are simple:

- Learn the fundamental exercises and attain a good proficiency in them.
- In most cases, utilize a higher number of repetitions to solidify movement patterns and build up connective tissue strength.
- Focus heavily on the personal weaknesses you bring to your workouts. For example, if you have a desk job, you may have issues stemming from poor posture that could lead to injury if left unaddressed. Most sedentary individuals tend to have very poor mobility and flexibility.
- Put yourself on a generalized, balanced routine that will begin with high repetitions and then transition to traditional strength training.

The needs of a *trained beginner* are simple:

- Emphasize consistency in training. Discipline is going to be the most important factor in making progress. It is not good to skip workouts, apart from potential overuse injuries or emergencies. There is some merit to the common saying: *The best program is the one you stick to.*

- Emphasize training that ensures good muscular development and strength, especially in the 5-8 repetition range
- Make sure there is a proper balance of both pushing and pulling exercises in your routine.
- Add in exercises to maintain structural balance if imbalances start to develop. Typically, this will be adding more horizontal pulling if you trained mostly pushing exercises before coming to body-weight training.
- Allow your body to accommodate to strength training to allow your connective tissues and underlying structures (such as your joints and bones) to adapt.

BEGINNER LEVEL: ENDING A CYCLE

There are two equally valid ways to terminate a mesocycle. Since linear progression and other simple methods can often be continued for many consecutive months, one scenario is to end a mesocycle when you hit a plateau phase in your training. In terms of scheduling, that would be after 1 Week has gone by without progression or increase in repetitions for all exercises. The alternative is to end the cycle after four to eight weeks, which allows a rest week for recovery.

This second scenario (ending after 4-8 weeks) is preferred if your joints or connective tissues are starting to get sore or overused. It is never a good idea to train your body into oblivion. In the beginning, your joints and connective tissues can be the limiting factor rather than actual nervous system fatigue or muscle recovery. However, if you can continue making progress, continue with your cycle.

For the most part, staying on four to eight-week block schedules tends to be a good framework. This schedule allows you to evaluate your progress, make any necessary changes, and give your body a break to deload. Do not be afraid to slow down your training. It is not a race but a journey.

INTERMEDIATE LEVEL: EXERCISES AND RECOMMENDATIONS

The intermediate ability level (levels six through nine) develops the strength and body awareness to execute some of the commonly desired gymnastics progressions. Namely, we are working on solid handstands and progressing toward one-arms, rings handstand work, freestanding handstand pushups, straight-arm press handstands, full back and front levers, straddle planche, slightly past vertical V-sit, and lots of other cool multi-plane pulling/pressing strength exercises.

The full range of motion concentrics and the isometrics are still at your disposal. At this point, the eccentric exercises tend to be useful for gaining strength, since pulling exercises tend to respond particularly well to them. Eccentrics can be particularly useful for the development of the back lever, front lever, one-arm chin-up, and other pulling variations. A pushing exercise they are also used for is straight-arm handstand eccentrics.

By this point you have worked your flexibility and mobility drills until your compression (hamstring and hips) is becoming very good—approaching maximal levels. Your chest can touch your knees in pike and to the ground in the straddle position, and your hands can be flat on the floor while standing with your legs

straight. If this is not the case, focus on these abilities until you can accomplish them. You will be unable to progress past intermediate level without these skills.

Once you have achieved this level of flexibility/mobility, preparing your joints and connective tissues plays a greater role since you will soon be moving on to strength-based moves that are harder on your joints, namely, the iron cross, one-arm chin-up, back lever, and planche. These exercises can lead to serious injuries of the shoulders, elbows, or other parts of the body if you do not adequately prepare by developing the specific muscular strength needed and conditioning your connective tissues adequately.

On the charts, the progressions highlighted in gray will help you increase the strength of the connective tissues in your shoulders and elbows in the context of iron cross training. By following these progressions, you should reach a place of adequate preparation to begin attempting both the iron cross and one-arm chin-up. These progressions can also be used to gradually prepare for other types of movement that can be hard on connective tissues.

INTERMEDIATE LEVEL: WEEKLY SCHEDULING

By the intermediate ability level, you should have developed a solid base of both strength and conditioning. Typically, those who enter this level will have approximately 12-24 months of bodyweight training under their belt or more. For athletes with greater body mass (175 pounds or more), it may take longer to reach this level. Athletes with a strength sport background or a very solid barbell or weights background also should not rush to reach the intermediate level. These athletes must take it slow at the beginner level with the straight-arm exercises because, though they may easily have the raw strength, they do not yet have adequate connective tissue strength to perform straight-arm exercises at intermediate level. A lack of connective tissue strength makes you particularly susceptible to injury.

At the intermediate level, you can decide whether or not you want to add an extra workout to your weekly schedule. The general strategy for adding an extra workouts is to add one for each year you have spent consistently doing strength and conditioning work. This is a safe and conservative recommendation. Certainly, extra workouts can be added earlier, but you run the risk of overtraining and burning out. If an extra day of workouts is added, your schedule may look like M/Tue/Thur/F or Tue/W/Sat/Sun. The other alternative is to add an additional exercise for each of the push and pull categories to your existing M/W/F schedule. If you are transitioning to a 4x per week schedule instead of 3x per week, drop down to two exercises per push and pull category for each workout for at least one cycle. Build up volume as you get stronger and your conditioning increases.

If you are adding an extra workout to your weekly schedule, make sure to track how you feel for the first few weeks. Look for signs of overtraining: loss of appetite, deterioration of sleep quality, decrease in motivation, and so on. If your body indicates that it is being overworked, it is a good idea to drop back down to a 3x per week schedule until you build a better strength and conditioning base.

Alternatively, you may be interested in switching to a split routine at this point to ensure that your connective tissues and other body parts get more rest. Such routines could include push/pull, upper/lower, or straight-arm/bent-arm. Three-part splits—like push/pull/legs—are not the best option at this stage of training, can be used if it fits your schedule well.

As an intermediate, you can expect to progress every few workouts or weekly. Use the simple intra- and inter-exercise progressions. If these don't work out for you, try to learn how to implement accumulation and intensification phases of training or light/heavy-type work. Of these two, light/heavy implementation is recommended first.

Quality of work is more important than *quantity*. More is not always better, especially in the case of bodyweight work where a significant amount of energy must be spent not only to learn skills correctly but also to perform them correctly. Form deteriorates much more easily with bodyweight work than barbells. If you are thinking about adding more exercises, first consider how your body is reacting.

- Are you making progress week to week?
- How do you feel during the 24-48 hours following a workout?
- Is the quality of other lifestyle factors like sleep, work, and family deteriorating?

It is not a good idea to add exercises if you are losing sleep or are under a high amount of stress, or if you are struggling with soreness of any kind. If a joint is sore, this is especially true. If you are making good progress, why change what is working for you? Stick with what works. It does no good to undertrain, but overtraining can be much more frustrating. However, it is a good idea to push your limits every once in awhile. This will let you see where you are in your training and give you an idea of what you are capable of, but it is very important to back down after pushing yourself past your limits so your body will have proper time to recover. When in doubt, take an extra rest day and see how you feel.

The needs of a person at the *intermediate level* are not quite as simple as the needs of a beginner. At the intermediate level, your training needs begin to diversify based on your specific goals. Therefore, a general routine (such as a full-body routine) will no longer be effective. Your training must become more specialized to fit your goals. This includes not just the strength, hypertrophy, or endurance portions of your workouts but also skill work, sport-specific skills, flexibility, mobility, prehabilitation, and rehabilitation. Here are some examples:

- If your goal is endurance, you should work strength at lower volumes in order to keep efficiency of exercises high and work your specific endurance exercises.
- If your goal is hypertrophy, you should switch from a full-body routine to various splits in most cases. This was discussed specifically in Chapter 5.
- If your goal is strength, you should increase your frequency as much as possible without overtraining or developing overuse injuries.
- You must adapt your frequency, volume, and intensity of training to maintain progress at this ability level. You will also need to learn how to use more complex programming methods.

INTERMEDIATE LEVEL: ENDING A CYCLE

Progression at this stage should generally happen every other workout to weekly. At minimum, you should progress in either repetitions or progressions every couple of workouts to every week or two. Do not be surprised if you do not see the results you expect, especially when you get to levels eight and nine. If you can keep progressing for eight weeks or more and are pain-free, keep doing what you are doing.

If you make absolutely no progress after four weeks, terminate the mesocycle. Remember, fatigue tends to mask fitness. Proper and adequate stimulus must be applied over a long period of time. If you prematurely terminate workouts (at the two or three-week mark), your body might not have received enough accumulated stimuli to adapt. The four-week mark is a good place to terminate, even if no progress is made. You are likely to come back stronger after your recovery week, even if you saw no progress during your cycle. If this is the case, do not consider it a failed cycle.

If, on the other hand, you discover that you have made no progress whatsoever, you should apply additional volume or intensity during the next cycle in order to force adaptations to occur. This can be in the form of adding an additional workout day, adding additional exercises, increasing the number of sets, manipulating exercises with a weight vest to increase intensity, or in another manner.

If you make no progress for two mesocycles in a row, consult the advanced section of this book for options.

Also terminate a mesocycle if your joints or connective tissues begin to feel sore, as this could be a sign of overtraining. These areas tend to be more of a limiting factor than actual nervous system fatigue or muscle recovery during the intermediate stage. A rest week or two may be required to allow for prehabilitation work aimed at healing your joints and connective tissues before you begin a new cycle. It can be difficult for someone who has been working out consistently to back down and rest. You don't need to quit working out altogether; simply remove the offending exercises from your routine and replace them with lower-level progressions and/or prehabilitation work until you can work back up to where you were previously.

ADVANCED LEVEL: EXERCISES AND RECOMMENDATIONS

The advanced level (levels ten through thirteen) is where you will learn the iron cross, planche, and manna. Also, you will develop many combinations on rings/parallettes/floor, from straight body press to handstands. Unless you have insanely good genetics or a great sense for intuitive training, consistency is likely not enough to go far at this point. Your training will now require advanced concepts like periodization and its derivatives (discussed in previous chapters).

The core concepts from lower ability levels like exercise selection and frequency are similar, but you may want to manipulate the volume and intensity by changing around the sets and repetition structure on various days. Variation must be coupled with consistency to produce good results.

The three types of exercises still apply: concentric, isometric, and eccentric. Continue to use the familiar principles outlined in this book. If a technique from another training method has proven successful for you, by all means, incorporate it. *Overcoming Gravity* outlines methods that were successfully used to train the author, his athletes, and first edition users to the advanced level and beyond, but these methods are not the only methods that work. This book's goal is to teach you to think critically, set goals, and build programs that will help you progress toward your own goals, not to proselytize.

By now you will typically be using some form of periodization such as accumulation and intensification or light/heavy routines. If or when you start utilizing more complex periodization methods such as DUP, constructing a routine and then planning a repetition scheme according to type of days takes a little getting used to, particularly if you are are accustomed to the failure method. However, you only need to calculate it

once in order to grasp how to do it correctly. Let's say you want ten repetitions for an isometric hold. Your formula will be *10 * 2s = 20s hold*. So you will want to pick an isometric hold that you can do for twenty seconds, according to your maximum hold times.

If you select your time in this manner, it will be easy to modify an exercise. To make the exercise more challenging, add ankle weights or a weighted vest; to make it easier, use an assistance method like bands, a pulley system, or assistance from another person. You may have to select straddle planche or straddle front lever instead of the full variation. As you move up toward a high-intensity day (such as a 5x3 block, where you will be performing three repetitions of *3*2s = 6s holds*), pick the appropriate planche or front lever progression where you can perform all of the holds for six seconds.

Hybrid sets of an exercise can be particularly effective for at the advanced ability level. Hybrid sets are a good solution for isometric exercises that need to be made more challenging. Let's say you were working up to a full planche but could not hold it for the adequate 6-8s needed to advance to the next level. You would begin your set with a maximum hold of 2-3s of the full planche, and then as you fatigue, quickly open up your legs and move into a straddle planche position. Hold this for another period of time to gain additional volume.

These type of exercises work best for advanced athletes; they are not efficient while your technique is still poor. If you have been performing bodyweight exercise with good technique for years, your ability to maintain proper tension will be very useful to correctly implement these techniques. It requires a lot of precision to change from a straddle planche to an advanced tuck planche while maintaining good body position. Beginner and intermediate athletes would usually lack the shoulder and core stabilization required.

Unless the exercise itself is your goal, isolation exercises are only recommended to target weak links in your routine. Most advanced athletes already know their weak links, or at least have inklings of what the weak links in their bodies may be, based on their abilities. For example, you can tell your lats are much more developed than your pecs and biceps for pulling movements if you can feel them activating and contracting more while performing pulling movements! In that case, they will also have greater hypertrophy and strength than your other muscle groups. You can utilize biceps curls as isolation work to specifically amend that biceps weakness. This a good reason to use an isolation exercise.

Here are a few more examples, if you are a gymnast who performs a lot of straight-arm work, then train one-arm pull-ups, your back might be much stronger than your arms. Biceps curls or other biceps exercise may be useful to improve your overall strength. The same is true for barbell lifts like the deadlift, which uses the legs, hips, and back extensively. Many people have a weak link in their back or even their quads if they are posterior chain dominant. Isolation exercises can help keep your body's specific strengths in balance.

Another good reason to use isolations exercises is to lowering the stress level from the compound movements on your connective tissues and targeting the weak links that may be prone to injury. For example, if your elbows get noticeably sore during back lever work, eliminate that work for a period of time and add biceps curls to your workouts instead. In this type of situation, isolation exercises are extremely effective. They should be used sparingly, however, as performing compound exercises still carry the most benefits. Of course, if you are aiming for hypertrophy, isolation work on top of your compound exercises will carry you forward to your goals.

ADVANCED LEVEL: WEEKLY SCHEDULING

It will typically require two to four years of consistent training to reach the advanced level, depending on your genetics, dedication, schedule, and recovery factors like diet and sleep quality. On average, it takes two and a half to four years to reach this level if an athlete is training consistently. Athletes with a higher body mass (175 pounds of more) may take longer—three to five years or longer—to reach this level.

As stated in the intermediate weekly scheduling section of this chapter, adding one extra workout day for every year you have spent working out is a good rule of thumb. If you started out with three workouts per week and have already added a fourth, I would wait two and a half years before adding in a fifth workout per week. Remember the factors we discussed regarding progress and recovery? If you are not getting enough sleep, quality food, or have high amounts of stress, it may not be a good idea to add an additional workout.

If you are training five days a week, the M/Tue/W/F/Sat or Tue/W/Thur/Sat/Sun schedules are good ones. They are basically 3/1/2/1 schedules with the "1" being a rest day. You can also use a 5/2 schedule (working out Monday-Friday with the weekend off) but this is a slightly less effective schedule.

Training more than five days per week is not recommended. It is easy to burn out with a frequency this high. If you want to start playing around with high-frequency routines like two-a-days, please be careful. Utilize shorter cycles (two to four weeks instead of the standard four to eight weeks) and/or significantly reduce the volume per workout.

If you are at the advanced level of strength or beyond and are determined to experiment with six or more workouts per week, utilize one of the five-day schedules first, such as the 3/1/2/1 schedule, with workout days on M/Tue/W/F/Sat. After you have adapted to this schedule, double up on Saturday so that you have morning and evening workouts. Split the volume of one workout into two separate workouts on Saturday to start. You can then ease into doing two full workouts on Saturday. Be very careful when experimenting in this manner! If you push it too much because you want to get stronger more quickly, you could end up doing serious damage to your body. Remember, you can progress with a simple schedule of three workouts per week—up to five if you really want to do more. It puts enormous strain on your body to not have at least two rest days per week. Working out six days a week is tremendously taxing: two-a-days are preferred if you experiment with more frequent workouts.

Use splits if full-body volume is too much. They may be useful at this point in order to allow enough rest time for your body between repeating the same exercises if they are intense enough.

Moving into the *advanced level* brings with it a new set of issues:

- Your training will become even more specific or geared toward your sport.
- Shoring up weak links becomes vastly more important in order to progress. Specific isolation work may be effective in this instance to keep your strengths in balance.
- While sleep, nutrition, and eliminating stress are important for beginners and intermediates, you must get even more serious about these factors at the advanced level. Even a 1% improvement will make an impact at the advanced level, as improving strength and muscle mass is more difficult.
- Keeping a training log is vital at this level, as understanding how your body responds to training is critical. It is important to practice this good habit of logging your training no matter your level. It will allow you to look back and see how your body responds to rests, deloads, exercise intensity, and volume. This will make planning workouts easier.

ADVANCED LEVEL: ENDING A CYCLE

Progression at the advanced level should happen weekly. Add repetitions or increase progression difficulty at least every two weeks. If you are not able to do this after two weeks, some factors of your training are off. Re-examine your use of periodization concepts and observe the results.

As you reach the higher advanced ability levels, you may not notice significant progress until the middle of a mesocycle, the end of a mesocycle, or even after the rest week, unless you are correctly using periodization concepts like DUP. Do not be surprised by this; by now you should have learned patience when it comes to progressing. The strength gains required to jump from one advanced level to the next take a fair amount of time to acquire.

Indications for terminating a cycle at the advanced level are similar to other ability levels. If you make absolutely no progress after four weeks, terminate the cycle. Make sure you wait four weeks, because if you terminate a cycle prematurely, you may not have applied enough of an accumulated stimulus to force your body to adapt. You may come back stronger after the recovery week, even if you did not progress during the cycle. Just as you did in the intermediate stage, if you terminate a cycle, add additional volume or intensity to force adaptations in the next cycle. If you do not make visible progress for two cycles, try a combination of light/heavy exercises with high/low repetitions, respectively. Or, take a close look at your sleep quality, nutrition, and/or stress levels.

Alternatively, you can adjust the programming of your periodization instead of terminating a cycle. Part of your plan was ineffective; if you can refer to your log and determine what adjustment did not work, you can make additional adjustments mid-cycle to get yourself back on track. In this instance, you may want to seek advice from someone more experienced.

Always terminate a mesocycle if your joints or connective tissues get particularly sore, as this may be a sign of overuse rather than simple fatigue or muscle recovery. You may need a week or two of prehabilitation work aimed at healing your connective tissues and joints before you begin another cycle.

INTER-MESOCYCLE FACTORS

There are three main inter-mesocycle factors: *deloading*, *maximal strength testing*, and *workout restructuring*. None of these are specific to beginner, intermediate, or advanced ability levels.

DELOADING

Deloading is an art. The goal is to supercompensate without losing the adaptations you have gained from the previous mesocycle by increasing the amount of rest you are allowing yourself. Unless you have a great coach, it takes a lot of experience to deload well. You need to vary the general protocols to adapt to different situations, depending on recovery factors like time availability, sleep quality, nutrition, etc. Overall, it is more productive to perform some type of exercise during a recovery week than to give yourself complete and total rest. Here are some options that tend to work well:

- **Decreasing the Frequency**—For example: eliminate two days of workouts in your week. If you are on a Monday/Tuesday/Recovery/Friday schedule, this leads to performing only twice during a recovery week, such as Monday/Recovery.
- **Decreasing the Volume**—For example: keep the same workout schedule but eliminate half of the exercises. For example, if you have a routine composed of half isometrics and half full range of motion exercises, eliminate the isometrics. Do this for a week, as it is more productive in most cases to continue working on full range of motion during rest weeks. Continue with your skill work. If a cycle was particularly hard on your body, it may be beneficial to eliminate all of the isometric exercises and focus exclusively on skill work and prehabilitative exercises. This type of deloading would focus on handstands and ring support work, as well as improving shoulder, wrist, back, hip and ankle health and mobility.
- **Decreasing the Intensity**—For example: drop all of the exercise progressions back one level. This has the added bonus of being prehabilitative work, as you are performing an easier exercise for more repetitions during your rest week. This helps deload your joints and connective tissues from the intensity of the exercise, as well as train your joints and connective tissues with a lighter exercise to help injury-proof them.
- **Other Deloading Variations**—Manipulate one of the various factors such as decreasing the frequency, volume, or intensity in various other ways. For example, decreasing the volume has many variations: you can decrease the sets, eliminate exercises, modify the number of repetitions, increase rest times, modify the tempo to be easier, and much more. You can even deload while modifying several of these factors at once. Deloading is not rigid.
- **Rest Weeks**—You can implement more prehabilitative work and stretching protocols to reduce the amount of scar tissue/adhesions in your muscles and get your mobility ready for the next training cycle.
- **Light Exercises**—Perform an activity that you don't normally, such as pick-up basketball or a light run. Make sure you can comfortably carry on a conversation while exercising, in order to prevent it from becoming too intense.
- **Most Common Practice for Deloading**—Train only one or two days during your recovery week and only do one exercise from each of the push, pull, and legs categories. Perform one or two sets not-to-failure and implement the last set to failure. This prevents strength decrements, but maintains a low volume so you can recover well. The rest of the week is best spent on soft tissue massage, mobility work, prehabilitation, and any necessary rehabilitation work. The purpose of rest weeks is for your body to recover and for you to work on any weaknesses that get neglected during full-on training.

MAXIMAL STRENGTH TESTING

Maximal strength testing is useful to find new maxes with exercises after a deload week as your body may supercompensate and gain strength and hypertrophy when you cut down on the training and increase the rest.

This is important because you want to start off your new mesocycle in accordance with your new abilities so as not to undertrain.

Maximal strength testing should be done near the end of a deload week with one rest day before the next cycle begins. For example, if you ended your prior mesocycle on a Sunday and are going to start your new mesocycle on Monday then maximal strength testing should be done that Saturday.

Maximal strength testing for concentric, isometric, and eccentric exercises will give you a general idea of how much you have improved after most of the supercompensation from the previous cycle takes place, allowing the fatigue to dissipate and the fitness to manifest itself. Testing after supercompensation gives you quality numbers on which to base your progressions and hold times for the next cycle.

To perform maximal strength testing, begin with a typical warm-up to make sure you are ready to train. Warm up with five to eight repetitions of a low progression of the skill or strength progression you are testing. Next, perform a few repetitions or short holds of the progression that you are maximally testing. Finally, after three to five minutes of rest, maximally test the exercise or isometric in question. Organize your exercises according to the methods outlined in the strength section on concentric, isometric, and eccentric exercises or whatever methods you are using for your next routine and mesocycle.

The process is relatively simple. In advanced training, it is typical not to see any strength gains until after the supercompensation period takes place.

WORKOUT RESTRUCTURING

Working restructuring occurs when you achieve your goals or have re-evaluated to add or subtract certain exercises. There is no hard or fast rule for setting new goals, except to keep in mind that the key to building strength is repeating movements in a progressive manner. If you have workout attention deficit disorder and frequently switch up your routines, you might build some low- or intermediate-level muscle and strength, but you will find high-level strength elusive.

When you achieve a workout goal (for example, full back lever), you have two options. You can keep it in your workout once a week to maintain it, or you can move on to more progressive goals like front lever and other pulling exercises. This is the great thing about categorizing exercises into a push, pull, and legs system; there is typically some overlap among the different goals in each category. For example, becoming strong in planche pushups will confer strength benefits to your handstand pushups and dips. This means that even if you drop achieved goals from your routine, you will likely be able to perform them later without any practice.

If you would prefer to keep an exercise you have mastered in your routine, perform a low volume of the exercise after your warm-up and before your strength exercises. Typically, if you were performing the full back lever for a total volume of thirty seconds, you would want to add in a couple five to ten-second holds after your warm-up in order to maintain it. This should not detract from your strength workouts since you can already perform the exercise, it will simply maintain your ability to perform it without taking up a full exercise slot in your routine.

Do not change goals every mesocycle. If you have multiple long-term goals, stick with them for at least two or three mesocycles to see significant improvement. If you are unable to reach a goal by then, put it on

hold. Work on something else and come back to it. Putting goals on hold can be particularly effective if they have components beyond strength, such as straight-arm press handstands. These require good flexibility and compression, which you might not yet have, so put them on hold (even though you have the muscle strength) while you develop proper flexibility and compression.

If you feel strongly that you need to go in a different direction with your exercises, evaluate and substitute the exercise or exercises in or out of your routine, but always remember that *being consistent is the best way to make progress*.

Regarding A/B routines (or two different workouts with different exercises), push/pull splits, and upper/lower splits: these are not recommended because you do not get the same frequency with the skills as you would with a full-body routine for beginners. If you crave variety they are certainly options, but you should know that your gains are likely to decrease.

ELITE STRENGTH PROGRAMMING

Elite strength programming depends on the individual more than it does on the programming. This should not deter you from aiming toward this level. For example, some women might be unable to reach high-level rings strength skills like the inverted cross even with decades of perfect training. That is not to say that no woman will ever achieve these strength moves—after all, the competitors in women's Olympic weightlifting are putting up nearly 2x bodyweight snatches (weight to overhead in one movement) and 2.5x bodyweight clean and jerks (weight to overhead in two movements). According to John Gill's website on historical strength performances, Lillian Leitzel was said to have performed twenty-seven dynamic one-arm chin-ups in 1918. Some analysis indicates that this strength feat was equivalent to approximately six regular one-arm chin-ups. These types of strength feats are incredible and elite. Who knows the true capabilities that women have? It is likely that Lillian Leitzel had enough strength for the iron cross!

We must, however, discuss genetic limitations. Some athletes will require ten years or more to reach an elite strength level, whereas those with crazy good genetics can reach this level in two years or less. Coaches have seen athletes walk into the gymnastics gym with very little formal weight or gymnastics training and be able to perform an iron cross or front lever even with no connective tissue strengthening. During one gymnastics summer camp, I once saw an 8-year-old kid perform a round-off back handspring without any spotting because he "felt like it and thought he could do it." He performed it like he had been training in gymnastics for five years. There are some incredibly talented athletes out there.

If you are one of the athletes who may take a solid decade of training to perform high level strength movements, be aware that while you still have potential for greater strength gains, you are likely to plateau more quickly. This is simply the luck of the draw. Utilize methods like DUP and/or heavy/medium/light days as much as you can, then start looking into more specialized work via either the conjugate or concurrent method of periodization. Supplemental isolation or specific strength work may be necessary as well.

If anyone is at this level with at least this much time spent on training, they should be smart enough to eke out every bit from their nutrition and sleep quality as well. This is a great place to optimize in order to continue to increase your strength.

Perhaps you are progressing up to or beyond this point in a few years without any type of periodization or formal training. If so, be glad you have good genetics. DUP and the programming mentioned above will help you get started once you stall out on whatever training plan you are using.

The FIG COP contains an enormous number of strength moves on rings that are not included in the skill and strength progression charts. Moves such as the maltese, victorian, and some strength combinations you will only see in the Olympics are obtainable if you are willing to put in the time and dedication. If you are at this point, please take someone else under your wing and teach them, as this is how knowledge is most effectively passed on.

A Note from Steven Low:

Based on those I have coached, I am quite confident that everyone can obtain at least level eight to nine on the strength and skill progression charts regardless of body type or physiology. This is true if you are willing to make the commitment to consistent training. The planche may remain elusive, but I am confident that everyone, with proper training, nutrition, and sleep, can accomplish the full back lever, full front lever, straddle planche, and possibly one-arm chin-ups and the iron cross.

Obviously, those with a heavier bodyweight are at a disadvantage, but it is certainly doable. Bert Assirati, one of the famed strongmen of the early 1900's, at 266 pounds, was able to obtain three one-arm chin-ups and the iron cross. He clearly had good genetics on his side. Notwithstanding this, with dedicated training, 99% of people who weigh significantly less than him should be able to attain the same skills. This is why I "never say never" to athletes who weigh in at 200 pounds performing one-arm chin-ups and the iron cross. It may take a while, but it is certainly possible. Likewise, John Gill, the father of modern bouldering (a subtype of rock climbing) was a rings aficionado. He was 6'2" and weighed 185 pounds (183 centimeters and 84 kilograms), but was able to obtain the maltese cross, inverted cross, iron cross, one-arm chin-ups, one-arm front-lever, and other remarkable strength feats.

In the end, my conclusion is this: Train hard and consistently. Deload properly. Get your nutrition, sleep, and stress level under control. If you have extra fat hanging off of you, lose weight so you can perform your exercises more easily. Do not use genetics as an excuse to not have fun and go after your goals. Most people will never even know if their genetics are "good" or not because they fail to commit to their training for more than a couple years. Do not worry about things you cannot control.

One final thing: It must be noted that, for high-end advanced and elite strength athletes, you should follow whatever type of workout you plan. This means that any heavy and intense days must be heavy and intense, and any light or low-volume days need to be kept light and low volume. Since you need to put a high amount of stress on your body to keep adaptations coming, there is less margin for error in programming the higher your level. Likewise, recovery factors must be factored in: nutrition, sleep, and stress. This is not to say you should ignore these at the beginner and intermediate levels; you should have them keyed in at all times for maximal progress. This is why there is the saying: *train hard, rest harder*. You must not forget that in order for adaptations to become visible, you must take a break from your training and rest. Recovery reveals adaptations. A good training and recovery regimen is necessary for progress.

One of the better lessons is taken from the Bulgarian system of Olympic weightlifting. They would train multiple times a day at a high intensity. However, their training was interspersed with pure recovery

factors—mobility work, eating, napping, sleeping. This can be distilled into the saying: *Train. Eat. Sleep. Repeat.* The core concepts that underlie training are universal, and if you try to sidestep them you will fail to improve.

ADDITIONAL PROGRAMMING AND MESOCYCLE CONSIDERATIONS

Structuring a routine does not need to encompass everything. Let's say, for example, that you have many different goals in regards to upper-body pushing. You want to obtain a bodyweight press, 1.5x bodyweight bench press, weighted dip with an extra 25% bodyweight, planche, and a freestanding handstand pushup.

There are only so many goals that you can work at one time without spreading yourself too thin. A good system is two pushing, two pulling, and two legs goals and subsequently structuring a routine toward that maximum by selecting exercises for each of those goals. If you are better conditioned, perhaps you will do seven to nine exercises to work toward those goals, rather than the traditional six. This routine would be performed at a frequency of 3x per week, give or take a workout depending upon the user's conditioning base, other sporting activities, and other factors.

Take this real-world example from about five years ago. Steven Low worked handstand pushups and planche work for six months in a row with proper rest breaks every six to eight weeks. Of course, he had other types of pressing goals, but those two exercises were his main focus for strength at the time. When he went to test other exercises he found that the second time he tried weighted dips he was able to work himself up to ninety pounds for five repetitions. Later, when he tried pressing for the first time after completing more strength work, he was able to perform a bodyweight overhead press easily.

Many of the various forms of pressing-type exercises overlap, sometimes fairly significantly. Therefore, you absolutely do not have to attempt to fit in or work everything at once. Doing so will hinder your training.

Keep things simple. Pick out a small subset of goals that you want to work toward. Work those goals religiously for a whole cycle. You should see good, consistent progress toward those goals. If, at the end of the cycle, you want to change your goals and change your exercises, feel free to do so. If you want to strength test other movements, that also works. You do not have to strength test only the movements you were working on during the cycle.

Adjustments can be made during the deload week if you want to change your focus. That is also the time to focus on different aspects of your development if you are considering changing them. In terms of programming, here is a generalized model that can be followed:

1. Linear progression or linear repetition progression is first. If possible, add repetitions or improve your progressions every workout. Do this for most of the beginner phase of training.
2. Simple intra- and inter-exercise progressions are next. You will want to increase the number of repetitions or progressions every other workout or so. Do this from the end of the beginner phase of training through the beginning of the intermediate phase.
3. Simple periodization is next. Utilize accumulation and intensification phases in training or the light/heavy model of changing the repetitions from workout to workout. Do this during the mid-intermediate to late-intermediate phase of training.

4. Daily undulating periodization (DUP) works exceedingly well as you move into the upper intermediate and advanced phases of training.
5. When you are midway through the advanced level of training or beyond, a hybridized light/heavy DUP type system is effective. You may also want to start experimenting with concurrent or conjugate models of periodization if you are having trouble progressing.
6. At the elite level of training, a concurrent or conjugate system will likely work best.

In conclusion, do not make things too complicated. Selecting a few goals (instead of many) and building a routine around them makes your workout routine simple and easy to accomplish. The level of complexity in programming should only be advanced when absolutely necessary; you do not need these complexities to make progress.

Once you have thought "Maybe I should do ...." or "Maybe it would be better if I changed this..." three or four times, you are probably over-thinking it. It is true that it takes a lot of practice to succeed, but over-thinking your programming will cause you to focus too much of your time on making your routine "perfect." The biggest factor for progress is consistency, not having a perfect routine.

Another reason to keep things simple is that introducing too many factors at once hurts your ability to analyze your routines and modify them for your next cycle. If you only change a few variables in your next cycle, you can more accurately pinpoint your level of improvement and which changes were major contributors to that improvement. If you change multiple variables at once, how will you know what actually helped you improve? Even more complicated is the scenario that if you made absolutely no progress, what were the variables that were helping and which were hindering you?

Keep whatever you do as simple as possible. Follow the KISS model—*keep it simple, stupid.* Make very few changes to your overall programming from cycle to cycle so you can see what affects your progress. This allows you to become a better programmer much faster, and it will also help you overall in making faster progress.

STOP READING. TAKE ACTION.

Now that you have planned the core portion of your workouts, you can begin to determine which factors need to be evaluated during and after a mesocycle.

Bookmark this page or make note of it in your workout log. You should refer back to this section (part two—chapters seven through twelve) to re-evaluate your goals, exercise, and progress. Do this weekly if you are a beginner or intermediate athlete, or bi-weekly to monthly if you are advanced.

The material contained in part two of *Overcoming Gravity* is dense, making certain portions difficult to comprehend the first time you read it. If your schedule allows, re-read any chapters that you had difficulty understanding. Knowing and applying these concepts will help you improve your workouts so that you can progress more effectively.

CHAPTER 12 SUMMARY
MESOCYCLE PLANNING

In this chapter, we looked at the different levels of strength programming both during and after a mesocycle. We noted how the weekly scheduling of workouts via frequency and overall volume via amounts of exercises, intensity, repetitions, and sets all affect how progress is made at these different levels. We observed that beginners tend to progress the fastest and require less advanced programming, while intermediate and advanced athletes may require more progressive loading or complexity in programming

We discussed the different factors related to exercise choice and when to terminate cycles.

We discussed deloading, maximal strength testing, workout restructuring, elite strength and how to apply these concepts to your rest week and how to integrate them into the mesocycle that follows. Deloading allows supercompensations to occur and affords a rest break for additional maximal strength testing. Workout restructuring can be utilized if you want to focus on different goals or implement different exercises to work toward the same goals. Finally, it takes a great deal of time to reach the elite strength ability level due to various inherent and environmental factors.

Part Three

FACTORS THAT INFLUENCE TRAINING

- CHAPTER 13 -

ENDURANCE, CARDIO, CROSS TRAINING, HYBRID TEMPLATES, AND ROUTINES

Not all athletes will be solely focused on bodyweight training as their primary form of strength work. Here are several factors that will influence your training, no matter what your goals.

ENDURANCE AND CARDIO

Endurance is much easier to understand than strength training. It is a catch-all term to describe high repetitions of any particular activity. While in fact it is distinct from metabolic conditioning and circuit training, we often use the term *endurance* to encompass all of these concepts.

Cycling, long distance running, long distance swimming, and other 10-20+ minute sustained workouts are typically called *cardiovascular endurance activities*. Metabolic conditioning is generally used in the context of training the various metabolism systems that produce energy in your body. Typically, this type of training involves different types of activities performed in a sustained manner over time. The training usually takes place in single-digit minutes, but can often last longer. Circuit training typically involves moving from one weight lifting exercise to another, and although it is possible to involve disparate activities, usually its practitioners exclusively focus on weights.

It is important to know about energy pathways. Phosphocreatine or creatine phosphate provides most of the energy for activities with very short durations (0-10s), the glycolytic pathway provides most of the energy for activities with moderate durations (10-75s), and the oxidative phosphorylation pathway provides most of the energy for activities with longer durations (75s and longer). Phosphocreatine and glycolytic systems are termed *anaerobic* and the oxidative system is termed *aerobic*. Here is summary of Table II from Gastin's review on energy system interaction and relative contribution during maximal exercise:

Duration of max exercise	% Anaerobic	% Aerobic
0-10 seconds	94	6
0-15 seconds	88	12
0-20 seconds	82	18
0-30 seconds	73	27
0-45 seconds	63	37
0-60 seconds	55	45
0-75 seconds	49	51
0-90 seconds	44	56
0-120 seconds	37	63
0-180 seconds	27	73
0-240 seconds	21	79

Studies on elite track and field athletes tell a similar tale. For 400m athletes, where the men's world record is around 43 seconds, the contribution is 60/40 anaerobic to aerobic. For 800m athletes, where the men's world record is around 100 seconds, the contribution rises to 40/60 anaerobic to aerobic. This agrees with the 1600m world record of 223 seconds, which is approximately 20/80 anaerobic to aerobic.

This indicates that if you want to train cardiovascular endurance capacity, your training needs to be significantly longer than four minutes in order to work the capacity of these systems. Studies and training programs show that to work these systems well, sub-anaerobic threshold running is recommended for periods of twenty minutes to an hour or more.

In terms of any type of "full energy system training" or metabolic conditioning, there are programs like *CrossFit*. In most of the short-duration CrossFit workouts (which run two to five minutes) energy is primarily provided by your aerobic system. To truly work the anaerobic system to maximal capacity, you should undertake 30-75 seconds to minimize both phosphocreatine and aerobic contribution. Anecdotally, this is the time when metabolic acidosis ("the burn") is primarily felt—which coincides with scientific research. If you analyze CrossFit workouts, you will find that there is a lot of overlap and need to be efficient in all of the pathways.

Both endurance and metabolic conditioning work similarly on a biological level. High repetitions for endurance require a high level of neural adaptation in the specific technique as well as a high level of energy pathway efficiency in order to continually produce energy. Metabolic conditioning requires the exact same adaptations, with a slight lessening of CNS adaptation, leaning more toward very high energy pathway efficiency since there are more exercises to perform. (Hence, metabolic conditioning is somewhat lighter on the CNS or central nervous system.) One of the most important attributes of these workouts—aside from reaching your goals—is they both work toward increasing your overall work capacity. This means that if you suddenly decided to begin strength training—even if you are combining strength training with endurance or metabolic conditioning—your muscles and CNS should be able to handle more work while you are performing a routine. This allows you to stress them more for increased hypertrophy without overtraining.

Adding endurance into a routine follows the same guidelines as strength training without the exceptions. It is acceptable and even encouraged to go to failure most or all of the time. This is especially true with metabolic conditioning. You can go to failure all of the time here because the many different exercises performed

have a high energy requirement, which puts stress on your energy systems and relatively less on the nervous system. Therefore, it will not burn out your nervous system and will still stimulate your muscles enough that they adapt and produce energy more efficiently. This in turn increases your work capacity next time you exercise. Pushing "through the burn" here results in raising your lactic acid threshold (glycolytic pathway). On the other hand, not going to failure can also be utilized well with endurance and metabolic conditioning. In metabolic conditioning, if you stop short of failure, your work capacity will increase the next time you exercise within the same session. This means you will be able to perform more work in a shorter amount of time, and your total power output will rise. This is akin to a higher intensity exercise, because although it is different from a 1 RM exercise, the total intensity is distributed throughout your body. In this one instance, metabolic conditioning is more similar to strength than endurance.

Now that you have a foundation in energy systems, we can discuss some examples of how this knowledge might be used in your workouts.

To-Failure Training

Obviously, one of the ways to perform endurance exercises is to push it to the max. Failure is optional, but not encouraged on the first set because it decreases your maxes for subsequent sets. The total number of repetitions for the whole workout will usually be higher if failure is not hit on the first few sets. For example, if you can perform a maximum of twenty dips and want to increase to fifty dips, then one endurance workout could be 3x18. If you only performed fifteen, than 5x15 would be a possibility. Keep in mind that the higher number you pick, the fewer sets you will be able to perform. Generally, the best workout is one that maximizes the number of repetitions per workout, so 5x15 would be better than 3x18 since it is seventy-five repetitions vs. fifty-four. Some people are naturally inclined to endurance exercises, having greater proportions of slow-twitch muscle fibers. They might be able to perform much closer to their endurance RM for more sets than other athletes. This is true of women compared to men. Find out what your body can do and go with that.

Grease the Groove

Grease the groove can be used for strength or modified for endurance. Here is the way it was performed for strength training: Six to ten submaximal sets or more, interspersed throughout the day. Typically, you will perform about 60-80% of your maximum number of repetitions. We will use dips as an example. If your maximum is four dips, you will want to perform about two or three dips for one set each. You will then perform dips six to ten times every hour or two throughout the day. This leads to performing up to thirty dips during the day, whereas if you were to perform dips only during your workout you would probably be able to do only four or five sets of three before you become fatigued and unable to do more. If we continue with the four dips example, it may only take a few weeks for you to develop the ability to perform ten or more. Staying submaximal with your sets will help you avoid overworking your body, but gives you enough practice to make you quite good at the movement in a short period of time.

To modify for endurance, simply use an exercise that you can perform many repetitions of and modify it accordingly. Thus, if you can perform a max of twenty pushups in a set, you will perform 60-80% of that number (six to ten sets of twelve to sixteen pushups) throughout the course of a day. Since endurance work is less intense than strength work, you can likely move up to 75-90% to work sets of fifteen to eighteen repetitions. Going to-failure or near-failure is needed in order to maximize endurance gains.

Ladders and Pyramids

Ladders are a fairly simple concept. You start a timer and do one repetition of an exercise and then rest until the minute is up. Next, you do two repetitions of the exercise and rest until the minute is up. Continue this progression until you cannot complete the ladder any longer. A minute is an arbitrary amount of time; you can use any amount of time you desire. You also do not need to go up the ladder in a "one, two, three" manner. Instead, you could begin at five and go "five, ten, fifteen" or any variation thereof.

Pyramids are similar to ladders except after you "climb the ladder to failure" you also climb back down. For example, if you completed seven repetitions of pull-ups and failed on the next set, you would "climb down the ladder" by performing repetitions of six, five, four, three, two, and one pull-up. As with ladders, you can go in increments of two's, five's, and so on.

Both ladders and pyramids are ways to drastically increase the volume of the number of repetitions of an exercise in a single session. If you take the example of the maximum of twenty dips in the to-failure training section, you might only work 5x15 or seventy-five total repetitions, with the last set to failure. If you contrast this to pyramid training, you are likely to work up to a maximal set of twelve repetitions (1+2+3+4+...+10+11+12+11+10+...+3+2+1). However, you will perform a total amount of 144 repetitions, nearly double the volume of 5x15. Much like hypertrophy, volume plays a big factor in obtaining endurance.

Metabolic Conditioning and circuits

Metabolic conditioning workouts are not difficult to construct, but it takes a good knowledge of your body to program them effectively. CrossFit is one of the most popular commercially-available types of "no rest" workouts, but you can choose two to five exercises that you normally perform more than ten repetitions of. Arrange them as you desire and set an arbitrary number of repetitions to perform for each exercise, usually somewhere between 25-75% of your maximum ability. Then, choose a number of rounds to perform the circuit, say three to five. Perform this workout as quickly as possible. Alternatively, there is the "AMRAP" method, which is "as many rounds as possible" in a particular time period.

Programming metabolic workouts is really an art, and you must have a specific goal going in to them. It is important to know whether you are attempting to train oxidative capacities or glycolytic capacities (aerobic or anaerobic energy pathways). Additionally, it is important to program a workout according to personal ability levels. Getting near the end of your workout and being so fatigued that you can only grind out single repetitions is not a particularly effective method for increasing capacity.

There is a thoughtless criticism known as "any asshole": any asshole could throw together a bunch of exercises into a workout. Usually anyone who spouts the "any asshole" criticism also has the unconscious goal to feel miserable during their own workouts, rather than having a clear goal about how to develop their athletic capacity to perform better. While "any asshole" workouts can improve capacity to some extent, they will not improve it optimally. The practice leads to workouts that provide too much of a stimulus or devolve toward overtraining. More is not always better. Effective workouts increase work capacity both in potential metabolic conditioning and strength/endurance. A measurable amount of capacity should increase from workout to workout, week to week, or perhaps with repeat workouts.

High-Intensity Interval Training

High-intensity interval training (HIIT) and similar techniques, like fartlek, are good ways to work all of the energy systems in your body because it depletes them very fast. HIIT workouts are generally composed of all-out sprints for a short period of time (15-30 seconds), followed by jogging, walking, or another form of rest for 30-45 seconds. HIIT builds both the aerobic and anaerobic pathways in the body very quickly, which leads to good metabolic conditioning and cardiovascular health.

Training anaerobic vs. aerobic capacities is a matter of intensity and adjustment of volume. Anaerobic qualities, much like strength, are best trained by operating at maximal capacities with longer rest times. For example, you might sprint for ten seconds and rest for two to three minutes to work maximal anaerobic qualities. This ensures that the muscles are fully replenished with energy and that your next effort will be closer to maximal than if you had simply rested for only one minute.

Tabata protocol is a specific form of HIIT, named for the Japanese scientist who experimented with it by cycling for eight periods that consisted of twenty seconds of all-out activity followed by ten seconds of rest. This protocol is similar to metabolic conditioning and HIIT-type workouts, and it can be used to rapidly increase anaerobic capacity. Tabata protocol is very similar to HIIT except it is done with exercises other than running and jogging.

You can modify the Tabata protocol according your needs. You could run on thirty or sixty-second intervals where you go all-out and then rest. For example, if you performed a thirty-second interval of bodyweight squats, you would do as many squats as you can for twenty seconds and rest for ten seconds. Repeat this process multiple times, usually five rounds or more. The sixty-second protocol works on the scale of forty-five seconds on and fifteen-seconds off. It is essentially a variation of a metabolic conditioning workout that works all of the body's energy systems very rapidly.

Cardio – Generalized Aerobic Capacity

Despite the fact that *low-intensity steady state* (LISS) endurance training is demonized by many, it remains the most effective way to increase aerobic capacity. There is a reason why every intermediate and long-distance runner uses LISS training. This type of endurance training is performed at or slightly below (5-10%) anaerobic threshold. Therefore the anaerobic pathways are not taxed, while maximal stress is put on the aerobic system in order to stress adaptations. To put this in a more colloquial way: stay slightly "below the burn" or at a low enough intensity that you can carry on a conversation while performing the aerobic exercise. Perform for thirty to sixty minutes or more, depending on your sport and/or the qualities you want to improve.

The main reason to place LISS training in a routine is it can improve recovery for strength workouts when it is performed at lower levels.

Should you or should you not perform extra cardio? What about other exercises or sports that are similar to cardio? (Pick-up basketball, football, and/or other sports.) To decide, you need to learn a few terms:

- **Passive Rest** – Doing absolutely nothing related to exercise or activity on a rest day. Passive rest days usually occur the day after a workout.

- **Active Rest** – Performing activities that get you moving without heavy exertion. In other words, staying below your anaerobic threshold while keeping active. Usually this occurs in the form of recreational sports.
- **Active Recovery** – Performing a mindful workout at a much lower intensity. This could be technique work like handstands or sport-specific technique work performed at low-intensity thresholds.

A common problem occurs in young and/or competitive athletes: both active rest and active recovery seem to always turn into a full-blown workout. If you are unable to remain low-intensity with your exercises, you should absolutely not perform any type of active rest or active recovery. Your body requires rest! Rest causes your body to get stronger and prepare for your next intense workout.

However, if you have the self-control to keep things low-intensity, you will usually find that some type of light work may help your training, especially as you progress in strength and work capacity. Indeed, it has been noted that many elite athletes that choose mostly anaerobic training yield benefits from low-intensity cardio work. The Chinese gymnastics team chooses this practice, as do some of the world's top powerlifters. This is why fighters and multi-round event athletes do significantly better with their "wind"—aerobic base—when they have LISS training in their program.

It goes without saying that low-level activity is generally good, as it increases parasympathetic nervous system stimulation which facilitates digestion and nutrient shuttling to repair muscles and connective tissues. It also increases blood flow to the brain, which improves mood and helps provide nutrients to recover neural stress. It can improve posture. It lowers resting heart rate. It increases work capacity during strength workouts through more efficient energy recovery.

Cardio work makes the most impact at intermediate and advanced ability levels. For beginners who are focused mainly on strength and hypertrophy, cardio does not need to be trained. You can improve without it. Rest days should be passive rest days unless you absolutely want to train cardio as it provides additional benefits. As you move into the intermediate and advanced range, some form of low-level activity (cardio, active rest, active recovery) may be useful, even on your rest days. This will promote an increase in overall work capacity and speed up overall recovery. As you become stronger, it will become more important for recovery.

Circus arts have active rest built in, with their extra technique training every day. They perform three to four hours or more of primarily non-strength technique training and get a lot of low-level activity to promote recovery. That is how these athletes are able to build up to working out five to seven days a week, often for six to eight hours at a time (with breaks). Even if you are not interested in honing your skills to acrobat levels, you can enjoy life while adding in active rest days using pickup sports or recreational swimming, cycling, jogging, hiking, or walking. All of these are great for recovery, so long as they do not become workouts themselves.

In studying how cardio affects elite-level athletes, we can draw the conclusion that activity is good for your body. As long as it is kept at lower intensities outside of workouts, it will help both your recovery and strength workouts.

There is often a concern that LISS cardio will make you slower, but that is simply not the case as long as you are training strength and power as primary attributes. Cardio simply becomes a small component of the

overall workout. We see the reverse of this in elite endurance athletes. They will typically train LISS anywhere from 60-80% of their workouts, but they will also aim at increasing strength, power, and anaerobic capacity, especially close to competitions. Strength, power, and anaerobic capacity can help endurance athletes win races in the final sprint; light activity can help strength and power athletes in recovery and work capacity.

All you need is a good balance. The *Pareto Principle* (or *80/20 Rule*) tends to be a good rule of thumb for maintaining a balance between power, strength, and endurance in your workouts. If you are a strength and power athlete, 80% of your training should be devoted toward that, with 20% of your training devoted to walking or LISS cardio to promote recovery—and vice versa for endurance athletes.

Whatever you do: *listen to your body*. This cannot be stressed enough. You may start out with the 80/20 Rule for strength and power vs. cardio, but if you are feeling particularly fatigued you may need to cut back on the strength and power work for a bit and increase recovery. If you sense that increasing cardio has negatively impacted your training, scale it back and focus more on strength and power. There is variance with any large population; adjust according to how your body responds.

It goes without saying that passive rest is not good for the body. There are studies that show those with desk jobs or who are inactive for long periods of time have a higher mortality rate, even if they exercise regularly. The body does not like inactivity, so if your passive rest is akin to sitting on the couch all day, that is not good. Going for a walk or light jog would be superior from a health standpoint.

CROSS TRAINING

You cannot combine a bodyweight program with another sport's strength and conditioning program and expect to have good results. Splitting time between activities will cause your gains to lag in each if you are not a beginner. You also have a greater chance of overtraining. Therefore, if you have significant aspirations in other sports, it may be a good idea to take a long look at bodyweight training with your coach to determine if it may negatively impact your performance there. Sometimes it will; other times, it will not. Occasionally, with sports like wrestling or martial arts, bodyweight strength training may be the best way to improve strength and conditioning.

A lot depends on the coach. Some coaches are "my way or the highway." If your sport is really important to you, do it their way. Other coaches are more flexible. They may still want you to do it their way, but if it's only strength and conditioning, and you have good information they may incorporate it. Some might not care at all about strength and conditioning, in which case the ball is in your court. Figure out what type of coach you have and act accordingly.

Ideally, your coach has your best interests at heart and you can trust them. Keep them in the loop if you intend to add or substitute bodyweight strength training for any other strength and conditioning work or for traditional weight training. You might even ask for a trial period where you try bodyweight strength training on an experimental basis. Be sure to stick with it if your results are good. Your coach can and should advise you. They have substantially more experience than you do and have good reasons behind the methods they use. If their reasoning seems outdated, bring them scientific research or other support from top-level coaches. The best compromise is to improve on your own and help your coach become better too.

Properly run strength and conditioning for other sports may start interfering with your bodyweight workouts. If you are serious about your sport, specific training for that sport should be above all else. If training a bodyweight movement such as handstands interferes with training for your sport, it may need to be eliminated. You should train for your sport when you are fresh, not when your energy level is depleted from training for less important things first.

Likewise, sport-specific strength and conditioning takes precedence for bodyweight training. Sometimes you can fit a bodyweight workout here and there; other times, you cannot.

If you are training or practicing for your sport five times or more per week, it would probably not be prudent to add any extensive bodyweight strength and conditioning workouts. However, skill-based training may still apply if you desire to work on bodyweight skills such as handstand work.

If your sport has no specific strength and conditioning work, it may be useful to add bodyweight training in its place. However, consult your coach first to see if there is any sport-specific strength and conditioning work that they recommend.

More is not always better! When in doubt, you should err on the side of eliminating extracurricular workouts. Integrate some bodyweight training into your workout regime only if you have the time and are not overtraining or burning out. Judge this by taking a close look at how you perform in your sport. In some cases (such as rock climbing or wrestling), bodyweight training can be extremely effective. It all depends on your sport and coach.

Be smart. You cannot do too many things at once. You have to prioritize what you want most in life; otherwise, you will not be good at anything. When in doubt, seek advice from those more experienced than you. Do not be afraid to be humble. Accept that you do not know everything and can always learn more.

Let's examine some specific integration with other sports and disciplines.

Gymnastics, parkour, and climbing each consist of three distinct components. There is a psychological component, consisting of overcoming fear and being able to perform under pressure. There is a skill-based component where the practitioner needs to learn all of the specific skills. Finally, there is a physical preparation component, which typically includes strength and conditioning based on increasing the athlete's abilities toward that discipline.

Bodyweight strength training distinctly falls under the umbrella of strength and conditioning, and is a safe and methodical way to increase physical abilities. This is consistent with every major level of organized athletics. Gymnasts do not just practice their skills—they also perform large amounts of strength and conditioning. Track and field athletes do not just run—they spend time in the weight room improving their strength or explosiveness. Swimmers do not just swim—they spend time in the weight room to improve their power.

Here is the fallacy of the recreational athlete: Because they do not believe in structured strength and conditioning, they typically practice only their favorite activity. Physical preparation via strength and conditioning should always be a separate but integrated part of training. Most sports or disciplines use the weight room; however, bodyweight strength training can be used effectively as well. To be great at your activity, you cannot solely practice it and expect to improve optimally.

There is another fallacy that often appears in recreational athletes. It is the notion that strength and conditioning should mimic sports activities. Studies have proven this to be false. Throwing heavier balls to get stronger or more powerful for baseball does not improve your ability to throw a ball faster. Swinging a heavier bat does not improve bat speed and power. Likewise, for sprinting, performing single-leg weighted half squats does not necessarily result in faster sprinting. This is important to know, as it allows us to broadly apply strength and conditioning principles toward developing specific attributes rather than to mimic sport-specific movements. It is more important to select exercises that optimally improve overall strength (or to work on weak links), rather than to attempt to mimic sport-specific movements. This overall strength will then be useful to the sport-specific movement you bring onto the field.

There is an interesting phenomenon across various disciplines with beginner and intermediate athletes. As mentioned, a general 80/20 Rule applies for elite athletes in sport-specific training as well as other types of complementary training. For beginner and intermediates, there is a different 80/20 rule: this one of prioritizing the time invested in sport-specific skills (80% of training) and strengthening and conditioning (20% of training). Thus, there should be an 80:20 or 4:1 ratio of sport-specific training to other types of training. 80% of your time should be spent practicing sport-specific skills and 20% of your time should be spent on physical preparation via strength and conditioning, mobility work, injury proofing, and the like. This is not just to improve your physical ability, but to help prevent catastrophic or overuse injuries. In context with the previous 80/20 Rule: 80% of your time should be spent on sports specific skills, 16% (80% of 20%) of your time on strength and conditioning primary attributes of your sport, and 4% (20% of 20%) of your time on cross training attributes.

Therefore, for an emerging discipline like parkour or climbing, the amount of time split across weekly activities should be approximately an 80/20 split for beginners and intermediates. Rafe Kelley (formerly of *Parkour Visions*), and Ryan Ford (of *Apex Movement*) both espouse a split of three to four days of parkour-specific practice to two days of strength and conditioning work. A sample weekly structure of a split between parkour-skill work and strength work may look like this:

Monday: Parkour Skill Work
Tuesday: Strength and Conditioning
Wednesday: Rest Day
Thursday: Parkour Skill Work
Friday: Strength and Conditioning
Saturday: Parkour Skill Work
Sunday: Rest Day

Given that the parkour sessions last for two to four hours, and your strength and conditioning work may last one to two hours, when you add up the hours on discipline practice and strength and conditioning you will see approximately an 80:20 ratio. For most beginner and intermediate athletes (of any sport), the preferred schedule is a full-body routine performed two to three times per week (depending on how much skill work must be accomplished in each session) performed in combination with two full rest days each week. A modification of the above schedule to place most of the parkour skill work on the weekends may look like this:

Monday: Full-Body Strength Work
Tuesday: Rest Day

Wednesday: Parkour Skill Work
Thursday: Full-Body Strength Work
Friday: Rest Day
Saturday: Parkour Skill Work
Sunday: Parkour Skill Work

For other sports, such as gymnastics, the strength and conditioning work will usually be placed at the end of each practice. Practices can last four to five hours and may take place four to five times per week. Two to three hours may be spent on skill work, and the rest of the time is spent on flexibility and mobility training, adding strength and conditioning at the end. A similar schedule may be employed for climbing: hit the gym for three or four sessions per week and aim for an hour of strength and conditioning after each climbing session. Each of these routines tends to be around the 4:1 ratio of sport-specific work to physical preparation. In every case, it is assumed that your sport-specific skill work will last 2-4 hours each time you practice it.

Monday: Climbing + Strength and Conditioning
Tuesday: Rest Day
Wednesday: Climbing + Optional Strength and Conditioning
Thursday: Rest Day
Friday: Climbing + Strength and Conditioning
Saturday: Flex Day (could be spent climbing, recovery, or resting)
Sunday: Rest Day

Climbing is an interesting discipline to address because unlike most other athletics, which tend to do well with a upper/lower split (because you can bias the leg-intensive, sport-specific training on one day, and lower-body strength and conditioning on other days) the opposite is true for climbing. Here is an example of how this may play out (again, sport-specific training will last 2-4 hours)

Monday: Climbing + Lower-Body Strength and Conditioning
Tuesday: Upper-Body Strength and Conditioning
Wednesday: Rest Day
Thursday: Climbing
Friday: Upper-Body Strength and Conditioning
Saturday: Climbing + Lower-Body Strength and Conditioning
Sunday: Rest Day

There are obviously many things that go into strength and conditioning beyond just exercising to increase strength. Flexibility, mobility, prehabilitation, isolation work, and more can be trained on rest days, training days, in warm-ups, or after a workout. You can mix and match to fit your schedule. For example, many people climb three days a week and perform yoga as flexibility and mobility work after their workouts. Then, on their off days, they perform mobility and strength and conditioning work. Here is an example of what this might look like:

Monday: Climbing + Yoga
Tuesday: Strength and Conditioning
Wednesday: Climbing + Mobility Work
Thursday: Rest Day
Friday: Climbing + Yoga

Saturday: Strength and Conditioning
Sunday: Rest Day

You are not limited to a specific routine based on your sport. It is important to identify your weaknesses and modify your routine accordingly. If you have difficult with certain movements (such as heel hooks in climbing), you may need to perform more flexibility work or yoga over the course of a cycle in order to improve your abilities. If you are having difficulty with climb-ups onto walls in parkour, you may want to spend extra time focusing on your skill work, as well as adding additional strength work specifically for pull-ups, dips, and muscle-ups. Let's say your strength and flexibility is good, but you needed to improve hand strength for climbing. This is easily done: add two or three sessions of hang board, campus board, or system board work to your routine. Always identify the specific areas that need to be improved if you want to progress.

Strength work is the foundation of athletic development. If you develop strength first, many other attributes and sport-specific skills will develop optimally, such as: cardiovascular endurance, stamina, flexibility, power, speed, agility, coordination, balance, and accuracy. Because everything builds on strength, it is the most important attribute for beginner and intermediate athletes to develop.

This is true even in endurance-related sports. Elite marathoners can run a mile in four and a half minutes, twenty-six times in a row. It is not possible to run this fast if you do not possess a large amount of strength endurance. Even the mile and 1500-meter world record holder, Hicham El Guerrouj, had strength and power work in his workout regimen at least three to four times per week, and he was running each of those stretches upwards of nine times, depending on the phase of his training.

You cannot ignore physical preparation if you want to improve in your sport. Weight training is a good way to gain physical preparation, however, bodyweight strength training is an excellent alternative to weight training, especially in certain sports and/or disciplines.

HYBRID TEMPLATES

Hybrid templates are for those athletes who are interested in using both weights and bodyweight for training. It is good to include all possible tools in your toolbox. There is a time and place for every type of exercise, aside from those that are unreasonably dangerous.

Some barbell-focused people snub their nose at bodyweight exercise, criticizing it for being too easy or too high-repetition without understanding the depth of what is possible. There are also some bodyweight fanatics who claim that weights are inferior to bodyweight training for various reasons. Both of these fanatical positions are short-sighted. Bodyweight and barbells complement each other extremely well in most circumstances, and many high-level athletes of various sports utilize both in their training.

There are many different methods to integrate barbell or dumbell exercises into your routine. Here we address only the most common: *substitution, complementing,* and *supplementing*.

Substitution

For a full-body routine, here is the typical exercise prescription: two upper-body pushing exercise, two upper-body pulling exercises, and one to two leg exercises. This will keep your body balanced and allow good

strength and mass progression. Often the two upper-body exercises (for both pushing and pulling) are further differentiated by the selection of one exercise that focuses on horizontal movement and one exercise that focuses on vertical movement. This helps to maintain structural balance. If you are also using all compound exercises, a routine like this can hit every muscle in the body, awarding gains to strength and hypertrophy all around. A typical barbell-specific routine may look like this:

- Upper Push: Bench Press + Press or Dips
- Upper Pull: Pull-ups + Bent-Over Rows
- Legs: Squat + Deadlift

A matching bodyweight strength routine would seek to replace each of these weighted or barbell exercises with their bodyweight equivalents according to plane of movement:

- Upper Push: A Pushup or Planche Progression + Dips or Handstand Pushup Variation
- Upper Pull: Pull-ups + Inverted Rows or Front Lever Pull-up
- Legs: Squats or Pistols + Glute Ham Raise/Hamstring Curl

If your goal is to increase both strength and hypertrophy, these routines would be performed with difficult exercises, typically in the five to twelve repetition range. As you progress with barbells, add weight. As you progress with bodyweight, add repetitions until you can move to the next progression. It's that easy. Substitute a specific barbell or bodyweight exercise with its counterpart. If you want to add handstand pushups to your barbell-focused routine, substitute them for the other vertical pressing movement—in this case, press or dips. Want to work on the planche? Substitute it for the bench press.

Complementing

If your goals are more focused, you may want to *complement* your exercises. For example, many people want to work on both bench press and the planche at the same time. This is fine. They complement each other well. The bench press is great for adding brute pressing strength and hypertrophy, while the planche is great for increasing upper-body control and strength. People will say: "just train planche" or "just train bench"—the benefits to training one exercise exclusively are centered on your ultimate goal. Do you want to achieve a certain level of proficiency in just one? Or might you want to be good at both? There is nothing wrong with either choice.

In a classic beginner routine, you would eliminate the vertical pushing exercises. While being specific is good, you need to be wary of structural balance until you become more focused. This could become problematic if you are focusing all of your work toward vertical pulling. Horizontal pulling focuses your muscle strength and hypertrophy toward the scapular retractors and posterior shoulder much more than the vertical pulling exercises. By eliminating one of these types of exercises in your routine you risk creating an imbalance in your shoulder over time, as most vertical pulling exercises hit the chest and lats strongly, which are shoulder internal rotators. Most pushing exercises emphasize shoulder internal rotation as well. This encourages the body to be in posture where it is hunched forward, which is bad for structural integrity, especially if you have a desk job or are in school for many hours a day. This problem can typically be balanced with horizontal pulling. If you want to improve your horizontal pushing to the extent that you decide to forgo other types of pushing movements, try to balance them out with enough horizontal pulling to offset imbalances.

In conclusion, be aware of the risk-to-benefit ratios. If you notice that an imbalance is developing, back off and move toward a more structured, all-around routine. Continue until the imbalances are corrected; then, you can return to a complementing structure.

Supplementing

Many effective and proven routines, such as Jim Wendler's *5/3/1 Program*, use *supplemental* bodyweight or barbell exercises to help bring up weak links, provide conditioning, or develop other attributes. 5/3/1 works one primary exercise, such as squat, deadlift, bench press, or overhead press. You then add supplemental *assistance work* to these lifts. For example, with the deadlift, your supplemental work would be focused on your weak links. If you have weak glutes, work some hip/hinge exercises, such as good mornings. If you have weak hamstrings, work straight leg deadlifts, glute ham raises, or a similar exercise. If you have a weak back, work reverse hyperextensions. For bench press, choose some other form of pressing that focuses on weaknesses, or all-around exercises like dips.

Bodyweight strength responds in a similar manner. Simply use a bodyweight exercise as your main lift and supplement it with weights to focus on your weaknesses, hypertrophy, or whatever you wish to develop. As a more advanced athlete, depending on your goals and weaknesses, this can be an effective method to progress. In many cases, you can use weights to help supplement bodyweight exercises to work on both the neural adaptations and strength development needed for hypertrophy. Also, if you are dealing with injuries, you can substitute some weighted exercises for bodyweight exercises without aggravating your injuries so that they can fully heal.

Consider the planche. There are many ways to use weighted exercises to supplement its development. If you are working on brute pressing strength and potential hypertrophy, the smith machine is a useful tool. Using an undergrip / supinated grip, position yourself so your hips are underneath the bar instead of your chest. This puts the bar in a planche-oriented position. Now, load up the barbell with weights and do modified planche pushups.

It is a useful exercise for numerous reasons. Since your body is straight, along the bench, you do not have to worry about reinforcing the poor technique that commonly occurs when people arch their backs to compensate while performing planche pushups. You also do not have to worry about hitting the correct pushup angles with your shoulders, as the machine keeps the bar properly aligned. It also gives you a way to track your strength: with progressive loading. You can see how your strength is developing by tracking how much weight you can push. As an added bonus, after a certain point, weights can be a better stimulus for hypertrophy than bodyweight exercises, particularly in the shoulders and chest.

Dumbbells are also effective for many advanced bodyweight exercises. Going back to the planche example, you can work on dumbbell planche pushups like with a smith machine: Simply keep your hands above your hips while performing the pushup movement. Additionally, training more advanced exercises like maltese or inverted cross is easy with dumbbells. A favorite exercises to condition the elbow and build strength and hypertrophy involves using a pair of dumbbells:

- Begin in a planche position and hold for two seconds.
- Move to the maltese position and hold for two seconds.
- Move back to the planche position and repeat this sequence three to five times.

Of course, training on rings is preferable. Dumbbells are not a perfect substitute for rings, but not everyone has access to rings.

Another benefit of using weights is that you can interchange the weights to be just heavy enough to work on building up the connective tissue without causing injury. This is especially true for the straight-arm exercises that are very tough on the elbows (such as back lever, planche, maltese, and inverted cross).

A lack of gym availability is probably the most common issue I have seen in people who are training both weights and bodyweight. They have access to a globo gym (a disparaging term for a big-name, corporate gym) that does not allow them to perform bodyweight exercises and they have no equipment at home to work on bodyweight exercises, either. Others train consistently at home on the weekends and can barely make it to the gym on a weekday, leaving very little time to devote to training. If this is the case for you, adjust your routine to fit your schedule from the beginning. Depending on your goals, you may even want to have two separate routines that work around your schedule. A typical barbell routine is a routine you are usually able to perform at a globo gym.

- Upper Push: Bench Press + Press or Dips
- Upper Pull: Pull-ups + Bent-Over Rows
- Legs: Squats + Deadlift

An emulated bodyweight strength routine would seek to replace each of these weighted or barbell exercises with their bodyweight equivalents according to plane of movement:

- Upper Push: A Pushup or Planche Progression + Dips or Handstand Pushup Variation
- Upper Pull: Pull-ups + Inverted Rows or Front Lever Pull-up
- Legs: Squats or Pistols + A Glute Ham Raise/Hamstring Curl

Obviously, you want to modify these toward your goals. It is possible to train ground-based bodyweight exercises (such as the planche) at a globo gym, so you could do planche on both days instead of, say, bench press on your gym day. Alternatively, you can utilize the gym equipment to work on specific goals like smith machine planche pushups or dumbbell planche pushups.

How you structure your routines really is up to you and should be based on your goals. Upper-body bodyweight exercises and lower-body barbell exercises are highly recommended and proven to work. However, if you are interested in mixing and matching different bodyweight and barbell exercises for your upper-body and lower-body, go for it. Here is a non-exhaustive list of exercises that you can mix and match:

Barbell Pushing Exercises

- Upper: Bench Press, Dumbbell Presses, Decline/Incline Bench, Military Press, Behind-the-Neck Press, Jerks, Push Press
- Lower: Goblet Squats, Front Squats, High-Bar Back Squats, Low-Bar Back Squats, Overhead Squats, Hack Squats, Lunges

Note: Upright Rows are not on this list because of the shoulder impingement risk factor.

Barbell Pulling Exercises

- Upper: One-Arm DB Rows, Seated Rows, Bent-Over Rows, Pendlay Rows, Face Pulls
- Lower: Deadlifts, Snatch, Clean/Power Clean, any Olympic Lift Variation from ground to shoulder or hang to shoulder

Bodyweight Pushing Exercises

- Upper: Handstand Pushups, Handstand Presses, Planche, Pushups, Clapping Pushups, Dips, Maltese, Inverted Cross
- Lower: Bodyweight Squats, Pistols/Single Leg Squat, Shrimp Squats

Bodyweight Pulling Exercises

- Upper: Pull-ups (two arms, uneven, one-arm, etc.), Clapping Pull-ups, Inverted Rows, Inverted Pull-ups, Back Lever, Front Lever, Iron Cross
- Lower: Leg Curls, King Deadlifts, Glute Ham Raises

Miscellaneous

- Combined Upper: Muscle-ups, Inverted Muscle-ups, Any transitional movement involving a bar or rings (above-to-below or below-to-above)
- Combined Lower: Sprinting, Stairs, Vertical Leaping, Broad Jumping, and many more

Exrx.net has these and many more exercises with animated gifs to show you how they should look. In general, the classification system for the legs gets a bit fuzzy, as most leg exercises work every leg muscle. The main distinction generally made is that of push vs. pull, but the another distinction is that of knee dominant vs. hip dominant or hip hinge. Make sure you have balance in your workouts and work on any weak points you may have.

ROUTINES

Routines, sequences, and combinations are highly underrated and are actually an interesting way to work the muscles. One of their primary benefits is they allow you to transition in and out of many different types of movements consecutively using your muscles in ways you would not with typical exercises. Transitions from exercise to exercise can be very difficult and thus beneficial for gaining great concentric range of motion strength.

Routines, sequences, and combinations are best suited to advanced level strengths. Strength is mostly neurological adaptations, so it is best to first train movement patterns in typical repetition exercises in order to build the requisite strength. Training multiple exercises and moving through different transitions is great, but it does not allow you to stay as focused on the movement patterns themselves. You can liken this to a barbell complex or quick circuit of different strength exercises—it works better once you are already fairly strong.

Routines or combinations can consist of any type of exercises strung together in a series. They are usually performed on rings or parallettes. There are literally thousands of different variations. Some of the most common combinations are listed in the progression charts from the FIG COP along with a few variations of other movement combinations like *handstand → elbow lever → handstand*. Sample programming can be found in Part 4. These combinations are a very good way to get in some quick work if you do not have time for regular exercises. You can throw together a sequence of five to six skills and perform it five times in a row for a decent training session that makes a nice switch from "the grind" (doing the same or similar routines repeatedly).

Routines are an excellent way to incorporate skill and strength moves that you have already mastered but have not used in a while. Combining mastered movements with movements you are currently working on can create some interesting routines/sequences/combinations that will work your muscles differently than your usual methods. This is one of the major ways advanced-level and especially elite-level strength is developed. At these levels, your focus starts to shift from obtaining higher-level isometric holds to moving between these skills. Transitions between isometric holds (such as from the front lever to iron cross) may actually be harder than the holds themselves. Front lever is an A-rated skill, iron cross is a B-rated skill, and front lever to iron cross transition is called a *Pineda*, which is a D-level skill. Indeed, many high-level gymnasts cease doing specific strength work and focus solely on the strength skills in their routines to provide enough stimulus for adaptation.

Though routines and sequences can be used successfully to work on all-around movement strength, it is important not to remove all of your dedicated strength work.

Routines, sequences, and combinations can be fun to perform (and film!) as well. Play around with these types of movements once you can perform many of the high-level isometric holds, especially on rings. You may discover that you enjoy performing these types of routines more than the strict training of particular movements!

Remember, there is some trade off between working specific movements in a dedicated fashion to gain strength vs. working routines, much like there is some trade off between doing full range of motion concentrics vs. isometrics. If it is a trade off you are willing to make for the sake of variety or for your goals, go for it.

Here is the "beginner routine" used as a standard by Gymkana, an exhibitional gymnastics group, for decades:

- Begin from Hang
- Muscle-up to Support
- L-Sit
- Shoulder Stand
- Come down to Support
- Immediately roll back into Inverted Hang
- Back Lever
- German Hang Pullout
- Swing to Flyaway Dismount (or move back to hang and drop off)

This is one example where many basic skills are put into a sequence. These can be fun, especially when training with other people.

CHAPTER 13 SUMMARY

ENDURANCE, CARDIO, CROSS TRAINING, HYBRID TEMPLATES, AND ROUTINES

In this chapter, we looked at how endurance, cardio, cross training, hybrid templates, and routines apply to bodyweight strength training workouts.

Endurance trains both aerobic endurance and local muscular endurance. There are multiple techniques that you can use to construct your workouts.

Cross training is also highly variable, and your ideal routine will depend on the sport, coach, and level of strength and conditioning program implemented. If you are interested in learning bodyweight strength progressions and skills, have a conversation with your coach first and err on the side of less over more.

Strength and conditioning are a fundamental aspect of various sports. Specifically, strength and conditioning are important for improving effectively and to prevent injury.

Hybrid templates can be used to mix and match exercises from barbell and bodyweight exercises into a single routine.

Routines have their place as an alternate training method, and can be useful for increasing performance, working movements in succession, or simply having fun.

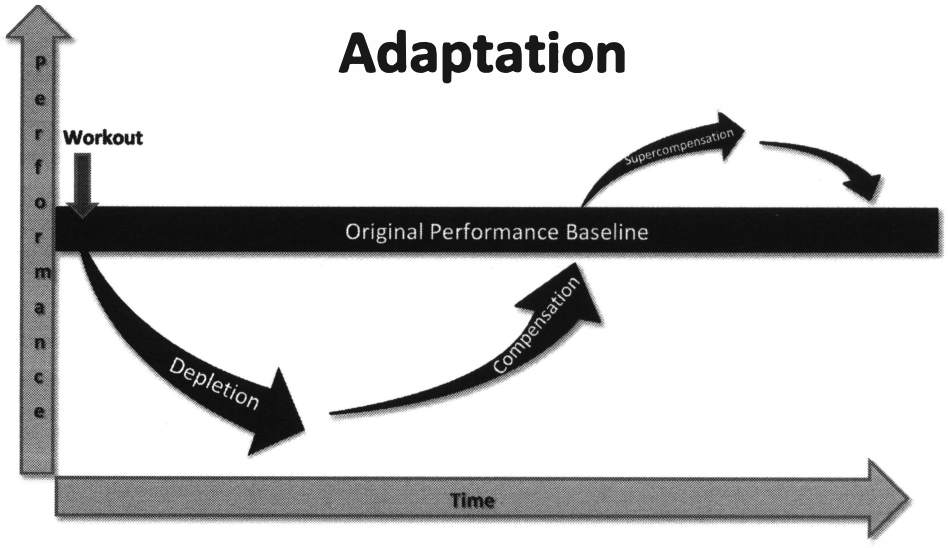
- CHAPTER 14 -

OVERREACHING AND OVERTRAINING

It is important to know the difference between *overreaching* and *overtraining*. You must learn what to watch out for and how to deal with these issues properly when they arise.

- Overreaching is a temporary state attained over multiple workouts when your abilities become depressed below baseline. A normal amount of rest or a deload period will cause your body to rebound (or supercompensate) such that your capabilities increase.
- Overtraining is a state that is reached through many workouts where your abilities have been continually depressed. This results in an overall regression of your capabilities, even after deloading and resting. Symptoms include regression of capabilities, sleep disruption, decrease in appetite, perpetual soreness, and increased risk of injury.

OVERREACHING



Overreaching is not a bad thing in itself. If you continue training for long periods of time while overreaching, however, it could devolve into overtraining. On a positive note, it is quite difficult to reach a state of

overtraining, especially as a beginner. Overreaching is much more common, and it can actually be a good thing. Many athletes plan short periods of overreaching to induce supercompensation. In sports, this is called peaking or tapering, which is usually used for competitions. Think back to the fatigue and fitness model. As fitness improves, it becomes substantially harder to progress because your body adapts to the training stimuli. Therefore, as you advance into the intermediate and advanced levels of training, you need to consider your mesocycles in terms of several weeks or two-week blocks.

The comparison to an accumulation and intensification model is obvious. An accumulation phase is essentially a carefully planned overload of your body with enough volume to depress your capabilities to a certain extent. Once this capability depression quota is hit, you shift your training to a state of intensification, where you perform a lighter volume of work at a higher intensity. Lowering the volume allows your body to rapidly supercompensate, even at a high intensity, which will reveal gains and further increase your strength.

This is the core of the "dual factor" theory which uses planned overreaching to progress. In this method, the athlete combines several workouts (typically weekly or bi-weekly) to depress the body's capabilities and then allows progression in the following weeks. For elite athletes, planned cycles could extend over months or even over years.

Beginners can use a weekly cycle. Planned overreaching works best with at least a couple of rest or light days so that the body can recover from the total volume of the week. One of the ways you can structure a planned overreaching cycle within a week is a 4/3 (four days on; three days off), 5/2 (five days on; two days off), or similar schedule. This method is not fully recommended, as there are far easier ways to progress when you are a beginner moving into the intermediate level. (for example, simple methods of progression and light/heavy). However, this program could be useful if you are a shift worker or need your weekends free for other activities.

Thinking long-term is best when structuring planned overreaching. In an intermediate or advanced training cycle, a decrease in capabilities during the week is not always bad, provided that you have sufficient rest at the end of the week for recovery, supercompensation, and adjustment before the next few weeks of the mesocycle. An accumulation phase, where you intentionally aim to decrease your capabilities with an intensification cycle during the week after your body has recovered, may last two weeks. This would form a three-week "cycle" and you would have two of these in a six-week mesocycle.

- Week 1 – Accumulation
- Week 2 – Accumulation
- Week 3 – Intensification
- Week 4 – Accumulation
- Week 5 – Accumulation
- Week 6 – Intensification

Again, it is okay if you are not progressing within a mesocycle, as gains can be masked by fatigue. Once you reach the end of the mesocycle and rest or decrease volume, your body may supercompensate and come back stronger.

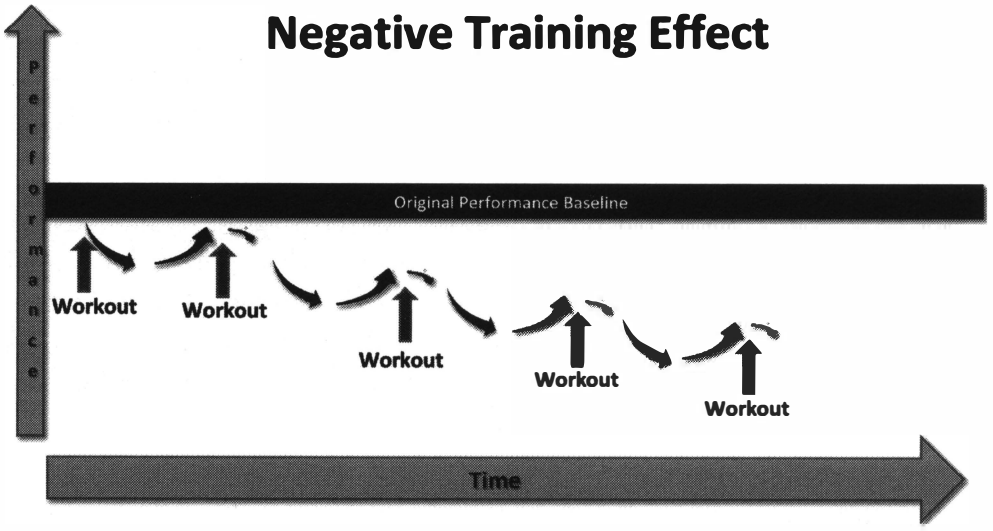
Programming these advanced training concepts into your routine will definitely take thought and experimentation because everyone is different. Do not worry if you are having problems adjusting. A training log is

your best friend here, as it allows you to look back and see if your abilities were increasing or decreasing over a mesocycle. Plus, you can see the effect of supercompensation if you did not make progress within a mesocycle but suddenly got stronger after a deload week. It is important to know how your body responds at certain frequencies, intensities, and volumes of training. Becoming familiar with your own responses will help you to self-modify your routine to elicit the best progress for your level of ability.

Be aware of the differences between DUP and overreaching: you are not required to have depressed capabilities during training in order to progress. Overreaching is merely a method of applying the fatigue and fitness model to your training. DUP and other periodization models allow you to progress without depressing your abilities, even with advanced athletes. You should choose the method that best fits your overall goals.

Most high-level programs have some periodization with a type of overreaching effect built in. This allows an athlete to progress within the training sessions, as well as supercompensate to peak for competitions. However, this takes much more planning than what is covered in *Overcoming Gravity*. You have to really know how you respond to training to build in progress during a cycle *and* an overreaching effect at the end. The importance of logging your workouts cannot be overstated.

OVERTRAINING



Overtraining is actually a prolonged state of "under-recovery" where your body does not have the ability to properly repair itself. It takes weeks or even months to recover from this state; your capabilities are heavily depressed, often even below starting level. This state can only be reached through chronic overworking, so you will hopefully never reach it—the only way to get to this state is by not getting enough rest for several consecutive months. Deload properly and you will have nothing to be concerned about.

The biggest thing that beginners should be concerned about is not overtraining, but performing too much volume in a single workout. This high volume is not necessarily more than a beginner can handle, but it can cause overuse injuries or inhibit optimal progression. Remember, more is not always better.

If your capabilities are increasing with each workout, you are not overreaching or overtraining. You could actually be performing either more or less than your body can handle. Experiment with volume, intensity and/or frequency of workouts to increase gains and promote recovery.

If you are plateauing or regressing and you have not taken a break from working out in a while, it may be time to deload (depending on where you are in your mesocycle). Rest to see if that helps. If not, the cause is most likely undertraining. Also be sure to examine your sleep schedule, diet, and any stress factors in your life, as all of these substantially affect recovery. Any one of these could be the actual issue. Take an extra rest day if needed to determine what is taking place. Missing a workout or two is much better than wasting time in a chronic plateau or regression.

The two most obvious symptoms of overtraining are a decrease in appetite and sleep quality. If this occurs after you have recently increased volume or raised intensity, it may be a good idea to remove any extra stress factors so your body has time to adapt. As previously stated, overtraining is not something you should be concerned about if you are progressing toward your goals. If you are not, definitely evaluate your training, sleep, diet, stress levels, and other factors. If you need advice to break through a plateau, do not hesitate to talk to someone with more experience than you.

Lyle McDonald of *Body Recomposition* has written a solid series of article on overtraining. According to observed symptoms, there are two types of overtraining—one is parasympathetic nervous system dominant (*addisonic overtraining*) and the other is sympathetic nervous system dominant (*basedowic overtraining*). The terms addisonic and basedowic are not used much anymore because the symptoms are named after specific unrelated diseases. Conceptually, however, it helps to understand them based on the symptoms of autonomic nervous system dysfunction present. Causes can be multiple—encompassing training and nutritional caloric intake as well as vitamin and mineral sufficiency, sleep, stress, and many other factors. What is important is to recognize the symptoms of each, which may give you an indication that you need to cut back on training and increase recovery:

Addisonic Overtraining

- Increased diastolic blood pressure (over 100mm/hg) during and after physical exertion.
- Impaired coordination
- Decreased endurance
- Low resting heart rate
- Persistent muscle aches
- Slight increase in recovery time
- Slight loss in motivation
- Decreased adrenal function/adrenal fatigue

Basedowic Overtraining

- Slight increase in blood pressure
- Impaired coordination with increased reaction time (reacting takes longer)
- Decreased endurance with tendency to fatigue easily
- Increased sleep requirements

- Elevated resting heart rate
- Increased appetite
- Increased metabolism and sweating
- Increased rate of breathing under stress
- Increased head aches and colds; decreased immune system
- Increased nervousness, unease, decreased motivation, eventual depression
- Increased sympathetic nervous system activity (fight or flight)

RATE OF PERCEIVED EXERTION AND TRAINING LOGS

Rate of perceived exertion (RPE) is one of the scales used to track progress in training. It is especially useful in any training that relies on auto-regulation. The RPE scale runs from 0-10 where 0 is rest and 10 is maximal exertion. You rate an exercise on an intensity range of 1-10, depending on how you intense you felt the exercise was to execute on a given day. There are many types of scales that can be used for measurement (such as the *Borg*, *Visual Analog*, and *Likert*) but the RPE scale is both the simplest and the most widely used.

The RPE can tell you very quickly when you are having potential issues with an exercise. If you are performing three sets of five tuck planche pushups at an RPE of eight for the day, you will know that you can push yourself harder in the next workout. On the other hand, if your tuck planche pushups is an RPE of ten for three sets of five, you know that if you make the full jump to 3x6 tuck planche pushups in your next workout, you will likely fail. A linear repetition addition may be a better option to progress: 5-5-5 → 6-5-5 → 6-6-5 → 6-6-6.

RPE was intentionally left out of the chapter that discusses methods of strength progression because it is best used to manage and avoid overreaching and overtraining as opposed to progressing with strength workouts. For instance, you may have subsequent workouts where you perform 5-5-5 for one-arm chin-ups in a set with an RPE of ten. In your next workout, you may only hit 5-5-4 and 5-4-3 repetitions of one-arm chin-ups with the RPE holding at ten. This is a serious issue, as it indicates that you are decreasing in strength while your RPE is maxed out. You may be overreaching or overtraining. The solution in this case will likely be a deload, not increasing volume.

It is vital to use both a training log and an indicator scale like RPE. Training logs allow you to track everything related to your workout. They allow you to review your previous workouts to note when and how you progressed so you can plan solid progressions for future workouts. You may also notice patterns—both good and bad—that will help you as you construct future workout routines.

If you are a coach, it is important to maintain individual training logs for each of your athletes. This will help you see which concepts work the best for certain individuals—what works well for one athlete may impair progression with another. When coaching many athletes it is hard to remember specifics about each of their workouts from week to week; in this instance a training log is critical.

Having a training log also allows an athlete to ask for help if they are stuck. It provides a large amount of information that enables troubleshooting of a routine in all aspects: from athlete to coach, from coach to coach, from coach to athlete, and from athlete to athlete. When athletes tell their coaches that they are not progressing with their routine, the coach needs to know all of the available factors in order to make an

educated guess as to why they are not progressing. This includes the athlete's routine, sets and repetitions, tempo, rest times, overall volume, frequency, and intensity of exercises, nutrition, sleep schedule, stress levels, any potential injuries, and any other factors that may be negatively affecting their exercise program. This level of detail helps immensely in making recommendations for improvement. Attempting to do this blind is like throwing dirt against a wall and expecting it to stick, whereas if you have a detailed training log it functions like a laser-guided missile that can easily root out the areas of deficiency.

When an athlete commits to tracking their own progress, they become truly invested in their training. They will ask more questions and provide better feedback than they would if they did not keep a training log. It provides a clear pathway to mentorship in life outside the sport, which is one of the most overlooked aspects of training. Many athletes are mentored in the areas of physical development and spots, without receiving personal mentorship in life. Adding this holistic aspect to the coach-athlete relationship will help the athlete be a success in the long run of life, even outside of their sport.

CHAPTER 14 SUMMARY
OVERREACHING AND OVERTRAINING

In beginners, overreaching results in a visible stalling of progress from workout to workout. The advised remedy is to deload until you can move back to constant progression. For intermediate and advanced strength levels (where progress occurs more on a weekly basis than workout basis), planned overreaching can and should be used to apply adequate stress to the body to force strength and muscle mass adaptations.

Overtraining is not something to be concerned about unless your abilities are constantly regressing. If that is the case, it may be a good idea to take significant time off to recover—and there are serious signs and symptoms to know. Make sure you keep up with recovery factors. Sleep, nutrition, and stress reduction are the keys to get out of an overtraining deficit. If you need help, contact a medical professional.

One very good practice is to use the rate of perceived exertion (RPE) scale to track progress in a training log. Noting the RPE in addition to your repetitions, sets, volume, intensity, and frequency may be beneficial in the long run, even if it is subjective.

- CHAPTER 15 -

HEALTH AND INJURY MANAGEMENT

Injuries are a particularly hard topic to address since there is no one-size-fits-all prescription to nurse someone back to health. Everyone responds differently to treatments and has different recovery factors to take into account, including but not limited to: nutrition, sleep schedule, general overall health, and training schedule. It is absolutely crucial to receive individual care for your specific injury. Certain issues absolutely require a visit to an orthopedic sports doctor or physical therapist.

With this in mind, understand that the information contained in chapters fifteen and sixteen reflects a generalized approach to health and injury management. Something that may work very well for one athlete may not work at all for someone else—it could even have a negative effect! Every athlete is different. A doctor or therapist will be able to examine your individual situation and prescribe rehabilitative or prehabilitative work to restore you to health. If your medical professional says something that contradicts information provided in these chapters, listen to them as they know your case!

> Any information found in chapters fifteen and sixteen of *Overcoming Gravity* is for informational purposes only. None of this should be misconstrued as medical advice. You should always consult your medical professional before utilizing any information located herein. Self-treatment without advice from a medical professional is not recommended and is therefore at your own risk.

ADDRESSING "THE BURN," PAIN, AND SORENESS

Everyone has heard the saying, No pain, no gain. The phrase is ubiquitous in the athletic world for pushing through pain. Some coaches—typically at the high school level and below—believe in this saying unconditionally. Let's distinguish between "the burn," pain, and soreness in order to get a better understanding of the concepts these terms represent.

- *"The burn"* is a broad, colloquial term that refers to intense exercise in which one's cardiovascular or muscular systems are pushed to their limits. The burn comes from metabolic acidosis, which is produced when you exercise at an intensity that exhausts your muscles' supply of oxygen. Lactic acid is produced as a byproduct of metabolic acidosis, so a common term you may here is

lactic acidosis, lactate threshold, or terms associated with lactic. The muscles need oxygen to break down the glucose that produces energy. Without the oxygen, it uses enzymes to break down the glucose, and lactic acid results as a side product. With the muscles overwhelmed and trying to get more oxygen, the bloodstream can become overrun with lactic acid. It is easily overcome with a few minutes of rest.

- *Pain* is a complex phenomenon that occurs for any number of reasons and has influence from biological or physiological, psychological, and sociological factors. The currently prevalent model used to describe an experience of pain is the biopsychosocial model. *Acute* pain may signal—but not always—that something is wrong in the body, such as overuse or an injury. *Chronic* cases of pain are usually complex phenomena where there are no recurring mechanisms of injury and the pain is propagated by various biological, psychological, and/or sociological factors.
- *Soreness* or *delayed onset muscle soreness* (DOMS) is a phenomenon that occurs in response to exercise, stretching, or other activities that the body is not accustomed to. DOMS typically occurs 24 hours after the activity is completed. It is characterized by a dull, indistinct, pain-like sensation in the muscles that is exacerbated by movement. Soreness can be decreased in part by prolonged movement and mobility or some form of light exercise to increase blood flow.

The pain you feel during exercise when your muscles start to "burn" or after exercise is completed does not typically have a negative impact on your body, except in rare situations where is becomes excessive and you continue to push through it. A certain amount of stress on the muscles helps to force anaerobic adaptations in the muscles, a positive goal. This type of "pain" is not an injury risk.

On the other hand, *delayed onset muscle soreness* (DOMS) generally occurs approximately 24 hours after exercise and can last 48-72 hours. In extreme cases, it can last 7-10 days. It typically happens to trained athletes coming back from a layoff. DOMS generally occurs when you (1) try new exercises, (2) increase volume or frequency, or (3) perform excessive amounts of eccentric components of exercises.

Your body is able to progress in both strength and hypertrophy without having to go through the pain of soreness or the burn. Even if you do feel sore, know that as long as you are increasing your strength, gaining muscle mass, or meeting any of your goals you do not have to modify your routine. If you are *not* progressing, *then* it is time to make a strategic change of some sort—even if you are not experiencing any soreness.

Laying out some guidelines for training while sore is a good idea, as people new to training often do not realize the difference between pain and soreness and do not know when they should continue or cease exercising. Here are the guidelines:

- If you are too sore to move, exercise very lightly. You should also be hydrating, self-massaging, foam rolling, or whatever else you can do to alleviate the discomfort. Although studies have indicated that some of these methods do not actually help, the placebo effect can be a strong factor.
- You can work out if you are not too sore, but do not overdo it.
- Otherwise, do not worry about soreness. If you are training frequently enough it should start to go away as your workout capacity increases.
- If you are always sore after workouts, your workout regimen is likely not enough to bring adaptations in the muscles that eliminate soreness (such as 1-2x per week body-part splits). In these

cases, the soreness is probably hindering your workouts. Increase your frequency to 3x per week full-body and the soreness will likely dissipate.

Whether you see it as positive or negative, soreness is not something to worry about, as you can make progress with or without it. Generally, it will be more of an annoyance. If you plan on performing a high-volume workout or a routine with a lot of eccentric movements, you can expect to be sore afterward.

Pain is different. However, chasing pain or a lack of pain is not good. The best concept to understand pain in exercise is the concept of *aggravating exercises*. The reason why pain is less important than aggravating exercises is important. Sometimes if there is pain, an injury may feel and move better after exercise. Sometimes if there is no pain, an injury may get more stiff and worse. Hence, removing aggravating exercises is more important than trying to use pain as a guide. If there is pain, but exercises lessen the pain and improve the injury then keep those. Pain is one factor, but it is not the most important factor in determining whether to use exercises for rehabilitation or not.

For specific advice on whether or not to work through pain, contact your medical professional. A book cannot diagnose you or correct your injuries. You can only learn the factors that affect propensity for injury, learn to integrate these principles for prehabilitation, and learn how to work around injuries in a routine.

FACTORS THAT AFFECT PROPENSITY FOR INJURIES

There are four main factors that contribute to the integrity and health of tissues of the human body:

- *Posture*: The static presentation of the body.
- *Biomechanics*: The movement of the body.
- *Mobility*: The capability of joints and muscles to move within their range of motion.
- *Muscle Length-Tension Relationships*: Interactions that force generation of movement.

These factors all interact with one another. Posture and biomechanics represent the neural control of the central nervous system in its interaction with the environment. *Posture* is the static presentation of the body in space, and *biomechanics* are the dynamic element of movement. We receive feedback from our senses via these pathways in two ways. *Proprioceptive feedback* from static elements, and *kinesthetic feedback* from moving elements. Proprioceptive feedback is being able to sense where the body is in space, and kinesthetic feedback is the ability to sense various movements in space. The brain and its neurological system control the body, and each of these neural elements exerts influence on musculoskeletal structures.

Biomechanics effect constant recalculations of the nervous system as the environment changes. This is why exercises are the best way to teach the body how to move and work correctly. Resistance exercise is also an effective way to train the nervous system and strengthen the muscles. Maintaining proper technique in an exercise significantly reduces the propensity for injury after the body begins to become fatigued.

The rest of the factors all apply broadly to biomechanical movement.

If you have ever been to physical therapy, particularly for back pain, you already know that many of the exercises prescribed are those that work on stability; in effect, re-teaching fundamental movements like those you see babies learning from birth to three years old. As we grow up, our bodies naturally learn movements

that our nervous systems reinforce. However, our culture is one of schools and desk jobs, causing us to "practice" body positions that make us lose our ability to move effectively, thus increasing propensity for injury. Becoming more proficient with rolling, crawling, squatting, and other fundamental movements that our bodies learned when we were younger will drastically decrease propensity for injury due to the body's inherent carryover effect from simple to more complex movements.

Posture or good body alignment provides a platform to optimize the ability of the musculoskeletal structures to apply and dissipate force when called upon during movement. Studies have shown that bad posture is not always correlated with pain. In other words, there is not always a structural problem in the body where there is pain. MRI studies have shown that 20-50% of healthy, pain-free populations may yet have bulging discs, herniated discs, stenosis (narrowing of a passage that nerves run through), and other degenerative conditions. They have these conditions, even though they do not have pain. Despite these studies, from a health and wellness perspective, good body alignment is a relevant factor to quality movement which may indirectly decrease propensity for injury. This is why we want to take a look at good posture.

Sitting with your shoulders hunched forward (colloquially "caveman posture") puts your shoulders in an unstable position by changing the length and tension relationships of the muscles. This is prevalent among people who perform desk jobs or work in front of a computer for hours at a time and it causes all kinds of problems. There is the increased propensity for impingement due to internal rotation of the shoulder that leads to decreased space under the acromion. There is increased risk of anterior instability that may lead to subluxation or dislocation due to posterior shoulder weakness. There is increased stress on the AC joint as it moves into the overhead position, which can negatively affect overhead work like handstands. These are only a few examples of increased propensity for injury due to poor posture.

Posture also affects your thoughts and your decision-making. Those who stand taller tend to be more confident and decisive. They are more esteemed by peers for leadership and their voice is given more weight. It is also better for breathing and having a calm mindset in stressful situations.

Your body is trained by the things you do continually. If you teach your body to do negative things, it will learn these things and adjust accordingly—leading to injuries, poor posture, and poor movements. Therefore, prehabilitation and rehabilitative protocol must continually focus on both biomechanics and re-teaching proper posture. Re-teaching your body may require more than simply a few weeks or months of constant diligence to correct problem areas. This is not a chore, but an additional step to improve your overall health and performance.

Mobility is the interaction of the voluntary muscles in their range of motion taking into account how posture and biomechanics affect movement. Kinesthetic feedback is provided to the central nervous system via muscle spindles, which regulate muscle length. Muscle spindles are located in the muscles themselves, while the control system for these muscle spindles is gamma motor neurons. Passive tension is generated when muscles are taken to the edge of their range of motion. Additional muscle length-tension relationships are comprised of kinesthetic feedback to the central nervous system via the golgi tendon organs. These regulate muscle tension and the ability to voluntarily output force. Golgi tendon organs are located at the muscle-tendon junction. Both of these feedback systems are essential to regulate your posture and biomechanics.

Posture, mobility, and the manner in which force is applied all affect how you execute a technique or movement. It is important to focus on these things to build a solid foundation for quality movements. In

terms of managing injuries, an organized approach is best. If you do get injured, use this four-step approach to work your way back to performing a normal routine.

- Goal Setting in Rehabilitation
- Working Around Injuries
- Programming Rehabilitation
- Moving Back into Exercise

GOAL SETTING IN REHABILITATION

Having goals for addressing injuries is important. All physical therapists should have functional goals for their patients. This is required not only for insurance reimbursement, but to warrant the type of treatment that is given. For our purposes, goals give us a timeline. Generally, a medical professional is required to help you set your injury goals because you often do not know how an injury will respond to treatment and how long it will take to heal. You may not even know enough about an injury to know how to rehabilitate it. Do not hesitate to consult a medical professional to come up with goals for your injury—the following guidelines are for informational purposes only.

Goals force you to identify what may or may not be working, and they also keep you motivated. As with your workouts, you should know that something is wrong if you are not progressing from one rehabilitation session to the next on a weekly basis. You may have to make adjustments to your rehabilitation or prehabilitation program to continually make progress in addressing an injury.

In this sense, rehabilitation is a lower-level extension of programming for regular strength and conditioning. It is not that different from regular training. The key is learning the concepts and knowing your options if you are plateauing. Keep in mind that the injured area is sensitive and prone to re-injury. Careful care must be given to an injured body part.

The healing cascade is a normal process of body tissue. It occurs naturally, given enough time. The most prevalent example is with the skin, but all tissues respond similarly when injured—even the brain. The process is predictable and divided into the following three stages:

1. *Inflammation Phase*: Damage stimulates the immune system to clean up injured areas and various growth factors are released to start the proliferation phase.
2. *Proliferation Phase*: New tissues are laid down via rapid cell division.
3. *Maturation Phase*: Tissue is matured and remodeled to handle whatever stresses are necessary in that area.

It is important to realize that the healing cascade is how all body tissues mature to some extent. One of the fundamentals of workouts is that exercise damages muscle cells. Muscles become inflamed and the immune system cleans up the damage. There is proliferation of new muscle cells or satellite cells to repair the damage, and new contractile fibers are laid down. The muscle then matures and remodels to become bigger and stronger.

Another example is that of calluses on the hand. Stress is placed on your tissues when you lift heavy weights or hang onto the pull-up bar to the extent that your hand starts burning and hurting. Your tissues

then become inflamed and begin the process of healing. Your skin cells proliferate and multiply, and they will finally mature and remodel into a callus.

There are problems that can occur with "too much, too soon." Aggravation of an inflamed area can result in blisters, opening of wounds, scarring, and re-injury. These are so common that you should be able to apply this understanding to your prehabilitation and rehabilitation.

Injuries are best thought of in chronological context. The following timeline can be used to aid you in knowing what to focus on, depending on where you are in the healing process of an injury.

1. *Determine cause of injury*. In bodyweight training, this will most often be a particular movement that aggravates the injured area. For example, elbow tendonitis with pull-ups.
2. *Eliminate aggravating exercises*. Failure to do this is the number one way to make the injury worse. Don't be afraid to remove an exercise from your routine temporarily, even if you are progressing with it. If you don't do this, it will likely hinder your progress in the long run.
3. *Get professional advice from a sports medicine doctor or physical therapist.* This is tied with the first two points. A professional will be able to examine your body for the particular weak link, instability, or other issue that is causing the problem. Knowing exactly what you need to work on will shorten your recovery time.
4. *Follow the advice of your medical professional!* If they do not offer you a plan, you should ask them for one. This is especially true if you are seeing a physical therapist. Ask for exercise(s) you can do at home as well.
5. *Rehabilitate*. If the cause of injury is known, rehabilitation must be integrated with tissue remodeling phases dependent on the diagnosed issue. If your medical professional gives you a plan and exercises to perform, keep these things in mind:
    - Inflammation is a natural occurrence and not inherently bad as long as it is not excessive. Do not try to perform more exercises than your plan recommends. It is important to minimize inflammation on the affected areas.
    - Exercise is important in the healing process; solely resting is the worst thing you can do for an injury. This applies for both acute and chronic conditions.
    - In the tissue inflammatory phase, continuing with exercise is vital in maintenance of range of motion and joint mobility and deterrence of atrophy.
6. *Exercise*. Low weights/intensity, high repetitions, not-to-failure to increase endurance and decrease risk of re-injury, blood flow, and minor amounts of inflammation in the area for healing.
    - The critical point of the tissue proliferation and remodeling phase is keeping a balance between
      (1) programming in rehabilitation exercises for delicate remodeling of tissues and
      (2) forcing adaptive changes and organizing remodeling.
    - Exercise must be progressive in correcting issues with posture and/or biomechanics.
    - Exercise must encourage good gross movement patterns.

Tissue healing rates vary depending on which tissue is injured. Skin injuries typically heal in a few weeks, but if you have a cartilage injury or shoulder labrum repair, the proliferation and remodeling phase may last three to

four months since these types of cells heal slowly due to limited blood supply. Functional activities like throwing will not be approved for someone undergoing physical therapy before that amount of time has elapsed.

It is very important to understand what is actually injured and what type of protocol is needed to treat that specific injury. *This is the importance of a professional diagnosis and treatment plan from a medical professional!* Medical diagnosis is essential even if you do not need to go to physical therapy and can self-treat your injury. In the context of prehabilitation and rehabilitation, you should be asking yourself these questions:

- Is what I am doing helping my recovery on a measurable level? (Week to week or month to month.)
- Is what I am doing prolonging my recovery? If so, why? Is it because I am doing too much or not enough? Do I need a professional opinion on whether I am doing too much or not enough?

Use your critical thinking abilities. Do not do something just because it was suggested to you. When in doubt, see a medical professional.

Tissue Type	Quality Trained	Repetitions	Sets	Intensity / % 1 RM
Muscle	Strength	1 – 5	5	80 – 90%
Muscle	Strength & Speed	6 – 15	3 – 5	Fast Pace
Muscle	Endurance & Speed	10 – 25	3 – 5	Fast Pace
Muscle	Strength & Endurance	15 – 30	3 – 5	70 – 80%
Muscle	Endurance	30 – 50	3 – 5	60%
Tendon	Tendon Healing	100 – 200	1 – 3	40 – 60%
Cartilage	Cartilage Healing	Thousands	1	20%

The most important recommendations indicated by the above chart have to do with connective tissue overuse. Though the information may seem counterintuitive, this chart is backed by research and published by the University of Maryland, Baltimore. If you watch the NFL, you often see players with knee ligament or meniscus injuries on the sidelines riding the stationary bike during practice or games. This is because cycling, in particular, is effective for treating these types of injuries for the following reasons:

- *No impact*. Ligaments and cartilage are at a high risk for re-injury with impact because they stabilize the knee during movement. You do not want your last line of defense against injury being tested right after it has been repaired.
- *High-repetition*. This does many things, including increasing blood flow as the joints in your knees are exercised, which allows nutrients to repair injured tissue.
- *Low-intensity*. As the tissue is healing you want to apply low-level mechanical stress to assist in remodeling of the tissues. If you do not do this, your connective tissues may re-align in a cross-hatch pattern rather than linearly, like a rope. Tissues that are not remodeled correctly are at a much higher risk of re-injury.

- *Longer time.* You often spend ten to twenty minutes or more on a cycle. This allows you to accumulate the hundreds, if not thousands, of low-intensity repetitions needed for proper blood flow and mechanical stress without aggravating the area.
- *Not-to-failure.* None of these exercises are performed to the point where you are exhausted, which would stress injured tissues too much and possibly re-injure them.

This is the importance of the high amount of repetitions for tendonitis or other potential connective tissue prehabilitation and rehabilitation. If you suspect your injury is a joint or cartilage issue, have it checked by a medical professional.

There are several effective approaches for overuse prehabilitation or rehabilitation injuries. The general time frame is the same as a mesocycle, four to eight weeks. This tends to be a bit conservative for prehabilitation but is usually spot-on for rehabilitation.

- For most stabilizer muscles, such as the rotator cuff or the muscles around the scapula, employ high repetitions in the 30-50 range, not-to-failure, for 3-5 sets per muscle. Aim to progress slowly in prehabilitation so that the weights do not put you in the failure range for the final repetitions. The goal is to build endurance for the stabilizers, so they have less propensity for injury, especially near failure. This is important because most injuries tend to occur at the beginning of a workout due to improper warm-ups or near the end of a workout when you are fatigued.

- For stabilizer muscles that are used for explosive movements, such as the arm for baseball pitchers, Charles Poliquin's recommendation of 30-100 repetitions per set for endurance training for about 3 weeks followed by phases of 8-12 and 6-8 repetitions at a high tempo are effective. Follow up with specific strength work and explosive training to get re-accustomed to rigorous sports training. This benefits not just baseball pitchers but any sport or discipline with explosive movement like gymnastics, parkour, martial arts, and the like. Your goal is to build endurance to lessen the chance of injury and increase blood flow to heal the area and encourage correct remodeling of tissues.

- There is also a more progressive method that works for most connective tissue overuse injuries or muscles, and it is not limited to stabilizers. Instead of remaining solely in the high-repetition range or jumping straight down to a low-repetition range, gradually decrease the amount of repetitions and increase intensity. For example, work with forty repetitions the first week, thirty repetitions the second week, twenty repetitions the third week, and finally move into the ten-repetition range the fourth week. This represents a gradual increase of intensity to prepare the tissues for the five to twelve range for strength and hypertrophy training, but it also gives the tissues multiple weeks of high-repetition work to increase blood flow, encourage remodeling, and promote overall healing. This can also help the body learn good movement patterns.

- Start with 40% of the volume previously used and add roughly 20% per week until you reach your original workout load. It will take about four weeks to reach full-intensity, giving your injured tissues time to be strengthened. If a relapse occurs, drop the volume 20-40% (depending on how the injury responds) and add 10-15% per week.

These types of exercises respond well to a 2151 tempo, but any similar tempo that varies the time by one second can also work well: 1-3, 0-2, 4-6, 0-2. It is only important to have a controlled concentric component

of 1-3 seconds so as to limit the speed of the repetition in order to ensure that there is enough time to concentrate on proper technique. After a slight pause or rest at the end of the repetition, the 4-6 eccentric phase (muscle lengthening) will re-educate your nervous system to fire correctly. It will also injury-proof the tissue. End with a slight pause or rest at the end of the repetition.

The eccentric tends to be the most useful component in treating any type of pain or injury, especially in prehabilitation and rehabilitation of tendonitis and strains. The eccentric component of exercise causes muscle damage which creates an inflammatory response which is necessary for healing, especially in chronic injuries. The eccentric component also provides sustained, low-intensity stress for remodeling. High repetitions along with muscle contraction help to force blood in and out of the particular areas that need it.

The eccentric component may very well be critical for re-teaching your body to correctly activate its muscles once again, since eccentrics preferentially activate fast-twitch fibers. After a sprained ankle, your body will experience pain, causing your nervous system to sense a threat – which in turn causes your muscles to spasm and tighten to protect the injured area. Eccentrics re-train your nervous system to decrease the threat response and increase motor control again. If you have injured a particular area, you may experience shakiness when trying to control a movement once you begin to perform rehabilitation work. You can correct this with a uniform-speed eccentric movement.

In the physical therapy clinic, eccentrics have also been used to increase flexibility. Patients with frozen shoulders or impaired internal/external rotation have improved 20-30 degrees in range of motion in a single session using not-to-failure slow eccentric motions. The reason for this may be that eccentric movement allows the nervous system to decrease the threat response and re-teach neuromuscular control. The decreased threat response is manifested in a desensitization of gamma motor neurons, which control muscle spindles, which control muscle tension at the edge of the range of motion, usually increasing it. If decreasing your threat response decreases the sensitivity of the muscle spindles, you should be able to move your muscles into a new range of motion.

The theory works well in practice. Slow eccentrics through the range of motion to the edge of the range of motion can be used effectively to gain flexibility or increase range of motion, especially after injury. Aim for a general, systematic approach when addressing a specific area. Here is a typical order of progression for this:

1. Do not aggravate the particular area
2. Regain range of motion and mobility
3. Slowly begin to strengthen the area from all angles
4. Correct any imbalances
5. Move back into regular exercise

Here are specific details for each of these phases. Adjustments can be made depending on how the area heals.

1. Use relaxation and soft tissue techniques on the afflicted area(s). With tendons and connective tissues, it is particularly important to massage the muscles more than the tendons. With overuse injuries, the muscles are typically so tight that even light movements cause them to pull on the attached tissues, thus aggravating the injured area. Loosening the muscles helps significantly.

2. Perform light stretching and mobility work in all directions for the specific tissues that are afflicted. For example, elbow tendonitis will require stretching the flexors and extensors in the wrist, plus mobility work all around. While stretching does not prevent injury, it can be used to help recover from an injury.
3. Train the affected areas with a no impact, high-repetition, low-intensity, not-to-failure method.
4. Strengthen the opposing muscle groups to ensure that there is a balance of strength and hypertrophy at the joints. For example if you have inner elbow tendonitis (golfer's elbow) with your flexors, you will want to perform reverse wrist curls to train your extensors. For anterior shoulder pain, it would be a good idea to strengthen the muscles of your posterior shoulder and scapula.
5. Slowly build up to strength and hypertrophy training from lower progressions.

This approach aims to cover posture, biomechanics, mobility, and muscle length-tension relationships all at once. You may need to add additional elements depending on the injury.

When executing prehabilitation exercises, there are some additional factors you should take into consideration. Adherence to these items will speed your recovery, but keep in mind that there are still physiological limitations of time for healing to fully take place. Here are the factors to consider:

- Prehabilitation and rehabilitation should not aggravate the area where you are working. This should be pretty obvious, but it is important to reiterate.
- Aim to perform any prehabilitative or rehabilitative exercise with a full range of motion and keep control with good form. It is critical to ensure there is no deviation from accurate technique and control when you are recovering from an injury. Rehabilitation is not useful if the wrong structures are being rehabilitated. Additionally, strengthening an area in a limited range of motion is not conducive to regaining full operating capacity of the structure(s) you want to heal.
- During the concentric and eccentric phases of your movements, you are looking for a smooth, well-controlled motion at a uniform speed. Do not worry about acceleration through the movement, like you do in your usual standard strength training. Your biggest focus should be on the slow eccentric phase of the movement, as it is the most important factor in rehabilitation.
- Quit if you are getting close to failure or if the exercises aggravate the injured area. The main goal is to get back to exercising, not to push yourself and potentially get injured again.

Jerky movements lead to instability, especially when repeated often, and may represent a significant factor in the development of injury conditions like tendonitis. They increase impulse forces on the muscles, tendons, and other body tissues, which can also lead to additional damage. It is very important to restore smooth movements through controlled eccentric training. This will allow healing to occur faster and more completely.

Pain is another big inhibitor of muscle function. Whenever your body senses a noxious stimulus, it sends feedback to the motor cortex to inhibit force production. In other words, if you punch someone in the arm and then make them lift weights, their capabilities will be inhibited even if there is not significant damage to their muscles. Your body has natural limiters on the muscle via golgi tendon organs. They limit motor drive if there is pain present.

If you have suffered a catastrophic injury, the amount of time it will take to recover can be estimated by the number of letters in the name of the tissue that is injured. This is fairly easy to remember and gives a

good approximation. For example, a torn ligament will take approximately 8 months (ligament = 8 letters) to rehabilitate properly. Your other tissues are cartilage (9), bone (4), muscle (6), and tendon (6). These figures are used only for catastrophic injuries. Strengthening your tissues to the point where you can exercise again should only take a fraction of this time.

Your overall goal is to reach the point where you can again perform the exercises on your original workout plan. You must progress from low-intensity to high-intensity repetitions of an exercise. Taking a month to get back to full workload is going to be typical for a minimal to moderate injury (around a Grade I strain or two to three months of tendonitis). Decreasing the volume in your routine for a month will allow your tissues to calm down and recover properly. Scale accordingly.

For minimal injuries, it will take a quarter to half of the time that the injury has been present. If the injury has lasted for four months, it will likely take four to eight weeks to reach full health. This is dependent upon individual recovery factors—diet, sleep quality, stress levels, ability to rehabilitate without pain, how your body responds, and more.

This is an extremely conservative protocol, but it is wise to spend a little extra time now so the same injury will be less likely to re-occur. When in doubt, it is always best to err on the conservative side when it comes to volume. You can always increase the volume if needed, but if you attempt to do too much, it is easy to re-injure yourself. Talk to your medical professional and take it slow.

RICE VS. MEAT

There has been a lot of discussion and debate in recent times about a RICE vs. MEAT approach. The following is for informational purposes only; talk to your medical professional before using any of these methods. Here are the definitions of the two acronyms.

Rice

- *Rest*: Rest the injured area.
- *Ice*: Ice the injured area to decrease swelling and inflammation.
- *Compression*: Compress the area (with an ace wrap, sleeve, etc.) to reduce swelling.
- *Elevatation*: Elevate the area so the blood in swollen areas can drain back to the heart.

Meat

- *Movement*: Mobilize the area based on your pain tolerance. This assumes that pain is a normal part of an injury and not something to be afraid of. Movement is a critical factor right after an injury has occurred, even over rest.
- *Exercise*: Goes beyond movement to actual exercises aimed at rehabilitating or prehabilitating the injured area. Exclusively no-impact, high-repetition, low-intensity, not-to-failure exercises.
- *Analgesia*: Control the pain with medication instead of ice.
- *Treatment*: Fairly broad term, can encompass all additional methods used in a doctor's office or physical therapy clinic. Could also include alternative medicine, such as cortisone shots, hydrotherapy, contrast baths, ultrasound, acupuncture, dry needling, prolotherapy, plasma rich platelets, extracorporeal shockwave therapy, and more.

The RICE approach is the traditional model for injury treatment. The MEAT approach is an alternative model that is basically physical therapy rehabilitation in disguise. It is important to note that in the MEAT approach, physical therapy is indicated from day one or even day zero. Have a knee replacement? Sprained your ankle? The studies show that earlier you can begin physical therapy, the better. The only cases which are exempted from this are surgeries like ligament or tendon repairs that require anchors or sutures to heal a bit before beginning physical therapy, and any injury that is given a non-weight bearing status.

The RICE approach is rarely used anymore, even for acute injuries like a sprained ankle (assuming there are no catastrophic issues like torn ligaments or broken bones). Rest is obviously not good for a sprained ankle. You want as much early movement as you can get within your pain tolerance level. Slow range of motion movement will actually decrease your pain in many cases. Immobilizing the area leads to much longer recovery times because your muscles begin to stiffen up and motor control quality decreases. The use of ice is hotly debated. In practice, if there is no swelling taking place, ice is unnecessary. If there *is* swelling, compression is actually more effective than ice. Ice is really only useful for dulling pain, and analgesics usually work better for this. If you use compression, elevation is also unnecessary. Based on these factors, the RICE approach would seem to be outdated and inferior to the MEAT approach.

To watch the MEAT approach in action, one need only take notice of those athletes with severely sprained ankles who return to jogging and running the next day when they could not put weight on it for 15-30 minutes after the sprain. For an *inversion sprain* (where the foot rolls inward), work into *dorsiflexion* (moving your toe toward your head) and *eversion* (out, to the side, away from your other foot). *Plantar flexion* (moving your toe away from your other foot) and *inversion* (moving the toe toward your other foot) will be painful, since that is how you sprained it. However, if you move slowly and continue to mobilize into dorsiflexion and eversion, the pain will typically begin to subside within ten minutes, and you may even be able to walk on it. If you remain unable to walk, continue to mobilize your ankle with light massage. You should eventually be able to walk without a limp, though your ankle and foot will be sore.

People who use the RICE model often wind up limping or needing assistance to walk, and continue to have difficulty walking for up to a week or more. On the other hand, those who begin mobilization early on, do not use ice, and continue to gently mobilize the injury into the night, tend to wake the next morning feeling fine. They can walk normally and some can even jog or run.

The opinion of a medical professional can not be overstated. If you use the MEAT approach without consulting a medical professional, you do so at your own risk.

WORKING AROUND INJURIES

Working around injuries typically involves removing aggravating exercises in your routine and replacing them with alternative and supplemental exercises until the injury is corrected. The most important thing is that you continue to rehabilitate injuries as you work around them.

Stay in the habit of working out. Intra-limb and opposite limb exercises are tools used for maintaining strength in the joint that has been injured while you continue to normally exercise the unaffected limbs and other areas. This promotes blood circulation which facilitates healing in the areas that have been injured.

In the following example, the athlete has a right shoulder injury. It still hurts to move it, and there are doctor's orders to rest/avoid exercise with this injured body part. Here are some types of exercises you can utilize when working around the injury.

Alternative Exercises

- Aim for alternative exercises. If it hurts to perform dips but it does not hurt to perform pushups, make that substitution. Continue working out without further irritating the injury.
- If a particular exercise irritates an injured area of the body, try moving down a couple of progressions with that exercise. If the lower progression can be performed without irritating the injury, keep exercising using that lower progression.

These are the two main options. It is important to keep working out (safely!) in order to maintain strength and hypertrophy gains and stay in the habit of exercising regularly.

Intra-Limb Exercise

The number one reason your muscles begin to atrophy (the opposite of hypertrophy) is immobility and disuse. Atrophy caused by immobility occurs very rapidly, often as soon as a week or two after restricting a joint due to injury. Anyone who has worn a cast after breaking a bone has seen how this works.

Using the example of the shoulder injury, the first thing you want to examine is whether or not you can use the rest of your arm for exercise. If so, you can counter the effects of atrophy with isolation exercises for your elbows, wrists, and fingers. If a doctor has been seen, it would be a good idea to talk to them to see if arm or forearm exercise is contraindicated during the period of immobility for the shoulder. If exercise is cleared, it is time to get busy.

This is a great time to perform specific isolation exercises for your arms like biceps curls or triceps extensions. Forearm exercises can maintain strength in your arm while your shoulder is immobile. Grip work is often a good choice as well. Exercises that use part of the shoulder muscle for stabilization should be avoided if they irritate the injury.

Using your arm and forearm muscles sends neurological output to the arm as a whole—important, because the radiating effect of neuromuscular impulses will fight atrophy. Activity from the motor neurons is very important to the health of the muscle. In fact, if one were to cut through a motor nerve or sever the spinal cord, related muscles will begin to atrophy within a matter of days. In the case of shoulder injury, you may find it harder to grip the bar during pull-ups or dips due to this effect.

You should aim to do as much light exercise or mobility work as you can without irritating the injured area. It will stimulate blood flow, thus speeding up the healing process and preventing muscle atrophy while maintaining this very important range of motion.

There are almost always ways to continue training injured limbs without making the injury worse. However, if any type of movement irritates an injured joint, this is a major red flag and you should see a medical professional immediately. If your doctor or physical therapist has given you the green light to perform rehabilitation work, but doing so is painful, consult them as well. There are some instances where it is helpful to work through the pain, but this is not always the case. Note that your aim should always be to feel better than when you started exercising, or at least to end feeling good overall.

Opposing Limb Exercise

Referring again to our right shoulder injury model, one of the things that can retain strength in the injured arm is performing strength work with your uninjured arm. Your nervous system is very adaptive; one of its interesting adaptations is the phenomena of *cross education*. When a unilaterally trained skill or strength movement is performed with the opposite limb, strength benefits are transferred, even if that particular limb has not practiced the skill or performed any strength work. Performing unilateral work with your uninjured left arm will benefit your injured right arm.

As an experiment, if you normally throw a ball or dribble a basketball with your left arm, practice throwing or dribbling with your right arm. After a significant unilateral practice, test your left arm. You should be able to dribble better or throw the ball farther without having practiced on that arm at all.

Studies show that the transfer of strength to the opposite limb from cross education is around 5-10%. While this is not much, it is still very beneficial, especially if your injury sets you back more than two weeks. At this point, your body is at risk for muscle atrophy and rapid decrease in neurological strength. Retaining as much strength and stability as possible is critical for speedy recovery.

You do need to take care to ensure that no imbalances develop between uninjured and injured limbs. This can be accomplished by maintaining a low volume and fairly high intensity level, similar to typical strength work. Aim for a few sets of three to six repetitions with the opposite arm if you are going to perform unilateral work.

Unaffected Limbs and Other Areas

After exhausting all options with your injured limb and the opposing limb, you still need to continue working the rest of your body. Some types of full-body exercises like squats and deadlifts may interfere with proper healing. Any exercise that irritates your injury should be avoided until you recover.

This is a great opportunity to work on specific weaknesses that do not interact with your injured right shoulder (to use our model). For example, if you know you have tight hamstrings or a tight back, you can improve these mobility limitations while you are recovering from your injury. This is especially important if flexibility and mobility are lagging behind in certain skills like press handstand, V-sit or manna-type work. For your legs, it may be better to focus on light-intensity exercises to help improve your heart rate and blood flow, as this will accelerate the healing process. Pursue balance and agility work. If your injury is in your lower body you might be able to focus on handstands or rings strength. Work on as many weaknesses as you can without impeding the injury recovery process. Do not allow an injury to steal your motivation; let it be a learning experience and opportunity to work on your weaknesses so you can come back stronger than ever.

FINDING A GOOD MEDICAL PROFESSIONAL

When it comes to finding a good medical professional, you should look for a well-qualified orthopedic doctor, physical therapist, or chiropractor that really listens to your situation and connects with your personality. While there are some massage therapists and personal trainers who know a lot about injuries, this is the exception. Find a professional who works specifically with athletes.

Medical professionals will specialize in different things, especially orthopedic doctors. Some work specifically with the lower body, some with the upper body. There are shoulder specialists, knee specialists, and so

forth. It is less important to find the specialist for your exact injury than to find one that works with athletes and has a good reputation. As the saying goes, *the cream of the crop rises to the top.* These tend to work with college or high school athletic teams and have extensive knowledge of orthopedic injuries and treatment options based on the severity of the injury. Here is a threefold plan for choosing a qualified medical professional:

- Ask your family and friends for a referral. Athletic friends can usually recommend a good doctor, physical therapist, or other medical professionals.
- Contact local schools and universities and ask which physicians and therapists they use for their athletic teams. Chances are they have good knowledge of exercise as they are experienced with athletes.
- If you know any medical professionals, ask them for the name of their doctor or physical therapist. Most health care practitioners know the top professionals in their field, and may even know them personally. There is a much greater chance of success when you see the "doctor of doctors" or "physical therapist of physical therapists."

Good medical professionals should be able to explain not only why they are performing particular treatments and but also the methodology behind them. If you have any question about a specific treatment, ask them directly. Learn to think critically about your body.

GOOD/BAD EXERCISES AND HOW TO THINK CRITICALLY

Welcome to the world of exercise, where everyone has an opinion on everything. To learn how to discern between "good" and "bad" exercises, follow these steps:

- "Bad" or "worse" is always relative. Ask for specifics.

For example, in terms of shoulder injury risk, one-arm chin-ups are potentially a "worse" exercise compared to weighted pull-ups. This is because in the former, you must control the torqueing movement that is not present with two-handed pull-ups. If the torque is not properly controlled it can lead to rotator cuff dysfunction, tendonitis, or a similar injury.

For something to be "bad" it has to be compared to something else. If someone says a particular exercise is bad, they should be able to suggest a better exercise you can perform instead. Likewise, "good" must be relative to a specific goal. If training for one-arm chin-ups by performing certain exercises is contraindicated, there are other exercises you can use. There is more than one way to reach most goals and exercises fall on a spectrum of good, bad, and everything in between.

- "Bad" or "worse" suggests a mechanism of potential injury.

Using the above example, the mechanism of potential injury is the relative control of the torque at the shoulder. However, you must control torque with any exercise. It is more accurate to say that a one-arm chin-up performed without adequate preparation for effective control is a bad move, rather than labeling the movement itself as bad. For things like squats with a rounded back, the rounded back may increase your risk of injury because the fluid in the disc will start to put posterior pressure on the laminal fibers, which may cause bulging or herniation of the discs. However, rounded back squats or deadlifts can be successfully built up to where there is minimal risk of injury.

Anecdotal evidence and experience counts for some. A coach's story about a patient who randomly hurt their arm doing X is one data point. However, if there are stories of one hundred people hurting their arms doing X the advice tends to be credible. The same is true of research. If research backs up the experience of one hundred people hurting their arms in the same manner, it is safe to label that experience as "bad" for that particular method.

Let's say you have only met a few people who have injured themselves performing kipping pull-ups (not much experience) and there is not a lot of research on the amount of force that kipping pull-ups place on the shoulders (not much data). However, you know there is a mechanism of injury wherein a heavily fatigued body dropping into the bottom of a pull-up position can cause rotator cuff or even labrum injury. This rate of injury appears to be higher in those performing kipping pull-ups than those performing standard pull-ups. You can therefore logically conclude that kipping pull-ups carry a higher rate of injury than standard pull-ups, even though you do not have much experience or research to back it up. In light of this, a good coach would advise beginners or those who are more prone to injury to avoid kipping pull-ups when they are just starting out. This doesn't mean kipping pull-ups are inherently a bad exercise—though they would certainly be bad be under certain conditions, such as with beginners (because they have not yet learned proper technique), with those who have previously injured their shoulders, and with athletes who are fatigued.

Exercise is always a cost-benefit assessment. One might perform the most dangerous exercises in the world and never get injured. A cost-benefit assessment looks at exercises as tools. A chain saw is a great tool for cutting, but carries some inherent risk of injury, whereas a power saw or hand saw is less dangerous but also less effective. All exercises bring with them a tension of risk vs. reward, some more than others. If an exercise is considered "dangerous" you may want to avoid it until you are more experienced. Research your exercises so you can be informed of any inherent dangers, and plan accordingly. This is where critical thinking comes in.

Always fact check. There could be a mechanism of injury that sounds logical but is false. Science has known for some time that a gluten allergy is a celiac disease, but has recently discovered that gluten insensitivity appears not to exist. In light of this, one could ask why eating gluten is ever detrimental for people who don't have celiac disease?

(The answer may partially lie in other research such as FODMAPs—fermentable oligo-, di-, monosaccharides and polyols. Those who remove FODMAPs from their diet due to irritable bowel syndrome and other gastrointestinal distress issues may show marked increases in how well they feel and perform. Even though "gluten insensitivity" may be a misnomer, this does not mean certain foods do not cause the symptoms. Wheat and other grain products in particular tend to have a lot of fructans, galactans, and polyols, all of which may irritate the bowels.)

To review:

- "Bad" is relative, especially in setting goals. Seek out alternatives. This can lead to you learning about useful, "good" exercises. If a person criticizes without suggesting a better alternative, they are likely just voicing their personal preference.
- To be truly "bad" an exercise must exhibit potential mechanisms of injury. If no mechanism of injury is indicated, the person advising you against an exercise is most likely spouting "broscience," (which is also colloquially known as "talking out of their butt.") Yes, the word broscience made it into this book.
- It is important to distinguish between hearsay, experience, and research.
- Always fact check. Google, Wikipedia, and WebMD are wonderful tools, but always consult experts in the field as well. This can be more difficult in some areas, such as nutrition.

CHAPTER 15 SUMMARY
HEALTH AND INJURY MANAGEMENT

Propensity for overuse, pain location, tissue quality, posture and positioning, and biomechanics all play critical roles in the development of an injury, either acute or chronic. Even if you have a good idea of what your injury is, have a qualified medical professional check it out.

A general evaluation of the circumstances surrounding any injury brings one to the conclusion that it is always best to see a medical professional for a diagnosis. Once you have a diagnosis, you can directly address the cause of the injury, allowing for faster recovery. If a solution is not readily available, it may be necessary to utilize the "wait and see" approach, though this is not preferred.

A chronological treatment of injury will allow for work on concepts such as protection from atrophy, range of motion, strength, etc. during the inflammatory, proliferation, and remodeling phases.

There are particular loading, repetitions, sets, and volume for rehabilitating specific injuries. Each injury needs to be addressed within the context of its severity and interference with normal bodily function. Most types of injuries can be addressed with light, controlled, eccentric exercises. High repetitions tend to work best.

It is possible to effectively and safely program around injuries using the methods of intra-limb exercises, opposite limb exercises, and exercising in unaffected areas. Intra-limb exercises on unaffected areas help maintain the strength and mobility of uninjured tissues. Opposite-limb exercises assist by the theory of cross education. Exercising in unaffected areas assists with blood flow and overall well-being.

Always perform rehabilitation work for your injuries instead of avoiding them by programming other types of exercises to compensate.

In situations of non-critical injuries, the traditional RICE approach is less effective than the newer MEAT approach. Methods to find a good medical professional and how to approach good/bad exercises by thinking critically were also covered.

- CHAPTER 16 -

LIFESTYLE FACTORS

Although lifestyle factors are not the primary focus of this book, they are very important to your training.

SLEEP QUALITY

Skimping on sleep is a surefire way to decrease progress with both strength and hypertrophy. Sleep is vital for recovery. While you sleep, your body prepares for your next workout. Sleep is the most anabolic time during the day.

The amount of sleep needed each night will vary from one person to another, ranging from six to nine hours. Most people do well with seven and a half to nine hours. Sleep cycles are typically an hour and a half in length, so it is actually more beneficial to get seven and a half or nine hours of sleep than eight hours. Your sleep cycles may be a bit longer or shorter: spend some time evaluating what works best for you. It is important, because waking up mid-cycle will cause you to feel groggy. It is important to wake in a lighter sleep rather than in the middle of a deep sleep. You can easily track your sleep cycles through free or paid iPhone and Android apps; there are even alarm clock apps that will wake you during your lightest period of sleep within a set window. Beyond this, there are numerous ways you can improve your sleep. Here are a few quick tips:

- Use *F.lux* or a similar dimming application for your computer/phone that emits red light after dark in order to not mess with circadian rhythms.
- Limit use of electronic devices one to two hours before bedtime. Use this time to read or meditate.
- Eliminate electronic devices, outlets, and plugs near your bed.
- Sleep in a pitch-black room with blackout curtains, or use a sleep blindfold.
- Eliminate all sounds; use earplugs if needed. Alternatively, some people sleep better with white noise (rain-type sounds or fans) than utter silence.
- Sleep in a cool, dry room (about 60-65 degrees if possible).
- The best scenario is getting to bed early enough that you wake without an alarm. Try to go to bed before 10:00.
- Keep your sleep habits consistent. It is better to go to bed consistently at a later time than jumping around (10:00 one night, 1:00am the next, 11:00 the night after).
- Avoid caffeine and other stimulants before bed.
- Avoid alcohol and other depressants before bed. Although alcohol can help you fall asleep faster, your sleep quality will usually suffer.

Here are some physical exercises and other techniques that can help improve sleep quality:

- Stand on one leg until you are exhausted, then switch to the other leg and do the same. This fatigues your hip muscles, which can improve sleep quality.
- Perform Esther Gokhale's spine lengthening routine before bed. Move from sitting to stretching your spine out as you lie down.
- Exhaust yourself from physical activity like hiking, pickup sports, lifting, running, etc.
- Deep breathing exercises.
- Deep tissue massage.
- Light stretching or foam rolling.
- Long, hot showers. (Cold showers are more effective for some people.)
- Plan any exercise, especially high-intensity exercise, earlier in the day rather than later.

These are just a few of the ways you can improve your sleep quality. Experiment with these and others until you find what works best for you. Supplements can be used, but try the natural methods listed above first. If you are already doing many of these things, the following list of supplements can improve sleep but they should be just that—supplements. Always consult a medical professional before using these or any other supplements.

- Medium chain triglycerides from sources like coconut milk.
- Magnesium. Orally works, but it absorbs better topically—via Epsom salt or other magnesium salt baths, especially.
- Melatonin.
- Phosphatidylserine, an anti-cortisol supplement.
- 5-hydroxytryptophan or 5-HTP, a derivative of tryptophan.
- L-theonine.
- Valerian root.

Sleep can be a troublesome issue. Here are two final tips. One is more of a psychological conditioning tip—use the bedroom *only* for sleep or sex. It can be difficult to fall asleep if you hang out in your room a lot and are conditioned to watch TV, play adrenaline-infused games, or study in an alert state there.

The second tip is a personal technique that I utilize. First, settle into a comfortable reclined position. Then, initiate a deep breathing cycle (in through the nose out through the mouth) with a 6/3 cadence—six seconds of inhalation through your nose and three seconds of exhalation through your mouth. Now roll your eyes back in your head as though you are already knocked out from sleeping. Finally, begin actively daydreaming or imagining something cool—something you wish would happen that is not directly related to daily life. This prevents your mind from wandering and getting frustrated and may help transition you into the sleep you desire.

Andrew Weil has a similar technique called the *4-7-8 breathing technique*. To perform this, breathe in through your nose for four seconds. Now, hold your breath for seven seconds. After that, exhale through your mouth for 8 seconds. Repeat the cycle until you are relaxed and fall asleep. Elongating your breathing, paired with holding your breath, helps calm down your nervous system and slow your heart rate for relaxation.

NUTRITION

Since this is not a nutrition book, the only recommendation is that you eat lots of nutrient-rich foods and avoid foods to which you have allergies or sensitivities. This approach works for most people and successfully avoids the polarizing nutrition recommendations of so-called fad diets.

Nutrient-rich foods are prevalent in most cultures: fruits, vegetables, nuts, seeds, meat, birds, fish, eggs, dairy, and grains. High-quality foods contain all of the vitamins and nutrients you need, and also have a relatively low caloric density to help you stay lean. Carbohydrate staples are generally solid as long as you are not allergic or sensitive to them: potatoes, sweet potatoes, rice, yams, and various grains (ideally prepared traditionally through soaking). Animal meats, especially organ meats, tend to be the best way to get protein. You can get good fats from the remaining categories, such as nuts, fish, and dairy.

If you find yourself allergic or sensitive to any particular foods or categories of food, avoid these while attempting to gain as many nutrients as possible from what is left. Consulting a nutritionist may be required, depending on your degree of sensitivity or reaction. There are allergy tests that are made to detect these sensitivities and reactions.

Studies have shown that many athletes benefit from increasing their daily protein intake to .7 grams per pound or about 1.5 grams per kilogram of bodyweight. If you are training for strength of hypertrophy, this or a slightly higher protein intake is recommended. Experiment and find out what works best for you.

Here are four general statements that sum up the biggest concepts that most athletes need to learn. If you have personal weight loss or weight gain (for muscle mass) goals, you may need to make some modifications.

- **Diet modulates weight.** Nutrition is what governs your weight. If you consume more calories than your body actually uses, you will gain weight. In contrast, if you consume fewer calories than your body uses, you will lose weight. To burn fat, cut your calories consumption.
- **Exercise modulates body composition.** Exercise is what causes the body to gain muscle mass and/or use fat for energy. This is especially true on a hypocaloric diet, where you eat fewer calories than you burn in a day. When athletes are cutting to make a weight class, they still work out and eat enough protein so that they will maintain as much muscle as possible. Obviously, diet modulates body composition to some extent too. An obese person losing 50-100 lbs of fat will have improved body composition.
- **Nutrition quality is related to health and partly to weight.** Nutrition quality is specifically related to health in that the more nutrient-dense foods you eat, the healthier you will be. High or low nutritional quality only partly affects people's weight as regards the speed of weight loss on a caloric deficit, unless there are already dysfunctions in metabolism (like thyroid problems).
- **Exercise intensity improves speed of body composition changes.** High-intensity exercises like sprinting, strength and hypertrophy training through barbells or bodyweight, circuit training, etc. tend to improve the speed of body composition changes over lower-intensity exercise like cardio, cycling, and other endurance sports. The fastest way to drop weight is a combination of high-intensity and low-intensity exercise.

Some colloquial statements like "*Abs are made in the kitchen*" are true (although exercise helps). Others like "*high repetitions and low weights for toning*" are false (toning is simply increasing muscle and decreasing fat mass). The fastest way to tone would be to get your diet under control, lose weight, and perform hypertrophy-specific training to increase muscle mass.

- Calories In = What You Eat
- Calories Out = Total Daily Energy Expenditure (TDEE) = Basal Metabolic Rate (BMR) + Activity

Calories in is a simple concept as it takes stock of what you eat. *Calories out* is only slightly more complicated. The concept of *total daily energy expenditure* (TDEE) is a combination of *basal metabolic rate* (BMR) and calories expended through activity. BMR is a physiological term for the energy it takes to keep you alive while in a state of rest. Most of your energy is expended to keep your body warm and your organs running. Activity accounts for the rest of the calories you burn. With these two concepts in mind, we can begin to talk about weight loss and weight gain.

Weight Loss

If you are obese and change your diet to consist of low calorie, nutrient-dense foods (such as vegetables), you will naturally lose weight. The problem with the modern *standard American diet* (SAD) is it contains very few nutrients per calorie. Potato chips and French fries are low in nutrients, high in calories, and are not very filling. Most sugary foods are like this too. Modern processed grains like spaghetti and bread are similar, though several decades ago they were not. Cut down on these common American foods and consume more fruits and vegetables and traditionally prepared (soaked, slow cooked) grains in their place.

Given that diet modulates weight, you need to consume fewer calories than you are burning. Eating more filling foods will help. Eat until you are satisfied (70-80% full) rather than 100% full. In conjunction with this, eliminate as many empty calories as you can, especially liquids. Replace juices, sodas, and lattes with water, tea, or black coffee.

Tracking calories solves many weight loss issues, as most people routinely underestimate how many calories they actually consume each day, especially through liquids that contain 150-180 calories per serving. In terms of tracking *calories in* < *calories out* it is best to take two actions during the course of a week. Chart your food intake for the week using a physical or online food journal like FitDay. Divide by the number of days to find out how many calories you typically burn each week. You want to consume approximately 200-500 fewer calories in subsequent weeks if you are trying to lose weight. Alternatively, you can use the Internet to find a TDEE equation that will allow you to estimate your BMR and calories burned from activities. This should give you a ballpark number to start from; decrease calories from there.

Weight Gain

If you are looking to gain weight, the process is super simple: Eat like a madman. In order to gain weight in the context of musclemass, three things need to be present:

- **High-Intensity Stimulus:** lifting weights, bodyweight strength training, sprinting, and the like. This is necessary to force your body to adapt to add muscle mass.
- **Caloric Excess:** This gives your body the energy needed to produce muscle mass.

- **Enough Protein:** Generally, aim for .7-1 g/lbs protein per day of the weight that you want to be. If you are 150 lbs and want to weigh 200 lbs, aim for 200 g/lbs protein per day.

The only difference between this and what you should do for weight loss is that you increase the amount of calories you ingest instead of decreasing it.

Let's talk about the scenario of losing fat and gaining muscle simultaneously. The general rule of thumb is that extra fat within the body is an energy source that can be metabolized by the body. Therefore, if you are overweight and lifting weights, but eating in a caloric deficit, your body can call on the fat mass as the extra energy needed to build muscle. As your body composition improves you will no longer be able to do this as effectively. However, this is one of the extraordinary capabilities of the body and a reason why lifting weights can be superior for losing fat than cardio or higher repetitions. The higher your percentage of body fat, the easier it will be for your body to lose fat and gain muscle simultaneously.

Workout Nutrition

Workout nutrition is a specific case. Eating one to two hours before working out could either have a positive or negative effect on your workout. Food in the gut may cause parasympathetic nervous system activation, which may interfere with the optimal sympathetic nervous system output needed for exercise. However, it really depends on the individual. Many athletes prefer fasting before a workout, but you should try both methods and do what works best.

A recent meta-analysis by Brad Shoenfeld entitled *The effect of protein timing on muscle strength and hypertrophy* suggests that the timing of protein intake may not matter as much as your total daily protein intake. Drinking a protein shake before, around the time of a workout, or after helps people accumulate the amount of total protein they need for the day. Protein synthesis occurs in approximately 3 hour spikes in the body, so time will tell if more research affirms this. Classically, if you want to optimize muscle mass gain, divide your protein intake into 30-gram portions taken every two to three hours.

Supplementing with liquids instead of eating after a workout does make a difference. Liquid nutrition reaches the muscles faster. While it is preferable, it is not absolutely necessary. Whole chocolate milk is one of the best workout drinks because it contains natural whey, casein, and carbohydrates for energy.

Supplements should be just that—supplements to a good diet. The primary supplements that have been proven to work effectively are whey, creatine, casein, and BCAAs. But use good judgment: research has consistently shown that multivitamins and minerals tend not to be as effective as real food, so eat as much nutrient-rich food as possible. Ensure particularly that you get enough vitamin D from sunlight and fish oil. If you do have a deficiency in any area, supplements can definitely help, though be careful if you self-diagnose: there is not enough data available on the long-term effects of vitamin and mineral supplementation for those who do not have a deficiency. For the latest unbiased research on supplements, visit www.examine.com.

WORKING OUT WHILE SICK

Controversy exists over whether or not you should work out while you are sick. High-intensity workouts place greater amounts of stress on the body, which can exacerbate an illness. The same immune system that helps restore physiological damage from workouts also fights infections and pathogens. If your body is working

overtime to recover from a high-intensity workout, it may have a hard time recovering from an illness. People who are sick often perform a workout and become sicker, and people who are nearly recovered from an illness might perform a workout, only to have their illness return a few days later.

It is not generally a good idea to perform resistance training, high-intensity interval training, circuit training, or sprinting when you are sick or recovering from an illness. Allow your body to fully focus on recovery, rather than diverting your immune system to repair muscles post-workout. If you do decide to work out, some low-intensity resistance or strength training can be fine, assuming that the damage done to your muscles is minimal. High-repetition endurance training can also be acceptable as long as the overall volume is not too high. The type of training that does the most muscle damage is moderate to heavy weight and moderate repetitions in the six to twelve range; this is what should be avoided.

It is widely held that it is okay to work out if you have only a head cold, but you should not work out if the illness is in your throat, chest, or lower body. This holds true, as long as you keep the intensity of the workout low. However, if you have a fever, you should not work out at all. Allow your body to use all of its resources to fight off infection while you are in this vulnerable state.

Chest illnesses like pneumonia and bronchitis are more potent than head colds. Doctors prefer that you stay in bed while recovering from these illnesses. However, this can create an issue for an athlete. Total rest and immobility (i.e., bed rest) can fosters these conditions further. While you are in a hospital on bed rest, you are at risk of nosocomial infections. At such a time, your body needs some type of movement aside from an actual workout, which it could not handle. You may want to get up to take a short walk to get your blood flowing, or perform deep breathing exercises, especially if you are coughing a lot. This is better than lying there, doing nothing.

If you feel like your body is up for a workout, keep the intensity light. Perhaps you could go for an easy recovery run, or perform a warm-up routine. Pay close attention to how you feel and take notes in your workout book. If you have the tendency to overdo it once you get warmed up, avoid workouts completely until you are back to full health.

Any exercise you perform should leave you feeling better than you started. If you begin to feel worse, stop exercising and rest for the remainder of the day. Remember, your body and muscles recover when you rest, and the same is true for recovering from illnesses.

CHAPTER 16 SUMMARY
LIFESTYLE FACTORS

Sleep quality and nutrition have a big influence on the body, so you should do everything you can to ensure you get enough sleep and sufficient nutrients from your food.

In general, diet modulates weight. Exercise modulates body composition. **Nutrition quality is related to health and partly to weight. Exercise intensity improves speed of body composition changes.**

Weight gain and loss is a product of calories in and out. For athletes, aim for .7-1 g/lbs per day of protein. Modify your caloric intake to your needs in terms of weight loss or weight (muscle) gain.

Supplements are not recommended as a rule, as it is more beneficial to get the majority of your nutrients directly from actual food. However, supplements can help if you develop a deficiency in a certain area. It is particularly important to ensure your body gets enough vitamin D through sunlight and omega 3s such as in fish oil. If you are sick, avoid working out; if you do choose to work out, keep it light.

Part Four

PROGRAM IMPLEMENTATION

- CHAPTER 17 -

UNTRAINED BEGINNER: ROUTINE CONSTRUCTION AND PROGRESSION

INTRODUCTION

The programs included in this book are examples to give you an *idea* of what your created routine could look like. Don't use these routines verbatim; instead follow them as guidelines and modify them to fit your own goals, recovery factors, and to allow room for other activities you enjoy. The goal of *Overcoming Gravity* is to teach you how to construct effective routines to progress you toward your personal goals. If you use the examples offered verbatim, you are missing the point—you must learn to schedule your own routines to fit your own life. Never take advice blindly—there may be something that works better for you!

It is common for some athletes to come in with a flexibility or skill deficit despite having the strength to execute some high-level strength movements (especially in the context of handstands). Athletes with a weight-lifting background and those who participate in sports at a competitive level will find this to be the case. Not everyone has developed their strength and flexibility to be uniform across the board on the provided strength and progression charts. This is normal.

The area(s) where you are lacking could be the place where you make the most progress, provided that comparable amounts of time are invested on all aspects of development. Working your strengths is good, but it is also important to bring up weaknesses, work on flexibility, and ensure your skills are uniform between push and pull exercises. This will help you remain injury-free. The ambition for developing higher-level straight-arm isometrics routed through the skill and strength-skill movements like handstands and straight-arm press handstands will pay dividends later in your training.

You may find that you progress with certain techniques or exercises much more quickly than with others, given your own abilities and anthropometry (limb lengths). You can approach this either by decreasing the overall volume of these exercises or playing to your strengths. Make sure that you keep yourself structurally balanced.

The material in this chapter will show you how to modify material that was presented earlier into a coherent routine that works for you. The focus will be on helping you select proper exercises, frequency, volume,

and repetition schemes for your own workouts. Think of the earlier chapters as puzzle pieces and these next four chapters as those pieces coming together to form a clear picture.

Regarding *notation*—example routines will be written in several different notations. You must develop the ability to read various routine notations, since different coaches and athletes use different types of notations. Sometimes the notation will read *exercise: sets x reps*; other times, *sets x reps of exercise*. There are many variations.

UNTRAINED BEGINNER: ROUTINE CONSTRUCTION

To review, here are general needs of the *rank* or *untrained beginner:*

- Become introduced to fundamental exercises and attain a good proficiency in them.
- In most cases, utilize a higher number of repetitions to solidify movement patterns and build up connective tissue strength.
- Focus heavily on any individual weaknesses that you bring to exercising. For example, if you have a desk job, you may have issues stemming from poor posture that could lead to injury if left unaddressed. Most sedentary individuals tend to have very poor mobility and flexibility.
- Get on a generalized, balanced routine that will begin with high repetitions and then transition to traditional strength training.

At the lowest levels of ability, your aim should be to develop basic strength, prepare the joints for upcoming levels of ability, and gain mobility, especially in the shoulder girdle, back, and hips. Most untrained beginners are new to the world of exercise or have not exercised in some time. Other populations that may fit into this category are athletes of advanced age, those who have previous injuries, or those with such busy schedules they cannot dedicate much time to exercise.

If you are new to organized exercise, you will need a plan that starts you off slowly so your body can prepare for the rigors of exercise. Here is a list of goals from the sample routine in Chapter 5. These are arbitrary goals, selected as hypothetical examples to show you how to progress using a routine. You will select your own list of goals.

Sample Goals

- 10 Freestanding Handstands
- 5 Strict Muscle-ups
- 5s Planche
- 5s Front Lever
- 10 Pistols
- 10 Vertical V-Sits
- 5s Iron Cross

These are target goals; a beginner must work their way up to them. At this stage, upper-level goals like back levers, front levers, planches, and other isometrics should not be part of your routine. You must first develop strength in the basics and perform high-repetition work coupled with mobility in order to prepare your joints and connective tissues adequately.

Practice the exercises and next progressions at this skill level on the strength and skill progression charts. In the range of Level 1-4, you will notice that there are only a few exercises that go down to Level 1-2. At these levels, you will focus primarily on fundamental upper-body exercises like wall handstands, lower-level L-sit progressions, pushups, pull-ups, dips, and rows. The rest of your routine will reflect this. (see *strength work*)

Warm-Up

- Blood Flow: 10-20 Burpees, 60s Crawling (or variable distance, such as 100 meters)
- Mobility: 15x Wrist Circles, Shoulder Circles, Bodyweight Squats, and any other body part or joint that needs to be warmed up, 60s of Support Hold Work (parallel bars or rings or chairs/counters), 5x Skin the Cat / German Hangs
- Positional Drills: 30-60s of Plank, Both Side Planks, Reverse Plank, Hollow, and Arch Holds.

Let's talk about the *blood flow* portion of the warm-up first. For untrained beginners, burpees with a pushup (start standing, squat down, pushup position, pushup, squat position, end with a jump) may actually take away from your workout if they are too intense. Squat thrusts might be a better option to increase your heart rate and kick-start blood flow. If you are very new to exercise or out of shape and have not yet reached Level 1, I recommend employing a different exercise, such as jumping rope, jumping jacks, or light jogging.

Mobility should be tailored for the individual based on their needs and goals. The mobility section of the sample routine currently lists wrist circles, shoulder circles, bodyweight squats, sixty seconds of support hold work, and five German hangs. This may not be enough mobility work for an individual who is untrained or out of shape. If you have any range of motion issues or previous injuries, you need to perform more mobility work for those areas. Wrist circles usually work great for warming up your wrists. However, individuals who regularly use computers and/or those with tight wrists from a previous injury might need an extensive wrist warm-up that could include:

- Stretching your wrists with palms flat and hands pointed in all directions. Perform each hand direction individually and move in and out of these positions 5-10 times.
- Stretching your wrists with the back of your palm against the ground and hands pointed in all directions. Perform each hand direction individually and move in and out of these positions 5-10 times.
- Placing your palms flat against the ground and pulsing your fingers into the ground to lift your palms off the ground.
- Placing the palm of one hand flat on the ground and use the other hand to pick up one finger at a time to mobilize each finger individually.

This is just mobility work for the wrist. There are plenty of other mobility exercises for the elbows, shoulders, scapular, back, and legs that can be used depending on which parts of your body feel tight. As a beginner, it can be very helpful to have a light mobility or stretching routine to perform on rest days. Mobility work can be time-consuming; if the amount of mobility work your joints need is too much to perform *with* a workout, put it all in a single routine for your rest day. This will enable you to work less mobility on your workout days so that you have more time with skill building.

Keep in mind that mobility work will be beneficial in the long run. Lower-level flexibility and joint work will get your joints used to moving to end range of motion without a lot of weight on them and this will

prepare them to handle heavier loads down the road. This will be essential when you progress with your exercises. (such as when moving from standard handstands to one-arm handstands).

Positional drills will also be quite useful in the long run, as they will help you maintain correct body positioning while performing more difficult exercises. You should perform positional drills now, at this low skill level, so you have time to get used to maintaining body tension when connecting the exercises, critical for performing more advanced bodyweight exercises correctly. You can phase out positional drills as you become stronger and more versed in correct technique, but they are vital in the beginning. The plank, side planks, reverse (stomach up) plank, and hollow/arch holds are good for learning proper body positioning. If you are learning a sports discipline that requires specific body positioning training (like martial arts or dance) this is a good place in your workout to practice those positions as well.

Skill Work

- 5-10 minutes of handstand work, performed against the wall.

This is the only skill work that I recommend for untrained beginners unless you are specifically training for a sport or discipline that requires more. The time above includes rest times. You may only be inverted for five to ten seconds during the first few sets. With a minute or two of rest between sets, your total accumulation of handstand time may only end up being thirty to forty-five seconds. As you become stronger, this number may increase to sixty seconds or longer.

Handstand work is tough on the wrists, especially if you do not have much practice supporting your bodyweight on your wrists. Counteract this by performing additional mobility work, but if your wrists still feel weak, it is likely that handstand work may have to be decreased. You may end up only practicing handstands for thirty seconds each workout for your first few months of training until your wrists are conditioned enough to allow you to practice more. This is fine. Do not be worry if you have to take handstands or any other exercises slower if your wrists or any other joint(s) are limiting you. It is better to build up slowly and stay healthy than aggravate your joints and end up performing prehabilitation or rehabilitation work. In the long run, you will progress faster by starting slower.

Strength Work

- *Jumping Pull-ups*: 3x5→15 with 3 minutes of rest at 50x0 tempo
- *Jumping Dips:* 3x5→15 with 3 minutes of rest at 50x0 tempo
- *Ring Rows:* 3x5→15 with 3 minutes of rest at 10x0 tempo
- *Pushups:* 3x5→15 with 3 minutes of rest at 10x0 tempo
- *Squats (pistol progression or barbell):* 3x5→15 with 3 minutes of rest at 10x0 tempo
- *Deep Step-ups:* 3x5→15 with 3 minutes of rest at 10x0 tempo
- *Tuck L-Sit* for 60s total, in as many sets as needed, not to failure
- *Compression Work* for 3x10s

This is an example of a basic routine focused on improving strength in the categories of vertical pushing, horizontal pushing, vertical pulling, and horizontal pulling. This routine also facilitates balance between the muscles of the shoulder girdle and focuses on improving overall strength. You will notice several changes were made to the routine above from the example presented in Chapter 5. This is to better facilitate the needs of an untrained beginner. The changes made are as follows:

- All of the exercises were modified to the appropriate level. Here's how this may look in practice: You may begin with three repetitions of dips, five repetitions of pull-ups, eight repetitions of push-ups, and nine repetitions of rows and so forth for the remainder of the exercises. It is natural for there to be differences between the exercises; you will still increase them in subsequent workouts.
- An elongated 5s eccentric was added, useful to gain strength and improve overall for the jumping pull-ups and dips, which consist of a feet-assisted concentric.

The number of repetitions was increased from eight to fifteen across the board. Untrained beginners typically need to perform more repetitions to facilitate connective tissue strengthening before making bigger jumps in progressions. There is no detriment to higher repetitions and moving up in progressions for either hypertrophy or strength for untrained beginners. Hypertrophy remains the same because all fibers are capable of hypertrophy and need to be trained and beginners have inefficient neural pathways (lack of recruitment and synchronization), which means strength gains will come from multiple repetitions, not just working with lower repetitions.

The next section shows how all of this fits together in workouts and progressions from week to week and answers common questions.

Prehabilitation, Isolation Work, Flexibility Work, and Cool Down

- 3x1-minute sets of *Rice Bucket* (for the wrists)
- 3x10 *Biceps Curls*
- 3-5x30s *Splits Holds*
- 3-5x30s *German Hangs*
- 3-5x20s *Back Bridges*
- 1 minute of *Deep Breathing* (in through the nose, out through the mouth)

Finally, we have *prehabilitation*. As an untrained beginner, you can add or subtract the amount of work performed based on your needs. This is the time to do additional wrist work (aside from mobility) if you are having issues with your wrists from putting weight on them during handstands. Wall slides or shoulder stretching could be added if you cannot get your arms directly overhead for a handstand. You can do specific scapular work like retractions or depressions plus rotator cuff work to keep your shoulders healthy. Back and leg flexibility work may be needed. Yoga or Pilates may be good options if you need an extensive amount of mobility and/or flexibility in your lower body.

Most of the time, isolation work for weak links is not needed at this point, unless you want to add particular isolation work to increase strength and hypertrophy in specific muscles like your biceps. The most attention should be paid to the compound exercises in the routine in order to improve gross motor movement.

If you are an untrained beginner coming in with a high level of strength, you could consider integrating some basic static holds into your routine. Your workouts at this point will be focused on improving wall and freestanding handstands, L-sits, and possibly moving toward elbow levers (if that is one of your goals). Skill work used for other activities and disciplines may be integrated in here as well. As you move into Levels 3-4, the recommended exercises branch out into a varied set of movements and static positions as denoted by the exercises listed in the charts:

- Wall HeSPUs
- Back Lever
- Front Lever
- Planche
- Muscle-ups
- Rings Pushups
- Dips and L-Dips
- Pull-ups and L-Pull-ups
- Rows

Choose your direction based on both short-term and long-term goals. You may ultimately want to learn all of the skills listed above, but it is not a good idea to work toward all of them at once, as spreading yourself too thin will set you back. Instead, pick two pushing and two pulling goals and build a routine around them. It is best to select an overarching "theme" for your routine. Many people want to obtain the static holds as their primary goal. If that is your goal, build a routine around those strength isometrics. On the other hand, if your goal is to train for a sport, your routine should be more biased toward getting strong at movements and only adding static positions later as you improve in strength at many different ranges of motions. Remember, there are no right or wrong answers here; you need to decide what you want to learn and prioritize that.

Select these movements if you want to focus on isometric exercises:

- Wall HeSPUs
- Back Lever
- Front Lever
- Planche
- Muscle-ups
- Rows

Select these if want to focus on overall strength:

- Wall HeSPUs
- Muscle-ups
- Rings Pushups
- Dips and L-Dips
- Pull-ups and L-Pull-ups
- Rows

The warm-up, skill work, and prehabilitation/flexibility/cool down portions of your routine remain the same; the only difference is in the strength work portion. Here are two examples of what you could use for the strength work portion of your routine:

- *Jumping Pull-ups:* 3x5→15 with 3 minutes of rest at 50x0 tempo
- *Jumping Dips:* 3x5→15 with 3 minutes of rest at 50x0 tempo
- *Ring Rows:* 3x5→15 with 3 minutes of rest at 10x0 tempo
- *Pushups:* 3x5→15 with 3 minutes of rest at 10x0 tempo
- *Squats (pistol progression or barbell):* 3x5→15 with 3 minutes of rest at 10x0 tempo

- *Deep Step-ups:* 3x5→15 with 3 minutes of rest at 10x0 tempo
- *Tuck L-Sit* for 60s total, in as many sets as needed, not to failure
- *Compression Work* for 3x10s
- X seconds of *Frog Stand* or *SA Frog Stand* (planche)
- X seconds of *Tuck Back Lever* or *Advanced Tuck Back Lever*
- 3x5→15 of *Wall HeSPU* or *Muscle-up Work*
- X seconds of *Tuck Front Lever* or 3x5-12 of *Wide Rows Progression*
- *Squats (pistol progression or barbell)*: 3x5→15 with 3 minutes of rest at 10x0 tempo
- *Deep Step-ups:* 3x5→15 with 3 minutes of rest at 10x0 tempo
- *Tuck L-Sit* for 60s total, in as many sets as needed, not to failure
- *Compression Work* for 3x10s

You should refer to the isometric charts to get how many Y sets of X second holds you need depending on your maximal holds. A purely dynamic-focused routine could look like this:

- *Dips and L-Dips* 3x(3→15) with 3 minutes of rest at 10x0 tempo
- *Pull-ups and L-Pull-ups* 3x(3→15) with 3 minutes of rest at 10x0 tempo
- *RTO Pushups* 3x(3→15) with 3 minutes of rest at 10x0 tempo
- *Rows* 3x(3→15) with 3 minutes of rest at 10x0 tempo
- *Squats (pistol progression or barbell):* 3x5→15 with 3 minutes of rest at 10x0 tempo
- *Deep Step-ups:* 3x5→15 with 3 minutes of rest at 10x0 tempo
- *Tuck L-Sit* for 60s total, in as many sets as needed, not to failure
- *Compression Work* for 3x10s

Other exercises that may be substituted into your routine:

- Appropriate *Muscle-up or Assistance Work* 3x(3→15) with 3 minutes of rest at 10x0 tempo
- *Wall HeSPUs* 3x(3→15) with 3 minutes of rest at 10x0 tempo

At this level, you may not need to get to the point where you perform fifteen to twenty repetitions. If you have been working this many previously, it may be helpful to stop at twelve instead. However, if you are experiencing any connective tissue soreness or are at risk of a potential overuse injury, stick with the higher repetitions to train your connective tissue without overloading.

UNTRAINED BEGINNER: ROUTINE PROGRESSION

Your completed routine should look something like this:

Warm-Up

- Blood Flow: 10-20 Burpees, 60 Crawling (or variable distance, such as 100 meters)
- Mobility: 15x Wrist Circles, Shoulder Circles, Bodyweight Squats, and any other body part or joint that needs to be warmed up, 60 of Support Hold Work (parallel bars or rings or chairs/counters), 5x Skin the Cat / German Hangs
- Positional Drills: 30-60 of Plank, Both Side Planks, Reverse Plank, Hollow, and Arch Holds.

Skill Work

- 5-10 minutes of Handstand Work, performed against the wall.

Strength Work

- *Jumping Pull-ups*: 3x5→15 with 3 minutes of rest at 50x0 tempo
- *Jumping Dips*: 3x5→15 with 3 minutes of rest at 50x0 tempo
- *Ring Rows*: 3x5→15 with 3 minutes of rest at 10x0 tempo
- *Pushups*: 3x5→15 with 3 minutes of rest at 10x0 tempo
- *Squats (pistol progression or barbell)*: 3x5→15 with 3 minutes of rest at 10x0 tempo
- *Deep Step-ups*: 3x5→15 with 3 minutes of rest at 10x0 tempo
- *Tuck L-Sit* for 60s total, in as many sets as needed, not to failure
- *Compression Work* for 3x10s

Prehabilitation, Isolation Work, Flexibility Work, and Cool Down

- 3x1-minute sets of *Rice Bucket* (for the wrists)
- 3x10 *Biceps Curls*
- 3-5x30s *Splits Holds*
- 3-5x30s *German hangs*
- 3-5x20s *Back Bridges*
- 1 minute of *Deep Breathing* (in through the nose, out through the mouth)

Common Setbacks

There are certain areas where untrained beginners commonly run into difficulties.

Routine Balance: If you have poor posture, add an additional horizontal rowing motion in order to bring up the strength and muscle mass of the back. This will help balance things out, especially important if you have a desk job and your posture has been affected by prolonged sitting. There is also specific stretching to correct posture. Poor posture may not directly cause injuries, but if you improve your posture you will look better, feel better, have better proficiency in your technique, and increased ability to move through your range of motion without limitations or discomfort.

Adding an extra horizontal pulling exercise is helpful, since the most common poor posture involves the head and shoulders hunching forward. However, if you come from a background of pulling instead of pushing (such as swimming, rowing, or rock climbing), and your posture is imbalanced in the opposite direction, you may need to add an additional horizontal pushing exercise. Imbalances will become visible when performing exercises on the progression chart. If your pushing exercises are more than a progression or two ahead of pulling or if pulling is at a similar progression or above as pushing you may have an imbalance that should be corrected. Pushing tends to be a bit stronger than pulling.

Length of the Routine: It may take a beginner a decent amount of time to perform this routine, as there is so much that goes into a routine of this nature. The full-body routine is strongly recommended for this level, because it includes off days. A full-body routine can be shortened by moving any of the non-strength components to your rest days.

Your routine will include a quick warm-up, skill work, and strength work. Use your off days to perform additional mobility work, prehabilitation work, isolation work, and flexibility work. This is a great alternative for those who want to do something every day.

Tempo Modifications: If you are having trouble executing proper technique on the X portion (acceleration) of the 10x0 tempo, it may be effective to modify it to a 1010 tempo instead. Perfecting technique by practicing uniform movement is better than compromising form with a 10x0 tempo.

Strength Progression: Linear repetition progression (5-5-5 → 6-6-6 → 7-7-7) will typically be the best way to progress at this level. You can expect this to help you move through most of the beginner levels up to Level 5. However, it may be necessary to use repetition addition (5-5-5 → 6-5-5 → 6-6-5 → 6-6-6) or some of the other method of progression if you get stuck after a workout or two. In particular, you may be progressing effectively with one exercise like pushups, but get stuck on dips. If this is the case, continue to progress with the linear repetition progression with pushups and change the progression with the dips. Here's an example of what this could look like:

- *Pushups*: 5-5-5 → 6-6-6 → 7-7-7 → 8-8-8
- *Dips*: 5-5-5 → 6-5-5 → 6-6-5 → 6-6-6

This is completely normal and may even occur with exercises that involve the same muscle group. There could be multiple factors at play. Some exercises progress faster than others. Fatigue from performing pushups could slow your progression with dips. The key at this stage is not to get hung up on the lack of progress you are making (whether real or perceived) as long as you are making progress.

Some people stall on pushups while others do not stall until they reach one-arm pushups or high-level planche work. Every individual is different. What works for another person may not work for you. There are no "one size fits all" rules in bodyweight training. This is why it is so important to learn how your own body works in relation to training. Don't push yourself trying to keep up with someone else's progress.

Paralysis by Analysis: Most people who are new to exercise are eager to find the perfect routine. Let's disabuse you of that notion right now. *There is no perfect routine*. In fact, as the saying goes: "The best routine is the one you are actually doing." Some people spend weeks thinking about how to construct the perfect routine, perhaps even contacting seasoned athletes and coaches for advice, while others dive straight into training. The person who does the latter will be that many weeks ahead in their training. Their routine may be imperfect, but it is actually being performed. *Get moving now and make adjustments as you go.* Part of learning how to properly construct a solid routine is figuring out how your body responds to different exercises, and you cannot learn this from the advice of others. Once your routine is off the ground, that is the time to potentially begin seeking advice on how you can modify it later.

Routine Mania: On the other end of the spectrum are the athletes who have a tendency to construct a routine, try it out, and immediately abandon it. These people pop up on forums talking about their new routines and asking for critiques. A few weeks later, they have a different "new routine." This is extremely counterproductive, as both strength and hypertrophy are predicated on progressive overload, which assumes you are performing the same exercises over and over and actually progressing with them. You will make better progress sticking with your original routine than you will by switching to a "new and improved" routine after only two weeks. In the beginning, the minimum a routine should last is four weeks because you will naturally

see progress if you stick with exercises for that period of time. Mesocycles should last about four to eight weeks. Untrained beginners may see some progress in as little as two or three workouts, but it typically takes three to four weeks to see significant progress in terms of physique or strength. Sticking to the program you created is important because it will teach you about yourself and how your body responds to exercise in the latter weeks of the program.

Overuse Modifications: Untrained beginners are likely to have to substantially modify their routines based on what issues appear. One common issue is discovering that too fast progression is too difficult on your connective tissues. In this case, increasing the repetitions from fifteen to twenty may be useful. Additionally, integrating more prehabilitation and mobility work is should be readily considered for untrained beginners.

It is impossible to recommend set amounts of prehabilitation, mobility, and flexibility work because everyone is different. You must learn the underlying concepts for implementing this type of work into your routine. For example, if you feel your wrists are being overworked, follow this two-step process:

- Eliminate, reduce volume, or substitute exercises.
- Add additional prehabilitation, isolation, mobility, or flexibility work as needed for the particular area.

Eliminating, reducing volume, or substituting exercises is fairly straightforward. If your wrists are being aggravated while performing handstands, eliminate handstands until your wrists are better prepared to handle them. In the meantime, work on other wrist-supported exercises like supports or planks that will condition your wrists without aggravating them. Add additional prehabilitation, isolation, mobility, or flexibility work for the particular area as needed. Some of the extensive wrist exercises mentioned earlier in this chapter may be particularly useful. You can add in some dumbbell wrist curls or rice bucket exercises. If you feel unsure, or this is all too complicated, you can always ask a medical professional, such as an orthopedic sports doctor or physical therapist. You can also consult coaches, athletes who are more advanced than yourself, or even people with more extensive experience than you on the Internet. I recommend these Reddit threads: www.reddit.com/r/bodyweightfitness and www.reddit.com/r/overcominggravity.

Avoiding Injuries: In the long run, learning how to modify your routine based on how your body responds—especially in the context of potential overuse injuries—is going to be THE most important thing you can learn when it comes to training. The number one predictor of an injury is a previous injury. Knowing when you need to back down and modify your routine is valuable information that will stick with you for decades in both coaching and training.

- CHAPTER 18 -

TRAINED BEGINNER: ROUTINE CONSTRUCTION AND PROGRESSION

TRAINED BEGINNER: ROUTINE CONSTRUCTION

"Trained" beginners come to bodyweight training from weight training, various sports training, or other organized athletic activities. They will fall anywhere from Levels 2-6—some come in higher or lower, but this is where the vast majority will fall. If you enter in Levels 2-4, it is recommended you refer to the previous section for untrained beginners, as you will progress faster if you begin there. This section will specifically address Levels 5-6.

The needs of a *trained beginner* are simple:

- Emphasize consistency in training. Discipline is going to be the most important factor in making progress. It is not good to skip workouts, apart from potential overuse injuries or emergencies. There is some merit to the phrase: *The best program is the one you stick to.*
- Focus on training that ensures good muscular development and strength, especially in the 5-8 repetition range
- Make sure there is a proper balance of both pushing and pulling exercises in your routine.
- Add in exercises to maintain structural balance if imbalances start to develop. Typically, this will mean adding more horizontal pulling if you trained mostly pushing exercises before coming to bodyweight training.
- Allow your body to accommodate to strength training to allow your connective tissues and underlying structures (such as your joints and bones) to adapt.

This stage requires a shift in training philosophy. Since freestanding handstands are nearly mastered, focus must shift toward achieving press-to handstands, as well as rings, shoulder stands, and handstands. The charts indicate various other skills to begin working, such as forward roll to support and kip to support. Rings strength and associated skills are beginning to be more integrated, and you should begin to progress from some of the tuck and advanced tuck positions into straddle and layout positions for isometric exercises.

There is now a wider variety of skills to learn, so keeping your routine focused is a priority. You will progress faster overall if you keep exercises geared toward specific goals. Limit yourself to two or three. It is better to focus and achieve a single goal than to attempt many goals at once and not obtain any of them. After you have reached a few of your goals, you can shift to working toward new goals while maintaining the skills you have already developed.

A full-body routine still works best at this stage. However, if you have time constraints or are simply looking for some variety, this is the first stage at which a split routine could work. If you choose the full-body approach, you should perform your routine three to four times a week. As for splits, most types that were recommended earlier are fine—push/pull, straight-arm/bent-arm, and upper/lower. Stay away from a three-part split like push/pull/legs. A dual push/pull works well integrating with leg exercises—squat and pistols are pushing exercises and deadlifts and deep step-ups are a pull. The split you choose (if you choose one at all) will depend on your schedule and any sports you practice. If you favor a sport or discipline that employs a lot of lower-body exercise, for example, an upper/lower split will be the most effective.

Do not neglect to work on straight-arm presses in conjunction with handstands and the L-sit/V-sit/manna progression as skill work. At this level, this skill work is critical.

Let us think back to our goals, and see how our routine may look at this point:

Sample Goals

- 10 Freestanding Handstands
- 5 Strict Muscle-ups
- 5s Planche
- 5s Front Lever
- 10 Pistols
- 10 Vertical V-Sits
- 5s Iron Cross

Warm-up and skill work plus prehabilitation, isolation work, and flexibility work should be implemented as needed. Make adjustments as described in the untrained beginner section.

A routine focused on static exercises may look like this:

- X seconds of *Tuck* or *Advanced Tuck Planche*
- X seconds of *Straddle* or *Half Layout Back Lever*
- X seconds of *Advanced Tuck Front Lever*
- 3x5→15 of *Strict Muscle-ups* with 3 minutes of rest at 10x0 tempo
- 3x5→15 *Squats* (pistol progression or barbell) with 3 minutes of rest at 10x0 tempo
- 3x5→15 *Deep Step-ups* (weighted if necessary) with 3 minutes of rest at 10x0 tempo
- *Straddle L-Sit* or *RTO L-Sit* for 60s total, in as many sets as needed, not to failure
- *Compression Work* for 3x10s

Alternatively, here is a dynamic-focused routine with three push and three pull exercises:

- 3x3→15 of *Tuck* and *Advanced Tuck FL Pull-ups* with 3 minutes of rest at 10x0 tempo
- 3x3→15 of *Tuck PL Pushups* with 3 minutes of rest at 10x0 tempo

- 3x3→15 of *Strict Muscle-ups* with 3 minutes of rest at 10x0 tempo
- 3x3→15 of *Archer Ring Rows* with 3 minutes of rest at 10x0 tempo
- 3x5→15 *Squats* (pistol progression or barbell) with 3 minutes of rest at 10x0 tempo
- 3x5→15 *Deep Step-ups* (weighted if necessary) with 3 minutes of rest at 10x0 tempo
- *Straddle L-Sit* or *RTO L-Sit* for 60s total, in as many sets as needed, not to failure
- *Compression Work* for 3x10s

If you want to substitute exercises with specific handstand variations you can perform:

- *Tuck* and *Advanced Tuck FL Pull-ups*
- *Tuck PL Pushups*
- *Wall HSPUs* or *Freestanding HSPUs*
- *Straight-Arm Press Eccentrics* or *Elevated Straight-Arm Press*
- *Bent-Arm Press HS*

A four times per week push/pull pull routine may be structured M/Tue/Thur/F with push on M/Thur and pull on Tue/F. Below you will find an actual example of a routine that was constructed by an athlete from the previous edition to good effect.

Monday

- Push Pre-Hab: *Wrist Pushups* 1x10, *Dumbbell Finger Curls* 1x10, *Straight-Arm Dumbbell Rotation* 1x10
- Handstands: 10 minutes of *Freestanding Handstands*
- 8x5 seconds of *Tuck Planche*
- 3x5 of *Ring Dips*
- 3x30s of *Planche Leans*
- 3x5 of *Natural Hamstring Curls*
- +Legs (*Squat Variation*)

Tuesday

- Pull Pre-Hab: *Wrist Pushups* 1x10, *Dumbbell Finger Curls* 1x10, *Straight-Arm Dumbbell Rotation* 1x10, *External Rotations* or *Cuban Presses*, and *Wall Extensions* (facing the wall with band on forearms)
- Handstands: Same as Monday
- 16x8 seconds of *Advanced Tuck Front Lever*
- 5x3 of *Advanced Tuck Front Lever Pull-ups*
- 4x3 of *False Grip Pull-ups*
- +Legs (*Deadlift Variation*)

Thursday

- Push Pre-Hab: Same as Monday
- Handstands: Same as Monday
- 5-6x5 seconds of *Advanced Tuck Planche Eccentrics*
- 4x2 of *HSPU* (stomach to wall, on parallettes)

- 3x30 seconds of *Planche Leans*
- 3x5 of *Natural Hamstring Curls*
- +Legs (*Squat Variation*)

Friday

- Pull Pre-Hab: Same as Tuesday
- Handstands: Same as Monday
- 5x5 seconds of *Front Lever Negatives*
- 3x6-8 reps of *One-Arm Rows*
- 4x3 of *False Grip Pull-ups*
- +Legs (*Deadlift Variation*)

Athlete's comments about the above routine:

"My height is 5'8" and my weight is 215 lbs. I am around 8% body fat. I am also a type 1 diabetic in the 99th percentile for blood sugar control and I eat a very strict Paleo diet. This routine template was basic push/pull cycle with handstand work, as well as a fair amount of pre-hab work.

My original template for pushing work had me using tuck planche, RTO ring support hold statics, as well as RTO pushups/handstand pushups. As the cycle went on, I began to drop the extra statics. On the pulling days I was using advanced tuck front lever, single leg eccentrics (which eventually progressed to full front lever eccentrics), front lever rows, and some single-arm dumbbell rows, for which I was using about one-fourth of my bodyweight (roughly 55 lbs.) for a controlled tempo.

This is by no means a perfect program. I started doing L-sit work after handstands, but that was inconsistent. The core of the program stayed consistent from week to week, my goal was to improve on the planche and front lever. However, I experimented with different movements some weeks and cut out certain aspects if my energy level was low. I expect to keep a similar format now that stresses are lower and my energy is a lot higher. Regarding the handstands, I would do stomach-to-wall holds, push off with my toes, and hold as long as possible. Toward the beginning of the cycle I could only hold for five seconds; toward the end I was banging out ten to fifteen-second holds.

For comparison, I was doing a Killroy70 template with less leg work and back lever included prior to this push/pull program. With your advice and simplifying my training, I am doing fantastic. I am leaner now that I am doing one extra workout a week with lower volume and higher intensity. I am also a lot stronger. Prehabilitation has gone a long way toward keeping me healthy. I now have an easier time getting stronger, especially with the help of your intensity chart. As a side note to this new cycle and the benefits of bodyweight training: I regularly compete with the top-level CrossFit athletes I coach and I am simply stronger than any of them. I give them a run for their money even though I don't practice with them. I can do a heavier weighted pull-up than most, and aside from practicing technique with an empty bar, I was able to split-jerk 260 lbs. at a bodyweight of 215 lbs. a few weeks ago. I attribute this to my gymnastics training."

While the exercise selection that this athlete chose is perhaps not ideal, and the repetition ranges and volumes fluctuate significantly from exercise to exercise, the athlete in question made very good progress with a routine he constructed himself. Enough cannot be said about the *importance of constructing your own routine* over using the examples blindly. You *can* figure out what does and does not work for you as long as you follow

the general principles of routine construction. The basic structure this athlete used was a classic push/pull, modified for a heavier individual.

For individuals weighing 200 lbs., a program performed four times per week with two push and two pull workouts tends to work best. Upper/lower and straight-arm/bent-arm can be effective as well. Performing a full-body program three times a week may be too intense, especially if the workouts include exercises like the planche. If you choose to perform a straight-arm/bent-arm routine four times per week, it can be structured M/Tue/Thur/F with straight-arm work on M/Thur and bent-arm work on Tue/F.

Straight-Arm

- X seconds of *Tuck* or *Advanced Tuck Planche*
- X seconds of *Straddle* or *Half Layout Back Lever*
- X seconds of *Advanced Tuck Front Lever*
- 3x(3-10) of *Straight-Arm Press Eccentrics / Elevated SA Press*
- *RTO Support Holds*
- +Legs

Bent-Arm

- 3x(3-10) of *Wall HSPUs* or *Freestanding HSPUs*
- 3x(3-10) of *Tuck* and *Advanced Tuck FL Pull-ups*
- 3x(3-10) of *Tuck PL Pushups*
- 3x(3-10) of *Strict Muscle-ups*
- 3x(3-10) of *Archer Ring Rows*
- +Legs

An alternating straight-arm/bent-arm routine is, in a sense, a hybrid of static and dynamic exercises. It is not necessary to break these up into separate training days, but some people like emphasizing these two seemingly different modes of strength training; splitting them up allows for more intense focus on each.

Upper-body and lower-body splits are self-explanatory.

TRAINED BEGINNER: ROUTINE PROGRESSION

The main thing to focus on at this stage is *consistency*. Hopefully you are past the stages of paralysis by analysis and routine mania. At this point, being able to stick to your workout schedule will be the biggest factor that will determine whether or not you progress. As you know: the best routine is the one you actually perform! Consistency is now prized above all else. Hitting six out of six full-body routines in two weeks is more important than hitting only five out of six, even if those five are flawless. Likewise, going twelve for twelve in four weeks is more important than finding a better routine halfway through a four-week cycle and performing it for the remainder of the cycle.

Your consistent work builds positive habits you will use for training in the long run. Consistency means you will work out when you are exhausted and/or don't feel like it, just as you would when you are motivated. It means you will make time to work out between school and family obligations. You may have to modify

your routine and eliminate some mobility or flexibility work if you have time restraints, but it is important that you develop positive habits that will stick with you and help you reach your goals.

The mental fortitude and strength you gain from consistency in training will stick with you beyond your workouts. It will give you strength to deal with tricky family situations. It will buffer when you are stressed due to deadlines at work. It will aid you when you are being pulled in multiple directions and have little time to rest. Consistency and discipline are life skills. Learn them through your workouts and these skills will pay dividends in every area of your life.

Repetitions: Bring your repetitions down into the 5-12 range and keep them there. You may still jump up to the 15-20 range here and there for connective tissue strength on some exercise progressions if they aggravate particular areas of your body. However, the 5-12 range will be paramount to building strength and hypertrophy. If you desire to bias more toward strength as you progress through this stage of training, start working in the 3-8 range.

Routine Balance: By now your posture and technique should look good. If this is not the case, continue to correct imbalances that you developed from previous exercise or sports. Let's review:

If you have poor posture, add an additional horizontal rowing motion in order to bring up the strength and muscle mass of the back, especially if you have a desk job. Additional specific stretching can also correct posture. When you improve your posture, you will look better, feel better, have better proficiency in your technique, and increased ability to move through your range of motion without limitations or discomfort.

Adding an extra horizontal pulling exercise is helpful for most people since the most common poor posture involves the head and shoulders hunching forward. However, if your previous sport was a pulling instead of pushing activity (swimming, rock climbing, etc.), you may need an additional horizontal pushing exercise. Imbalances will show up when you perform exercises on the progression chart. Pushing tends to be a bit stronger than pulling, but if pushing is more than a progression ahead of pulling or if pulling is at a similar progression as pushing you may have an imbalance.

Once you have achieved good posture, your next goal is to maintain the balance between pushing and pulling. The easiest way at this stage is to keep pushing and pulling exercises numerically equal. If you are performing two upper-body pushing exercises, perform two upper-body pulling exercises and so forth. This is useful not only for your health, but for revealing specific weaknesses you may need to correct later on.

Regarding the Length of a Routine: Recommendations for the untrained beginner apply to the trained beginner. At this point, you should know how to modify your routine as needed. If you have time constraints, you can move skill work, flexibility work, isolation work, or prehabilitation work to your rest days. This is the benefit of having all of your strength work on full-body days.

Additional Skill Work: It may be a good idea to add additional skill work on rest days (as well as workout days) at this point. For untrained beginners, performing handstands six to seven days per week may be too much for the wrists; progressing to the trained beginner stage may take anywhere from three to twelve months. By this time you should have a good idea how much skill and strength work your wrists, shoulders, and other connective tissues can handle. It is often the case that you increase your work capacity to perform more skill work as you continue to practice wrist and shoulder mobility and prehabilitation. You can perform this additional skill work on your rest days.

If you choose to add skill work, start with one extra day per week. Do this for at least two weeks. At this point, you can add another extra day of skill work if you wish. Continue this pattern if you want to keep adding skill work. It is important to allow your body that two-week buffer or more so it can adjust to the new workload before you add more. If you try to do too much at once, you will be sore or find yourself in real pain. That said, if you go slow and steady in two-week increments, you will notice your proficiency increase very quickly once you start to add additional skill work; the extra practice pays off immediately.

Strength Progression: As you move into the trained beginner range, you will likely begin to fail with linear progression (5-5-5 with 5 lbs., with 10 lbs., with 15 lbs.) or linear repetition progression (5-5-5 → 6-6-6 → 7-7-7). Set addition or last set to failure methods work very well as replacements.

- Set Addition: 6-6-6 to 6-6-6-6, then 7-7-7
- Last Set to Failure: 5-5-5 to 5-5-6 to 5-5-7 to 6-6-6

Other methods like repetition addition, tempo changes, and density modifications can be useful, but set addition and last set to failure are the best methods for success in trained beginners. Once you stop progressing using these two methods, learn how to manipulate density and implement accumulation/intensification as your new methods of progression. These methods will work well as you transition from the trained beginner range to the intermediate range.

Although, you should be using simple inter-exercise progressions at this point, you are likely to find that you stall with them. While weight addition using ankle weights to increase the difficulty of an exercise of the previous progression or assistance using bands to decrease the difficulty of an exercise of the next progression are the most intuitive practices for beginners to learn, hybrid sets will be the most effective way for most people to bridge the gap. Here is an example:

- 3 sets of 10 *Pull-ups*
- 3 sets of (1 *Wide Grip Pull-up*, followed by 6 *Pull-ups*)
- 3 sets of (2 *Wide Grip Pull-ups*, followed by 4 *Pull-ups*)
- 3 sets of (3 *Wide Grip Pull-ups*, followed by 2 *Pull-ups*)
- 3 sets of (4 *Wide Grip Pull-ups*, followed by 0 *Pull-ups*)

You can even use hybrid sets with weight addition for the easier exercises if you want to go from a difficult exercise and get volume with a slightly harder exercise. At this stage in your training, learn to use these types of progressions effectively. If you get stuck and need to use a different progression, make sure you note the progression you are going to use in your training log and chart your progress. This will allow you to see what works well for your body. Some progressions will work better than others.

Overuse Modifications: Overuse in untrained beginners and trained beginners is similar. After training for a while, overuse modifications will be spaced further apart until you reach some of the intermediate and advanced exercises. If you have soreness, discomfort, or pain in your connective tissues, be sure to continue mobility and prehabilitation work. Remember these two useful modifications:

- Eliminate, reduce volume, or substitute exercises.
- Add additional prehabilitation, isolation, mobility, or flexibility work as needed for the particular area.

Eliminating, reducing volume, or substituting exercises is straightforward and was well-discussed previously. When seeking prehabilitation, isolation, mobility, or flexibility exercises to add, look at some of the extensive exercises mentioned in those sections. Remember to consult a medical professional, such as an orthopedic sports doctor or physical therapist if you feel overwhelmed or confused. Ask for advice from coaches, advanced athletes, or the Internet. These Reddit threads have useful discussions: www.reddit.com/r/bodyweightfitness and www.reddit.com/r/overcominggravity.

Avoiding Injuries: It pays to reiterate information on avoiding injuries. Learning how to modify your routine based on how your body responds—especially in the context of potential overuse injuries—is going to be THE most important thing you learn when it comes to training. The number one predictor of an injury is a previous injury. Know the signs, back down, and modify your routine whenever necessary.

- CHAPTER 19 -

INTERMEDIATE: ROUTINE CONSTRUCTION AND PROGRESSION

INTERMEDIATE: ROUTINE CONSTRUCTION

As you move into the *intermediate range* your needs diversify. Identify your goals—are you training for strength, hypertrophy, or endurance? Training will diversify based on these goals and will become more specific. In most cases, your full-body routine will become less effective. This includes not only the strength, hypertrophy, and endurance portions of your workout but also your skill work, sports specific skills, flexibility, mobility, prehabilitation, and rehabilitation. Here are some examples:

- If your goal is *endurance*, you will start to work strength at lower volumes in order to keep efficiency of exercises high and work specific endurance exercises.
- If your goal is *hypertrophy*, you will typically begin transitioning from a full-body routine to various splits.
- If your goal is *strength*, you will typically increase your frequency as much as possible without overtraining or developing overuse injuries.

Adapting frequency, volume, and intensity of training to maintain progress must occur in this range. You will need to learn how to use more complex training programming.

Begin to move to the upper range of A-strength movements or isometric holds. Non-athletes will think strength at this level is quite impressive and, perhaps, unattainable. However, with consistent, hard work, most athletes are able to attain this skill level. They can do so within one to three years, depending on the individual. You may attain it sooner due to a sports or strength background—or later due to inconsistent training or miscellaneous factors like poor nutrition, bad sleep quality, busy school schedules, stressful lifestyle, or even genetics.

Repetition ranges for this stage are the 3-8 range if you want to focus mostly on strength. However, if you still need or desire hypertrophy, the 5-15 repetition range will work until you move up to the next progression. Aside from potentially adding another day of exercise, this is the only change in philosophy at this point.

Daily undulated periodization may be required near the middle or end of the intermediate phase, but it is not needed earlier. Other minor forms of periodization like accumulation and intensification may be useful. Likewise, structuring light and heavy days will be effective as well. Some of the simple intra-exercise and simple inter-exercise progressions will likely still work, depending on your body. However, it is unlikely that a method like linear repetition progression would still be effective.

A full-body routine of static exercises performed 3-5x per week may look something like this:

- X seconds of *Advanced Tuck* or *Straddle Planche* (can be taken to the rings as well)
- X seconds of *Full Back Lever* or *Back Lever Pullouts*
- X seconds of *Full Front Lever*
- 3x(3→8) of *Straddle FL Rows*
- 3x(3→8) of *Advanced Tuck Pl Pushups*
- 3x(3→8) of *Freestanding HSPUs* or *Rings Strap HSPUs*
- *Squats* (*pistol progression or barbell*): 3x5→15 with 3 minutes of rest at 10x0 tempo
- *Deep Step-ups*: 3x5→15 with 3 minutes of rest at 10x0 tempo
- *100-degree V-Sit* for 60s total, in as many sets as needed, not to failure
- *Compression Work* for 3x10s

A dynamic strength routine performed 3-5x per week may look like this:

- 3x(3→8) of *Straight-Arm Straddle* or *Pike Press Handstands*
- 3x(3→8) of *Freestanding HSPUs* or *Rings Strap HSPUs*
- 3x(3→8) of *Straddle FL Rows*
- 3x(3→8) of *Advanced Tuck PL Pushups*
- 3x(3→8) of *Strict Bar Muscle-ups* or *Front Lever MU to Planche Variation*
- 3x(3→8) of *One-Arm Ring Rows* (do each arm with weaker arm first)
- *Squats* (*pistol progression or barbell*): 3x5→15 with 3 minutes of rest at 10x0 tempo
- *Deep Step-ups*: 3x5→15 with 3 minutes of rest at 10x0 tempo
- *100-degree V-Sit* for 60 seconds total, in as many sets as needed, not to failure
- *Compression Work* for 3x10s

Other potential exercises depending on your goals:

- One-Arm Pushups
- RTO Leaned-Forward Dips
- One-Arm Rows
- Explosive Pull-up Variations
- Starting OAC Progressions
- Weighted Pull-ups
- Weighted Dips

Note that these routines have three upper-body push and three upper-body pull exercises. This may be too much for those with limited time or who cannot handle that much volume. In the intermediate, it can be more effective to use a split routine like push/pull, upper/lower, or bent-arm/straight-arm over a full-body routine.

A push/pull and bent-arm/straight-arm split will follow a similar variation of exercises. Typically, these are performed four times per week so you hit each split twice. *A/B/rest/A/B/rest/rest* or *A/B/rest/A/rest/B/rest*. You could also do five workouts per week on a *A/B/rest/A/B/A/rest* schedule with the next week being alternated as *B/A/rest/B/A/B/rest* to compensate.

In the chapter for trained beginners, push/pull was discussed, so here are some examples of upper/lower and bent-arm/straight-arm with the same volume as the full-body routine. First, the upper/lower split:

Upper

- X seconds of *Advanced Tuck* or *Straddle Planche* (can be taken to the rings as well)
- X seconds of *Full Back Lever* or *Back Lever Pullouts*
- X seconds of *Full Front Lever*
- 3x(3→8) of *Straddle FL Rows*
- 3x(3→8) of *Advanced Tuck PL Pushups*
- 3x(3→8) of *Freestanding HSPUs* or *Rings Strap HSPUs*

Lower + Core

- *Squats* (*pistol progression or barbell*): 3x3→8 with 3 minutes of rest at 10x0 tempo
- *Deep Step-ups*: 3x3→8 with 3 minutes of rest at 10x0 tempo
- *Leg Curls* (feet under a couch or other heavy object): 3x5→15 with 3 minutes of rest at 10x0 tempo
- *100-degree V-Sit* for 60 seconds total, in as many sets, as needed not to failure
- *Compression Work* for 3x10s

Next, the bent-arm/straight-arm split:

Bent-Arm + Legs

- 3x(3→8) of *Straddle FL Rows*
- 3x(3→8) of *Advanced Tuck PL Pushups*
- 3x(3→8) of *Strict Bar Muscle-ups* or *Front Lever MU to Planche Variation*
- 3x(3→8) of *One-Arm Ring Rows* (do each arm with weaker arm first)
- *Squats* (*pistol progression or barbell*): 3x3→6 with 3 minutes of rest at 10x0 tempo
- *Deep Step-ups*: 3x3→8 with 3 minutes of rest at 10x0 tempo

Straight-Arm + Core

- Handstand-focused Training
- X seconds of *Advanced Tuck* or *Straddle Planche* (can be taken to the rings as well)
- X seconds of *Full Back Lever* or *Back Lever Pullouts*
- X seconds of *Full Front Lever*
- 3x(3→8) of *Straight-Arm Straddle* or *Pike Press Handstands*
- *100-degree V-Sit* for 60 seconds total, in as many sets as needed, not to failure
- *Compression Work* for 3x10s

Core is grouped with legs in the upper/lower split because with push and pull in the upper body there are generally more upper-body exercises than leg exercises. Adding core to the legs day simply keeps the time even.

In the bent-arm/straight-arm split, bent-arm is paired with legs and straight-arm with core because of the straight-arm and core day. Many of the straight-arm exercises require a solid amount of core work. They have been paired so there would be a strong core stimulus to facilitate both strength and hypertrophy gain. Barbell leg exercises tend to be fairly intense on the nervous system, as are straight-arm isometrics. Those have been separated to promote recovery.

None of this structuring is by mistake or coincidence. If you have questions or concerns about structuring a routine in a particular manner, always refer back to your goals. In this case, separating the intense nervous system exercises from each other promotes recovery, which will help to prevent potential plateauing via under-recovery. Core work is paired with levers and straight-arm work specifically to improve both attributes at once.

If you so desire, you can choose a push/pull/legs split. Madeleine Leander (aka Maddelisk) is a woman who has used a push/pull/legs split to great effect at an intermediate to advanced level of ability. She competes in street workout competitions. For a montage of some of her training including human flags, front lever, straddle back lever, strict muscle ups, and other feats, check out: www.youtube.com/watch?v=agGluK1YNQ8

Day 1 - Push

- 4*10 seconds *Planche* training. *Advanced Tuck Planche* for as long as possible, then *Tuck Planche*
- Some extra skill work of your choice (ex: *Tiger Bends* or *Elbow Levers*)
- 4*(5-10) *Wall Handstand Pushups*
- 4*10 *Planche Pushups* with help of a rubber band
- 5 *Straddle Press to Handstand*
- 4*(5-15 seconds) *L-Sit*
- 60 second *Planche Lean*

Day 2 - Pull

- 4 sets of *Front Lever Holds*. Starting with 10-second holds, starting with straddle and moving over to one-leg-bent
- 2*(3-5) *Eccentric One-Arm Pull-ups*
- 3*(3-5) *One-Arm Pull-ups* with the help of a rubber band under the feet
- A few sets of *Human Flag* and *Flag Pull-ups*
- 2*(2-4) *Slow, False Grip Muscle-ups*
- 3*(5-10) *Strict Muscle-ups*
- 5*5 *Explosive Pull-ups* (clap, hands to toes, etc.)
- 3*10 *Tuck Front Lever Pull-ups*

Day 3 - Legs + Deadlift

- 4*10 *High Jumps*
- 4*10 *Deadlift* 80-100 kg
- 3*(5-8) *Pistol Squats*

Day 4 - Push

- 15 *Straddle Straight-Arm Press to Handstand*
- 10 *Bent-Arm L-Sit to Handstand*

- 4*6 seconds *Tuck Planche Holds*
- 4*(3-5) *Weighted Dips* at 40 kg (80 % of bodyweight)
- 3*(3-8) *Wall Handstand Pushups*
- Different variations of *Pushups (Archer, Rings, Diamond, Clap, etc.)* Total of 100 reps.

Day 5 - Pull

- 4*(15-20 seconds) *Front Lever Holds* with rubber band assistance
- 3*(3-5) *One-Arm Pull-ups* with your other arm holding a rubber band for assistance
- 4*3 *Explosive Muscle-ups* including different freestyle moves like *Clap Muscle-ups*
- 4*6 *Rings Archer Pull-ups*
- 4*(3-5) *Weighted Pull-ups* 20-35 kg (Lower the weight if you can't perform 3)
- 3*(3-5) *Slow Ring Muscle-ups*
- 3*10 *Dragon Flag* (fits well with *Front Lever*)

Day 6 - Legs

- 4*10 *Weighted Squats* 55-70 kg.
- 3*20 *Belly Back*
- 4 sets of variations of *Lunges (Weighted, Jumps, Walks)*

Day 7 - Flag Day + Extra Skill Work

- Specific Flag Warm-up, slowly moving in to the flag
- 8-10 sets of *Human Flag Variations (Holds, Walks, Pull-ups, etc.)*
- 4 sets of *Holds* with a rubber band on your feet for assistance
- *Extra Skill Work* (whatever you desire, plus freestyle moves like *Jump-Over-Bar Muscle-ups*)

Madeleine is an extremely strong woman who used the previous version of *Overcoming Gravity* while figuring out what works best for her. Here are her comments:

"My warm-up is almost the same every day. It takes about 4-5 minutes and I adjust it depending on how I feel. I have no exact numbers but it includes the following: High jumps, skin the cat, wrist warm-up, pushups, handstand (on Pull days I do pull-ups instead of handstand). I also end almost every day with flexibility work. I for example have a splits goal I want to reach.

What about rest days? I rest when I need to and don't add rest days to my program. If my body is too sore I rest. During this program it happened about one day every two weeks.

My height is about 5'2" and my weight around 110 pounds. Training for me is basically doing what I think is fun and for me the problem is that I sometimes want to train a bit too much. In addition to what you can see in the program above I also trained handstand around two out of 3 days. I forced myself to rest from the additional handstand on pull days just to give my wrists some rest. I do handstands at work, at home, whenever I feel like it.

Structuring my training with your system, I trained a bit less than I did before (when every day was play day) but it turned out to be a really good thing. My forearms used to suffer a lot because I had pulling exercises spread out over more days. That made it harder for me to improve.

Over the past year I've worked a lot with very specific goals. I prefer to set a long-term goal, for example

to be able to do L-sit to handstand with straight arms. The time was one year. And for each goal I set up I also set a lot of goals on the way. I adapted the short-term goals for my own training. The steps on the way, in this case, included frog stand to handstand, tuck planche, straddle press to handstand, pike press to handstand, and bent-arm L-sit to handstand. And for each step I figured out all kinds of exercises that I could use to reach the next level, including many exercises from Overcoming Gravity.

One of few weighted exercises that I still do is deadlift. I find it hard to built that lower back strength with bodyweight exercises only. I also like to do both weighted squats and pistol squats. Note also that for this program I removed back lever completely. Before I made my program I had some issues with it and it didn't feel good so I decided to take a few weeks of break from the back lever. Also, I'm not a big fan of cardio, and since I want my training to be fun I skip it."

Push/pull/legs is a good way to split up volume to get about 72 hours between every muscle group worked out. Even though there are no specific rest days, the athlete is getting a good amount of rest. This shows how an athlete can build up to a large workout capacity as well.

At the mid to upper end of the intermediate range (around Level 7-9), it may be necessary to switch to accumulation and intensification or light/heavy types of routines. The following example is part of a full-body routine, but it can be applied to various splits as well. Let us examine a sample accumulation and intensification routine. The first stage is an accumulation phase:

Accumulation

- 3x(8→12) of *Straight-Arm Straddle* or *Pike Press Handstands*
- 3x(8→12) of *Freestanding HSPUs* or *Rings Strap HSPUs*
- 3x(8→12) of *Straddle FL Rows*
- 3x(8→12) of *Advanced Tuck PL Pushups*
- 3x(8→12) of *Strict Bar Muscle-ups* or *Front Lever Muscle-ups to Planche Variation*
- 3x(8→12) of *One-Arm Ring Rows* (do each arm with weaker arm first)
- *Squats (pistol progression or barbell)*: 3x8→12 with 3 minutes of rest at 10x0 tempo
- *Deep Step-ups*: 3x8→12 with 3 minutes of rest at 10x0 tempo
- *100-degree V-Sit* for 60 seconds total, in as many sets as needed, not to failure
- *Compression Work* for 3x10s

The accumulation phase focuses on high-volume training, as a hypertrophy microcycle would in a traditional Russian mesocycle. The exercises chosen reflect a progression allowing eight to twelve repetitions in order to accumulate a lot of volume. Additional exercises like an extra push and an extra pull exercise may be added in this cycle for even more volume. Density training, such as decreasing rest times, can also be implemented in accumulation phases.

Intensification

After a week or two of accumulation work you will move to the intensification cycle. Here you will focus on fewer exercises and fewer repetitions but higher intensity. This intensity will be reflected in the repetition range. You can make the exercises more difficult by working the next higher progression or by using weights. Either of these will cause you to perform each exercise to near-failure.

- 3x(3→6) of *Straddle FL Rows*
- 3x(3→6) of *Advanced Tuck PL Pushups*
- 3x(3→6) of *Strict Bar Muscle-ups* or *Front Lever Muscle-ups* to *Planche Variation*
- 3x(3→6) of One-Arm Ring Rows (do each arm with weaker arm first)
- *Squats (pistol progression or barbell)*: 3x 3→6 with 3 minutes of rest at 10x0 tempo
- *Deep Step-ups*: 3x 3→6 with 3 minutes of rest at 10x0 tempo
- *100-degree V-Sit* for 60 seconds total, in as many sets as needed, not to failure
- *Compression Work* for 3x10s

The numbers will certainly not always look neat. For example, in order to obtain extra volume at a lower repetition range, you may be performing 3x6 straddle FL rows while your advanced tuck PL pushups are at 4x4 or 5x3. Likewise, if your one-arm ring rows are too easy at eight repetitions, but you cannot yet advance to the next progression, you may need to make the exercise more difficult by wearing a weighted vest. Alternatively, you could wear a backpack filled with books.

You may have to get creative with your training to implement it effectively, due to the strict repetition numbers. This is where eccentrics, bands, weights, and other variations used to make exercises easier or harder will play a role in your training. Building a pulley system—easier than it sounds—can pay big dividends in your training because you can easily modify your exercises to the appropriate difficulty by adding or subtracting weight as needed.

Let's discuss a different split – light/heavy. The easiest way to implement a light/heavy split is to alternate an accumulation workout with an intensification workout. Implementing an extremely basic light/heavy split will look exactly like performing the accumulation phase without the extra push and pull exercise on your first workout day. Your second workout day will consist of the intensification workout. In this type of light/heavy split, "light" would consist of decreased intensity (higher repetitions with easier exercises) and "heavy" would consist of increased intensity (lower repetitions and more difficult exercises). Stick with a strict repetition range, if possible.

1. 3x8→12
2. 5x3→5

Once you start the second light/accumulation workout, aim to increase the difficulty of the exercise. Your progression of repetitions should look like this:

1. 3x8
2. 5x3
3. 3x9
4. 5x4
5. 3x10
6. 5x5

This is a very basic form of periodization where your progression happens consistently with every other workout: *3x8 → 3x9 → 3x10* and *5x3 → 5x4 → 5x5* in the middle of that. Alternatively, you could stick with the same repetition range and make the exercises more difficult by adding weight.

INTERMEDIATE: ROUTINE PROGRESSION

Eccentrics and Density: At this stage in your training, eccentrics become more useful. One-arm chin-ups (OACs) respond particularly well to eccentrics. Front lever responds well to inverted hang; slow eccentric, to hang. These are facts you can use if you feel that your progress is slowing down or stalled. Another idea that may be useful is some form of density training. Try this: aim to decrease rest times between sets by thirty seconds over your next few workouts and follow that with an increase in repetitions or progressions as you improve.

Moving Beyond Simple Methods of Progression: Accumulation and intensification phases, as well as light/heavy workouts, are extremely effective for progression after simple intra-exercise and inter-exercise progressions fail to work. If you are having difficulty finding an intra-exercise or inter-exercise progression that enables you to progress, you may want to take this opportunity to deload and re-evaluate your training program. If you do this and see that your lack of progress is not due to any miscellaneous factors (nutrition, sleep quality, school schedules, lifestyle, etc.), it is time to begin learning how to implement more complex methods of progression.

Make sure you try light/heavy before you start DUP, as a typical DUP protocol involves forcing adaptations over three workouts before going back and increasing weight on the fourth workout. Light/heavy and similar models typically increase weight every other or every three workouts.

Look for opportunities to use small programming adjustments to improve your gains. You do not need a large, overarching change like a transition from a full-body routine to a DUP protocol. The solution can be as simple as using eccentrics, slightly adjusting your rest times from workout to workout, or switching to light/heavy workouts using high repetitions in one workout and low repetitions in the next. If you have stalled, make simple changes that will help you improve. Reserve drastic changes for when you completely stall on minor modifications.

Goals: At this point, you should begin to obtain some of your goals. Congratulations! Two common examples are back lever and front lever. When you have achieved a goal, add these exercises to the end of your warm-up in order to maintain them. They require only a small amount of volume to maintain, and you can replace them in your routine with other exercises geared toward achieving your remaining goals.

The more specific you are with your goals, the faster you will progress in your training. If you first perform the planche isometric and other horizontal strengthening pushing exercises like planche pushups, pseudo planche pushups, weighted pushups, or exercises with carryover like dips you will make optimal progress toward the planche.

Training at the intermediate level becomes inefficient when you try to improve multiple things at once. For example, if you seek to improve aerobic endurance, metabolic conditioning, and strength training at the same time, you are less likely to succeed than you would be if you selected only one or two of these qualities. Athletes who use gymnastics or bodyweight strength training for cross-training purposes or CrossFit may notice this phenomenon. In such cases, it may be beneficial to move toward a modified periodization system where you maintain what you have already obtained while focusing on improving one or two new things at a time. Once you have improved a particular attribute, shift your focus to maintaining it while systematically working to improve the next attribute. You will improve much more quickly overall than if you tried to improve everything all at once.

Repetitions: At this point, repetitions will be categorized according to the attributes that need to be developed. If you are training primarily with strength, you will want to remain in three to eight range. With hypertrophy, you will want to stick with the five to twelve range. Finally, with endurance or connective tissue strengthening, you will want to begin in the fifteen to twenty (or more) range. It is beneficial to use very high repetitions, such as twenty to fifty, for connective tissue strengthening, as strength movements place a large amount of stress on the muscles themselves. You no longer get the same benefit of improvements in recruitment and synchronization that you would as a beginner.

Weak Links: If you notice that your exercises are not progressing as they should, even with enough volume, you may need to look for *weak links*. For example, you may notice as you are training your one-arm pull-ups progression that your back tends to develop strength and hypertrophy more rapidly than your forearms and biceps. Or maybe it's the complete opposite—your back is developing slower than your biceps and forearms. These should be signals that you may have a weak link in a particular movement or skill. The addition of specific exercises (in our example, forearm training or biceps curls) will improve these weak links, which will therefore improve your capability to successfully attain the one-arm pull-up. Weak links are the biggest reason why people stall out with strength isometrics like front lever and planche.

Common weak links may manifest as soreness or pain. Shoulder aggravation tends to indicate overall weaknesses in scapular strength and stability. Extra scapular work with retraction (squeezing the shoulder blades together), protraction (pushing your hands as far away from you as possible), elevation (raising them up), and depression (moving them down) may be needed depending on the particular movement you are performing. Rotator cuff exercises may be indicated as well. For tendonitis, the pattern is usually weaknesses in the opposing muscle groups and general overuse of the worked muscle groups.

Modify, Modify, Modify: By now you should know your body well enough to modify your routine as needed. Once you obtain good flexibility and mobility (such as the splits or an excellent pike and straddle), you may not need additional flexibility training. Like the goals you obtained through training (such as the back lever), you can put these into your warm-up or mobility routine to maintain them instead of continuing to work them in your primary routine. This will free up space to work on other movements.

Additionally, while you can still adjust your routines to place skill work, prehabilitation, flexibility, mobility, and other work on rest days, one of the benefits of understanding your body better is that you can split your routines further. You may choose to have a morning and an evening workout instead of one big workout mid-day. This is not recommended for beginners due to a beginner tendency to go overboard, but as an intermediate you are experienced enough to know how to modify your routine based upon how your body feels. This is extremely useful for implementing additional skill work if you want to work sport-specific skills or handstands more than seven times per week.

Strength Progression: Strength modifications will likely be moving away from the simple intra-exercise and inter-exercise progressions toward more complex programming. Better progress will be made using basic periodization methods like intensification and accumulation and light/heavy routines.

Here is a very important piece of advice: *keep things as simple as possible*. If you change many facets of your routine at once and fail to progress, you will not know what went wrong, and it will be difficult to fix your routine to get back on track. On the other hand, making one or at maximum two changes at a time is far

simpler and will provide you with much better feedback. If one of the changes does not work, you have a 50% chance of knowing what it is the first time.

It is important to log your training here in particular because small changes are what will cause you to progress. Once you figure out which small changes work best for you, you are set for a while. Generally, exercises that work well in the intermediate phase will only need to be tweaked slightly to work in the advanced phase (addressed in the next chapter). Here is a quick example: If you have determined that light/heavy modifications work well for you, you also know that an alternating two-day split of light/heavy will likewise work well. It follows that a three-day split of light/medium/heavy (such as the DUP method for three workouts) will be your most effective next step.

Another example is frequency vs. an increase in volume. Let us say you first made the change to increase the amount of time in your handstand sessions from five to ten minutes. This had little effect on increasing your handstand abilities, so you reverted that change and instead increased your frequency with handstands for another two skill work sessions in a week. This time you saw drastic improvement. This gives you an enormously useful piece of information. For skill work, you now know that additional sessions work much better for you than increasing volume within sessions. This means that you will tend to improve faster when you can implement fresh sessions over increasing volume within a session. For any additional skill work, you now know it is probably better to break it up into additional sessions rather than adding additional volume to your routine.

Overuse Modifications: Overuse modification advice for intermediates is the same as for trained and untrained beginners. However, now that you are working some of the more advanced straight-arm movements and higher intensity progressions, you may experience rapid onset of overuse injury symptoms, such as soreness, discomfort, or pain in your connective tissues and joints. If this happens to you, use an alternative progression method to condition your connective tissues for that particular exercise.

For instance, you are working straddle back lever and the connective tissues in your elbows are holding up well. However, when you progress to the full back lever your elbows show signs of connective tissue overuse. You know that this may lead to a full-blown injury, so you drop down to the straddle back lever and implement biceps curls as a connective tissue exercise. After a few weeks, you attempt to train the full back lever again and feel fine. However, in your third session with the full back lever you begin to feel the same symptoms. You may need to drop back down to straddle back lever and continue conditioning your connective tissues. You may need to make this adjustment a few times in order to keep from injuring yourself. The vast majority of athletes are too impatient to stick to this adjustment. Keep in mind that being injured will set you back much longer than performing this modification to your routine so you can progress without injury.

Let's repeat our modification standards:

- Eliminate, reduce volume, or substitute exercises.
- Add additional prehabilitation, isolation, mobility, or flexibility work as needed for the particular area.

Eliminating, reducing volume, and substituting exercises is a standard way to protect yourself from injury. The process is discussed in detail earlier in this book.

Likewise, add additional prehabilitation, isolation, mobility, or flexibility work for the particular area as needed. Check back to earlier chapters if you need reference or exercise ideas. If you feel confused, consult a medical professional, such as an orthopedic sports doctor or physical therapist. Alternatively, you can ask advice from coaches, other more advanced athletes, or even certain places on the Internet, such as these subreddits: www.reddit.com/r/bodyweightfitness and www.reddit.com/r/overcominggravity.

Avoiding Injuries: In the long run, learning how to modify your routine based on how your body responds—especially in the context of potential overuse injuries—is the most important thing you can learn when it comes to training. The number one predictor of an injury is a previous injury. Knowing when you need to back down and modify your routine will aid you for decades in both coaching and training.

Routines: You can use routines to work on sequences of skills, or you can use them to drastically shorten your workouts by combining many skills you have already been working on. You should try to learn some type of routine because it will challenge your strength and strength/endurance. Athletes often derive great satisfaction from performing a routine that includes goals they have worked hard to obtain. It is one of the more rewarding experiences of bodyweight strength training. Here are some examples of different routines that you can put together as you improve in strength. For the most part, they are easy to construct. Here is a basic routine on rings:

- Muscle-up
- L-Sit
- Shoulder Stand
- Return to L-Sit
- Roll backward or forward to an Inverted Hang
- Back Lever Progression
- German Hang Pullout
- Front Lever Progression

As your strength increases, your routines can be anything you want them to be. If you wanted to work on front and back lever, your routine may look something like this:

- Hang Pull to Front Lever Progression
- Pull to Inverted Hang
- Back Lever Progression
- Muscle-up
- Forward Roll straight into
- Shoulder Stand
- L-Sit
- Press to Handstand
- Slow Muscle-up Negative to Hang

Basically, you can make up anything that you want to perform. Momentum-based movements like the kipping and felge skills (forward and backward rolls) are meant to be transitions. It looks cool when you can chain them with strength moves. Be creative with your routines. Share them with others as well.

Typically, you will want to combine a series of skill and strength moves and alternate them if you want to work on transition movements. However, if you are going for pure strength you can work several strength moves in a row, in shorter sequences. If you do this, it helps if you work alternating movements of pull and push. For example:

- Hang Pull to Front Lever
- Front Lever Muscle-up to Tuck Planche
- Tuck Planche, roll back underneath the rings to Back Lever
- Pull out of Back Lever, Muscle-up to Press Handstand

If you know how to do freestanding rings handstand pushups, you might enjoy this routine: do as many rings handstand pushups as you can. Then, if that arbitrary number is four, perform four of each of the following.

- Freestanding Rings Handstand Pushups
- Advanced Tuck Planche Pushups
- Dips with Rings-Turned-Out (RTO)
- Inverted Pull-ups
- Straddle Front Lever Pull-ups
- Regular Pull-ups

This sequence is good for building strength/endurance in the shoulder girdle. You might have some fun experimenting with it in reverse, but it may become difficult to estimate how many free rings handstand pushups you can perform by the end.

Here's a fun game to play with friends; it's called *parallettes add-on*. Start with a skill like the L-sit. The next person performs the L-sit, a press handstand, and adds another skill at the end. This continues until someone fails.

Training does not have to be boring. If you are getting tired of doing discrete movements while working toward strength, mix it up! Make it fun to work on these skills and strength movements. After all, that is why you are training—because you enjoy it, not just because you want to perform impressive movements.

- CHAPTER 20 -

ADVANCED: ROUTINE CONSTRUCTION AND PROGRESSION

ADVANCED: ROUTINE CONSTRUCTION

Moving into the *advanced range* brings with it a new set of issues:

- Your training will become even more geared toward your specific sport or training.
- Shoring up weak links becomes vastly more important in order to progress in training. Many people have a weak link in their backs or even their quads if they are posterior chain dominant. Specific isolation work may be effective. If, for example, your back tends to be vastly stronger than your arms, biceps curls or other biceps exercise may be useful to shore up the weak links and improve your strength overall. The holds true for barbell lifts like the deadlift, which uses the legs, hips, and back extensively.
- While sleep quality, nutrition, and eliminating stress are important at every level, being on top of these health issues will help immensely at the advanced stage. Even 1% improvement will add up when you discover that increasing your strength and/or muscle mass starts to become difficult.
- Understanding how your body responds to training is important. At this stage, having a training log comes in handy, as it does at every stage of training. You can look back over how your body responded to certain rests, deloads, and intensity/volume of exercises. This makes the planning of workouts over the course of several weeks much easier.

Programming for the advanced level centers on a transition to the impressive B-skills and the need for more complex programming. You will learn to fully implement DUP protocol and other push/pull modifications to routines, as this type of training is the most effective at this point (though the traditional programming can be still used).

Here follow some examples of DUP protocol actually used in training. The first program was successfully implemented in 2006. The other exercises show examples of how to implement the DUP protocol on a similar repetition but variable weight scheme. (In this case, a makeshift weight belt was designed using a piece of rope with weights hooked onto it to provide additional resistance; an alternative would be a weighted vest.)

Daily Undulated Periodization (DUP) routine performed 3x per week. (Note: this athlete did not have access to a gym every day, so the days were not as consistent as they would have been with a traditional M/W/F program.)

The goal was iron cross, so iron cross pulls were the primary focus.

Monday

- 3x10 *Cross Pulls*
- 3x10 *Archer Rows*
- 3x10 *Straddle FL Rows*
- 3x10 *Hanging Leg Lifts*
- 3x10 *Pistols*

Wednesday

- 3x7 *Cross Pulls* + 15 lbs.
- 3x7 *Archer Rows* + 15 lbs.
- 3x7 *Straddle FL Rows* + 15 lbs.
- 3x7 *Hanging Leg Lifts* + 6 lbs.
- Deadlifts for 1x7 + 110 lbs., 1x7 + 170 lbs., and 1x7 + 200 lbs.

Saturday

- 3x4 *Theraband Cross Pulls*
- 3x4 *Straddle FL Rows* + 25 lbs.
- 3x4 *Archer Rows* + 25 lbs.
- 3x4 *Hanging Leg Lifts* + 10 lbs.
- 3x4 *Pistols* + 15 lbs.

Monday

- 3x10 *Cross Pulls* + 10 lbs.
- 3x10 *Straddle FL Rows* + 15 lbs.
- 3x10 *Archer Rows* + 15 lbs.
- 3x10 *Pistols* + 15 lbs.

Thursday

- 3x7 *Cross Pulls* + 20 lbs.
- 3x7 *Straddle FL Rows* + 23 lbs.
- 3x7 *Pistols* + 20 lbs.
- + Conditioning

Friday

- 3x4 *Cross Pulls* + 30 lbs.
- 3x4 *Straddle FL Rows* + 40 lbs.
- 3x4 *Archer Rows* + 40 lbs.

- 3x4 *Ring Dips* + 40 lbs.
- *Pistols* for 1x4 + 30 lbs and 2x4 + 40 lbs.

Tuesday

- 3x10 *Cross Pulls* + 20 lbs.
- 3x10 *Ring Dips* + 40 lbs.
- 3x10 *Ring Dips* + 40 lbs.
- 1x10 *Straddle FL Rows* + 30 lbs.
- + Conditioning

Note the increase in weight compared to the previous 10 RM, 7 RM, and 4 RM workouts. Attempt was made to keep exercises consistent with the repetitions but modify the weight accordingly (a good level of success was acheived). This allowed for large increases in weight on each exercise the following week: cross pulls, archer rows, and straddle FL rows all increased by 10-15 pounds after a week at 3x10 (from the first Monday to the second Monday). This is a substantial strength gain.

This particular athlete had poor nutrition at this time so the progress devolved after the first two weeks (which is why the entire cycle is not shown). Ultimately, cross pulls with an additional 50 pounds were achieved (in another cycle a few months later using a similar method.)

Here is a ~2 day per week program of light/heavy workouts. (Iron cross is again the ultimate goal.)

- Tuesday – *Cross Pulls* +10 lbs: 3x10
- Friday – *Cross Pulls* +15 lbs: 3x5
- Saturday – Miscellaneous Workout
- Tuesday – *Cross Pulls* +15 lbs: 3x10
- Friday – *Cross Pulls* +25 lbs: 3x5
- Tuesday – *Cross Pulls* +20 lbs: 3x8
- Friday – *Cross Pulls*: 1x8 bodyweight, 4x4 +35 lbs.
- Tuesday – *Cross Pulls*: 1x8 bodyweight, 3x8 +25 lbs.
- Thursday – *Cable Cross Pulls*: 4x5 with a setting of 6
- Tuesday – *Cross Pulls*: 1x8 bodyweight, 1x5 20 lbs, 3x4 40 lbs.
- Friday – *Cross Pulls*: 1x8 bodyweight, 1x4 25 lbs, 2x3 47.5 lbs., 1x3 50 lbs.
- Tuesday – *Cross Pulls*: 1x8 bodyweight, 1x4 25 lbs, 3x3 50 lbs.

Notice the manipulation of volume, alternating from 10 RM and 5 RM. As the cycle progresses, you build toward 8 RM and 4/5 RM, which biases the workout more toward strength. By the end, you are performing a 3 RM workout. This is a modification you can make with light/heavy or DUP, which is similar to classic periodization with its hypertrophy, strength, and power cycles. Instead of sticking with 10 RM, 7 RM, and 4 RM, you can instead run a hypertrophy scheme at first, slowly biasing toward strength at the end. This is extremely beneficial because the modern DUP protocol is better than traditional periodization at maintaining attributes. This program was implemented to focus on strength protocol in order to perform the iron cross for a swiftly-upcoming event.

This is another actual program, this one implemented with weighted dips. It was not the only pushing exercise in the program, but it gives an example of how a single exercise can be structured to make progress.

Notations are in *weight x reps x sets*. If there are only two numbers, it is just *weight x reps*. An 'F' placed after a repetition denotes that it was a failed repetition.

- 5/27 – BWx10, 60x5, 80x5x4
- 5/28 – BWx10, 60x5, 80x5, 100x5x3
- 5/30 – BWx10, 60x5, 80x3, 120x4x3
- 5/31 – BWx10, 20x3, 80x3, 120x3, 130x3x3
- 6/2 – BWx10, 60x5, 80x3, 120x3, 140x3x3
- 6/3 – BWx5, 60x3, 80x3, 120x4+1 (rest-pause), 130x4x3
- 6/4 – BWx5, 60x3, 120x3, 180x1x7 (eccentrics)
- 6/7 – BWx10, 60x5, 120x3, 130x5x3
- 6/9 – BWx10, 70x3, 130x3, 150x3x2, 160x2 (PR)
- 6/11 – BWx5, 55x3, 110x3, 140x2, 160x1F, 160x1, 165x1F
- 6/14 – BWx5, 60x5, 120x3, 150x3x3
- 6/16 – BWx5, 70x3, 90x3, 130x2, 150x1, 165x1F, 165x1 (PR), 170x1 (PR), 175x1F

This was all performed at a bodyweight of 135 pounds. Thus, 170 pounds were added to 135 pounds of the athlete. The previous 1 RM was +155 pounds, and weighted dips had not been performed for a couple of months. During a three-week ramp-up with the above program, 15 pounds were added to this weighted dip. This proves how effective this protocol can be. Not many athletes can add such a significant amount of weight at such an advanced level of strength. (This does not even take into account the brevity of the ramp-up period.)

Note the consistent scheme of decreasing the repetitions and increasing the weight with almost every workout. The following RM progressions were followed on a day-to-day basis: 5, 5, 4, 3, 3, 4, heavy eccentrics (similar to a 1-2 RM), 5, 2, 1, 3, 1. Lowering weight and adding repetitions serves to add volume, which helps to force adaptations. You can then aim to max and hit a PR, even if you are advanced in strength.

By the way, this program was by no means optimal. Ramping up toward a 1 RM this quickly and in this way is incredibly taxing and does not provide as much volume as a strength stimulus. A better progression would be to start out with more repetitions and stick with 2-3 RM. Start out with 8 RM, then move to 6 RM, 4 RM, and slowly ramp down to 2-3 RM. However, as flawed as this repetition scheme was, it clearly demonstrates the potential of a hybridized DUP system at an advanced level of strength.

Another example is a push/pull system integrated with light/heavy work. This is an advanced system that focuses on week-to-week gains in each exercise while separating push and pull to add additional volume. This system can be particularly effective for hypertrophy because of the additional volume. A push/pull routine performed 4-5x per week may look like the typical M/Tue/Thur/F with push being on M/Thur and pull being on Tue/F. Here follows an example:

- Monday: Heavy Push
- Tuesday: Light Pull
- Wednesday: Rest
- Thursday: Light Push
- Friday: Heavy Pull
- Saturday: Rest
- Sunday: Rest

The exercises on the heavy days consist of 3-5 repetitions, while the exercises on the light days consist of 5-8 repetitions. You can bias this routine toward strength by lowering the repetition ranges. This would make the exercises on your heavy and light days 1-5 and 3-6 repetitions, respectively. If hypertrophy is your goal, simply skew the numbers of repetitions in the opposite direction. This would make the exercises on your heavy and light days 3-8 and 6-12 repetitions, respectively. Alternating your focus each week is completely acceptable and even encouraged if you hit a plateau.

Heavy Push

- 3x4 *Straddle Planche Pushups*
- 3x5 *Rings Freestanding HSPUs*
- 4x5 *90-degree Rings-Turned-Out (RTO) Dips*
- + Legs

Light Pull

- 3x8-10 *Straddle Front Lever Pull-ups*
- 3x8 *Pulley-assisted* (20-lb. assist) *OAC* (or *Iron Cross* variations)
- 3x6 *German Hang Pullouts*
- + Legs

Light Push

- 3x10 *Advanced Tuck Planche Pushups*
- 2x7 *Rings Freestanding HSPUs*
- 3x7 *90-degree Rings-Turned-Out (RTO) Dips*
- + Legs

Heavy Pull

- 3x3 *Full Front Lever Pull-ups*
- 3x4 *Pulley-assisted* (10-lb. assist) *OAC* (or *Iron Cross* variations)
- 3x3 *German Hang Pullouts* + 1 lb. ankle weights
- + Legs

This routine was structured using many different light/heavy variations. With some exercises, like the planche, it is very difficult to add weight effectively. There are multiple ways to work around this; the easiest is to use some form of added resistance in the form of weight belt, weighted vest, or other makeshift item. Alternatively, the subsequent progression may be made easier by using bands. Even without added weight the progressions themselves work well to base your light/heavy, DUP, or another workout structure on.

Say you are stuck at a transition where you can hold a straddle planche for five to six seconds during a "heavy" day, but cannot work higher times with the straddle planche to make it effective for a "light" day. You can always move down to the previous progression for the lighter day (the advanced tuck planche in this instance). Train this exercise with twenty-second holds on your light day. If you are training toward the planche on the floor or parallettes, it can be beneficial to move to the rings for your light day when you move down a progression. You could even use this as alternative supplementary work.

As you can see from the programming illustrated above, multiple factors are used distinguish a light day from a heavy day. They are based on what equipment may or may not be available. Be creative!

- To change a heavy day into a light day for rings HSPUs and RTO dips, decrease the number of sets and increase the number of repetitions per set.
- To go from a heavy day to light day with planche pushups, switch from the higher progression (straddle planche pushup) to the lower progression (advanced tuck planche pushup). You can do the same for front lever pull-ups.
- For German hang pullouts and one-arm chin-up work, you can use weights to make the heavy day more difficult; just decrease the number of repetitions per set.

If you are on a DUP protocol with light, medium, and heavy days you can use these same steps to adjust those days in order to progress effectively. When you progress to the upper portion of the advanced range, your gains tend to appear once per week with DUP but may begin to taper off to once every two weeks. Do not be upset if it takes an entire cycle to see even a small improvement in strength. An increase in complexity of programming will be needed if you want to continually progress at this level. At this point, training becomes a bit more instinctive, as you have developed a ridiculous amount of strength and overall knowledge of yourself and what works best for you.

The term auto-regulation and the style of training implied is how you will train from here on out. As discussed in the programming chapters, you want to have quality workouts. You know how your body handles stress and you will know if you can do more or need to stop on any given day. At this level, it is necessary to add or subtract exercises or sets mid-workout based on how your body feels. The best way to track a workout and its effect on your body is using the RPE system discussed in the chapter on overreaching and overtraining. It becomes very important to track how you are feeling in workouts, as your progress will not be as obvious from workout to workout. Do not try to rely on your memory alone. Take good notes. They will be beneficial for years to come.

At this level of training, you can finally try a light/heavy or DUP-type taper. Start with a repetition scheme of 12/6 for light/heavy, respectively. Every week, change the number of repetitions in your light and heavy workouts until you "taper" to hit a 1 RM at the end of the cycle. Week 1 at 12/6 RM, Week 2 at 10/5 RM, Week 3 at 8/4 RM, Week 4 at 6/3 RM, and Week 5 finishes with a 4/1-2 RM to set a *personal record* (PR). Sets should be held constant at three sets or increased as you move toward the heavier days, if you can handle the volume.

A hybridized DUP program on a push/pull system performed 4x per week may look like this:

Week 1

Heavy Push

- 3x6 *Straddle Planche Pushups*
- 4x6 *Rings Freestanding HSPUs*
- 3x6 *90-degree RTO Leaned-Forward Dips*
- + Legs

Light Pull

- 3x10 *Straddle Front Lever Pull-ups*
- 3x10 *Pulley-assisted* (20 lb. assist) *OAC* (or *Iron Cross* variations)
- 3x10 *German Hang Pullouts*
- + Legs

Light Push

- 3x10 *Rings Advanced Tuck Planche Pushups*
- 3x10 *Rings Freestanding HSPUs*
- 3x10 *90-degree RTO Dips*
- + Legs

Heavy Pull

- 3x6 *Full Front Lever Pull-ups*
- 3x6 *Pulley-assisted* (5-lbs assist) *OAC* (or *Iron Cross* variations)
- 3x6 *German Hang Pullouts*
- + Legs

Week 2

Heavy Push

- 3x4 *Straddle Planche Pushups* (+ 5 lb. vest or ankle weights)
- 4x4 *Rings Freestanding HSPUs* (+ 5 lb. vest or ankle weights)
- 3x4 *90-degree RTO Leaned-Forward Dips* (or change progression to e.g. *Dip Straight-Body Press to Handstand*)
- + Legs

Light Pull

- 3x7 *Full Front Lever Pull-ups*
- 3x7 *Pulley-assisted* (5-lbs assist) *OAC* (or *Iron Cross* variations)
- 3x7 *German Hang Pullouts*
- + Legs

Light Push

- 3x7 *Rings Advanced Tuck Planche Pushups*
- 3x7 *Rings Freestanding HSPUs*
- 3x7 *90-degree RTO Dips*
- + Legs

Heavy Pull

- 3x4 *Full Front Lever Pull-ups* (with weighted vest)
- 3x4 *Unassisted OAC* (or *Iron Cross* variations)
- 3x4 *German Hang Pullouts* (with ankle weights)
- + Legs

In Week 2, the light workouts are very similar to the heavy workouts from the previous week. You can make them slightly harder or easier, depending on how well you are progressing from week to week. The main objective is to progress.

Week 3

Heavy Push

- 5x3 *Straddle Planche Pushups* (+ 10 lb. vest or ankle weights)
- 5x3 *Rings Freestanding HSPUs* (+ 10 lb. vest or ankle weights)
- 3x3 *Dip Straight-Body Press to Handstand*
- + Legs

Light Pull

- 3x5 *Full Front Lever Pull-ups* (with weighted vest)
- 3x5 *Unassisted OAC* (or *Iron Cross* variations)
- 3x5 *German Hang Pullouts* (with ankle weights)
- + Legs

Light Push

- 3x5 *Straddle Planche Pushups* (+ 5 lb. vest or ankle weights)
- 3x5 *Rings Freestanding HSPUs* (+ 5 lb. vest or ankle weights)
- 3x5 *90-degree RTO Leaned-Forward Dips* (or change progression to e. g. *Dip Straight-Body Press to Handstand*)
- + Legs

Heavy Pull

- 3x3 *Full Front Lever Pull-ups* (+ 10 lb. weighted vest)
- 3x3 *OAC* (+ 5 lbs.)
- 3x3 *German Hang Pullouts* (with ankle weights)
- + Legs

Aim to see the same progress from Week 2 to Week 3 that you saw from Week 1 to Week 2. This is an example of a routine where you can progress from week to week, even as an advanced athlete.

ADVANCED: ROUTINE PROGRESSION

Modifying Routines: Sometimes workouts do not go as planned and progress is slower or faster than you expected. This can be affected by many factors aside from your actual workouts. It is difficult to know if programs will work at higher levels until you have significant experience. However, since you have come this far, you are likely experienced enough to have a "feel" for how a routine will progress. If you need to modify the number of repetitions to make your workout more or less difficult, you can trust yourself to make this call. Just be sure to keep your light days light and your heavy days heavy. That is the most important part of a split light/heavy routine.

Keep in mind that as the stimulus to force adaptations increases and your training increases to match it, it is very easy to start doing too much rather than too little. This situation is partially addressed by properly scheduling deload weeks, but be aware that you may be accumulating unaddressed fatigue in your many years of training, even if you are still progressing.

Overreaching and Overtraining: After many years of consistent training, take an extended deload period of a few weeks to a few months. During this time, it is not necessary to fully rest the entire time. Just relax! Enjoy some time off to spend with your family, do something fun, or perhaps learn a new sport. If you have been training consistently for years, there will be very little overall decrease in gains when you come back. Instead, your overall total fatigue will have dissipated, leaving you fresh and ready to continue with your training.

One notable athlete had trained consistently for nearly four years with appropriate rest breaks, and his abilities were around Level 11-12 in most categories. He took a two-month extended break, during which time his body continued to experience changes. His hypertrophy increased as he "recovered" more. He had not been aware that his body even needed this extended break, as he had been making good progress beforehand.

Sometimes when our abilities skyrocket, we lose sight of the other qualities that are important to training effectively. Life is not just a game to see who can be the best. We should really have a love for what we are doing, and this sometimes means taking a break. Rest can help you regain your appreciation for training, which can often be lost in the day-to-day grind. This fresh perspective often positions you for success when you return.

Utilizing Periodization: Do not be afraid of failure. Even if you do fail, at least you tried! Many of the periodization and programming schemes that you will try out in your early and intermediate, and even into the beginnings of the advanced stages will be mediocre. However, that experience will help you learn how your body responds to various exercises and periodization methods. It was only as you gain more experience that you will be able to analyze your programming and refine it to be more effective. You will learn that it is important to put forth the effort to experiment with your training to learn what will work well for you, especially if your progress has stalled.

If you are a coach, this will pay dividends for your athletes. Be flexible, as your athletes are not you and you are not your athletes. There is a general, foundational level of knowledge that coaches must learn in order to know what works for their sport. This fundamental knowledge can be used effectively for most athletes. However, the mark of a great coach is the ability to build upon these fundamentals and tailor an approach for each individual athlete based on their unique response to the training program. Unlike cookie-cutter programs, the goal of *Overcoming Gravity* is to teach you to identify what works best for you so you can build your own routine.

Goals: At the advanced training level, your goals need to become even more specific. Maintain the strength level of the goals you have already achieved while simultaneously working toward one push or one pull goal at a time. This enables you to focus *all* of your push and pull exercises toward your one specific goal. Such focus on one particular goal will help to drastically increase the rate at which you progress.

Consider Outside Factors: It is also very important to be aware of your sleep quality, nutrition, and stress levels. You will not get very far without having these factors in order. The easiest example to use is that of

David Brailsford and the British cycling team, who only won 2 gold medals from 1908-2002 but won 58 gold medals in world championships from 2003-2013 and 8 gold medals in the 2008/2012 Olympics. Basically, Coach Brailsford operated on the *marginal gains theory* in which he aimed to improve his athletes in every aspect in 1% increments.

If you can improve your workouts, sleep quality, nutrition, stress levels, and other factors by just 1%, these slight improvements will eventually accrue large improvements. It may seem like a negligible improvement to take off 0.01 seconds by improving performance through various factors here and there, but when you make 10 of these improvements it equals 0.10 seconds. In swimming, track and field, and cycling, 0.10 seconds can be the difference between first and fourth place.

Training Log: Keep one, and record RPE values too. Track changes in daily performance and how you felt while training. A written log will allow you to see if you are undertraining or overtraining, which is critical at this level. As an advanced athlete, the window for effective volume, frequency, and intensity narrows. Use information from your training log to modify your routines as necessary.

Weak Links: The advanced progressions are where weak links become much more pronounced. Check every few weeks to see if you need extra work in particular areas. Rely on your training log. The extremely difficult movements in an advanced workout place a large amount of strain on the areas being worked. Your weak links may be identified for you by the exercises you are performing. For example, you know a one-arm chin-up or iron cross is working your back muscles. However, if you are not progressing, you may need to focus your work in one of two places. Your back muscles may not be taxed enough due to a lack of volume. Alternatively, your biceps or other areas may be the weak link that is preventing progression. You may need to add a bit of isolation work to bring up these weak links. Experiment, take notes, and discover what will help you progress.

Overuse Modifications: When you are dealing with very difficult bodyweight exercises your body will usually tell you if an exercise is too much by the strain on your muscles or connective tissues. Listen closely to your body because higher intensity exercises have the tendency to injure you more, especially when you are fatigued. If you feel strain on an area, you should definitely not go to failure. As a reminder, here is the modification information from previous chapters:

- Eliminate, reduce volume, or substitute exercises.
- Add additional prehabilitation, isolation, mobility, or flexibility work as needed for the particular area.

Avoiding Injuries: It pays to remember that *the number one predictor of an injury is a previous injury.* Always back down and modify your routine based on how your body responds—especially in the context of potential overuse injuries. An injured athlete always progresses slower than one who stopped short of injury!

And Beyond: Beyond Level 12, athletes have diverse goals they want to achieve and the experience to make it happen. While this book covers a lot of ground, not much time is spent discussing special techniques to make workouts shorter, such as pairing exercises or various types of split routines. If you have further questions in that area, the Internet is a great resource. Your questions may even help another athlete! If you are at a complete loss or just want to continue the discussion, post on this Reddit forum: www.reddit.com/r/overcominggravity.

Part Five

INJURY/PREHABILITATION RESOURCES AND BODYWEIGHT EXERCISES

- CHAPTER 21 -

COMMON BODYWEIGHT TRAINING INJURIES

Overcoming Gravity is not intended to diagnose injuries of any kind. If there is a potential injury, schedule an appointment with your doctor, physical therapist, or medical professional. Always listen to the advice of your medical professional over anything read in this or any other book. These chapters are for informational purposes. If this information is used, it should only be done after consulting with your medical professionals.

This book covers a wide variety of topics and will not delve into heavy physiological details. The information contained in this chapter will be presented in a conceptual way. Keep in mind that while the injuries discussed may be the most common, just because you are experiencing and injury in an area described does not mean you necessarily have that particular dysfunction. The goal of this chapter is to expand your knowledge on common problem areas so that you can use correct prehabilitation measures. This information is not to be used in lieu of rehabilitation work. Rehabilitation work requires specific information tailored to your body, rather than the general information presented here.

TENDONITIS

Etiology

Tendonitis is an overuse injury where the ability of the tendon to sustain a workload is insufficient. There are many possible ways for it to develop, including muscle imbalances, general overuse, under-recovery, or even sudden injuries. Tendonitis typically develops because connective tissues adapt slower than muscles. As you get stronger, fast progression or a high volume of training may be too much for your connective tissues, even if your muscles are able to handle the workload. Over time this can have negative consequences, which could include tendonitis.

The scientific literature calls any pain and dysfunction of the tendinous structure "tendinopathy." There has been some debate over whether or not stages exist, but if they do, these are the general stages:

- The first stage of tendonitis is characterized by the "-itis" or inflammation. In this stage, the overuse is acute, and if untreated, you will likely feel sore or uncomfortable for a week. If the area is aggravated by persistent exercise, this stage could last a month or two and/or progress to stage two.
- The second stage is called *tendinosis,* characterized by chronic degeneration. In this stage, the inflammation tends to disappear as the soreness and discomfort progresses into full-blown pain. While the pain usually occurs during exercise, it can also be present while resting.

- The third stage of tendinopathy is where tendinosis progresses, which may result in weakening of the tendon such that partial or full tears of the tendon may occur.

The sensitization of the body from soreness and discomfort of the tendon to full-blown pain is usually a continuum rather than a process measurable in stages. You would not be able to determine whether you had tendonitis or tendinosis unless you had a biopsy performed and were able to look at your tendon under a microscope. Because of this, you should treat the stages as one continuous stage and incrementally prehabilitate the injury to full health.

Signs and Symptoms

- Stage One: The things to look for are pain, soreness, achiness, tenderness, and other subjective attributes that appear during or after exercise. These symptoms tend to noticeably improve with elimination of the aggravating exercises, and with the addition of mobility work and prehabilitation. Tendinpathy can also occur without pain, but since there is no way to detect this, there is no reason to discuss it. If you feel substantially weaker and can't determine a reason for it, consult a doctor.
- Stage Two: In this stage, the affected tendon and surrounding musculature will be tight and stiff, especially after periods of inactivity (like when you wake up in the morning). Pain during exercise is variable, but it may hurt even while not exercising. Sometimes the pain will start to go away after the muscle and tendons get warmed up for exercise, which makes you think you can do more. The fact that pain may go away during exercise is deceptive, so work capacity should be kept lower in order to rehabilitate properly.
- Stage Three: At this stage you should see a doctor or medical professional.

Typical Sites of Occurrence

Here are some of the most common sites tendonitis can develop while performing bodyweight exercises:

- *Medial* epicondylitis or *golfer's elbow* (inner elbow) arises from excessive high intensity pulling exercises.
- *Lateral epicondylitis* or *tennis elbow* (outer elbow) raises from too much wrist extension.
- *Triceps tendonitis* (elbow) arises from excessive high-intensity pushing exercises.
- *Biceps tendonitis* (elbow) arises from excessive high-intensity pulling exercises or shoulder compensations.
- *Wrist tendonitis* (wrist) arises from computer overuse or excess flexion/extension of the wrist. Learning to distinguish between this and other wrist injuries is discussed later.
- *Rotator cuff tendonitis* (shoulder) generally arises from excessive overhead exercise or low-control jerking movements.

Corrective Measures

Proper corrective measures for tendonitis will typically be a combination of prehabilitation exercises and those listed in the general health and injury management section.

Avoid Aggravating Exercises: Overuse tendonitis gets worse if you continue to perform exercises that aggravate it. Listen to your body. Continual aggravation of an injury will significantly hinder your training. Avoiding injury-aggravating exercises will solve 95% of potential overuse injuries with no further steps

needed. After you substitute an offending exercise for another or drop down a progression, you can always move back into it as your condition improves.

Mobility Work: Recent research shows that in the case of tendonitis, it is much better to perform mobility work than totally resting. Mobility work will promote healing because you are moving the affected area. Your tendons will be worked very lightly, which will not aggravate them further. This will allow any needed remodeling to take place and prevent disuse atrophy.

One to two weeks of mobility work should clear up mild tendonitis because the initial inflammation will promote healing. This does not mean you have to cease working out altogether; just avoid exercises that aggravate the overused area where the tendonitis is present. If this is successful, work your way back into exercise by starting with 40% volume and adding 10% back each week. Note that it is very easy to aggravate a sensitive area again (this is why you only add 10% volume each week). If there are signs of aggravation in regard to making it worse, immediately back off for the day. It is better to be conservative than to develop a chronic condition.

Unfortunately, chronic tendonitis may not respond favorably to mobility work and removing offending exercises. If the tendonitis does not clear up within a few weeks, there is a chance you are dealing with a case that is further along in the tendonitis continuum. This needs to be treated differently than mild tendonitis: rehabilitation exercises are needed to stimulate the inflammatory process along with massage to promote healing. Any other exercises that aggravate the affected area should be eliminated.

Self-Massage: Massage may help improve tissue quality by helping to release and reorganize the tissue via the body's natural inflammatory processes, as well as break up any potential scar tissues or adhesions that may be limiting proper movement of the affected and surrounding area. The concept of increasing blood flow to the tendon is false in light of current research.

While you should not aggressively massage the tendon area; some massage therapies might help. Cross-friction massage and myofascial release are two common techniques that can be used. Cross-friction massage is oriented perpendicular to a tendon, and myofascial release is oriented parallel to a tendon. If you can locate the muscle that the tendon connects to, you can attempt to loosen it up with the two aforementioned massage techniques. The goal is to loosen up the muscle tissues so that tension is not placed on the tendon at all times, as this may aggravate it.

To ensure the surrounding musculature is operating correctly and not causing excess strain to the affected area, apply cross-friction massage and myofascial release to the area between the joints that surround it. For example, with medial epicondylitis, massage all of the muscles between the shoulder and wrist. With patellar tendonitis, massage all of the muscles between the ankle and hip. If you desire, you can apply very light massage to the tendon as well and see if that helps in the long run. Start out very lightly, as the tendon may be sensitive. Soft tissue work that is too aggressive may further aggravate the injury.

Using alternative manual massage techniques may help. Graston technique, ART or trigger-points therapy, foam rolling, and golf/tennis ball rolling are some methods to consider. It is recommended that you talk to a medical professional to find out what is best for your particular case.

If your doctors clears it, aim for anywhere from five to thirty minutes of massage per day. Most of this should be focused on the muscle. If you find tight muscles with adhesions in the surrounding musculature,

focus on those areas as well. The time of day when you perform this does not matter, so you can break this up into a few sessions if need be.

Heat or Contrast Baths: Chapter 15 discussed MEAT vs. RICE and gave various reasons why ice is no longer considered the best treatment for sprains. If excessive swelling is present, use compression and/or anti-inflammatories.

Switching from ice to heat and contrast baths has shown some results in practice. It typically works well to complete two to five 15-minute sessions per day. For contrast baths you can alternate between cold or ice water and hot water every minute. Do this for five to eight rounds.

Light Stretching: Although studies show that stretching does not prevent injuries, it can be used effectively in programs to prehabilitate before an injury and rehabilitate after an injury. This is particularly important in cases of tendonitis where the muscles of the involved tendon may be excessively tight and have a limited range of motion. Pain causes muscles to tighten up, so stretching is generally useful.

Stretching should be aimed at the agonist muscles—the muscles that connect to the tendon in question—because they become tight and short from both pain and overuse, which may contribute to excessive strain on the tendon. On top of that, when there is distinct overuse on one side, there is usually an existing muscle imbalance. This puts stress on the joints and supporting structures like tendons and ligaments. Correcting the imbalance and loosening tight muscles should help get the tissue functioning properly.

Focus your stretching on the agonist muscles connected to the tendon and focus your strengthening for the antagonistic muscles on the opposite side. If you are dealing with medial epicondylitis at the elbow, stretch your forearm flexors and do strengthening work for your forearm extensors. For patellar tendonitis, stretch your quads and strengthen your hamstrings.

Light Eccentric Exercises: Research has consistently proven that eccentric exercises are the most effective protocol for rehabilitation of tendonitis. Performing eccentric exercises increases collagen formation and normalizes dysfunctional tendon structure. Bear in mind that sometimes the musculature at the affected joint will be unable to properly execute a movement due to pain compensation. If this is the case, eccentric exercises also help re-educate your nervous system to fire correctly.

Begin with a very light weight and work on the eccentric portion of the lift slowly and assuredly. The eccentric movement should take five to seven seconds. As you improve significantly, you can add in the concentric portion. Be careful not to overdo it. As stated in Chapter 15, this tends to be a 5121-type tempo. The concentric should be controlled (but not fast) with pauses at the end ranges of movement, and the eccentric should be longer. Start with twenty repetitions per set and work your way up to the thirty to fifty range before you increase intensity or add weight. This allows your body to adapt to the workload, which decreases the risk of making your injury worse and/or re-injuring yourself. Perform not-to-failure so as not to aggravate any existing injury.

Generally speaking, pain is not an accurate indicator during execution of an exercise in determining if you are doing too much. Rehabilitation may be performed with or without pain to great effectiveness. This is one of the main reasons that all rehabilitation measures should be chosen in consultation with an appropriate medical professional.

That said, early tendonitis prehabilitation tends to work best with very light weights at 40% of 1 RM and open chain exercises like eccentric flexion wrist curls for elbow tendonitis or eccentric leg extensions for knee tendonitis. For the concentric phase, you can use the other arm/leg to assist the arm/leg being prehabilitated. This approach makes it easy to load the joint with light weight (in the form of dumbbells or ankle weights). It also allows you to make very small increases in weight in order to continue a safe progression. As you progress, you can move to more closed chain exercises like the eccentric of slowly walking down stairs or negative pull-ups. Closed chain exercises tend to use a larger portion of bodyweight, so progressing to them too soon may aggravate the injury and interrupt the healing process.

Other Methods: Eccentrics are the only intervention with "strong evidence" confirmation in the scientific literature, which means multiple random controlled trials have confirmed their efficacy. Other methods may have no evidence, weak evidence, or moderate evidence to support their use in a rehabilitation program. What is meant by "weak evidence" is there is a potential mechanism, there is animal research, and/or there are pilot and/or case studies. However, there have been no random controlled trials (RCT) or the evidence gathered in random controlled trials is conflicting. "Moderate evidence" is an agreement of pilot and case studies, research, and one to two RCTs. Some methods that range from conflicting evidence to no evidence to moderate evidence include:

- Dry Needling
- Acupuncture
- Extracorporeal Shockwave Therapy
- Ultrasound
- Electrical Stimulation
- Low-Level Laser Therapy (LLLT)
- Platelet-Rich Plasma (PRP)
- Autologous Blood Injection
- Prolotherapy or other Sclerosing Agents
- Taping
- Surgery

There is moderate evidence for things such as extracorporeal shockwave threapy, some versions of prolotherapy and sclerosing agents, and some types of PRP on some versions of tendonitis. Interventions like corticosteroids and anti-inflammatories like NSAIDs may help in the short term but produce negative long-term results, which is why they are excluded from this list.

One of the big problems with the research is that interventions on certain portions of the body may not work on other portions of the body. For example, the research on lateral epicondylitis is a nightmare because longitudinal and follow up studies indicate virtually nothing works in the long term, even though eccentrics and general physical therapy including modalities do provide short term benefit. Many things that work for Achilles and patellar tendonitis do not necessarily work for shoulder or elbow tendonitis.

There are other methods not listed here, such as taking supplements. There is only conflicting evidence, no evidence, and/or potential weak evidence for the use of supplements. If they help, it may be on an individual level.

- Glucosamine and Chondroitin Sulfate (taken together at a 3:2 ratio, respectively)
- Methylsulfonylmethane (MSM)
- Cissus Quadrangularis
- S-Adenosylmethionine (SAMe)
- Fish Oil
- Vitamin C
- Hyaluronic Acid
- L-Lysine and other components of collagen and tendons

Planning Prehabilitative Sessions

Integration of prehabilitative sessions with regular workouts is the same: modify your routines by removing the aggravating exercises and replace them with similar exercises or easier progressions of the same exercise. If you need to modify further, perform your workouts using the concepts of intralimb, opposite limb, and other body-part exercise. If an exercise requires use of an injured limb, proceed *only* if it does not aggravate your injury. Additionally, make sure your tissues are sufficiently warmed up. Here is a general guideline of how you can structure a prehabilitative session:

- Mobility Work (to warm up the area)
- Stretching (5-10 minutes)
- Self-Massage (5-15 minutes)
- Light Eccentric Exercise (starting with 1-2 exercises, 1-2 sets of 15-20 reps)
- Heat or Contrast Bath (10-15 minutes)

Here is an example using elbow tendonitis. Perform the following for the specific tendon that is injured:

1. Wrist circles and other wrist mobility work, pronation and supination, and flexing/straightening of the elbow.
2. Very light stretching for 20-30 seconds (for each of the wrist positions), pronation and supination with the elbows extended and flexed all the way.
3. Light massage to the muscle and around the tendons.
4. Wrist curls at 40% 1 RM for 1-3 sets of 20 repetitions (up to 50) at a 5121 tempo. Additionally, for muscle strengthening/stretching, perform the following: Strengthening of the antagonist muscles of the tendon (1-2 exercises, 1-2 sets of 15-20 reps)
5. Apply heat to the affected muscle(s) and tendon(s) for 10-15 minutes.

Heat is flexible is regards its placement in the program. You can move it to the beginning of the session or before/after the stretching. Heat can be effective in warming up your tissues for stretching, massage, or exercise, especially if you are particularly stiff or sore.

Do not split up the prehabilitation from the routine even though you can perform this on off days as well. Instead, combine the sessions to work (in this order) on your warm-up, eccentrics, massage, stretching, and modalities to minimize rehabilitation time.

If you are adding prehabilitative work to your routine, this does not mean you need to rest completely or neglect other areas of your training. Even if you are injured—for example, if you have elbow tendonitis—

you can still perform leg work, core work, certain types of skill work, and corrective exercises like mobility/flexibility work for the injured areas of your body.

It is important to note that when there is tendonitis at "stability joints" like the elbows, there tends to be a loss of mobility or strength in the wrists and shoulders, which may add more stress on the elbows. The same thing occurs with tendonitis at the knees and losses of mobility or strength at the ankles and hips. Thus, if you have tendonitis at the elbows or knees you should work on improving mobility and flexibility of the two joints surrounding it.

As your condition improves, slowly begin to move from the isolated high-repetition exercises into lighter, compound movements. From there, you can slowly work back to heavy exercise. A good rule of thumb is to take a week to rehabilitate for each month you have been injured. So if you have been dealing with something for a year, you can expect it to take around twelve weeks to completely rehabilitate to the point where you are once again using heavy weights or high volumes.

MUSCLE STRAINS

Strains, *pulls*, *tears*, and *ruptures* are different names that describe the same muscle injury—the only difference is in the degree of injury sustained. A strain or pull is less serious than a tear or rupture. To keep it simple, the term *strains* will be used from this point forward.

Etiology and Assessment

A *muscle strain* occurs when the amount of force put on a muscle is greater than the ability of the muscle to generate an opposing force. This most often occurs during high-speed movement, however, it can also occur during sustained contractions. It tends to happen near the end of workouts when muscles are fatigued and cannot generate as much force as they could in the beginning of a workout. Muscle strains have a higher frequency of occurring under these circumstances:

- Where there has been a previous strain, because of an existing muscle weakness.
- After static stretching, as you begin to move into athletic activity, because the desensitization of muscle spindles may contribute to a muscle lengthening much farther than it should.
- In older populations, because the muscles become less pliable with age.
- In muscles with poor flexibility and mobility, because the muscle cannot elongate very far without straining especially as you fatigue.
- Near the end of workouts, because muscles have less ability to maintain adequate force output to prevent straining as fatigue increases.
- In weak people, because weak muscles strain more easily.
- In impingement—when the motor nerve output is decreased it leads to a decrease in force production from the muscle.

Muscle damage—especially factors related to the damage like delayed onset muscle soreness—is caused by eccentric muscle contraction. The same thing occurs with strains. They occur during the eccentric contraction of the muscle. Even in cases where a strain appears to occur during a 'concentric' contraction, it is actually happening during an eccentric contraction (right at the time of transition) or when the force is too great and tears the muscle.

The vast majority of strains—aside from catastrophic strains—will occur during an eccentric movement. Hamstring strains occur when the knee is moving forward or the foot is receiving the ground as the hamstring is lengthening. Back strains occur during deadlifts, as the back is rounding and the spinal erectors are lengthening. Biceps or shoulder strains occur when coming down from the top of a pull-up. In kicking sports, strains will tend to occur after kicking the ball extremely hard, as the leg travels up and forward in front.

Knowing the factors that increase propensity for strains is important. If you are more prone to strains, you must use caution when operating at high intensities. Athletes with known medical issues or previous strains need to be proactive. When performing intense workouts at high speeds, be sure to warm-up adequately and save the static stretching for after the workout. The one exception is if there are flexibility issues that impair proper technique. These should be addressed prior to working out to ensure safety during a workout.

When a strain does occur, here are a few signs that will help you recognize what is happening:

- There is pain in muscle lengthening and in muscle contraction.
- Strains tend to occur with a sudden and sharp onset of pain.
- Strains tend to occur in the muscle belly, the soft tissue of the muscle
- If the strain is severe, swelling and/or bruising may occur.
- If the strain is a tear, a divot or gap may appear in the muscle or it may rend apart altogether.

Strains are graded on a one to three scale:

Grade I tears consist of minor muscle tearing. There is little to no swelling and no bruising, but pain is present in the soft tissue. The amount of pain is often variable and contingent upon how the person perceives it. It is possible that pain will only occur during eccentric movements and not concentric movements. When light pressure is applied to the strained area, it is unlikely that you will feel intense pain, but you may feel a level of discomfort or mild pain.

Grade II tears are partial tears of the muscle. There is likely to be some swelling. Bruising is variable but will most likely be present, as the tissues are damaged/ruptured enough that there will be blood leaking out. Both concentric and eccentric movements will hurt, and putting pressure on the area will cause pain. You will have limited range of motion in the injured muscle and it will often begin to get tight in order to protect the injured tissues.

Grade III tears are complete or near-complete ruptures of the muscle. There will be swelling and bruising. There is likely to be a divot or gap where the muscle is torn apart. If this occurs, it is important to use compression and seek immediate medical attention.

In the event of a Grade III tear, go directly to the emergency room. (It is advisable to do so in the event of a Grade II tear as well; however, it may not be necessary in all cases. In any event, the following information is directed to those with Grade I and low Grade II tears only.)

Prehabilitation – Acute/Inflammatory Phase

Strains are different from tendonitis. With a strain, an actual injury has occurred, whereas an overuse injury like tendonitis may manifest as soreness or discomfort without any tissue disruption taking place. Prehabilitation for a strain will begin in the tissue remodeling phases rather than skipping to specific prehabilitation of the area.

If you are weak, you need to get stronger. If you have very tight muscles, it is imperative to increase mobility in those muscles through static stretching and/or proprioceptive neuromuscular facilitative stretching after your workouts. If you are older, it is essential to properly warm up before every workout, and you should perform all of your static stretching after your workouts unless your body requires it to help maintain proper technique.

Most importantly, *always maintain proper technique*. If you are performing timed workouts, it is important to emphasize technique over hitting a faster time. Constantly drilling technique is the key to success in every sport and athletic endeavor. You are not doing yourself any favors by taking shortcuts to look or feel better, you only increase your chance of injury when you do so.

The acute phase in all injuries is characterized by tissue damage that elicits an inflammatory response in the muscle. Swelling and bruising may or may not be present; however, if either is present, it is critical that you take all of the proper steps to encourage tissue healing:

- **Use Heat:** You can do this immediately if there is no swelling. Blood flow to the area is beneficial. There is some controversy over going directly to heat for acute injuries, so ice can be used if you want to stick to standard protocol. If there is swelling, you should use compression.
- **Anti-inflammatories:** Talk to your doctor first. For Grade I and II strains, most doctors will give you a prescription for NSAIDs like ibuprofen. Follow your doctor's guidelines. Be aware that chronic use of NSAIDs can lead to stomach issues.
- **Keep Moving Without Causing Pain:** It is important to keep the body part mobile in order to keep the muscles from tightening up and inhibiting the nervous system sensitization from the pain. Do not move in a way that causes pain. Strains should never be stretched because that is typically how they were injured in the first place.
- **Self-massage:** If there is excessive swelling, use your hands to push the swelling up toward your heart. This will help clear it out and speed up the healing process. Self-massage in this phase should focus on light/superficial massage to the surface of the skin that moves swelling toward the heart. Do not push hard into the tissue.

Repair and Remodeling Phases

These phases are usually separated, but repair and remodeling can occur simultaneously if the muscle is cared for properly.

In this stage, the body is repairing the damage that can be repaired, breaking down what cannot be repaired, forming scar tissue, and laying down new tissues. This phase begins within 48-96 hours after injury. When swelling is reduced and the tissue begins to feel better in movement, consider that you have left the acute phase and entered this phase. Be conservative in your judgment so as not to reinjure the strain, and take the following steps:

- **Continue Using Heat:** This helps increase blood flow, loosens tight muscles, and allows for increased movement capabilities. Keep moving as much as you can without pain.
- **Continue Anti-inflammatories:** Use as needed for both pain and excessive inflammation.
- **Maintain Self-massage**
- **Add Mobility Work:** Shift your primary focus to loosening tight muscles. You can massage deeper, provided that you are not inflicting pain. Add mobility work after to help expand your

range of motion. It is best to stretch into the range of discomfort but stop short of pain, as this can aggravate the injury. All of this is in addition to frequently moving the affected area.

Programming in this phase may follow these steps:

- Apply heat to the affected muscle (10-15 minutes)
- Massage the affected muscle (10-15 minutes)
- Perform mobility work focused on maintaining and slightly improving range of motion (5-10 minutes)

Resuming Exercise: Like with tendonitis, begin with very light weights so you have a good degree of control over the movement, which will ensure that you do not re-strain the muscle. Take it very slow: *it is very easy to aggravate the affected areas.*

Perform isolation work if it can be done without aggravation of the affected muscles. Keep the weight very low and only perform a few sets of 15-25 repetitions per set. Aim for a tempo around 5121 (similar to what you would use for tendonitis) that focuses on slower eccentrics, controlled concentrics, and pauses. Now is *not* the time to be aggressive with weight increases. If there is any type of twinge in the muscle, back off immediately. You want to work higher repetitions to build endurance, as your tissues will be extremely vulnerable when fatigued. With any injury that cannot be isolated (such as a lower back strain), supplement with isometrics. Non-weighted squats, back extensions, or very light deadlifts/good mornings can work well. For back strains, reverse hyperextensions can help, but use caution.

In most cases, you can perform isolation work nearly every day of the week provided that you keep the exercise low intensity and you feel better the next day. Keep the exercise and movement high, without fast progression. Use extra caution; it will take you even more time to recover if you re-strain a muscle.

Slowly progress your way from isometric exercises by increasing intensity. Once you have strengthened the area sufficiently, work your way back to light compound exercises. From there, progress the intensity in your compound exercises. At this point, you will be on your way back to full workouts. Progress will vary based on the individual. Don't be afraid to take it slow.

Preventative Measures: As discussed, strains are more likely to occur if you have strained a muscle previously. Here are a few things you can do to prevent another strain.

Improving mobility and flexibility is a major factor. This work should be integrated into your warm-up and cool down. Add in some soft tissue work like foam rolling and/or self-massage. Do dynamic and static stretches when appropriate.

Next, make your muscles more resistant to damage. As you know, the majority of damage that occurs during exercise takes place while performing eccentric movements. However, the muscles themselves gain a resistance to damage with repetitive eccentric work. The model by which this occurs is the *popping sarcomere theory*. This theory states that, during eccentric exercise, individual sarcomeres distend while a muscle is being lengthened, which accrues as damage. Excess or macroscopic sarcomeric distension in a localized area is a strain, but the body responds to microdamage by adding additional sarcomeres to the muscle during the inflammatory phase of the healing process. Subsequently, the muscle becomes more resistant to damage.

This means that the bulk of prehabilitative work should focus on slow, eccentric exercise. This is especially true if your routine or sport requires explosive movements. For example, a sprinter with a hamstring or groin strain will want to focus on eccentric hamstring curls for a 6-10s negative phase with higher repetitions. This will enable the athlete to build up resistance to damage in the future while rehabilitating the injured muscle(s) back to full strength.

You can then progress in your prehabilitative work to a 6-10s eccentric on the eccentric portion of compound lifts like deadlifts, good mornings, hyperextensions, Romanian deadlifts, and similar exercises. The goal is to work back to this type of strength and power work before resuming explosive exercises if your goals require them. Do not be too aggressive in adding weight and take care to strictly maintain your technique.

Conclusion

It is not difficult to recover from Grade I and low Grade II strains. High Grade II strains may require more attention. Treat them with the same methods, just know that the acute, repair and remodeling phases will take much longer. If you have a Grade III strain, you need to be seen by a qualified medical professional.

If you have a muscle strain, the hard part is having the patience to take care of your body through the protocols mentioned above. Be disciplined. Do not take your body for granted. Think of this time as a learning experience that you do not want to repeat. Perform proper mobility work, prehabilitative work, rehabilitative work, and focus on maintaining proper technique. Go slow.

TENSION HEADACHES

Tension headaches occur for several reasons. If the headache (or pain near the base of the skull) occurs only during exercise and/or shortly after exercise, it is likely that the cause is improper technique or excessive tensing of the muscles during exercise. A craned or arched neck shortens the muscles at the base of the skull and may cause them to cramp, which is one cause of tension headaches, or tight muscles may limit blood flow to the brain, also resulting in a headache. (Note that if your headaches or pain have occurred after blunt trauma or an accident and/or the pain seems at all unusual, you should get it checked out by a doctor. It could be symptomatic of something more serious.)

Many people get tension headaches while performing squats, deadlifts, and pull-ups. They are usually straining to keep their back straight during the movement. This may lead to arching or craning of the neck, especially when trying to get the chin to the bar during pull-ups. This can also occur during dips, handstand pushups, or any exercise where the head is excessively hyperextended.

This excessive head movement is important to eliminate because it decreases force output. There is space between your vertebrae that the nerves to your muscles emerge from to go to your limbs. When you arch or crane your neck, you decrease that space and it can compress those nerves. This can potentially decrease force outputs to the muscles because of temporary impingement. Imagine your limb falling asleep—it loses coordination, either from impingement of the nerve or occlusion of blood flow to the nerves. Proper form in the neck does not just prevent injury—it also allows you to optimally express our power and strength.

Besides fixing technique, there are multiple ways to get your body functioning normally. Heat and massage can loosen up the muscles in the neck area. Mobility work (e.g. taking the neck through non-painful

range of motion before and after exercise) is also effective. If you come across particularly tight muscles, it may be beneficial to perform more static types of stretching. Some combination of these four fixes will address most of these types of problems. If your tension headaches persist, you may need to see a physical therapist, chiropractor, or massage therapist. There are specific massage techniques like sub-occipital release that can provide excellent relief from tension headaches and allow you to exercise again effectively.

COSTOCHONDRITIS (TIETZE SYNDROME)

Tietze Syndrome tends to manifest as soreness, discomfort, and/or pain along the sternum or the area where the ribs/costal cartilages join in the middle of the chest. (See a doctor if pain is present deeper in the chest.)

The injury tends to occur in people who have not previously used rings, parallel bars, or are beginning bodyweight training at an entry level. It typically occurs when the pectoral muscles are used intensely. Exercises like rings-turned-out (RTO) support work, rings pushups, rings dips, and any other type of pressing that uses the chest may lead to pain or discomfort in the sternal area. It will typically manifest at the bottom of the movement, when your elbows are behind you and your hands are at armpit level. Back lever and front lever may aggravate this condition, as can pull-ups and one-arm chin-ups.

The pectoral muscles attach at the sternum and partially on the costal cartilages. If you have not previously used your chest in resistance training your connective tissues will not be very strong. Thus, when you do a deep movement (such as dips) where you really stretch out your pectorals, the origin of the muscle on the costal cartilages can start to pull them away from the costal facets on the sternum. This can lead to some popping, soreness, discomfort, and pain.

- If you experience this injury, *rest and allow it to heal.* Immediately remove the offending exercises from your routine and replace them with exercises that do not aggravate the condition.
- Keep your muscles working through full—but non-weight-bearing and non-painful—range of motion so that they do not tighten up. This movement will also help stimulate blood flow.
- Massage can soothe the area and prevent your muscles from tightening or pulling on the area.
- Heat can be used to stimulate blood flow and encourage healing once the affected area begins to feel better.
- Anti-inflammatories/NSAIDs can be used to decrease inflammation and promote healing, especially if the injury is particularly severe. Fish oil is good in all cases.

In a week or two, attempt the offending exercises again and determine if you are ready to add them back into your routine. Note that this time period will be longer if you aggravate the affected area. Work your way back *slowly*.

THORACIC SPINE/SCAPULA/RIBS

Any type of pain in the scapula/shoulder area should be checked out by a physical therapist or medical professional. This is especially important if you have chronic issues with the thoracic spine, scapula, and ribs. It is possible for your shoulder issue to be caused by something outside of the area where you are experiencing

pain and discomfort. This entire section assumes you will seek professional help where needed.

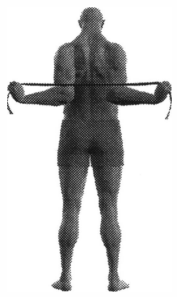
Neck: If your pain is in the neck area, within an inch of the spine on either side, and you have difficulty moving your neck in one or more directions, you likely have a vertebral facet or rib issue. Sleeping awkwardly or moving quickly can cause this to occur. These issues will spontaneously resolve as long as you stretch out any tight muscles and keep moving. Massages, hot showers, and heating packs can be particularly useful for decreasing the pain and increasing your range of motion. Aim for lots of mobility in the non-painful range.

If the issue does not resolve in a couple of days or gets worse, immediately see a chiropractor or physical therapist. If you do not take care of this quickly, the tissues in your neck will become excessively tight. It may require multiple visits, rather than just one or two. This can take valuable time from your training.

Scapulas: Discomfort, irritation, and/or pain around the scapulas (a.k.a. shoulder blades) can occur for a variety of reasons, most commonly a combination of poor posture, weak back muscles, stress, routine imbalance (typically from not enough pulling), and weak scapular retraction muscles.

One mobilization technique for shoulder blades uses a lacrosse or tennis ball. Simply roll the ball around on the tight/sore areas until they loosen up. Foam rolling and stretching exercises that involve all of the muscles in the arm and around the scapulas—including the chest, anterior and posterior shoulders, back, and lats—are also a good choice.

A bilateral issue with the shoulder blades tends to indicate a postural or structural issue. If the issue is unilateral, the cause could be technique, overuse, dominant vs. non-dominant sides, or even scoliosis. Because each person is different, self-diagnosis is not recommended. See a medical professional.



A great exercise to ease pain, discomfort, or tension around the shoulder blades is a band and wall exercise, as seen above. There are two setups that you can use for this exercise:

- You can use a Theraband to forcibly retract your scapula(s), such as in the picture above.
- The alternative is to face parallel to the wall, place your hand against the wall and extend it outward. Step toward the wall with your elbow behind your body to force your scapula into retraction.

Once you enter this position, there are three steps you will use to help encourage better posture, release stress, open up the chest area, and decrease tension on the back muscles. All of these, performed together, lead to a decrease in pain, discomfort, and/or tension in the neck and scapular area.

1. Begin with deep breathing. Inhale through your nose for four seconds, and exhale slowly through

your mouth for eight seconds. If you desire, you can hold your breath for five seconds and puff up your chest to generate tension for the surrounding muscles. The goal of this is to build up tension through contraction of the muscles and allow it to release as you exhale. This should begin to loosen up the anterior part of the shoulder.

2. Work on scapular retraction holds. With your shoulder blades forcibly retracted, contract your muscles to pull your shoulder blades toward the spine as much as possible. Hold this for ten seconds. Repeat three to five times for each shoulder blade. This helps to relax any tension and orient your muscles to a better posture.
3. Finally, squeeze your shoulder blades together again. Slowly shrug up and down to maximal shoulder blade elevation and depression. The range of motion should be about four to six inches as you move them up toward your ears and down toward your lower back. Pause for three to five seconds at the top and bottom to obtain a nice contraction of the muscles.

After this exercise, check out your posture. The exercise should open up your chest area and decrease muscle tightness in the front of your shoulders. It should also relieve discomfort and tension from the back of your shoulder blades. In the vast majority of cases, you will feel much better when you also stand up straight. This exercise is particularly beneficial if you carry tension in your shoulder blades.

The exercise over-exaggerates proper alignment in order to move you into a more neutral range afterward. Deep breathing helps relax the muscles and release tension. The retractions with elevation and depression re-orient the muscles to their proper resting length and eliminate tension. This exercise has been effective for gymnastics, parkour, climbing—even for Olympic lifters with the overhead position. Give it a try.

If the dysfunction does not improve after a week, see a medical professional.

LOWER BACK

Typically, when you injure your back, some sort of mechanical issue with pain accompanies it. This mechanical issue usually can be fixed to a certain extent. Even if it is permanent, it will likely not be disabling. (Studies have determined that even many non-athletes have bulging/herniated discs that do not cause pain or impair their ability to function.) Both the injury and the accompanying pain set off a process of dysfunction that causes the back muscles to spasm. This causes more pain and tightness that exacerbates the injury, and a negative feedback loop is born. Pain "turns off" the segmental stabilizer muscles around the spine, which causes dysfunction in timing for core activation, particularly in the transverse abdominis muscle. The body compensates by turning on "global muscles" in the core (such as spinal erectors) for stability, exacerbating the negative feedback loop. This is why your global muscles feel extremely tight after a back injury and why foam rolling or massage does not fix the problem—it is actually a stability issue. The solution involves correcting the timing of core activation by performing stability work for the deep, segmental muscle stabilizers. This rehabilitation method will naturally ease the tightness in the lower back.

Many of the exercises used in rehabilitation are the same movements a toddler performs when learning to walk. It is important to realize this. A toddler's movements train a nervous system that has not yet learned how to properly coordinate fundamental movements like rolling, crawling, and controlling the head. For example, segmental rolling (the manner in which a baby first learns how to roll) activates the core with

correct timing and teaches each of the muscle stabilizers between the vertebrae how to fire correctly, as all of the segments are moving independently. An athlete's rehabilitation exercises help sequence the correct firing and timing of muscles as these gross movement patterns are re-learned.

Physical therapy rehabilitation involves first getting your muscles to activate at the proper time and then stabilizing the area of an injury. You build upon these reinforced fundamental movement patterns with isolation work, followed by compound movements as you work your way back to where you were before the injury.

Lower back pain/injury is common among both weightlifters and non-weightlifters. There are many factors that can lead to lower back issues including the type of shoes you wear, the way you sit, lifting heavy items, poor posture, and biomechanics. Combine any of these with poor exercise or bad technique and the chance of injury increases exponentially. If you are training your lower body with squats, deadlifts, and other solid compound exercises, you may run into trouble with your lower back at some point. These issues will probably not happen while performing bodyweight exercises (if you focus on good technique), but they often will occur from rounding the back too much while stretching.

All of the different types of lower back injuries mentioned in the upcoming section require specialized attention. In some cases, you will be able to correct the issue yourself; other cases will require you to see a medical professional. When in doubt, always do the latter.

Flexion-based injuries occur from lower back rounding during a lift. The back is strongest when it has a natural curvature, and lifting with a rounded back puts your discs in a place where they can potentially fail.

Here are the three most common categories of lower back injuries:

- Bulging or herniated discs
- Sacroiliac joint (SI joint) slip or rotation
- Strained/pulled muscles

If your injury is accompanied by debilitating pain or neurological symptoms like sensory or motor deficits, see a medical professional immediately. Motor deficits are so critical, you may want to go directly to the emergency room. Additionally, if you suspect an injury that does not fall into any of these categories, see a medical professional.

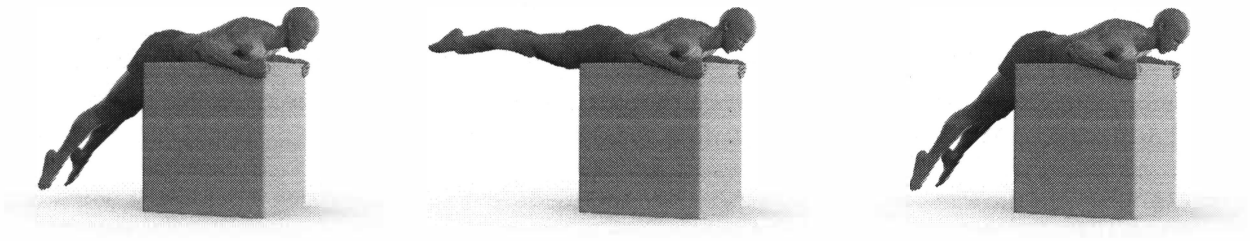
Bulging or herniated discs will cause pain on, in, or around the spine itself. You will feel it in the direct center of your back. If the issue is low enough on the spine, it may also impinge on the nerve roots that emerge from the spinal column. This causes radiating pain from the side of the spine or lower extremities called *radiculopathy*, discussed later in this chapter. The most common type of radiculopathy is *sciatica*. This typically manifests as radiating pain around the buttock region, which may continue into the legs—even as far down as the foot.

Action Steps: It is best to see an orthopedic doctor so they can assess the damage, which may require an MRI. From there, proper treatment can be determined. You will often be referred to a physical therapist before any surgery or steroid injections. They can help you work your way back to full exercise, but you must take care not to aggravate the injury, as this may lead to permanent conditions. In the meantime, there will be inflammation accompanying the pain. These symptoms can be relieved with proper mobility work.

Because every individual is different, exercises prescribed will vary. Some exercises will make the pain worse, some will help the pain, and some will have a neutral effect. Here is a list to get you started. Many

of these are fundamental movements that you learned as a toddler. Try a few and find out what works best for you.

- While lying on your back with your knees bent, rotate your knees from side to side
- Crawling (for core stability)
- Segmental Rolling
- Cat-Camels
- Bird-Dogs
- Glute Bridges
- Side Bridges
- McKenzie Method Exercises
- Reverse Hyperextensions



Reverse hyperextensions (shown above) are particularly good for rebuilding strength, stability, and hypertrophy in the lower back. These can be used for prehabilitation prior to returning to classic compound exercises like squats and deadlifts. This exercise has a very high success rate. Light kettlebell swings can also be used effectively.

Generally speaking, the aggravating exercises method applies here. Pain tends not to be an accurate indicator during rehabilitation, except during the initial few days of injury. Improved function may be accompanied with pain or not.

The value of non-painful mobility work can not be overstated. The main reason to avoid pain in this case is to avoid the sensitization which leads to tightening of the surrounding musculature. As your body begins to heal, your range of motion without pain should increase. Non-aggravating mobility work will substantially aid in this process. Focus on regaining mobility and strength in your ankles and hips and improving core strength and stability in your knees, arches, and your lower back in particular.

Sacroiliac Joint Issues: During improper lifting or bending, one side of your muscles may fail earlier than the other side. (We all have a dominant side.) If the weight is not immediately deloaded or your muscles do not strain, your sacroiliac (SI) joint may slip or become rotated, causing pain. This may also occur if a significant impact is made on one leg more often than the other, such as in uneven landings in gymnastics, parkour, or martial arts, etc.

SI joint issues tend to manifest pain directly above the butt crack and an inch or two to either side, depending on which joint has slipped or rotated. It is similar to the lower disc issues, so a slipped SI joint can also manifest as sciatica or any other form of radiculopathy.

If you run your hands down your sides from your ribs to your pelvis, the first bony protrusion you will encounter is called the *iliac crest*. This is at the level of the L4-L5 spinal disc. If you follow the iliac crest backward with your hand (it slopes downward) you will encounter your SI joint, which is located where your pelvis meets your sacral vertebrae. Your SI joint is about four inches long, so the pain may be located anywhere along it. If the pain is in this area, you may have an SI joint issue.

A slipped SI joint can manifest in one leg being functionally shorter than the other. When you locate your iliac crest, if one side is higher than the other, this may be an indication of an SI joint slip. On the other hand, a rotated SI joint might not manifest in a leg length discrepancy. If your pain is (1) one to two inches off-center from your spine, (2) is one to two inches lower than your iliac crest, and (3) feels like it is in the bony region of the pelvis—you may have an SI joint issue.

Action Steps: It is best to see a chiropractor or physical therapist. They should be able to correct the issue with various techniques.

If your SI joint is slipped and/or rotated, some muscles will be longer or shorter than usual. When an injury occurs, your body's natural response is to lock down the muscles to prevent further injury; in this case, that is not good news. You should see a chiropractor or physical therapist as soon as possible to correct this issue. While you are waiting for your appointment, keep your muscles loose by massaging them. You may also apply heat—just make sure it is not placed directly on the SI joint. You could place a heating pad on your lower back and/or hip muscles instead of your SI joint.

Few people have corrected SI issues themselves; it is not recommended unless you already have some level of experience. Performing a "fix-it" technique incorrectly will make your condition worse in the long run. If you are adamant about self-treating an SI issue, be aware that any technique used should correct the issue within one to three attempts. If you have not corrected the issue and you continue to perform your technique (such as cracking your back) repeatedly, you could do serious damage to your body.

If the pain in your lower back is below your ribs and above your SI joint, you likely have a strained muscle. **Strained and pulled lower back muscles** will be located in the muscle belly of your tissues on either side of your spine. Strains will usually occur during lifting, in your spinal erectors (the iliocostalis, longissimus, and spinalis muscles), but they can also occur in the quadratus lumborum and other muscles as well.

If you strain or pull a muscle, you do not need to see a doctor unless the injury is severe. Most doctors will give you a prescription for painkillers and tell you to rest. That said, if your tissues are turning black and blue and you feel like you need painkillers, see a doctor.

Action Steps: The etiology and rehabilitation of muscle strains have been addressed earlier in this chapter. However, other injuries sometimes appear to be strains because the muscles around an area of injury often tighten up or cramp. If you follow protocol and your issue persists, see a physical therapist.

That said, if your injury is more than two inches away from your spine and located within the muscle belly and *not* in the SI joint area, it is probably a muscle strain. If the pain radiating and located within two inches of the spine, it may be a bulging or herniated disc. If the pain is much lower (between the iliac crest and butt crack) and slightly offset, it is likely an SI joint issue.

If you are concerned about your injury, see a medical professional. The type of professional you should see will vary depending on your injury. Follow the advice recommended.

ANTERIOR INSTABILITY

Anterior instability is a shoulder issue that is accompanied by pain and the sensation that the shoulder could "pop out" (dislocate or sublux) at any moment. This is typically caused by imbalances and weakness—the front of the shoulder muscles are overdeveloped, the back of the shoulder muscles are weak, and the rotator cuff and other stabilizers are weak. It develops when you perform significantly more pushing exercises than pulling exercises, or vice versa, like football player that regularly bench presses but lacks consistent pulling movements in his routine, or a climber/swimmer, since their sports emphasize pulling over pushing.

You can usually tell if this is an issue by checking for large discrepancies in your strength on the progression charts. If your pushing movements are more than one level above your pulling movements (or vice versa), you may already have an imbalance. The good news is that fixing this issue is pretty straightforward:

- Perform high-repetition rotator cuff exercises, along the lines of 3-5x50. Work your way down as you get stronger to five to twelve repetitions.
- Include a good amount of shoulder blade work like LYTPs (discussed in the next chapter).
- Increase the amount of specific exercises that are off balance. For example, if you are off balance from performing too many pushing exercises over pulling exercises, adjust to a 2:1 or 3:2 ratio of pulling to pushing exercises.

This strategy should correct most shoulder imbalances and weaknesses. Soon, you should see your level of pushing and pulling exercises equalize. Use the progression charts to address any new imbalances that may develop. You will know that imbalances are being corrected when your shoulder feels more stable while performing exercises in areas where you were previously off balance.

SHOULDER IMPINGEMENT

Shoulder impingement occurs underneath the acromion when your soft tissues (muscles, tendons, bursas, fascia, and other areas) are compressed against the acromion (located on the scapula) by the greater tubercle of the humerus. The pain is superficial—deep shoulder pain is rarely an issue of impingement—and is usually located under the outermost body structure (the acromion) on the front or side of the shoulder. It is commonly referred to as *swimmer's shoulder* or *painful arc syndrome*, as impingement only occurs in a certain range when you lift your arm overhead (70-120 degrees if 0 degrees is your arm by your side and 180 degrees is your arm directly overhead).

Impingement typically occurs when your shoulder mechanics are thrown off or you lift improperly. It can also occur because of irritation from overuse. When you lift your arms over your head, your arms typically need to externally rotate to prevent the head of the humerus from rubbing against the acromion of the scapula. When this does not take place, impingement can occur.

Certain exercises like deadlift high pulls or upright rows (where the humerus is internally rotated, moving upward) create ideal conditions for impingement. It can also occur if your muscles are tight or "bound down" so that the scapula is unable to rotate upward. These exercises do not necessarily cause injury in themselves, but they are riskier to perform than other movements. Your rotator cuff muscles keep the head of the arm bone (the humerus) in its socket. When these muscles fatigue, the bone can ride up and smash your tissues into your acromion, causing the impingement.

Shoulder impingement is usually exacerbated by predisposing genetics factors in combination with poor technique and certain "risky" exercises. The genetic factor (oddly shaped acromions) is not something you should worry about. However, you can control the other factors: the type of exercises you perform, as well as your technique.

With any form of overhead press—especially handstand pushups—you should take extra care to use proper technique. The more "flared" your elbows are, the riskier the movement becomes—especially as you fatigue. For this reason, handstand pushup progressions are not recommended for beginners.

All wide grip/behind-the-neck exercises like wide grip pull-ups, behind-the-neck pull-ups, and the iron cross put you at higher risk for impingement, as wide grip movements place your shoulder in the same vulnerable position as flared elbows. Potential mobility issues can cause improper technique and these exercises tend to fatigue your rotator cuff muscles more quickly than other exercises.

Additionally, any form of pulling/pressing exercise that uses internal rotation of the humerus in abduction can lead to shoulder impingement. This does not apply to very many bodyweight exercises, except perhaps back lever pull-ups.

None of the exercises mentioned in the last three paragraphs are inherently dangerous; they are just riskier movements that can lead to shoulder impingement. These exercises can be performed safely if extra caution is taken to ensure that proper technique is used.

If you suspect shoulder impingement is taking place, eliminate the offending exercises and replace them with isolation exercises to slowly work your way back to compound exercises. In many cases, it may help to add specific rotator cuff work to your routine, as well as specific scapular work like LYTPs in the prehabilitation portion of your workout. For the rotator cuff work, you will want to work endurance first, so start with thirty to fifty repetitions. As you begin to feel better, alternate endurance with strength/hypertrophy work in the five to twelve range. You will also want to rest, perform non-painful mobility work, and perhaps utilize contrast baths. If the impingement is severe, you may want to take fish oil supplements and anti-inflammatory drugs like NSAIDs.

ACROMIOCLAVICULAR (AC) JOINT ISSUES

Acromioclavicular joint issues—or *AC joint issues*—tend to occur more from impact injuries than bodyweight training. However, those with loose AC joints, those with previous AC joint injuries, and those who are interested in performing explosive calisthenics will find this section to be helpful.

The AC joints connect your shoulder blades to the rest of your body through your clavicle. The joints are supposed to be relatively immobile, but they do move and twist slightly to allow your scapula to elevate and your arm to reach overhead. However, when the AC joints begin to move excessively because of a sprain or tearing of the ligaments, it is very easy to aggravate the area.

Here are a few practical steps to self-treat an AC joint issue. Each of these individual steps will take one to four weeks to complete, depending on the severity of the injury. It could take longer depending on how your body recovers. Generally speaking, the most important factors for healing will be maintaining a healthy diet and getting a lot of sleep.

- Rest. Massage the muscles around the affected area to prevent them from tightening and to increase blood flow. Take fish oil supplements and/or anti-inflammatory drugs like NSAIDs and apply heat to the area if needed.
- Once your AC joints begin to feel better, work to improve your range of motion with non-painful mobility work and begin strengthening your rotator cuff muscles to improve shoulder stability.
- If you have a loose AC joint, you will notice that your rotator cuff muscles will tend to tighten up because of the relative instability across multiple joints. Make sure you continually stretch them in order to maintain your range of motion with internal and external rotation stretches.
- Next, integrate specific rotator cuff exercises. Internal and external rotation exercises for 3-5 sets of 30-50 repetitions not-to-failure are good to start.
- Finally, begin to slowly work your way back to performing compound movements.

Note: This advice is for a specific issue that will manifest as inflammation and/or pain *at the AC joint*. Pain or swelling either underneath or toward the back of the AC joint could seem like an AC joint issue but actually be a completely different issue. There are many nerves, blood vessels, and muscles that run beneath the AC joint. If the issue you are dealing with does not manifest *at* the AC joint, it would be best to see a medical professional. This is especially true if radiating pain is present.

RADICULOPATHY OF THE ARM / RADIATING PAIN

Radiculopathy does not describe a specific condition, but a set of conditions where nerves are irritated due to impingement or inflammation. This can lead to weakness, numbness, difficulty controlling certain muscles, or radiating pain. These conditions can occur anywhere within the nervous system. The nerve issues can come from the spinal cord, the nerve root as it exits through the vertebrae, the thoracic outlet, any of the splits around the brachial plexus, and any place along the named nerve branches that descend into the arm, forearm, and hand. An issue that manifests as pain in the hand may actually be caused by issues in the wrist or neck.

This is something you should talk to a medical professional about, as messing around with your nervous system on your own is a bad idea. If you have any questions at all, see a professional immediately. If your doctor advises you to simply "rest and let it heal" or you are waiting for an appointment with your physical therapist, there are a few things you can do. You should always remove offending exercises from your routine, as they can exacerbate the problem.

Nerve Gliding / Neural Flossing Exercises: Like muscles, nerves can get tight and bound down by scar tissue. Exercises like nerve gliding and neural flossing can help mobilize and improve vascular flow. They are essentially stretching exercises for the nerves. Nerve glides are a great exercise to help stretch and mobilize your nerves—even if you do not have an arm radiculopathy issue.

First, let's take a brief look at the physiology of these exercises. The brachial plexus contains C5-T1 nerve roots that differentiate into five named nerves that supply motor function and sensation to the arms. Of the five named nerves, two stop near the shoulder and the arm—the axillary nerve and musculocutaneous nerve, respectively. The three primary nerves—median, ulnar, and radial—supply motor skills and sensation to the arm. These are longer and thus have a greater potential for aggravation.

Repetitive trauma or workouts where tissues become tight can create scar tissue and adhesions that bind down the nerves. Such nerve movement restriction can lead to symptoms including pain, tingling, numbness, or a cold feeling in the fingers. Studies have shown that nerve gliding and neural flossing can help athletes with nerve damage avoid surgery.

Nerve gliding and *neural flossing* are similar:

- *Gliding*: Moving one end (i.e. only your hand *or* neck) and stretching your nerves toward one particular side.
- *Flossing*: Moving both ends (i.e. your hand *and* neck) so that your nerves get 'flossed' through your tissues.

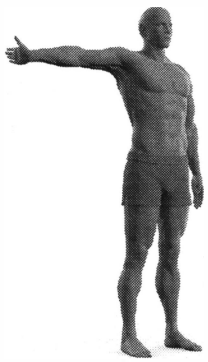
Performing Nerve Gliding

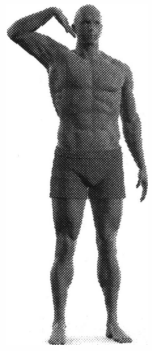
- Find a position that draws out the tension or symptoms.
- Release the tension of the stretch by backing off until symptoms decrease.
- "Glide" the nerve by simultaneously moving one of the components close to the spine and one away from the spine. For example, for the median nerve glide, move your hand back to a neutral position while moving your head away. You can then reverse by moving your head back while bending your wrist again.
- Oscillate back and forth while remaining below the symptom threshold. This will be similar to the discomfort you feel while stretching, but it is below the level of pain.

Performing Neural Flossing

- Find a position that draws out the tension or symptoms.
- Release the tension of the stretch by backing off until symptoms decrease. For example, back off at the neck while adding some tension at the hand.
- Simultaneously add tension on one end while releasing it from the opposing end. In the example above, this would entail moving your head and hand simultaneously.
- Reverse the action and repeat.

There are a few different methods for teaching nerve gliding exercises. Below you will find illustrations of what the ending positions should look like. Note that you can move your head away to increase tension if needed. If you feel tension and/or symptoms before you reach the ending position, you should back down and continue gliding/flossing from there.







Here is a look at the *median, ulnar,* and *radial* end positions, respectively.

Median Nerve Glide

- Move your arm out from your body until it reaches a 90-degree angle and then move it slightly behind you with your elbow straight and palm facing forward.
- Pull your wrist back until you feel tension.
- If you do not feel any tension, try leaning your head away by bending it to one side while keeping your face looking forward.

Ulnar Nerve Glide

- Bring your arm out to the side (abduction) with your elbow bent at shoulder level.
- Extend your wrist so your palm faces up with your fingers bent toward your head.
- Bend your elbow fully, bring your fingers toward your ears.
- If you reach your ear and do not feel any tension, you can attempt the "eyeglasses" technique. To do this, externally rotate your shoulder until your thumb and forefinger form a pair of "glasses" that cover your eyes.
- If you do not feel any tension, try leaning your head away by bending it to one side while keeping your face looking forward.

Radial Nerve Glide

- Place your hand at your side with your palm facing backward.
- Move your fingers toward the floor as much as possible by pushing down from your shoulder.
- Flex your wrist so that your hand is extended—like a bellhop waiting for a tip.
- If you do not feel any tension, try leaning your head away by bending it to one side while keeping your face looking forward.

It is best to perform these exercises slowly, in a quiet area, and when you have adequate time to relax, perform the exercises, and pay attention to any sensations (tension, symptoms, etc.) you experience. These exercises should be performed for approximately two sets of ten to fifteen repetitions. They should only be performed once per day until you can observe how your body responds the following day. If they are helping your body, you can consider adding a second session per day. If necessary, you can work up to three to five sessions per day. It is very important not to overstretch your nerves during any of these exercises. It is only good to feel *tension* while performing these exercises. If you feel symptoms (pain, tingling, numbness, or a cold feeling in the fingers), back off until you only feel tension.

The tension you feel may extend from the neck to the hand, or only along a portion of this route. Some evidence suggests you may also feel tension in your chest, back, or even your legs. If you are gliding on your sciatic nerve, you may feel tension in your arms as well.

In addition to these exercises, you can self-treat radiculopathy issues with any type of stretching, massage, and/or mobility work that begins with the spine and moves down to the point where the issue is. It is a good idea to perform an analysis on your posture as well. Remember, results will vary based on the individual. If you have any questions or concerns, see a medical professional.

Carpal Tunnel Syndrome is a common issue that most people have some level of knowledge about, so we will use it as an example to illustrate a point. Carpal tunnel is one of the most commonly misdiagnosed wrist/hand issues. There are many other things that can cause the symptoms of pain, tingling, and/or numbness in this area.

Tight muscles can impinge nerves and cause wrist issues that may appear to be carpal tunnel at first. The muscles that are particularly susceptible to causing this misdiagnosis include the pectoralis minor, latissimus dorsi, subscapularis, and pronator teres. However, other muscles in the neck, arms, and forearms can also create the effect. For example, shoulders that are rounded forward can create symptoms that resemble carpal tunnel due to improper tensioning and imbalances in multiple muscle groups near the shoulder, affecting the nerves in that area.

To correct this shoulder condition, you should focus on improving your thoracic spine posture by foam rolling, utilizing lacrosse balls, and/or performing other soft tissue work. You can combine any of these with the following method to increase wrist mobility: *heat → massage → stretching to the flexors of the wrist* (in this order). This will loosen up your wrist flexors, but you may also need to strengthen your wrist extensors if a muscle imbalance has affected them. Here is a sample plan that can be used to accomplish all of this simultaneously:

- 10-15 minutes of Heat
- 10-15 minutes of Massage
- 10-15 minutes of Wrist Extensor Strengthening
- 10-15 minutes of Wrist Flexor Stretching and Mobility Work

You can use this plan as-is or modify it to fit your needs. Once you select your plan, perform it one to three times per day, three to five days per week. This should provide optimal results.

There are many factors that must be evaluated in each individual case to determine what is actually going on and treat it accordingly. Make an appointment with a doctor or physical therapist before you attempt to self-treat a nerve/wrist issue. You can employ the aforementioned methods while you are waiting for your appointment. The work may stop the injury from progressing and get you on the path to healing.

WRIST ISSUES AND FOREARM SPLINTS

Wrist health is vital in bodyweight training, as your wrists support the entire weight of your body during many of the exercises. Unless you are coming from a sports background where you put significant amounts of weight on your wrists, it will be very easy to overuse them. The most common site for wrist pain/discomfort is along the side of your hand where your little finger is located. This happens when tendons in this area are aggravated—typically it will be an aggravation of the *triangular fibrocartilage complex* (TFCC). The TFCC acts much like the meniscus in your knees in that it helps keep the joints moving and functioning correctly; however, it can become aggravated by overuse or jerky movements.

If your wrists hurt too much to utilize bent wrist positions, an alternative is to use neutral wrist position techniques like support holds. Parallettes and rings can be particularly helpful. If you begin to experience wrist pain, here is a three-step process to help you get back on track:

- Remove aggravating exercises, perform light mobility work, apply heat and massage as needed. Additionally, anti-inflammatories can be used. Continue until you can move your wrist through a full range of motion without pain. See Chapter 11 for prehabilitation exercises.

- Re-strengthen your wrist and increase its range of motion by performing flexibility work to loosen tight wrist extensors and/or flexors. Rice bucket (opening and closing your fingers; rotating your wrists) and seated flexion/extension are two particularly effective exercises that can be used, as well as wrist pushups and wrist curls. Additionally, extensor-specific work is recommended because your flexors are usually stronger than they need to be. Do not perform compound exercises unless you can do so pain-free.
- Begin working your way back to performing compound exercises. After you have regained wrist strength, re-evaluate your explosive/power exercises and be careful.

Each phase make take a few days or a few weeks, depending on the extent of the injury. Discomfort should be your guide—do not cross the threshold into pain, as this may set you back significantly. If you need exercises for phases one and two, see the next chapter. Here is a look at some simple wrist exercises provided in Chapter 17 for untrained beginners:

- Stretching your wrists with palms flat and hands pointed in all directions. Perform each hand direction individually and move in and out of these positions 5-10 times.
- Stretching your wrists with the back of your palm against the ground and hands pointed in all directions. Perform each hand direction individually and move in and out of these positions 5-10 times.
- Placing your palms flat against the ground and pulsing your fingers into the ground to lift your palms off the ground.
- Placing the palm of one hand flat on the ground and use the other hand to pick up one finger at a time to mobilize each finger individually.

If wrist pain does not improve after two weeks, see a medical professional. Traditional overuse injuries that are properly cared for should have begun to resolve within this time period. There is always a chance you could have a more serious issue that requires professional care.

Forearm Splints typically manifest as pain along the bones or muscles of the forearm after an exercise or isometric hold. You won't feel pain while performing the movement—however, there is a sharp pain that manifests along your bone when you *finish* the movement and let go of the floor, parallettes, or rings. This typically means there is weakness or imbalance in your forearm muscles. Commonly, your flexors will be too strong and your extensors too weak. You can correct this issue by performing rice bucket exercises, wrist curls, and other exercises that focus on these weaknesses and/or imbalances. This condition can also manifest in the shoulder or as shin splints for runners.

JOINT CRACKING, POPPING, CLICKING, SNAPPING, AND CRUNCHING

Joint Cracking and Popping: The theory is that joints pop and crack due to cavitation. When a joint is "cracked" the volume within the joint capsule is increased through stretching. When this occurs, the pressure within the synovial fluid—the fluid that lubricates the joint—drops, which causes small amounts of air dissolved within the fluid to form bubbles, which then collapse on themselves. The formation of these bubbles and the collapse via cavitation causes the cracking or popping sound.

There have been various conflicting studies on this subject. One study of note is a fifty-year case study of a doctor documenting what took place when he cracked his knuckles everyday. He did not end up with arthritis. Most of the literature supports this claim. But another study showed that joint manipulation (such as cracking your knuckles, back, etc.) could potentially damage cartilage in the joints, which could potentially lead to earlier onset of arthritis. Another study indicated that knuckle cracking correlates with joint swelling and loss of grip strength—but performing manual labor, biting your nails, smoking, and drinking alcohol caused this as well. Thus, there may be potential confounding factors that affect those who crack their knuckles. It is possible that people with certain personality traits, bad habits, and high stress levels may be predisposed to arthritis, poorer recovery, and ligamental laxity. None of the other studies concluded that there were significant long-term effects of knuckle cracking.

What is particularly interesting is the swelling and loss of grip strength. Everyone has different genes that determine how tight the articular capsules of their joints and ligaments are. If you have joints that are particularly lax—are double-jointed—it may not be a good idea to crack your knuckles. This can also vary depending on gender. For example, pregnant women will have more *relaxin* in their bodies. This hormone increases ligamental laxity. Therefore, it may not be a good idea to crack your knuckles if you are pregnant.

Lax joints are often associated with lower strength levels and greater potential for orthopedic injury. The joints themselves are unstable due to loose connective tissues that reduce the amount of force the body can generate. Lax joints are common in sports that require excessive flexibility work, such as rhythmic gymnastics. Because this volume of flexibility work can significantly stretch your articular joint capsules, those with looser joints should avoid cracking them as a precautionary measure. This is especially true if your joints are being "stretched out" so that they can move further each time you crack them.

You can compensate for lax joints to some extent with proper strength work. If you are double-jointed or have generally loose joints, a structured strength workout can help safeguard you against injury.

If degeneration takes place in a joint and it cracks inadvertently, crepitus (a cracking or popping sound) can occur. If you suspect your joints are degenerating, it is best not to crack them intentionally.

Cracking the back tends to promote instability in the long run. While there is no significant evidence of negative effects to cracking the other joints, generally speaking, it is much easier to loosen something than it is to tighten it. Therefore, if you have any concerns, do not attempt to crack or pop your joints at all.

A very interesting study by Jonas Thelin et al, unrelated to joint cracking or popping, found that knee injuries account for the sports-related increased risk of knee osteoarthritis. It further found that the sole contributor to knee arthritis was knee injuries when weight, height, genetics, occupation, and smoking were factored out. Injuries lead to arthritis; another good reason to be careful and take it slow.

Joint Clicking: In most cases, if you are not experiencing pain no action is required. This is especially true if a particular joint has always clicked but has not caused pain. This happens frequently in those with lax joints. Lax joints and clicking in the knees, hips, elbows, and/or shoulders can be addressed with proper strength work. Proper technique while exercising will ensure that your joints are strong and balanced.

If your joints have not always clicked, you might be experiencing an acute onset from weightlifting, sports, or other activities. Take time to examine your activities and ensure that the clicking will not lead to a more serious issue. In most cases, joint clicking indicates issues of:

- Posture
- Biomechanics
- Mobility
- Imbalances

When these aspects are compromised, especially in your limb joints (ankles, knees, hips, wrists, elbows, and shoulders), there is potential for clicking and/or popping to begin. Clicking gets serious when symptoms develop and progress. Chronic clicking that does not progress is not a cause for concern.

Clicking most commonly occurs in the knee and shoulder. The knee has two extra pieces of articular cartilage between the femur and tibia called the *menisci*. Impingement of this tissue can easily occur during movement, which makes clicking a fairly common occurrence if something is even slightly off with the movement or technique. This clicking may not be an issue if you have always had it, but you may want to have it checked out by a medical professional just in case.

Posture and movement biomechanics contribute heavily to muscle imbalances and the deficiencies that develop in mobility. These have the potential to turn "clicking in the knee" into painful wear on the cartilage.

One of the common imbalances that develops in a culture of desk jobs and prolonged sitting is called *quadriceps dominance* or hamstring weakness. These can give rise to problems with the articulation of the joint itself. When synovial joints move against each other they must simultaneously glide and roll to function correctly. When mobility is limited by tight muscles or imbalances, the biomechanics of the movement are altered. In this case, if the hamstrings do not engage correctly during walking or squatting motions, there is likely an excessive anterior glide of the femur on the tibia. This significantly increases torque on the patellofemoral complex, which is bad for multiple reasons:

- Excessive anterior gliding of the femur may impinge the anterior portions of both the medial and lateral menisci, which causes clicking. This wears down the meniscus and articular cartilage more quickly, contributing to osteoarthritis.
- Excessive anterior gliding of the femur puts more strain on the ligaments of the knee.
- Increased torque on the patellofemoral complex causes the quads to become much more active, thus aggravating the imbalance of the quadriceps-hamstring strength ratio.
- Increased torque on the patellofemoral complex may lead to maltracking.

Other potential mechanisms of injury that may contribute to dysfunctions at the knee are weakness and decreased mobility of the ankles and hips. Likewise, dysfunctions at the wrist may affect the shoulder and vice versa. The elbows may affect other surrounding joints as well. Injuries are rarely isolated and there are typically multiple factors that contribute to them.

This is why it is important to learn proper posture and biomechanics while improving mobility and imbalances. You can use box squatting to help negate potential quad dominance. Focus on properly sitting back in a manner that engages your hamstrings and glutes. This shifts the weight distribution of the squat toward your heels, which will keep your shins upright and decrease the amount of torque placed on your patellofemoral complex. The engagement of your hamstrings will negate excessive anterior gliding of your femur. This should make your knee joint function properly, and it teaches you proper squat movement patterns.

The shoulder is the second most common site of clicking. While it does not have two extra pieces of cartilage like the knee, it has more mobility and a greater range of motion than any other joint in the body, making it easily destabilized by problems with posture, biomechanics, mobility, and muscle imbalances.

Clicking and limited mobility in the shoulder can be eliminated in many cases if the issue is tight muscles. For example, if the clicking feels more "anterior" in the shoulder that can mean the muscles on the front of the shoulder or the joint capsule itself are tight. Stretching the muscles and joint capsule on the front of the shoulder may eliminate the clicking altogether by decreasing the limitation on posterior glide of the humerus on the labrum. In other words, the anterior—front of the shoulder—tightness is locking the shoulder forward and preventing it from properly moving posteriorly—backward. If your shoulders are particularly immobile and clicking sounds begin to occur, this is most likely your issue.

Snapping and Crunching Sounds: If you have tissue that is rubbing and snapping, this signifies an injury. This typically occurs where tissues are not moving as they should, such as with IT band snapping syndrome and triceps snapping syndrome, though similar problems may occur in other parts of the body, such as nerves and tendons snapping, popping, and moving out of place.

In all of these cases, the problem is likely related to posture, biomechanics, mobility, and/or muscle imbalances. It is similar to the clicking scenario. The "fix" to eliminate pain and snapping involves loosening the tissues with soft tissue massage and anti-inflammatory drugs. However, to completely eliminate the problem, all four attributes—posture, biomechanics, mobility, and muscle imbalances—must be examined for issues and addressed. This usually requires an evaluation from a doctor or physical therapist.

If, for example, connective tissue that was holding the triceps tendon in place is missing after an accident, correcting issues in these four attributes may not help; you may require surgery instead. Likewise, crunching tends to signify an injury condition where the articular joint cartilage is not working properly or there is already damage. You need a doctor to look at this.

Here is a summary of "quick facts" from this section for future reference:

- Joint cracking and popping does not increase your chance of developing arthritis.
- However, if you have lax joints you may want to avoid cracking or popping your joints to avoid problems caused by potential joint destabilization. Focus on increasing the strength of your muscles and the tendons that connect them. This is particularly necessary if you notice that your joints are becoming more lax over time.
- Pain-free clicking is generally not an issue, especially if you have always had it.
- An onset of clicking may turn into a major problem. Correct assessment of posture, biomechanics, mobility, and muscle imbalances should be initiated through proper strength, mobility, and soft tissue work.
- Snapping and crunching sounds signify injury conditions. Proper care must be taken. See a doctor or physical therapist.

MUSCLE CRAMPING

Most muscle cramps will occur while you are performing active flexibility work like compression exercises. The active straddle compression or L-sit, for example, may cause cramping in your quadriceps, hip flexors,

or abdominal muscles. Likewise, high-level progressions of the V-sit and manna may cause cramping in the triceps, as well as the aforementioned areas. Other common exercises that may cause cramping are straddle movements (in the glutes), pushing movements (in the triceps), and pulling movements (in the biceps).

Muscles are most likely to cramp when they are moved into a short range of motion and contracted strongly. This is due to active insufficiency. A lack of adenosine triphosphate (ATP) causes the muscles to begin to cramp and can lead to sustained, intense muscle contractions, as the ATP used to release myosin heads from actin and pump calcium back into the sarcoplasmic reticulum. A sustained muscle contraction cuts off blood flow and, subsequently, oxygen availability.

Cramps dissolve naturally if you continue using the muscles that are cramping, just as soreness generally dissolves if you continue to exercise. Try foam rolling, static stretching, and massage anytime you get cramps. In most cases, less flexible athletes will get cramps easier than those who are flexible. Cramping is fairly normal for beginners, but will happen less frequently as you progress.

If you experience cramping outside of exercise, this may be an entirely different issue that requires special attention. You should check to ensure you are staying properly hydrated and getting enough vitamins/nutrients in your diet, particularly magnesium, sodium, and potassium. Because magnesium is a key element in muscle relaxation, it is important to ensure that you get enough of it. You may need to take supplements, as the modern diet is particularly deficient in this mineral.

Perform active compressions even when contractions are present. Your body may get used to short range contractions during the session, resulting in a decrease in cramping. If needed, you can massage your muscles between sets to get rid of any remaining cramps. Push through and you will reach a point where you have little to no issues with cramps.

CHAPTER 21 SUMMARY
COMMON BODYWEIGHT TRAINING INJURIES

This chapter discussed several common bodyweight training injuries. Remember, *Overcoming Gravity* is not intended to diagnose injuries of any kind. This should be done by a qualified medical professional. Make an appointment with a doctor, physical therapist or chiropractor to determine what is taking place in your body. After that, this chapter's advice may be useful to you.

The pain-alleviating procedures suggested in this chapter are methods that have been used in practice to great success, but all bodies are individual, all injuries are individual, and undiagnosed injuries can be further aggravated by certain exercises or rehabilitation techniques. Always see a medical professional if you think you are injured before you try to self-rehabilitate.

The contents of this chapter are for informational purposes only. Implementing any corrective measures is at your own risk.

- CHAPTER 22 -

PREHABILITATION, MOBILITY, AND FLEXIBILITY RESOURCES

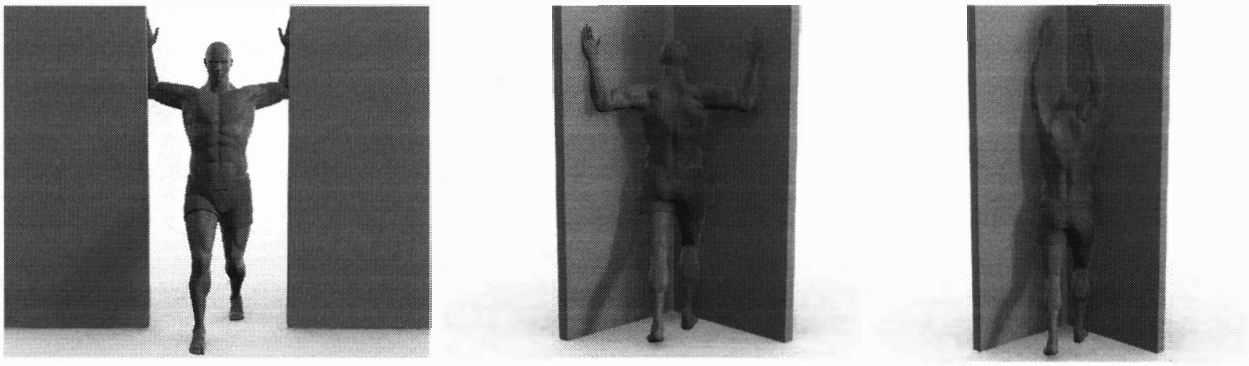
GENERAL IMBALANCE

If you suspect a muscle imbalance has occurred, the most important thing you can do is determine the cause. Those who work too many "beach muscle" programs at the expense of the back muscles will usually have imbalances at the shoulders. Imbalances in the wrists are usually caused by performing grip strength work without extensor work to complement it. These are just a few examples. You should be able to figure out what is imbalanced by reviewing the progression charts or simply observing how your body responds to your workouts. Once you do this, there is a long list of exercises, mobility, and soft tissue work you can use to correct any imbalances. Much of this has already been presented in other parts of *Overcoming Gravity*, but here is a generalized comprehensive list:

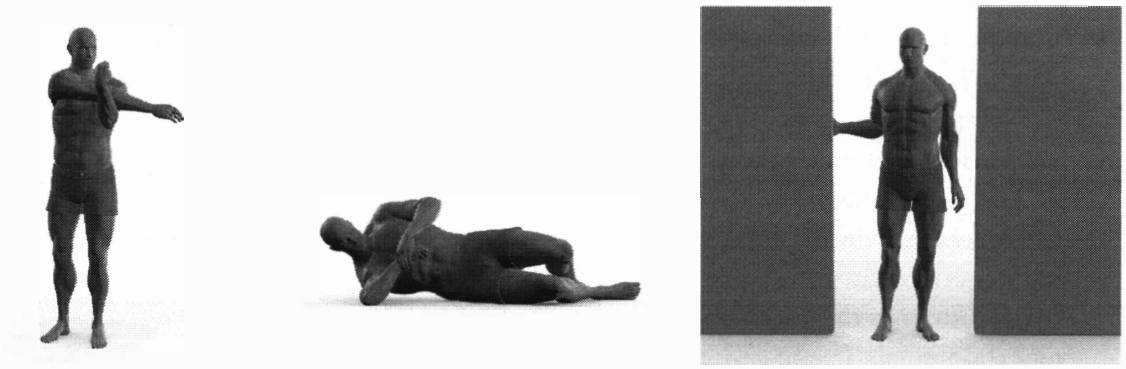
- Drop all pressing movements or pulling movements depending on the direction of your imbalance.
- Perform lots of horizontal pulling and rowing, but not upright rows or horizontal pushing if you are imbalanced in the opposite direction.
- In most cases, you will only need to strengthen the external rotators in your shoulders. If your external rotators are much stronger than your internal rotators (such as your chest and lats), you can ignore strengthening your internal rotators. This will allow you to balance your shoulder stability strength.
- Foam roll or lacrosse/tennis ball roll your thoracic spine. If deeper action is needed to assist extension, place one or two 45-pound plates on your chest. Breathe in and bring your arms overhead simultaneously.
- Massage and perform soft tissue work on your scapulae, anterior shoulders, and any other tight areas.
- Use heat to relax tight muscles.
- Use band dislocates and wall slides to improve range of motion in your shoulder.
- Use a basketball to roll out your chest, especially your pectoralis minor. If this does not work for you, use your hands to massage this area.
- Use anti-inflammatories as needed.
- Perform nerve glides. See the radiculopathy section in Chapter 21 for details.
- Deep tissue massage your entire upper body—all the way down to your forearms.

- Utilize LYTPs for strengthening back musculature. Pages 302-303 have more details.
- Posterior capsule stretch, sleeper stretch, external rotation stretch.
- For pectoral major, use corner stretch. Abduct your arms to 90 with your hands pointing up. Face the concave corner of a wall, and allow your elbows to touch the side of the wall. Then, lunge forward and allow the movement to stretch the anterior muscles of your shoulder. For lats, use a foam roller or balls and lie on your side on top of them.

Here are some examples of these exercises:



Doorway stretch plus two different variations of the corner stretch.



Posterior capsule stretch, sleeper stretch, and external rotation stretch.

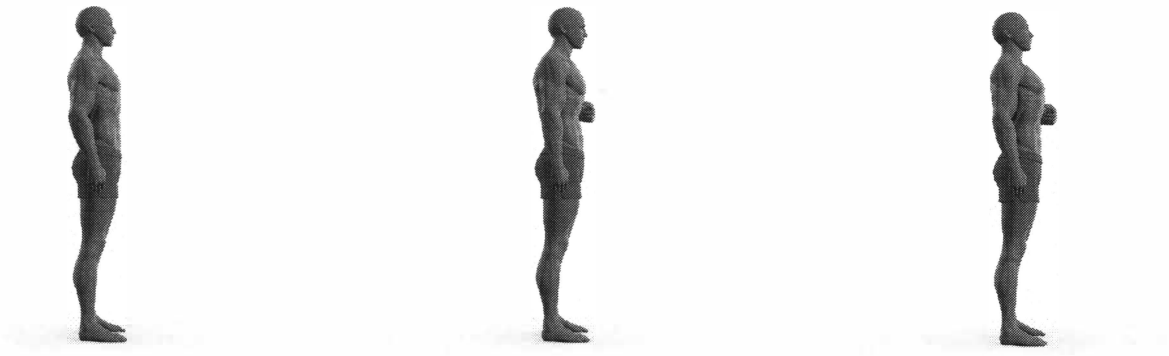
The latter three stretches should be used whether or not you are tight/restricted in your range of motion. A lack of range of motion usually requires stretching, though the presence of tightness could be unrelated. If you are tight but unrestricted, it could be an issue like poor posture or instability.

POSTURE

"Proper posture" is somewhat of a misnomer. In reality, there is no "perfect" or "proper" posture. Studies show that bad posture, like lack of stretching, has no direct correlation to increased rates of injury. However, good posture will absolutely enable a better expression of strength and technique. It will also make you look and feel

more confident. It can decrease strain on muscles and keep potential imbalances from developing. Posture is very important, though perhaps the term used should be "alignment" as there is no universal "posture" that is optimal.

Most exercises for improving posture/alignment focus on pulling the shoulders back and the neck in. These exercises are good, but they will not do much to improve alignment unless everything else in your body is also positioned properly.



As you can see, the chest-up position makes it easier to maintain good alignment. When thinking about upper body alignment, it is best to think from the core upward. Here are some positioning cues to keep you on track:

- Stand next to a mirror or use a wall to help cue you.
- Stand as you would normally.
- Place your feet shoulder-width apart with your toes pointed forward or out slightly.
- Find the correct pelvis orientation—you want the front of your pelvis to point forward. Many people will have an anterior pelvic tilt instead. You can correct this by squeezing your butt slightly and tilt your pelvis into proper alignment. Learn to remain in this position.
- Do not focus on pulling back your shoulders or changing your neck position. Some coaches will tell you to "holding the shoulders back" and "pull your chin back" to correct *upper crossed syndrome*, which is the head-forward, shoulders-rounded alignment, but this can cause tension where you want to release it.
- Instead, focus on the bottom of your sternum and tilt it up until you begin to feel a slight stretch on your abdominals. If your abdominals are not too tight, you should have a 20-30% tension on them. This is the "proud chest" position (or military posture) and maintaining it will relieve stiffness throughout your entire upper body.
- As you tilt the bottom of your sternum and chest up, your shoulder blades will pull up automatically and retract your neck back into position. This is much easier than focusing on your shoulder blades and neck, and will also help improve your core stabilization.
- If needed, pull your chin back into alignment (as if you have a double chin).

If you are using a mirror, look at yourself from the side. You should see that your weight is centered approximately over these landmarks on your body:

- Foot: navicular area, directly in front of your shin.
- Knee: lateral femoral condyle, on the side of your knee joint in the center.
- Hip: greater trochanter, the hip bone that prominently sticks out near your pockets.

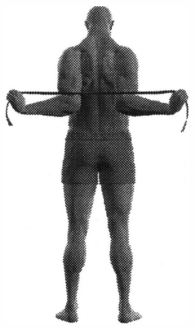
- Shoulder: ball of the humerus, in the middle of your shoulder.
- Skull: mastoid process, the bony part of your skull behind/under your ear.

If you are using a wall to help find your body landmarks, use a sharp corner as it makes it much easier. Here is a wall-strategy for improving alignment:

- Place your heels about an inch or two away from the wall. If you are using the sharp corner of a wall, place a ruler against it at a 45-degree angle and align your heels behind it.
- Make sure your weight is slightly in front of your ankles but distributed throughout your feet.
- Straighten your legs. Your butt should be against the wall.
- Slightly contract your butt muscles so the part of your butt that sticks out the most is against the wall. If you are using a corner, find out where your sacrum protrudes the most and place that area on the corner.
- The middle of your back should be flat against the wall. If you are using the corner, it should meet your body between your shoulder blades.
- Move your chest up to achieve good torso positioning and retract your head.
- If you place your fingers in the center of the back of your neck and run them up toward your hair, you should hit a large bump—your *external occipital protuberance*. This should be up against the wall or corner of the wall.

What you will typically find when using this method is it is relatively easy to align your pelvis and the portion of your back between the scapulas. However, it is quite difficult to place your external occipital protuberance against the wall. This is because working at a desk and/or in front of a computer (among other things) causes your head to tilt forward and shortens the muscles in the back of your neck to the point that your neck cannot properly orient to a new, correct position. You can strengthen the muscles on the front of your neck with exercises like chin tucks, and you should stretch the following muscles on the back of your neck: trapezeus, levator scapulae, scalenes, and splenius. Additionally, you may want to perform suboccipital muscle release exercises.

When you first begin to implement this strategy, you will probably feel like you are exerting effort all of the time to maintain your new alignment. This is normal. You will feel sore and tired for a couple of days to a couple of weeks as your body adjusts. You may find that your body reverts to its old alignment frequently and you have to move back into the new positions you have learned every fifteen to sixty minutes. The longer you maintain your new alignment, the easier it will become—until it is eventually effortless.



The band and wall exercise shown above helps ease pain, discomfort, and/or tension around the shoulder blades 95% of the time. There are two approaches you can use to set up this exercise:

- Use a Theraband to forcibly retract your shoulder blade(s), as shown above.
- Stand parallel to a wall and place your hand against the wall while extending it outward.
- Step toward the wall to force your shoulder blade(s) into retraction while keeping your elbow behind your body.

After you enter this position, there are three different steps you can take to encourage better alignment, release stress, open up the chest area, and decrease tension on your back muscles. When you perform all of these together, you should feel a decrease in pain, discomfort, and/or tension in your neck and shoulder blades. Here are the three steps:

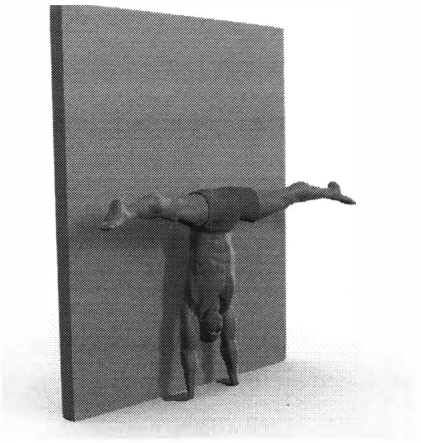
1. Begin with deep breathing. Inhale through your nose for four seconds; exhale slowly through your mouth for eight seconds. If you desire you can hold your breath for five seconds and puff up your chest to generate tension for the surrounding muscles. The goal of this is to build up tension through muscle contraction and allow it to release as you exhale. This should start loosening up the anterior part of your shoulder.
2. Work on scapular retraction holds. With your shoulder blades forcibly retracted, contract your muscles toward your spine as much as possible; hold for ten seconds. Repeat three to five times for each shoulder blade. This helps to relax any tension in your scapular muscles and orient them to a better alignment.
3. Finally, squeeze your shoulder blades together once again. Slowly shrug up and down to maximal shoulder blade elevation and depression. The range of motion should be about four to six inches as you move them up toward your ears and down toward your lower back. Pause for five seconds at the top and bottom to obtain a nice muscle contraction.

Check your alignment upon finishing this exercise. Your chest area should now be open and you should feel a decrease in muscle tightness in the front of your shoulders. Any tension/discomfort in the back of your shoulder blades should now be relieved as well. You should be able to easily stand up straight and feel significantly better overall.

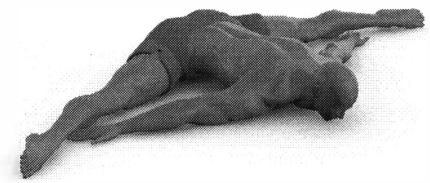
This exercise has been used to great effect for gymnastics, parkour, climbing, and even Olympic lifters (with the overhead position). An over-exaggeration of correct alignment makes it easy to move into a neutral range afterward. The deep breathing helps relax your muscles and release tension, and the scapular retractions with and without elevation and depression help eliminate tension and re-educate your muscles to the appropriate resting length.

HIPS

Hip mobility and flexibility is critical for bodyweight training. Many progressions (like straight arm press handstands) focus on general hip mobility. Most of the issues that appear with the hips will require improving overall mobility. Base general leg strength on weighted work like deadlifts and squats. Ideally, this leads to the development of deep squats, which are a fundamental human movement. This in turn decreases the amount of work required for optimal hip mobility. Below you will see a handstand transition pose that requires hip mobility and flexibility.

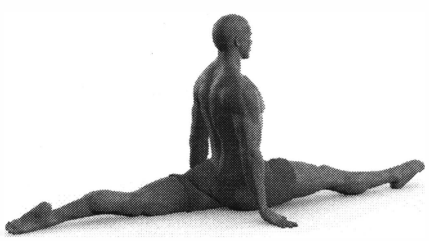


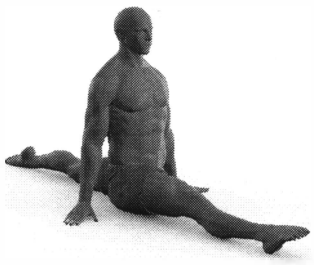
For flexibility work, you can use traditional stretching, PNF stretching, or loaded stretching. Programming is detailed in Chapter 11. Increase your active flexibility in the compressed straddle and pike positions. To perform more advanced moves like straight arm press handstands, you need a high amount of flexibility in your body to obtain the position passively, and a high amount of mobility and strength in your body to obtain the position actively. Here is a look at fully compressed straddle and pike positions, respectively:





Working the standard straddle stretch and three-way—left, middle, right—splits will get you to the straddle position shown above. These movements are easy to perform. It is common to work the straddle position with your chest to the floor in conjunction with the middle split, as these pair well together.





The left and right splits, respectively.

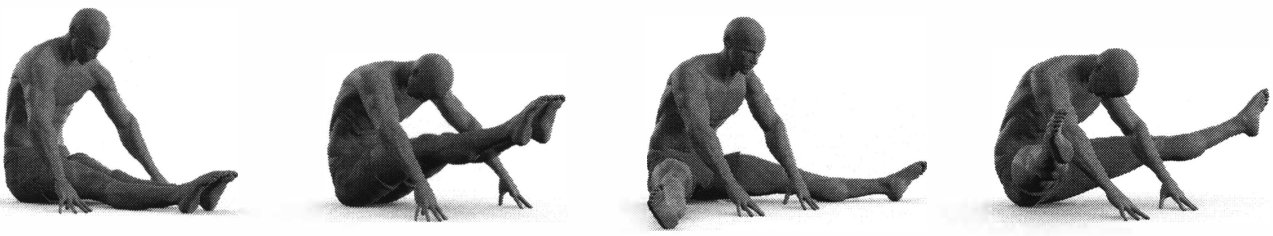
For the straddle and pike positions, reach as far up as you can to straighten your back, and then hinge at your hips. You will often begin to feel the stretching in your hamstrings first. From there, you can round your back, as it is not under any load. These stretches can be performed while standing as well. Try the Jefferson curl—where you stand tall and begin to segmentally roll your back down until you are touching your toes while remaining

standing. This can rapidly increase your flexibility gains, especially if you use weights while performing the movement. Be careful, though, as it is easy to injure yourself when you round your back while using weights.

The technique for the splits is straightforward. The main thing you want to focus on is keeping your quadriceps (located in the front of your leg) pointed toward the ground. While you are stretching, it is very easy for your hips to turn out and your leg to rotate. This may provide a false sense that you are increasing flexibility, but it should actually be avoided. You should also keep your torso upright as much as possible; you can bring your front knee to your chest to achieve an extra hamstring stretch if needed.

Consider combining flexibility and active flexibility work to build up the compression abdominal and hip flexor strength needed for more advanced skills. Here is one example of how a program could implement a combination of flexibility and active compression work:

- Stretch your hamstrings/adductors for thirty seconds.
- Keep your arms straight and hands by your knees.
- Pull your knees to your face, compressing your abs as hard as possible.
- Hold for ten seconds. If you experience cramping at first, you are doing it correctly.
- Repeat these steps five times.



Ideally, you want to get your knees to your face during the pike position. For the straddle position, it is ideal to get your chest to the ground. You may experience cramping in your hip flexors or quadriceps during this movement. If this occurs, massage them out and try again. Review Chapter 21 for details on how to deal with muscle cramps.

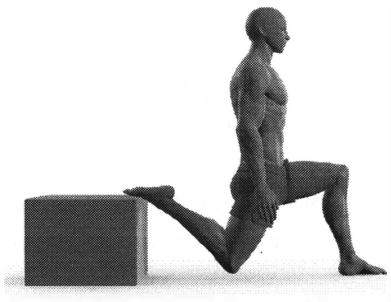
If you have access to barbells, other good movements to increase mobility and flexibility are Romanian deadlifts and good mornings. If you maintain strict form and use moderate loads, these exercises can be used to stretch your hamstrings. Closed chain exercises—where your feet are in contact with the ground—are particularly effective. You can also use exercises from the lunge position.

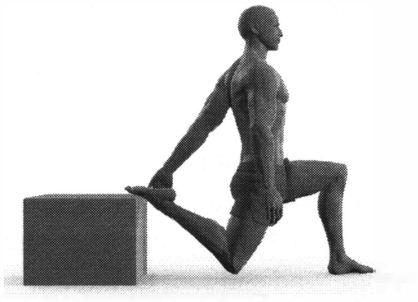


To stretch your hamstrings, begin in a bent-leg lunge with your torso upright (shown above). Slowly straighten your bent leg. Keep your chest up, and your back in its normal, lumbar curved position. Hold for a

few seconds before repeating. Once your front leg is straight, you can lean forward to modulate the force on your hamstring. This will allow you to stretch as much as you need to before backing off, making it easy to stay in the discomfort zone without crossing the pain threshold.

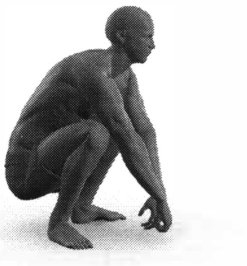
This can double as a muscle warm-up, since it is very similar to dynamic stretching. The movement keeps your muscle spindles from providing too much feedback to your nervous system and causing them to tighten up.



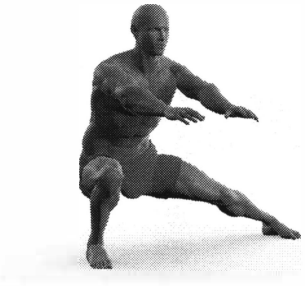


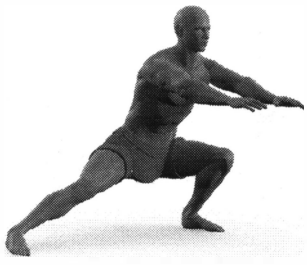
For your quadriceps and hip flexors, begin in a bent-leg lunge with your torso upright. Place your back leg—the right leg as shown above, in the image at left—on a raised object like a couch or chair. Then, squeeze your right glute and push your right hip forward. If you need to emphasize a greater stretch on your quadriceps, grab your back leg with your left arm (shown above, in the image at right).

You should feel a stretch primarily in your quadriceps and the hip flexor area of your leg (in the back). This exercise is useful for isolating these muscles so you can modulate the force as high as needed to stretch them effectively. Deep breathing is also useful to release the muscles, as some of your hip flexors (such as the psoas major) originate on the lumbar spine and the connective tissues in that area are partially integrated with your diaphragm.

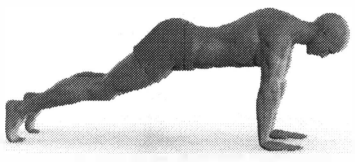
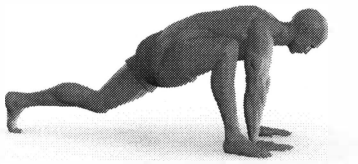


Hanging out in the bottom of the squat position (shown above) can be effective for increasing bent leg flexibility in your hips and thighs, as well as your legs. You can shift your weight onto each foot—moving it forward and backward—to stretch your calves. You can shift also your weight back and forth onto each leg and rotate them to add a stretch for your hips and thighs.





Side-to-side squats (shown above) can be particularly effective. Going back and forth between each leg works multiple muscles and can help stretch them if you settle into the squat. This exercise is great to warm up for pistols or other leg work. Modify the stretch by turning your straight leg upward or forward.

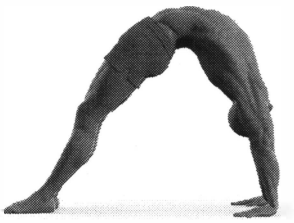
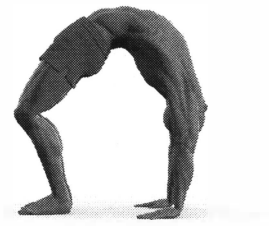



The spiderman stretch (shown above) is another useful exercise for overall hip mobility. Begin in a pushup position and use your abdominals and hip flexors to bring one of your legs forward. Place your foot inside or outside of the hand. (You can vary the stretch by placing your foot in different positions relative to your hand.) Shift your weight onto your foot to get a better stretch. Get the most out of this exercise by experimenting with various hand and foot positions.

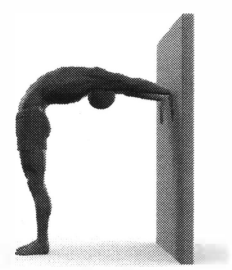
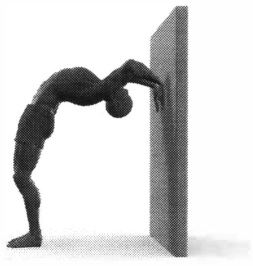
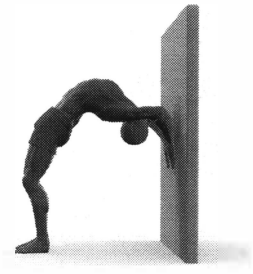
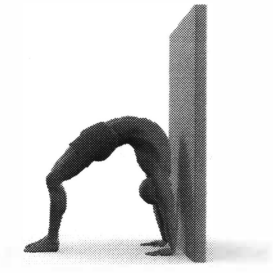
BACK

Keep the cervical vertebrae neutral while performing any of the techniques described in *Overcoming Gravity*. Craning your neck during a movement can impinge nerves, which may decrease your force output while performing strength work or lead to improper movement patterns while performing skill work.

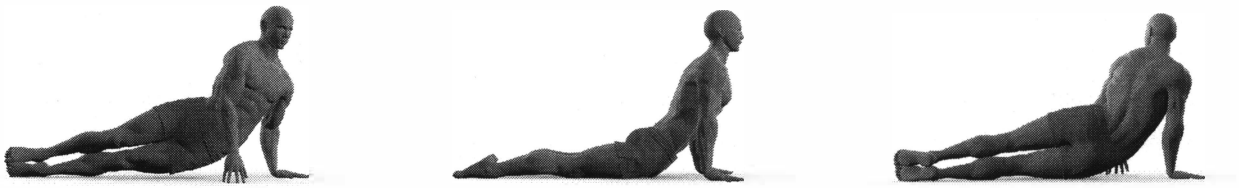
The movement that hits all of your thoracic and lumbar vertebrae is called the bridge. This is a staple in gymnastics. Here is a look at this movement:

Begin by lying on your back with your hands by your ears and your elbows pointed toward the ceiling. Then, push up into the bridge position. After you hit the position, try to use your feet to push your center of mass over your shoulders. Keep your arms straight, as this will help you obtain full overhead movement of the shoulder girdle. With practice, you can walk your feet closer to your hands and then re-straighten your legs to emphasize thoracic and lumbar extension (shown above, in the image at right). This is a very difficult move, so you will need to practice it every day if you want to make progress. If you have trouble getting into position, put your feet on a raised surface before attempting the movement.

Another good exercise is bridge wall walks (shown above). Begin roughly three feet from the wall, facing away from it. Slowly walk your hands backward and down the wall. Those with knee issues should be aware that this technique can be hard on the knees and use caution. This stretch helps to increase mobility in the entire upper body, rather than just the lower back. Most people also have limited mobility in their upper back and shoulders, not just their lower back. This exercise may confer more rapid improvements than straight-up bridge work.



If the bridge progression is too difficult to perform, try the seal stretch (shown above). Begin prone with your stomach on the ground; press up with your arms until they are straight. Allow your back to bend backward and feel the stretch through your abdominals and hips. If you have back issues, this is a good alternative to the bridge. Shift into a side seal position. This is the same principle as side plank positions, and it allows you to stretch specific muscles to increase mobility all over your torso. This exercise does very little for your upper back flexibility, so it will not aid in getting your arms overhead.

Those who work desk jobs or spend a lot of time in front of a computer will likely have poor posture in their thoracic spine, which will make it difficult to obtain a good handstand. It may also limit scapular movement. Performing thoracic extension mobility work should restore your ability to obtain full overhead flexion in your shoulder girdle. Also perform soft tissue work like foam rolling and using tennis/lacrosse balls to loosen up your facet joints between vertebrae and your costovertebral (rib-spine) joints.



The above example shows foam rolling on the back. Use foam rolling or tennis/lacrosse balls to work any of your soft tissues. It can be performed while lying on your back or against a wall. Try to extend your thoracic spine into an arch during the movement. You can also move your body in a twisting motion to improve your range. Your thoracic vertebrae are designed to twist; they allow for the highest amount of rotary motion of all your vertebrae.

If additional thoracic spine mobilization is needed, extend your arms overhead while rolling. You can also breathe in and arch your spine, or hold a weight (45 lbs. or lighter) on your chest as you extend over the foam roller (shown above, in the image at right). The latter will place more pressure on your deeper muscles to facilitate an increase in mobility.



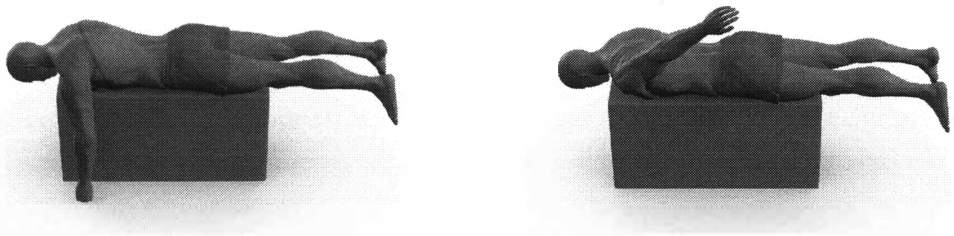
Mobilizing your lats with a foam roller (shown above) is particularly good for opening up your shoulders and releasing tension. There are many other thoracic shoulder mobility movements discussed in the next section of this chapter.

SHOULDERS

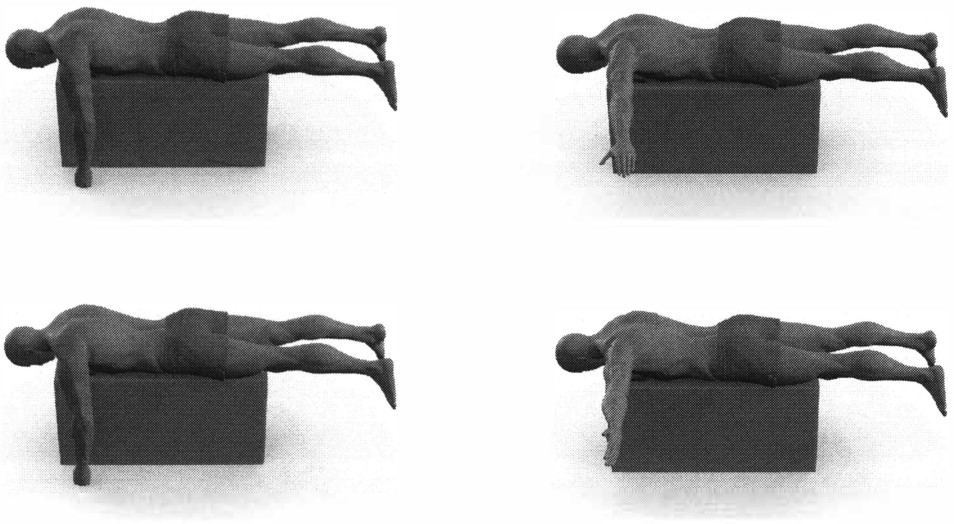
The shoulder is the lynchpin of the upper body and its most mobile area. This means that there is a greater potential for injury at your shoulder joints than any other place in your upper body. Care for your shoulders by using the manna and horizontal pulling to balance out pressing and vertical pulling work, respectively. In many cases, this will be sufficient; however, shoulder issues can still develop.

The isolation exercises that work extremely well for bringing up posterior shoulder strength and correcting some imbalances are the LYTPs. There is a good list of exercises on Dave Draper's website (DaveDraper.com). LYTPs in particular hit the rhomboids, middle and lower traps, posterior scapular muscles, and other deep posterior structures that are often neglected. Lower trapezius work specifically in the Y-movement is very useful for building the strength and musculature needed for straight-arm presses.

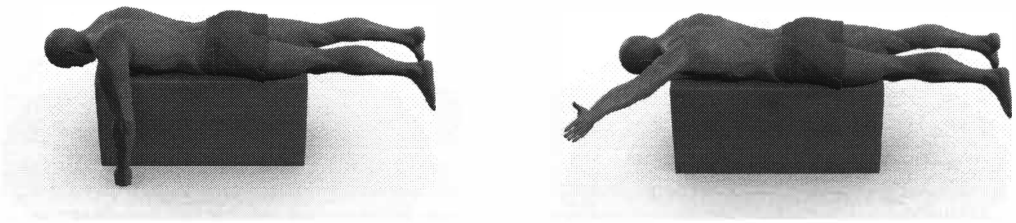
All of the following movements are performed while lying prone on a table. You can perform them with dumbbells, any kind of makeshift weights, or unweighted.



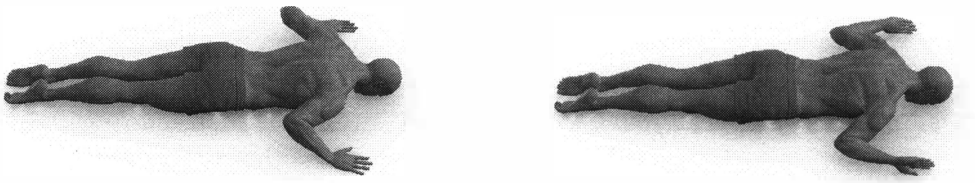
The L-movement in LYTP (also referred to as I) is initiated by pulling your arm from a straight-arm hang to your hip pocket (shown above). This is a specific posterior deltoid targeted exercise. Make sure you keep your scapula from drifting upward toward the ear, as this is a common compensation.



The T-movement in LYTP is a mid-trapezius and rhomboid exercise. Begin with your arm straight and extend it straight out horizontally with your palm down. (If you do both arms simultaneously, your body will form a "T".) Focus on pushing your hand as far from your body as possible without your body rising up off the table, and then retract your scapula near the top. When you do this with your palm facing down (shown above, first row of images), it will hit your rhomboids. When you do this with your thump up (shown above, second row of images), it will hit your mid-trapezius.



The Y-movement in LYTP is a lower-trapezius exercise. Begin with your arm straight and extend it straight out, horizontally, with your palm down. If you do both arm simultaneously, your body will form a "Y". Next, move your arm upward with your thumb facing up at a 110-degree angle between your head/torso and your shoulder. Push your hand as far away from your body as possible. As your hand rises, your scapula will naturally begin retracting and depressing simultaneously. Focus on the contraction of your scapula in order to get best lower-trapezius exercise possible. This is probably the most important exercise of the four LYTP movements because your lower-trapezius is often the weakest of your natural triangle of scapular stabilizers, which include your serratus anterior, upper-trapezius, and lower-trapezius. Strengthening this muscle will help keep your shoulders healthy.



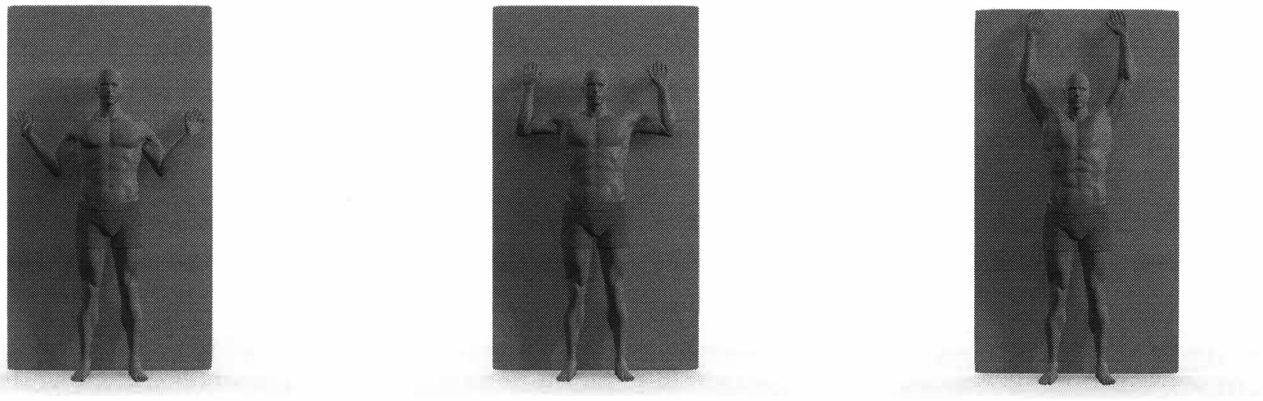
The P-movement in LYTP is the pivot prone position. This can be performed on the ground. Begin by forming an arrow using both arms with your body as the center of the arrow (shown above, first row of images). Then, bend your elbows nearly all the way. This should put your arms in a W-position, as shown above in the second row of images. Next, attempt to rotate your hands so that they face backward. This will activate the external rotators in your shoulder, as well as most of your other scapular muscles. This exercise provides your back muscles with a strong contractor that sets them up to effectively perform an isolation movement.



Scapular pushups (shown above) are useful to hit your serratus anterior; particularly good if the shoulders cannot stay protracted during the planche. The key to this exercise is to push your hands as far away from your

body as possible. Begin by getting into a pushup position with a straight body. Allow your shoulders to sink and your scapulas to pop out. Then, push your hands away from your body while keeping your arms straight. This will directly hit the serratus anterior muscles and help you find a good protracted shoulder position for the planche.

Most people have some limitation in their pectorals, lats, teres major, and the other shoulder muscles in respect to their ability to move their arms fully overhead (for handstands) and backward (for manna). Most mobility and flexibility work will be aimed at increasing mobility in these planes. A Theraband is useful for most of the exercises below.



Scapular wall slides (shown above) are an excellent tool for mobilizing your tissues in retraction combined with elevation and depression. To perform this exercise, stand with your back against a wall. Fully bend your elbows to a W-position with the back of your hands against the wall. Release and raise your arms overhead while keeping your lower back, shoulders, and arms against the wall. Begin with your scapulas in full depression and retract them as you move up—they should transition from retraction to elevation as you reach the top. As your arms reach overhead, your back may arch away from the wall, and your arms may move away from the wall as well. Keep practicing until you reach the point where this does not happen.



Band dislocates (shown above) are another good choice for shoulder mobility. This exercise stretches all of your anterior shoulder muscles and your shoulder capsule. To perform band dislocates, use a Theraband to bring your arms overhead and allow the arms to rotate backward. Alternatively, you can use a stick, broom, or any other stretchy or fixed object to keep your hands in place. As you bring your arms overhead, elevate your shoulder blades and externally rotate your arms through the position. If you do it correctly, you should

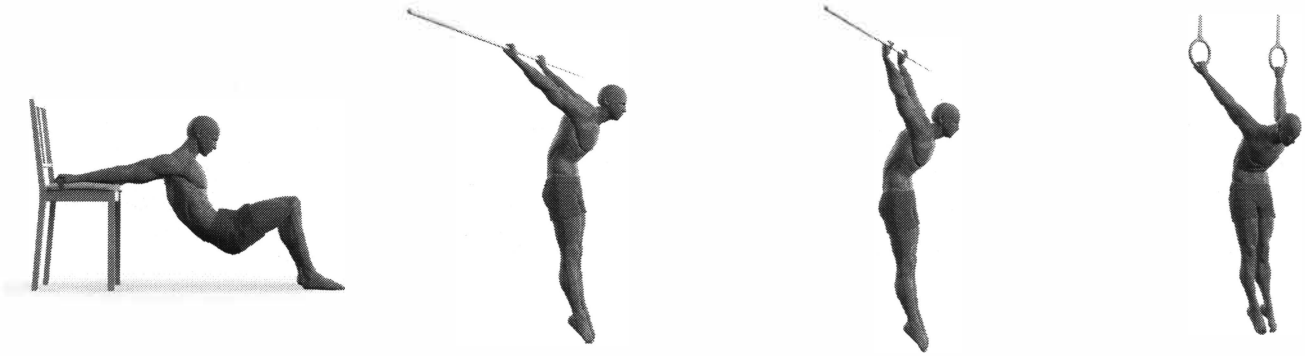
feel a large, pain-free stretch through your chest and the front of your shoulder. Reverse the movement by beginning with your hands behind you and repeating these steps backward. For a challenge, move your hands closer together.



Band wall slides (shown above) are a good, passive equivalent to wall slides. Begin facing the wall, holding a tight Theraband behind your head at shoulder-width, as shown above at left. Bend your arms out to the sides (as if you are doing a wall slide) and allow the Theraband to slide all the way down your back until your elbows are straight. This exercise emphasizes stretching of the chest and scapular retraction, but it can be tough on the wrists when the Theraband stretches while your arms are extended to the side. To counteract this, focus on elevating, retracting, and then depressing your shoulder blades throughout the movement as you are performing it.

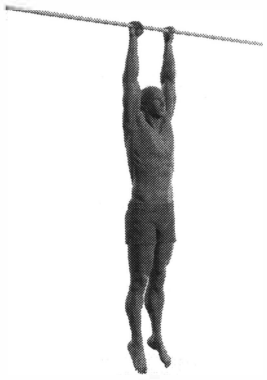


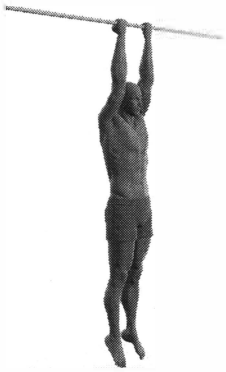
You can also hold a Theraband with your hands overhead and slide your hands out until they are perpendicular with your body. While doing this, allow your shoulder blades to retract in order to tighten your shoulder muscles. This is a good technique that helps warm up your shoulders for exercise, as it activates almost all of your back muscles. (see above photo)



There are many types of exercises for passive shoulder flexibility (behind the back, in extension) including: stretching with a chair (shown above, first image), using a Theraband to lock your hands together while using a raised surface to stretch your arms backward, and German hangs with a pull-up bar. As shown in two of the above images, you can place your hands on the bar in a chin-up or pull-up position. Then, bring your legs through your hands and relax into a stretch as shown above. This exercise can be performed on the rings as well (as shown in the last image above).

The chin-up position provides good conditioning for the elbows, a necessity for many straight-arm isometric exercises. When performing this, your elbows should face backward or down when there is tension on them. If you relax while in this position, you may feel this tension in your elbow joint, so be sure to keep your arms straight and contract your biceps so there is tension through your elbows.



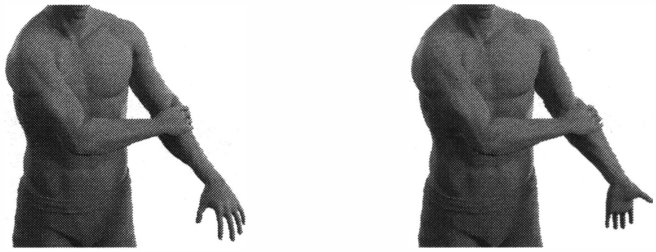


Another good exercise to loosen up your shoulders is to hang from the bar. As with the German hang, there is a pronated (pull-up) grip and a supinated (chin-up) grip. The supinated grip hang is particularly good because it externally rotates your humerus, thus protecting it from impingement. This also stretches the internal rotators of your humerus. If your shoulder can tolerate the intensity, you can also hang from the bar with one arm. This can be coupled with gravity-assisted PNF, which entails shrugging your shoulders and holding for five to fifteen seconds, then relaxing and allowing your muscles to stretch further. Additionally, you can use a foam roller, basketball, lacrosse ball, or tennis ball on your chest and lats to further loosen them between mobility work.

ELBOWS

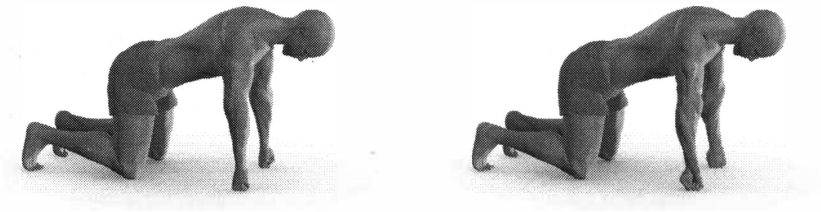
Your elbows are relatively simple joints that do not need much as far as mobility and flexibility are concerned. However, it is important to perform proper prehabilitation work, as your elbows are particularly vulnerable to injuries. The biggest issues to watch out for are tendonitis or stress due to overuse. Rings are very tough on the elbows, as are high-level pulling moves like one-arm chin-ups and the iron cross.

There are several muscles from the arm and forearm that attach around the elbow. These muscles can easily get "gummed up," so to speak. This places additional pressure on the joints and tendons, which is not good. It is vital to keep these areas healthy. You can perform tendonitis protocol for specific pathological states, and also massage these muscles both in the bent and straight-arm positions.



A favorite technique is to use the thumb and index fingers of the right hand to grab, push, or grip into the muscles directly above and below your left elbow. Then, flex and extend your left elbow and add in supination and pronation forearm rotation movements to loosen your tissues. (This is how it is shown in the image above; the exercise can be easily reversed to the opposite hand.)

It can also be helpful to massage your biceps and triceps, especially around the inside and outside of your elbows. When you push your fingers into these muscles you should be able to move them around with ease. If you find areas that are tight or sore, work them specifically for an extended period of time. You can also use techniques given in the tendonitis section of Chapter 21, such as cross friction and myofascial release. Cross friction massage is applied perpendicular to your tissues, while myofascial release techniques are applied parallel to your tissues. These affect your fascial tissue, as well as the muscle itself.

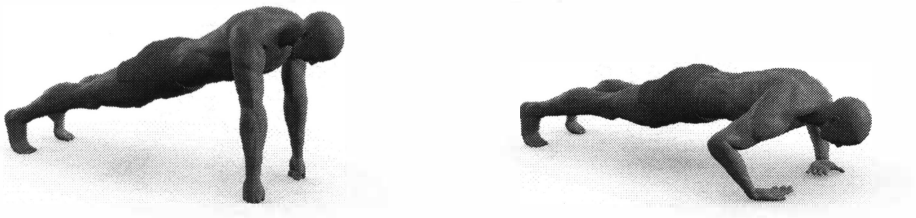


Above you will see a simple rotation exercise you can perform with your forearms while your fist is against the ground. This exercise is a combination of internal and external rotation of the shoulder, elbow supination and pronation, and support through the wrist. This exercise helps you to hit good pronation and supination in a weight-supported movement. You can perform it with your hands flat against the ground, or with either the back or front of your hand facing in. This will stretch the tissues around your elbows and prepare you for German hangs and rings support work.

It is important to note that many "elbow issues" are actually wrist issues. For example the golfer's and tennis elbow forms of tendonitis are best rehabilitated with wrist flexibility and mobility exercises.

WRISTS

The wrists are a very important joint; they are used in every bodyweight exercise. It is easy for them to become sore or tight when one first begins pursuing bodyweight training, as they have not been used in such a frequent capacity before. Certain disciplines such as martial arts use specific exercises like wrist pushups to condition their wrists for fighting and impact activity. Wrist pushups are certainly a good exercise in terms of mobility and prehabilitation; however, they are not an "end-all, be-all" for wrist mobility.



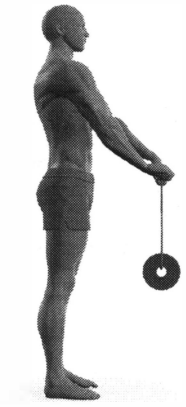
Wrist pushups (shown above) take the wrist through a full range of motion with the wrist in flexion, which is the unused movement of the wrist. This alone makes the exercise worthwhile, as it balances out the forearm extensors and wrist flexors that are typically extended in bodyweight movements. Additionally, wrist pushups strengthen and stretch your extensors, which are often weak and tight due to wrists being in flexion and used for gripping much of the time. Wrist pushups are one of the staples of martial artists.

To perform wrist pushups, begin in a pushup position with your fists on the ground. As you descend into a pushup, flip your wrists out and allow the back of your hand to make contact with the ground, then flip your hand back into the starting position as you ascend out of the pushup.

Any type of mobility/flexibility work that stretches your wrists is good, as is any work that strengthens your wrists. One of the drawbacks of wrist pushups is that they are hard to scale as you move up into various higher-level progressions. Your wrists are not built to hold all of your weight for extended periods of time. One way to combat this is by performing wrist pushups while on your knees or against a wall.



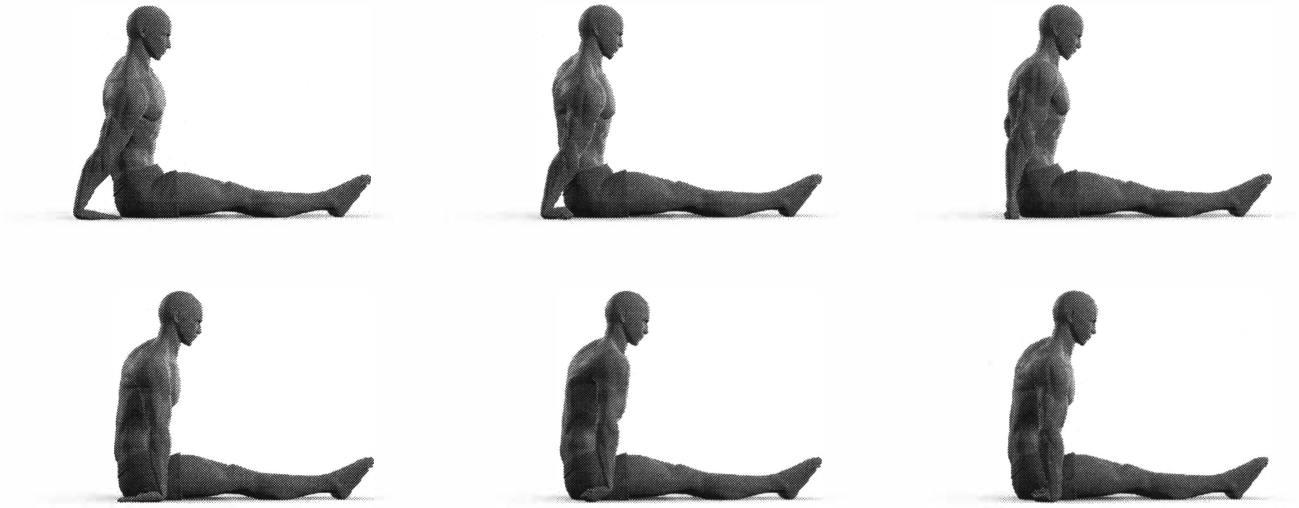
If you need mobility exercises that are less intense on your wrists, the ones shown above are a good alternative. Put the back or front of your hands together to stretch them. These exercises can be varied in many different ways: you can move your hands up and down, rotate your forearms so your fingers point in different directions, push harder with the fingers on one of your hands to intensify the stretch, etc. Because placing your hands against each other is an unstable surface compared to the ground, each of these will work your hands and wrists in different ways.



Another easy exercise for strengthening your wrists is the rice bucket. Fill a bucket with uncooked rice, about twelve inches deep. Insert your hand into the rice and rotate your wrist both clockwise and counterclockwise while keeping your elbow still. This exercise rapidly works every muscle in your forearm and helps "injury proof" your elbow, as many of your forearm muscles originate there. Do both wrists.

Much like the rice bucket, another way to strengthen and conditioning your wrists is with a wrist roller. You can buy one pretty inexpensively or make your own with a broomstick, PVC pipe, or similar item. Attach a rope to the middle of your

roller and place a weight on the end of the rope. Regardless of whether you buy or make one, a wrist roller is very easy to use: simply hold it out in front of you and use your wrists to roll it up while keeping your arms steady. You can also use a barbell, power rack, or other mounted device to focus more on the wrists. Specific grip work (which can help with strength development) can also be used at your discretion.



Above you will see an exercise for wrist mobility that can be performed virtually anywhere. Begin by sitting on the ground with your legs straight out in front of you. Then, put your hands flat on the ground beside and slightly behind you. The tips of your fingers should be near your butt. Next, straighten your arms in order to stretch the flexors in your forearms and fingers. You can then curl your fingers into a ball and allow your wrist to make a fist and roll forward. Hold this until you reach the end of your range of motion and feel a deep stretch. Be sure to turn the inside of your elbow to face as far forward as possible. From there, you can slightly bend your elbow and straighten your wrist and rock it from side to side to mobilize all of your muscles. To deep-stretch the muscles on the back of your hand, you can open and close your hands as well. For added strength, do the same thing in reverse by extending your wrist while digging your knuckles into the ground.

This exercise is preferable to wrist pushups because is it is gentler on the wrists, and the angle of your wrist coupled with pressure through your fingers helps mobilize the joint itself. This puts your wrist in a more natural position so that it feels better when you stretch your muscles to increase your range of motion.

Here are some additional wrist mobility exercises:

- With your palms flat against the ground and your fingers pointed in all directions, stretch your wrists and move in and out of different finger positions five to ten times.
- With the back of your palm against the ground and your fingers pointed in all directions, stretch your wrists and move in and out of different finger positions five to ten times.
- With your palms flat against the ground, pulse your fingers so your palms move off the ground and come back down without your fingers leaving the ground. Repeat.
- With your palm flat against the ground, use your other hand to lift each finger individually (one at a time). This will mobilize each finger for a deeper forearm stretch.

CONTRAST BATHS AND CONTRAST SHOWERS

Since your wrists do not get much overall blood flow but often have to support your full weight while performing bodyweight exercises, they are prone to soreness. If that is the case, contrast baths can be quite useful. Cold water alone will constrict your blood vessels and ease inflammation. However, contrast baths go a step further: they ease inflammation and then force blood in and out of the area due to alternating water temperatures.

Contrast baths are easy. Fill two buckets with water. One bucket should be as cold as possible (you can add ice); the other bucket should be as hot as you can stand. Try filling the bucket halfway with warm water and adding boiling water on top of that; just be very careful not to scald yourself. You should immerse your hand/wrist in each bucket for about a minute, than switch to the other bucket. For best results, begin and end with your hand/wrist in the cold bucket. Go back and forth between buckets five to ten times per session, two sessions a day, four to five days per week.

You do not have to be idle while you soak your wrists in a contrast bath. You can move your fingers around, stretch and mobilize your wrists in various positions, and perform a lot of general movement—good for your tendons, muscles, and joints.

Contrast showers can be used in the same manner, but for the entire body rather than just your hands/wrists. Scientific literature on total immersion ice baths or showers bears conflicting information. Many studies show contrast showers provide no benefits in regard to reducing soreness or improving performance. However, they definitely work in many cases—even if it is just a psychological or placebo effect. If it works, why not give it a try? Many trainers continue to use contrast showers in the belief that they offer a benefit in regards to overall tissue health, however minor. Always begin and end with cold. It may not be fun at first, but many people find it quite refreshing once they get used to it.

CALLUSES AND RIPS

Calluses can be a huge problem if they become too big, as they can tear easily. There are numerous ways to address this. Whatever you choose to do, be safe!

- Take a long, hot shower. When the calluses get white, you can scratch them off.
- Soak the callused area in a bucket of warm water. Once the calluses get soft and white, you can scratch them off (or use a razor/knife to remove them).
- Another alternative is to remove calluses with a pair of nail clippers.

As for rips or "flappers", they are miserable, as you can get them anywhere on your hands. Bodyweight training itself does not cause this, but it is possible to rip a portion of your skin if you let calluses grow too big, train a lot of swinging movements, or do anything that puts a lot of force on your hands.

As far as treatment goes, the first thing is to use a nail clipper or scissors to remove the extra skin. You can rip them off with your fingers, but you run the risk of ripping off more skin than necessary. If you decide to do this anyway, be sure to rip the skin "down and away." Once the offending "flap" is gone, the next step is to treat the area when you go to the gym or train. Do this by applying chalk to the affected area, followed by

light pressure or friction, as this will speed up the growth of new skin. The only way you can actually rebuild a callus is to use new skin. When you perform a movement, go to the point where the pain is tolerable, but not to the point where you rip your skin further or bleed. When you go home, be sure to stretch your affected hand(s) by extending your fingers in a pulsing motion. This will ensure that the new skin grows with adequate flexibility so it does not tear when you extend your fingers all the way. You should also moisturize your hands as they are healing so your skin does not crack and cause a more serious condition. Beyond this, you do not need to do anything fancy. Your body is good at healing itself if you take a few simple steps and then allow the process to take place.

CHAPTER 22 SUMMARY –
PREHABILITATION, MOBILITY, AND FLEXIBILITY RESOURCES

This chapter discussed how prehabilitation, mobility, and flexibility are all related to each other in the context of keeping your body healthy.

Some of the specifics were analyzed on how mobility and flexibility relate to injuries and pain. Treatment methods for acute and chronic pain will vary wildly. Techniques that use both the musculoskeletal and neuromuscular aspects represent the best "standard approach." (Remember that techniques that work well for one person may not work well for another.)

Specific prehabilitation, mobility, and flexibility exercises/techniques were presented for use in five key areas: the hips, back, shoulders, elbows, and wrists. Also discussed were contrast baths, contrast showers, and how to treat calluses and rips.

- CHAPTER 23 -

EXERCISE TECHNIQUE, DESCRIPTIONS, AND TIPS

RECOMMENDED EQUIPMENT

These exercise progressions are as "low-tech" as possible, since not everyone has access to top-shelf facilities or equipment. The only equipment you need to get started is a set of rings.

Some of the techniques shown use a set of parallel bars, mini-parallel bars called parallettes, or a singular bar like a high bar. Most of the bar movements can be substituted on the rings and most of the parallel bar movements can be substituted on the parallettes.

The type of rings or equipment you use will not make much difference. Some of the different brands available include Rogue rings and EXF rings. Wood rings are preferable over plastic rings because the feel is better, and it holds chalk better. Rogue also sells high-quality parallettes. Check out different gymnastics suppliers, or you can follow a do-it-yourself guide to make your own equipment at home. Here are two examples of websites that provide do-it-yourself instructions for rings and parallettes:

- Rings: www.instructables.com/id/How-to-make-PVC-gymnastic-fitness-rings
- Parallettes: www.celtickane.com/projects/homemade-parallettes

Rings maybe be mounted outside from a tree or inside in various places like on a pull-up bar in a doorway. Some people have installed rings from their ceilings by hanging them from cross beams. Parallettes, on the other hand, can be used anywhere. A wall may be helpful for some of the progressions.

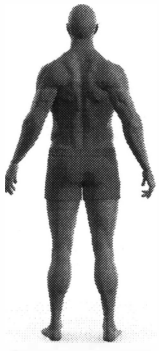
If you do not have access to equipment, you can still get started by being creative. For example, you can make a pull-up bar by hanging a broomstick from a tree with rope. Whatever you choose, remember to make safety your top priority. That being said, here are some alternatives for performing pull-ups and rows without traditional equipment:

- Pull-ups: trees, stairwells, playgrounds, ledges, sturdy door frames, or anything else you can hang from.
- Rows: Hang underneath a table or chair, put a broom across counters, tables, or chairs and hang underneath it, hang something like rings from your pull-up bar, or lower your rings.

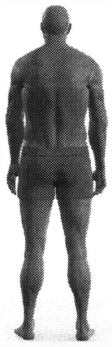
BASIC POSITIONING, IMPORTANT EXERCISES, AND COMMON FAULTS

Many of these basic positions are found in the sample warm-up routine. The warm-up is a good place for you to perform them, as they will help you develop body awareness and connective tissue integrity, which will help you stay injury-free.

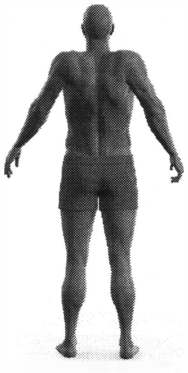
Scapular Positioning



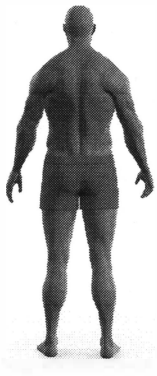
Retracted



Protracted



Elevated



Depressed

The above images show important differences in scapular positioning. All bodyweight exercises require proper scapular positioning in order to be performed effectively—and, in some cases, safely. *Retracted* and *protracted* mean *squeezed back* and *moved forward*, respectively. Likewise, *elevated* and *depressed* mean *up* and *down*, respectively.

Hollow, Arch, Plank, Reverse Plank



These are basic body positioning drills that will get you accustomed the different shapes needed for correct execution of bodyweight skills. You will eventually use each of these for advanced movements like handstands and other exercises. If you drill proper positioning in your warm-ups early on, it will set you up for long-term success.

When you perform positioning drills, focus on maintaining correct alignment (hollow, straight, or arched). You may need to see yourself in order to make corrections. Use a mirror or a camera. You could also ask a coach or athlete more experienced than you to watch you perform these drills and tell you what you need to work on. Eventually, you should be able to perform these drills with your eyes closed and maintain correct alignment.

Side planks, while they are not shown, essentially involve the side of your body facing the ground while your body itself is straight.

Rings Support and Rings-Turned-Out (RTO) Support Holds



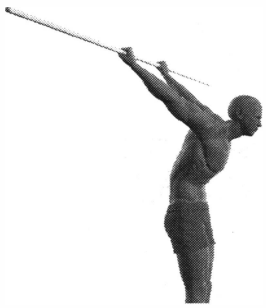


Rings support and *rings-turned-out (RTO) support* holds are critical for developing rings-specific strength movements. They are included in the warm-up because they also help you develop the connective tissue strength needed for many of the straight-arm isometric exercises. Focus on these if you have any rings aspirations or want to progress toward one-arm chin-ups.

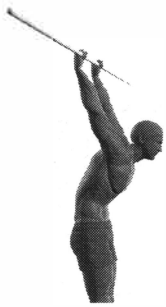
German Hang



Rings



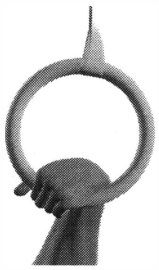
Supinated Grip

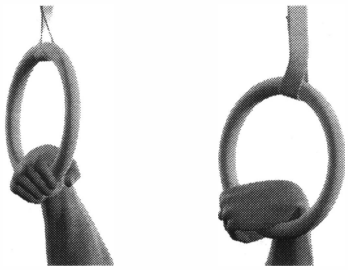


Pronated Grip

The *German hang* is discussed thoroughly in the *back lever progression* section. This static position and the process of moving in and out of it (often called *skin the cat*) is critical for developing shoulder flexibility as well as connective tissue strength in your shoulders and elbows. German hangs are as important as rings support and ring-turned-out support holds, to any athlete with rings or upper-level unilateral strength aspirations.

False Grip

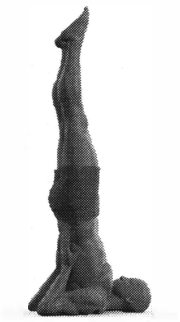




The *false grip* is discussed more thoroughly in the muscle-up section: it is one of the most important movements when you are learning to perform muscle-ups on both the rings and the bar, so begin practicing it now.

Candlestick



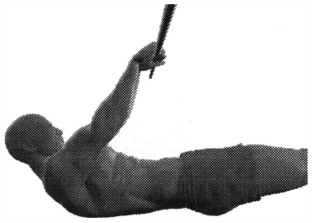


The *candlestick* positions are alternatives to the headstand and handstand positions. If you are a beginner and do not feel ready to move into headstands or handstands, put this movement into your warm-up, as it will help you get accustomed to the feeling of having your body inverted and vertically oriented. Focus on maintaining straight body positioning; do not allow your body to sag.

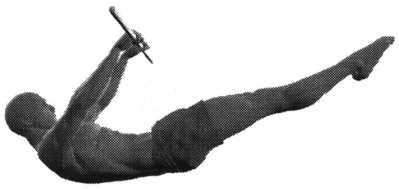
Common Bodyweight Faults



Body Arched or Sagging



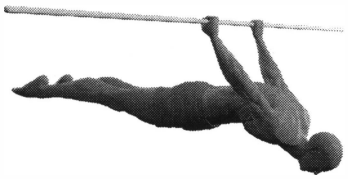
Chest Rounded



Too Hollowed / Back Rounded



Arms Bent, Body Arched



Chest Too Rounded



Banana Handstand,
as Opposed to a Straight Handstand

These are some of the common faults when performing bodyweight strength exercises. These faults signify improper body positioning during a movement or while executing an isometric hold, and are actually strength deficits that need to be worked out. (The "fault" makes the movement easier to perform, though incorrectly.) If you discover a fault in your own position, the best course is to downgrade your current progression and work your way back up with proper body positioning.

COMMON ABBREVIATIONS

These are common bodyweight strength training abbreviations that are used on the charts, throughout this book, and when discussing bodyweight strength training in any community.

Common Terms

BW	Bodyweight

Equipment

R	Rings
PB	Parallel Bars
FL	Front Lever (also means Floor when paired with PB)

Body and Hand Positioning

BA	Bent-Arm
BB	Bent-Body
SA	Straight-Arm
SB	Straight-Body
Adv	Advanced
Str	Straddle
Deg	Number of Degrees for Body or Hand Positioning (see also: RTO)
RTO	Rings-Turned-Out
FG	False Grip

Exercises

HS	Handstand
HeSPU	Headstand Pushup
HSPU	Handstand Pushup
BL	Back Lever
Inv	Inverted Hang
OAC	One-Arm Chin-up
PL	Planche
PU	Pushup
PPPU	Pseudo Planche Pushup
GH	German Hang
RC	Rope Climb
OA	One-Arm
EL	Elbow Lever
Ecc	Eccentrics
BTB	Behind the Back
Clap	Clapping your Hands Together
Slap	Slapping your Hands on a Body Part
BWD	Backward
FWD	Forward

- CHAPTER 24 -

HANDSTAND VARIATIONS

Handstands Progression – Page 1, Column 1

INTRODUCTION

Several books could be written on handstands alone. The information presented here is condensed and will focus only on the most important points of each technique. Many of the finer details are so physical, so individual, so movement or balance related, they cannot be understood simply through written words. A good coach with hands-on experience trumps all.

It is important to maintain proper technique while performing any type of handstand, and not just for aesthetics. Proper handstand technique stacks all of your joints in alignment and reduces the amount of muscular effort required to perform the movement. This makes the handstand significantly easier, and also improves body awareness and positioning for other skills you will learn in bodyweight training.

In the same way that the squat is foundational to human movement, handstands are one of the fundamental positions in bodyweight training. If your execution of an unweighted or air squat is lacking, you will likely not be able to execute loaded techniques like front squats, weighted back squats, overhead squats, and Olympic lifts. Without a solid foundation in the squat, all of your other exercises will fail to develop correctly. Proper handstands carry the same effect with many other bodyweight training techniques.

The handstand is the one skill that should be trained almost every day if you desire to become proficient in bodyweight training. Certain variations like the wall handstand make it very easy to log quality skill work without jeopardizing rest and recovery. Constant practice and refinement of handstand technique will yield consistent rewards in the future.

Note that performance on skill-based movements will typically fall into a bell curve based on consistency and progression. For example, when you begin practicing handstands you will normally fail all the time—then, as you improve, you will begin achieving two-second holds here and there. Further improvement will lead to consistent two-second holds, as well as occasional holds of around nine seconds. From this we can conclude two things:

1. The length of holds falls in the middle of the bell curve where your most consistent performance lies. This means that your abilities are best summed up by your consistent attempts. The median or average of your holds defines your ability.
2. There are outliers where you tend to do better or worse than your regular performance.

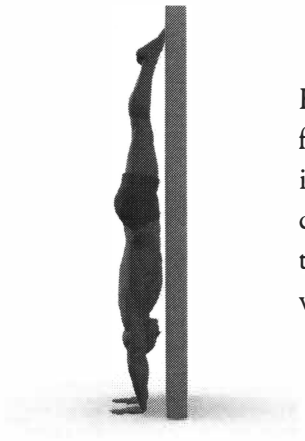
Do not focus on the outliers. When it comes to practicing skills, the key is to make them consistent. Raise the consistency of your holds by aiming toward the goal of performing the skill well all the time. In a sample group of ten handstand holds, you may perform zero seconds once, two seconds once, four seconds six times, eight seconds once, and ten seconds once. Your goal is to focus on obtaining the four-second range consistently and then improving upon it, rather than aiming for ten seconds all the time with mixed results. The human condition is to focus on the best (and post videos of it to YouTube or Instagram) and push the worst out of the mind. Instead, focus on becoming consistent. Consistency is key to developing greater static and dynamic body awareness. If you become fatigued and inconsistent in your holds, take a break. Don't push yourself too hard for that one ten-second hold, because that is not as important as overall consistency.

Additionally, it is imperative to minimize the roll out or pirouette fall as you exit the handstand position. Falling over in any handstand position tends to reinforce bad habits. It tells your body, "When I hit the point where I cannot hold a stable handstand, I need to bail out." Instead you should be fighting for every inch and every position, especially when you are learning. You obviously want to emphasize form, but if you do not learn how to fight for the handstand position you (1) do not build the strength-stability in your muscles to fight for it, and (2) you teach yourself bad habits.

To summarize, here are the concepts to focus on for handstands:

- If possible, work on handstands almost every day.
- Emphasize correct body positioning at all times.
- Focus on overall consistency.
- Form is the priority, but always fight for the handstand instead of bailing.
- Practice does not make perfect; perfect practice makes perfect.

You may encounter psychological issues with maintaining focus or fighting frustration if your holds aren't where you'd like them to be. If this occurs, step back, take a rest break, and calm yourself by practicing deep breathing (in through your nose, out through your mouth). This will slow your heart rate and increase concentration. Take time to visualize the movement in your mind before attempting it again once you are calm and rested. This practice can be used for any type of skill work, not just handstands.



WALL HANDSTAND – LEVELS 1-4

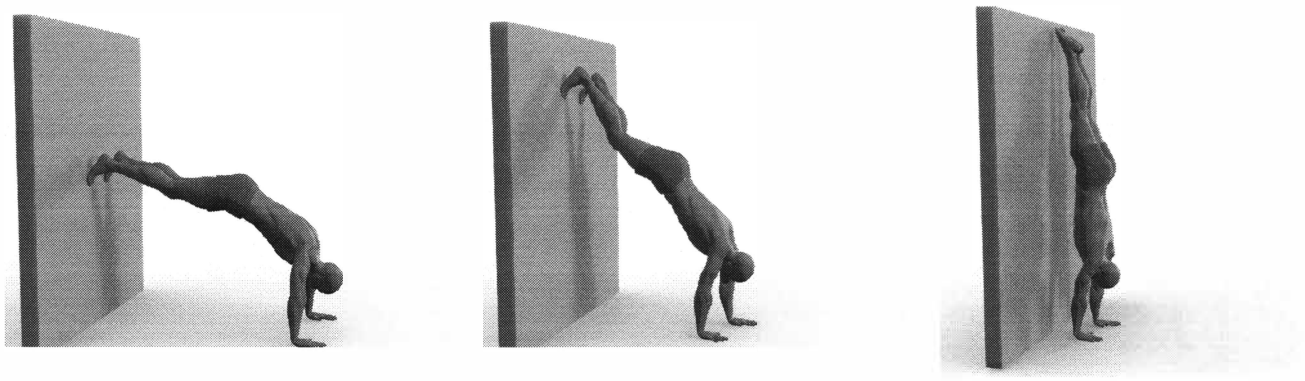
Handstands are a critical component of bodyweight training, as they lay a solid foundation for all gymnastics moves and many bodyweight movements. It is important to properly develop this movement, which is why it is first in the skill category. Wall handstands (which can be abbreviated *Wall HS*) are a category all to themselves for the first four difficulty levels. Wall handstands should be performed with the following technique notes in mind:

- Hands shoulder-width apart. This is important in the long run for handstand pushups, so do not get in the habit of hands wide when starting.
- Stomach to the wall.
- Hands as close to the wall as possible without tipping over. Your wrists will typically be two to six inches from the wall, depending on the width of your body.
- Arms locked straight.
- Pushed tall as much as possible. Your shoulders should be pushed as far away from your hands as possible, with your shoulder blades elevated. (Your shoulders should effectively be earmuffs with your armpits facing as far out as possible.)
- Thoracic spine fully extended. Your chest should be upright, which should generate some tension through the abdominals.
- Pelvis slightly posteriorly rotated. While your lower back is naturally curved in extension when standing, this should be gently reversed when you are in the handstand position. To cue this motion, squeeze your glutes slightly and simultaneously maintain tension on your abdominals (trying to bring your belly button back toward your spine). This should help eliminate the arch, a common error seen in handstand practice.
- Legs oriented neutrally so that they are in line with the rest of your body from all angles. There is a small amount of leeway here; our hips may need to bend in order for your toes to touch the wall. The closer to the wall your hands are placed, the less this will happen.
- Knees locked straight, with your toes pointed in order to keep your body tight. You can squeeze your legs together in order to generate tension and maintain proper handstand posture.
- Your scapulas should be fully elevated. At the height of elevation, retract them slightly in order to stabilize them.

All of these body cues summarize the ideal position for a handstand: a straight line with no bending anywhere in the body. Since your body is going to be a rigid like a plank of wood, small movements will control the portion that is in the air. Your forearms and hands (which are on the floor) will perform all of these small movements. To allow for the greatest amount of control, spread your fingers out as far as possible and exert pressure through your fingertips in order to maintain balance. Hand positioning against the floor will be further addressed in the grip section.

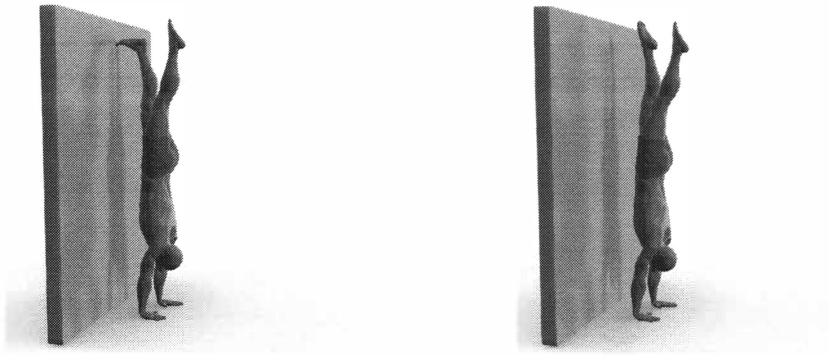
As you can imagine, using only your wrists to control a handstand will be difficult initially. New athletes who are learning the handstand will often use their shoulders and hips to change their body shape and

balance a handstand. This will cause their shoulders to come out of alignment with their head and the rest of their body, and their feet will move around a lot while in the air. Resist this temptation—it will instill bad habits that are hard to break. A proper handstand held for a minute or longer should primarily work your forearms (if you have the requisite strength). The rest of your body should be relatively unused except maybe some endurance burn in your shoulders.



The sequence above illustrates the technique to move into the stomach-to-wall wall handstand. Begin in a pushup position and slowly walk your legs up the wall while you simultaneously walk your hands closer to the wall. Keep your body straight and do not arch your back (doing so will force you out of the position via a forward roll or pirouette). If you are new to wall handstands, you may not be ready to perform this to the full extent that your stomach is against the wall. Only go as far as you are comfortable. If you are a beginner, you should only touch the wall with the tips of your toes. Over time, you will feel more at ease with this exercise and can conquer your fears by moving your stomach closer to the wall.

Once you become proficient with wall handstands, there will come a time where you barely push your toes off the wall. You will use your wrists to correct the overbalance by digging down with your fingers. This will keep you from tipping over. Avoid arching your lower back in order to compensate for when you push your toes off. Any adjustments should be made with your wrists.

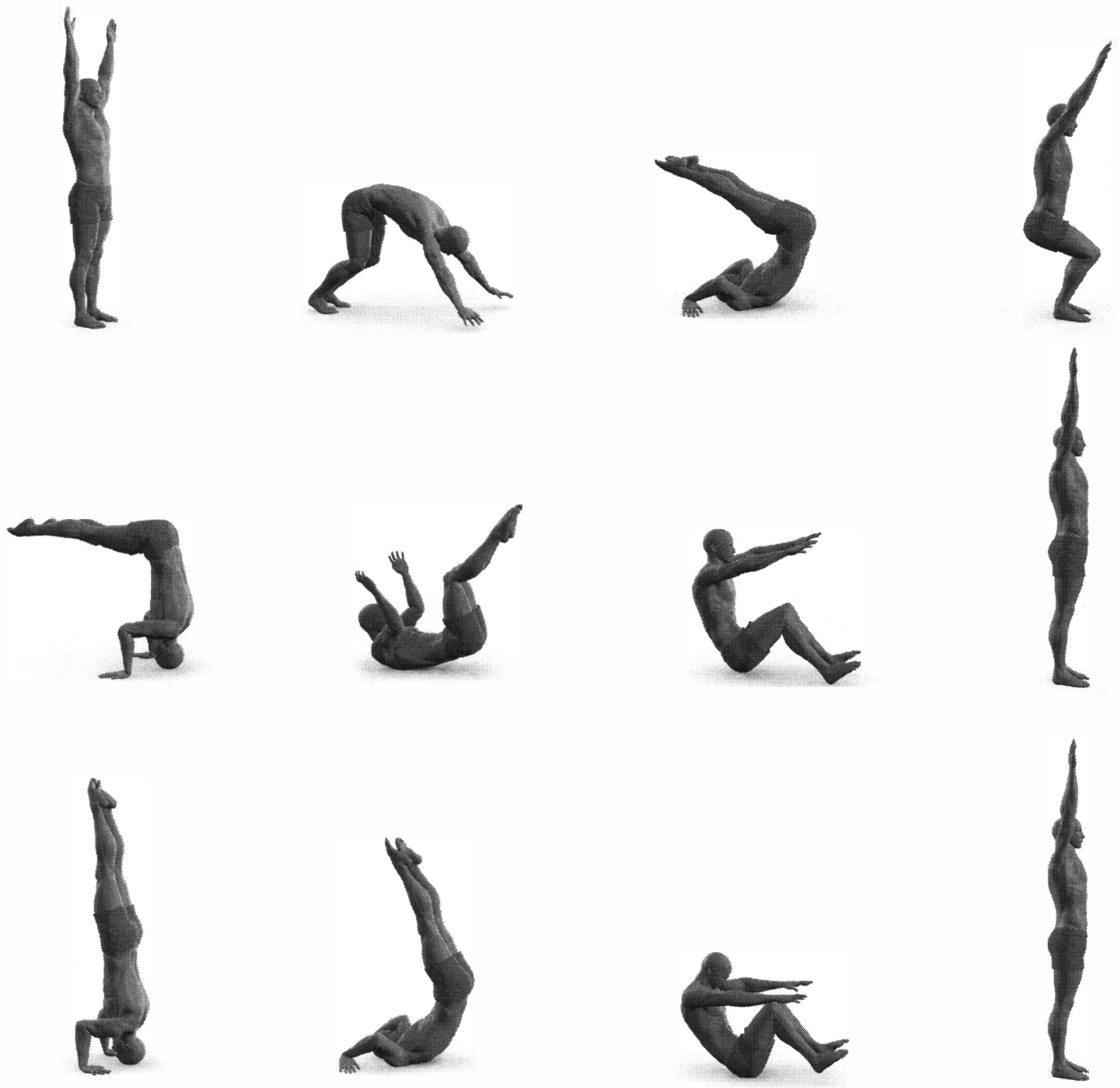


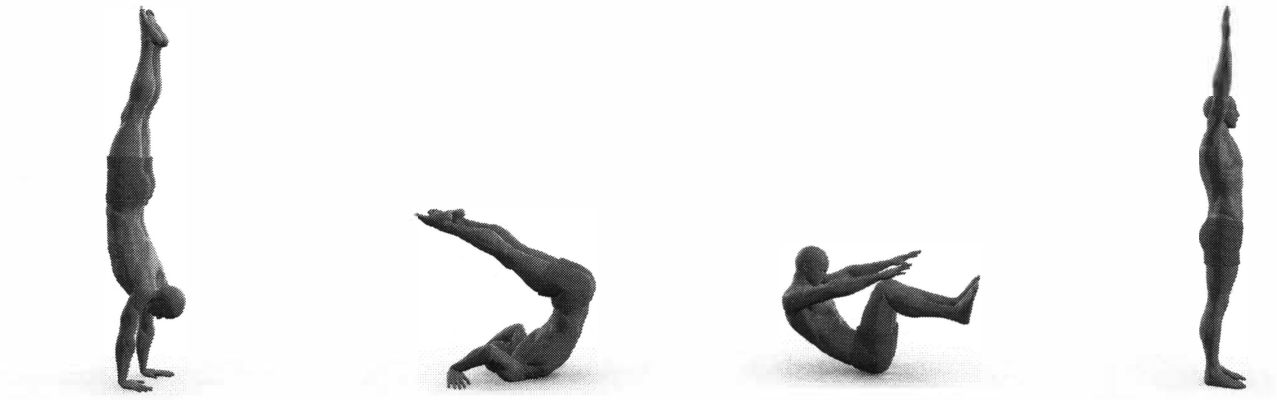
You can also push off from a handstand with split feet (shown above). To do this, begin with a balanced handstand position and split your feet apart with one foot remaining on the wall. Next, slowly move your remaining foot off the wall, bringing both feet together while maintaining balance. Hold this position for as long as possible.

As you become more proficient with this, you will be able to balance with both feet away from the wall for longer and longer periods. When you can hold this position for fifteen to twenty seconds, split your handstand workout into two parts: 1) kick up to freestanding handstands and 2) continue to work on your balance with freestanding wall handstands. Once you can consistently hold the position for thirty seconds or more (while maintaining proper balance with your body straight), it is time to solely focus on your freestanding kick to handstand movement.

Rolling Out and Pirouetting

There are two basic techniques to suddenly end (bail from) a handstand: rolling out and pirouetting. Rolling out is the best method if you are working against the wall—it correlates better to maintaining body positions. Using the pirouette movement to bail from a handstand as a beginner can lead to the development of bad habits. Stick with the roll out.



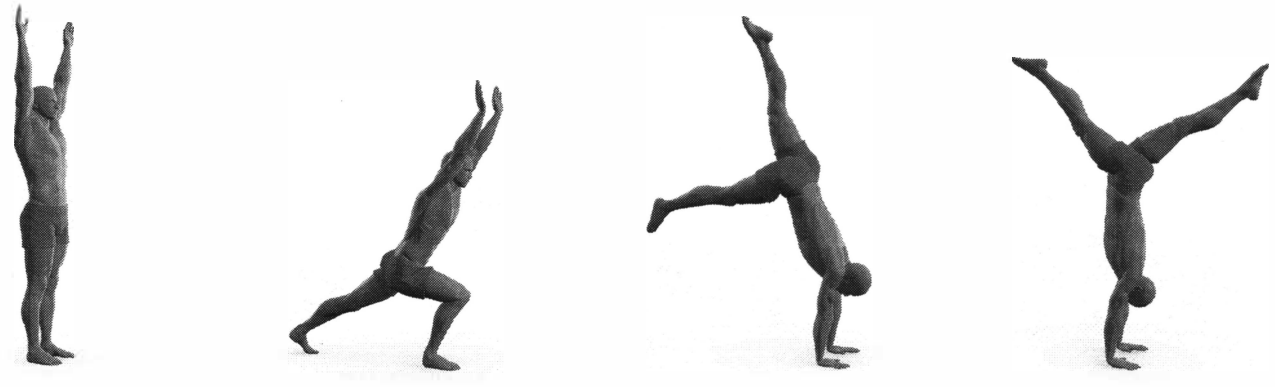


Rolling out of a handstand is an extension of the forward roll on the ground. If you are not proficient in the forward roll you should first practice it on a soft mat or grass. Apply pressure through your hands such that when you tuck your chin to your chest you will be able to put your weight on the back of your neck and roll smoothly out of a movement.

Working from the handstand position, bend your arms slowly so that you lower toward the ground in a controlled manner. From there, tuck your chin to your neck and curl your body into a fetal position as you allow gravity to move you through the roll. Above are some sequences you can practice to become more proficient in rolling out.

If you are unsure of how to do this correctly or fearful of rolling out from the handstand position, there are two options. The first option, which is preferred, is to ask for help from a spotter. They can hold your legs or ankles up and help you execute the roll in slow motion until you feel more comfortable. The other option is to learn how to pirouette out of a movement by twisting your body.

Kicking Up



The *lunge to handstand* (shown above) is often performed improperly. To get a sense of how much force is needed when kicking up to a handstand, start by practicing against the wall with your back to the wall. Make sure the movements are as consistent as possible. Mechanically, here is a set of instructions that beginners should follow:

- First, you want to take the handstand position upright: straight body, standing with your arms overhead. This makes the kick up to a handstand much easier because you keep your body in alignment

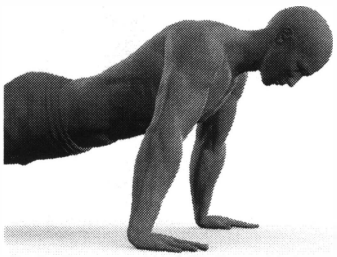
throughout the entire motion. Without this setup, your body will not be tight and will therefore not be controlled while you perform the movement. You should go into the movement with your legs together, arms overhead, shoulders "in" your ears, chest up, and core/shoulders tight.

- During the motion of kicking up to a handstand, the only part of the setup that will change is you will lunge with your leg—this is the hinge on which your body will rotate while remaining straight. The reason you move your lunging leg out of alignment is so you do not compromise the straight-body, arms overhead position you previously set up.
- Place your lunging leg approximately half of your height in front of you. Shift your weight onto that leg as you begin to tilt your upper body down for the kick up to a handstand. Your hands should lead the way. Be sure to keep the knee of your lunging leg as straight as possible to maintain proper tension in your hamstrings. Once your hands hit the ground, dig in with your fingertips to stabilize the handstand as you kick up. Use the tension in your hamstrings to kick up your lunging leg.
- At this point your legs should be together—in the air, above you—in a perfect straight-body position. If anything came out of alignment during the movement (such as your legs spreading apart), appropriate compensation will be necessary. Things like this will happen while you are learning. One way to determine what you did wrong is taking a video of yourself performing the movement, or you can have someone who has mastered it watch you and coach you in the right direction.

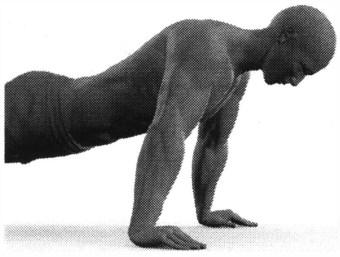
If you can execute the lunge to handstand correctly, you are in good shape. From there, all you have to do is exert the force necessary to hit the correct position during the kick up and be sure to apply the pressure from your fingertips. You may find it useful to use a wall at first to figure out how much you power should be in your kick. Once you become proficient at kicking up, you should feel like you can lock into a perfect handstand at the top of the movement without wobbling.

Note that the *back to the wall handstand* is a technique that can be used to teach a proper handstand. This is especially helpful if you lack the strength or technique to bail out of a handstand with your stomach to the wall. If you do use this technique, try to phase it out as soon as possible.

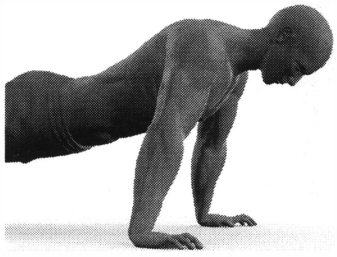
Grip



Flat Hand



Arched Hand



Cambered Hand

There are a few different ways to grip the ground: flat hand, arched hand, or cambered hand. There is nothing wrong with the flat and arched hand positions, but if you are working toward high-level handstand movements you should use the cambered hand position. This hand position allows you to generate more tension in your hand, enabling stronger, more precise corrections that are useful for advanced movements.

- The flat-hand grip is pretty straightforward—your whole hand is flat against the ground. It can be hard to balance a handstand with this grip, as you do so with your palms and fingertips.
- The arched-hand grip (or dome hand) puts only your fingertips and the heel of your hand in contact with the ground. This allows for full handstand balance much easier.
- The cambered-hand grip is a bit different. You begin by placing your palm in contact with the ground, then curling your fingertips in a manner that a dome is created, but only from your fingertips, as your entire palm remains in contact with the ground. This grip gives your hand three points of ground contact: fingertips, top of palm, and heel of palm. For an excellent analysis of this grip, visit the website of physical therapist Shon Grosse: http://shongrosse.com/2011/08/the-cambered-hand-pushup/

If you are falling forward, dig your fingertips into the ground. If you are falling over backward, distribute your weight through your palms. The additional control from the cambered hand grip may help those of you who are having problems with balance in the skill. Note that getting used to the new position may require some practice.

HEADSTAND – LEVEL N/A

This movement is not on the charts, but is important to recognize. While it has its uses, the same body positions can be built more thoroughly by performing a correct wall handstand. Headstands place an enormous amount of pressure on the neck. It is not a recommended position for beginners and is best performed under a coach's supervision.

If you decide to perform headstands anyway, here are a few things to know: Body positioning is the same as for a handstand, except for how you set up the movement. With a headstand, weight is placed on your head and hands in a tripod position. This means you can draw a triangle on the ground and place your head and hands at each of the three points. You can then use your head and the handstand position to keep your center of mass between those points as you move your legs overhead.

FREESTANDING HANDSTAND – LEVEL 5

A *freestanding handstand* (which can be abbreviated *Free HS*) is essentially a wall handstand without the wall. All of the same techniques used to perform a wall handstand apply. Because wall handstands are easier, most beginner athletes start there and work up to freestanding handstands.



Scapular Positioning: Your scapulas should be fully elevated. At the height of elevation, retract them slightly for stability.

If you walk into any gymnastics gym and tell every person present to kick up to a handstand and hold it, here is what you will see: Those with the best handstands are the most skilled overall, while those with the worst handstands are the least skilled overall. Handstands are one of the most fundamental movements in gymnastics and in bodyweight training as well. It is critical to become proficient in them, as it will make flipping, twisting, and other body movements that occur between being upright and being inverted much easier to execute. They provide an overview of an athlete's proprioceptive and kinesthetic awareness in the inverted position, which is counter-intuitive to normal body positioning. In a word: they are a critical skill to acquire.

Develop the freestanding handstand position on the floor, then move to parallettes and rings as you become more proficient. Rings handstands and one-arm handstands will be the true test of your handstand abilities long-term. It is actually easier to perform handstands on the parallettes (because it is easier to obtain a better grip), but it is safer to begin on the floor, especially if you have just progressed from wall handstands to freestanding handstands. If you still need to work on kicking up, bail techniques, and/or grip, you should read through the previous section.

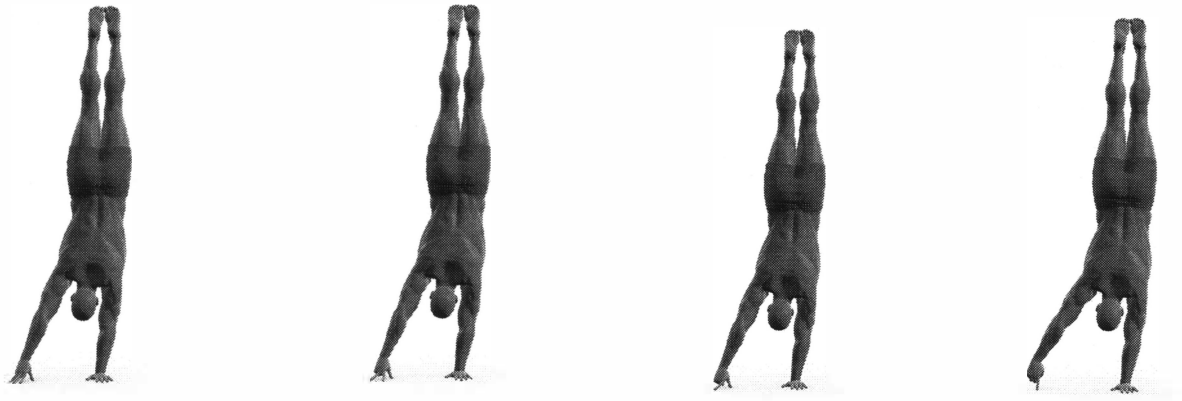
You should seek to reduce wobbling in both the dynamic and static senses. For the dynamic motion, you want to be able to kick straight up to a handstand without wobbling at all. It takes a lot of practice to learn proper control, as kick-up force is hard to modulate. You do not want to under-balance and come back down; nor do you want to overbalance and be forced to compensate by arching your back or walking on your hands. For the static motion, obtain a solid handstand position so that you only have to make a few corrections using your wrists. This level of superior control will look good to any observers, and it requires far less energy than wobbling back and forth.

Once you have developed the position through wall handstand training and become proficient in it, all it takes to achieve a freestanding handstand is consistent practice. Practice every day if you are able. This skill is

an A-list skill in the Gymnastics Code of Points. If you need additional information or further visualization, here are some additional resources:

- Valentin Uzunov's "The Handstand: a four-stage training model" – http://docslide.us/documents/the-handstand-a-four-stage-training-model.html
- GMB's handstand tutorial – http://gmb.io/handstand
- Natalie Reckerts's handstand tutorial – http://youtube.com/watch?v=Lz7a6eOb4Hs
- Antranik's comprehensive handstand tutorial – http://antranik.org/comprehensive-handstand-tutorial

FREESTANDING HANDSTAND WITH ONE-ARM SUPPORT – LEVELS 6-9



In the images above, you will find four variations of a freestanding handstand that you can use to work toward a one-arm handstand. All of these variations involve balancing with one hand and some of the fingers on your other hand (each variation uses a different number of fingers). From left to right: *Free HS with 4 Fingers* (Level 6), *Free HS with 3 Fingers* (Level 7), *Free HS with 2 Fingers* (Level 8), and *Free HS with 1 Finger* (Level 9).

Using a wall to assist with one-arm handstands is not effective. There are many photos online of one-arm handstands against a wall. While it makes a cute photo, using the wall does little to help develop the skill sets required for a true one-armed handstand. However, the wall can be useful for building up the necessary strength and conditioning, especially in your shoulders and wrists. These bear the brunt of the pressure but do not help much with balance, which is the foundation that the one-arm handstand is built upon.

Before you begin learning the one-arm handstand, you must develop a solid, straight-body handstand. The variation used to develop a one-arm handstand is a freestanding straddled handstand with a slow, progressive weight shift to one side. Use the straddled handstand because straddling your legs lowers your center of gravity, which makes the skill much easier to perform. With your legs spread, leverage to both sides is increased, making it more difficult for the body to sway in either direction. This gives stability. As you gain experience, challenge yourself by closing your legs.

The straddle handstand requires the ability to perform a solid handstand because your core is more apt to be unstable in this position, and you need the tight body position to learn correct balance at the wrists. Finding the correct center of balance in your hands is critical to learning this skill. You can reduce assistance in the straddled handstand by slowly removing fingers from the skill. First to go is the pinky. Follow that with the ring finger and continue until the thumb (and therefore the entire hand) is no longer helping.

Since balance at the wrists is critical to learning the skill, increased grip strength will significantly speed up its development. The center of balance of the one-arm handstand is somewhere near the joint of the ring finger (depending on one's anthropometry), so strengthening the whole grip is fine but you will see better results from specifically strengthening the last three fingers of each hand.

Advanced handstands of all kinds should be practiced either on a hard floor or hand balancing implements. It is much easier to maintain control with fingertips that are being pressed into a solid floor, or hands that are squeezing very strongly on implements or parallettes.

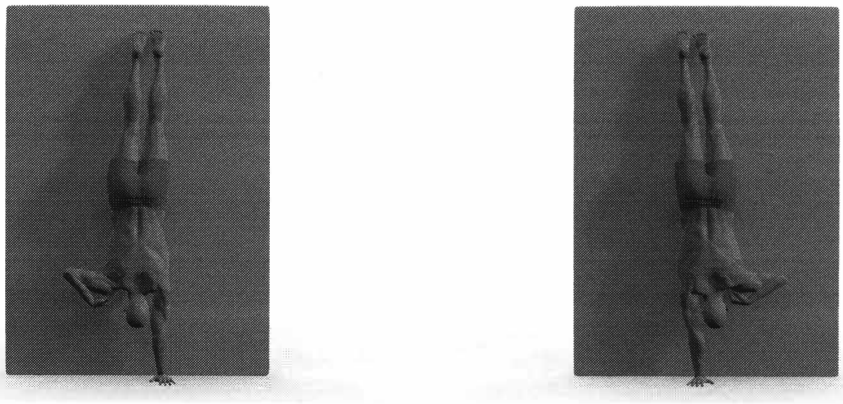
The key for the one-arm handstand is exactly like the freestanding handstand, except after you balance the straddle handstand, you should lock your shoulder in the active position (shoulder earmuff) and slowly shift your weight onto one arm. Since you are shifting your weight, the weight on your other arm will decrease and may cause you to come up on your fingertips on that hand. This is totally fine. Over time you will decrease the amount of the hand you use.

If you feel yourself wobbling throughout your body as your weight shifts to a one-arm hold, keep practicing. Remember, the critical component of learning a one-arm handstand is balancing the movement directly through your wrists. If your body is wobbling through your core or legs, you are not learning correct balance patterns, and are making the movement harder than it needs to be.

As you lean over, you will notice that the center of gravity in your hand will shift as well: toward the joint of your first ring finger. This progression of weight shifting in your planted hand is normal, so get used to the way it feels. You can supplement with specific grip work as well. Your ring and pinky fingers will strain to keep your balance centered in this small area, so it is important to take care of your joints. It is normal for one of your joints to get noticeably sore while practicing this movement. If this soreness does not dissipate naturally, take a break for a couple of days to allow your tissues to heal. This will prevent overuse injuries.

Yuri Marmerstein, a self-taught professional acrobat based in Las Vegas, consented to write the one-arm handstand section of *Overcoming Gravity*, found later in this chapter. You will find that he builds on the basics given here.

FREESTANDING HANDSTAND SHOULDER TAPS – LEVEL N/A



Freestanding handstand shoulder taps (which can be abbreviated *Free HS Shld Taps*) are not included on the charts, but this would be the position where they would appear. Free HS Shld Taps are a dynamic and intermediate balance skill. The goal of this skill is to balance from side to side and release your opposing hand at each juncture. This can serve as an excellent conditioning exercise and give you a good feel for dynamic stability in one-arm positions while maintaining adequate body tension.

These can be performed against a wall as conditioning for handstands, but proper care must be taken not to break form, close the shoulder angle, or arch your back. This skill is a critical component of learning the one-arm handstand. It is also a very good supplement in learning dynamic awareness, especially if you need to improve your handstand body position mechanics or want to do handstand walking for distance in the future.

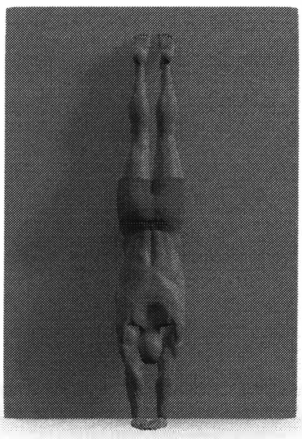
HANDSTAND WALKING – LEVEL N/A





Handstand walking is another good supplement for learning the one-arm handstand. Maintaining a correct tight-body technique is critical for learning this skill. If you have been able to advance this far, you should be ready to execute handstand walking without arching your handstand. This dynamic stability will help in your weight shift, which will ultimately help your one-arm handstand.

HANDS-CLOSE-TOGETHER HANDSTAND – LEVEL N/A



This is another variation you can utilize as you work toward the one-arm handstand. While performing this skill, you progressively move your hands closer together and begin biasing your weight onto one arm. Eventually, this will yield a handstand where one arm is on top of the other, and can be slowly lifted off so to bring you to a one-arm handstand position. This exercise is not as measurable as other variations, so it is not effective for training, but it does make a good supplemental exercise.

ONE-ARM HANDSTAND – LEVEL 10



Yuri Marmerstein is a self-taught professional acrobat based in Las Vegas. He is lending his expertise for this section.

"The one-arm handstand is an immensely complicated skill. It takes a lot of effort, perseverance, and dedication to learn compared to a traditional handstand. Realistically you can expect to train five to six days per week for a couple of years to achieve the balance and precision required for this skill.

Balance is all about making movements to maintain your center of gravity over your base of support. In essence, to stand is to continually save yourself from falling. On two arms, you can basically only fall in two directions—forward or backward. This makes the corrections pretty simple. However, on one arm, you have half the base of support and must now balance along both your sagittal and longitudinal axes. This means you can fall in any direction along 360 degrees of your hand. On top of this, there is a greater shoulder strength and stability requirement, in addition to body control and awareness. That is without mentioning the control required to keep your body from rotating while you are balancing on one arm.

I do not want to put anyone off, but I do want to be realistic. There is a reason why many people only dream of this skill and never achieve it. It is not something you can mess around with once a week and expect to master it. To make it work, you have to be a little bit obsessed.

Still interested?

Here are a few prerequisites you need to achieve before attempting a one-arm handstand:

- A minimum of sixty seconds freestanding balance on two arms. This is a bare minimum and it should be consistently achievable, not just a PR. The handstand in question should balance with minimal visible movement of the body. It will also be particularly helpful if it is in good alignment, meaning the body is stacked over the hands so that minimal strength is required to hold the position. It is possible to do a one-arm handstand without good alignment, but it is much more difficult.
- The next step toward mastery of the two-arm handstand is movement. This means you can change the position in a controlled manner while maintaining balance. Changing position can involve movement of the head, shoulders, legs, back, and anything else you can think of. You can start by isolating one joint at a time, then move on to multiple joints at the same time.
- Additionally, it is good to get comfortable with several leg positions aside from straight-body. You especially want to become proficient in the tuck position, open straddle (legs aligned with your body), and the closed-hip straddle (legs slightly out of the vertical line but in a deeper split).
- Another concept along these lines is being able to break form and come back in line. This is very

important for awareness of alignment, as it will not be as obvious when you are on one arm. Breaking form can involve pinking at the hips, arching the back, closing the shoulders, and many other variations.

- Another idea that can be experimented with is rotation of the hips on two arms. Begin by twisting your legs from a left split to a right split, passing through a straddle. You can also experiment by rotating the hips in a tuck and a straight-body position to obtain a greater understanding of what it should feel like. Rotation of the body is a very important issue to deal with when shifting to one arm, and having awareness of the sensation is the first step to correcting it.
- A crucial element that is often overlooked is handstand walking. I actually spent the majority of my first year of hand balancing walking rather than standing. I do not think this is the ideal progression and I teach walking after static balance to my students. However, when I began learning the shift to one arm later on, there was not much issue with the actual shift aside from technical subtleties. I recently worked some one-arm progressions with a gentleman who had excellent balance on two arms but didn't spend much time walking on his hands. This made the act of shifting weight very awkward for him. Even though walking on the hands involves a mindless shifting of weight from one hand to the other without maintaining balance, those repetitions are still a considerable help once the time comes to work one-arm handstands. Apart from that, walking on your hands yields excellent strength and control.
- A press handstand from a seated position on the floor would be a minimum. Ideally, a press-to-handstand from a seated position should be achieved.
- As far as handstand pushups go, they will not have as much benefit for the one-arm handstand as straight-arm presses will, but they are very important for general upper-body strength. Even though they are not necessarily required, practicing basic one-arm balances like the crocodile and air baby will also help with your control and awareness in the one-arm handstand.
- The final prerequisite is proficiency in press handstands and handstand pushups. It is a good idea to be able to get to a handstand as many different ways as possible, but being able to get there using a controlled press is very beneficial for shoulder strength, active flexibility, and body awareness. Additionally, a handstand that is falling toward the heel of the hand can be saved by going into a press. The same goes for a handstand pushup. Though the one-arm handstand is by no means a strength move, it will be considerably easier to learn having acquired the combination of strength and flexibility required for a press.

Once you have the prerequisites down, you can begin to actually train for the one-arm handstand. The first order of business is the one-arm distribution (how you get to one arm). This is not as easy as it may seem. There are many techniques for shifting your weight to one arm. However, generally speaking, the less you think about it, the better. As a minimum requirement, the arm you are shifting the weight to must be vertical. Everything else is variable. An exception is brute strength, but that is not ideal.

I am going to first describe the easiest way to shift to one arm before I explain the others. Assuming that both arms are precisely shoulder width, they should both be completely vertical. You should also assume a decent open shoulder position in the handstand line. If both arms are already vertical, you don't have to do anything with the arm you are shifting to. Rather, move the rest of your body to maintain the position of your primary arm. If you try this in a pushup position you will notice the shoulder of the free arm actually tilts upward a little bit. Do not change anything about the arm you are shifting to; try to minimize as many

variables as possible. The tension will remain in your supporting arm, but should begin to relax as the weight shifts to your free arm. This will be very important when the time comes to lift your hand. Additionally, your head should remain in basically the same position during the shift.

How do you actually shift weight? The idea is to move your hips over the arm you are shifting toward. There are two other ways distinct ways to shift, but both can cause their own issues. Still, it is worth experimenting both of them, as you might like them.

- The first way to shift is the classic "ear to shoulder" style. This involves a strong elevation in your supporting arm, as well as your head moving closer to that side. It makes for a more upright and refined-looking one-arm handstand position, but it can make it more difficult to find the balance. It is also easy to shift too far to where your arm is no longer vertical.
- The second way to shift is the exact opposite of this, where your head moves away from your supporting arm to counterbalance your hips tilting far over the side. This technique is more common among athletes without formal acrobatic training. It is easier to find balance in this type of one-arm handstand position, but it requires more strength to hold.

A good general rule states that the more variables you can eliminate, the easier a movement will be. However, one common mistake is losing tension in your supporting shoulder during a shift. This will almost certainly cause a loss of balance.

It is easiest to begin the motion of shifting from a pushup position. Once you can perform this, the next step is to take the concept to a chest-to-wall handstand. The idea here is the same as in the pushup position. Shift your hips all the way above one hand. Maintain shoulder tension. Attempt to keep your hips square to the wall, as you do not want your hips to twist while you shift weight. Being aware of what that feels like is essential to learning the one-arm handstand. Remember, it is important to grasp the concept of weight-shifting prior to adding the balance.

To move to the next level, add the weight shift into your freestanding handstand. Start with slow, controlled movements—gradually shift your weight to one arm and feel your other arm get lighter. Practice both sides and keep your hands flat on the ground for now. The feeling you want to begin to develop is how to tense one arm while relaxing the other.

On the topic of leg positioning, I find it easier to learn one-arm handstands in a straddle position. It takes a good amount of hip flexibility to gain advantage from this, though. Additionally, it can be hard to maintain proper body tension with your legs apart. I have seen plenty of people who had an easier time learning a straight-body one-arm handstand first, even though the balance required for that position is more precise.

Apart from the movement required to shift your weight back and forth, the rest of your body should remain in one piece during this exercise. Try your best not to change your body position during the shift. Move everything over at once after the shift.

Once you feel that you can go far enough to one side, with control, the next stage is to release the palm of your free arm and come up on your fingertips. This will require more lean and a slight tilting of your body in the direction of your working arm in order to take more weight off your free arm. Remember to always keep your supporting arm vertical.

My recommendation once you can lift to the fingers of your free arm is to bend that arm at the elbow. This is not the only way, of course, but I find it a useful cue in relaxing your arm. Unnecessary tension in your free arm will make it more difficult to maintain balance while lifting your arm later on.

Balancing with your fingertips on your free arm is a long and frustrating stage. This is where the slackers are separated from the truly dedicated. Before moving on from here, my recommendation is to be able to hold at least thirty seconds consistently with your fingertips. It is even better if you are able to change leg positions while doing so.

If you are training diligently every day, you can expect this stage to take several months. If you feel like you want to take your hand off the floor, do not do so at this time. This is your ego talking and no good will come of it at this point. Stay on your fingertips longer than you think you need to.

You want to achieve consistent thirty-second holds in both a straddle and straight-body position—both on your fingertips and one arm—before advancing to the next stage. It is also a good idea to attempt to never "fall" out of the one-arm balance. This means always fighting to come back to two arms before intentionally going back to your feet. It is important to show dominance with the movement. Come down because you wanted to, not because you fell.

Next, begin making your free hand lighter by shifting even more weight to the supporting side. When your hand and fingers feel light enough, you can treat it one of two ways: move to one finger support on your free arm or hold the same position (all fingertips), where you literally feel your free arm take no weight. It is very important to be able to place all of your weight onto your supporting hand before lifting your free hand; otherwise, the lift will cause your body to fall back to center.

When you feel that your supporting arm is absolutely weightless, you can experiment with lightly tapping the floor with your free hand. Doing this will allow you to begin obtaining an actual one-arm balance for several brief moments. It is imperative that any movement with your free arm be slow and deliberate. Any jerky movements will easily throw off your balance. It is my preference to lift at the elbow, maintaining shoulder position when I tap the floor. Doing this with a straight arm is okay, but it tends to create more tension in the shoulder of your free arm. Your goal is to increase the amount of time between taps, meaning you are achieving longer one-arm holds. The taps serve as a safety net during your period of one-arm balance, as you can reach your hand back to the floor to stabilize your body if you feel you are about to fall.



Once you become proficient with the finger taps, your next step is to fully lift that arm off the floor and hold a one-arm handstand. This is easier said than done. The actual lifting of your arm must be performed in such a way that it causes no movement in the rest of your body. Your free arm must be completely relaxed and bear no weight prior to being lifted.

Though there are many ways to lift your arm, I prefer to think of it as a *développé* from ballet. Rather than lifting your whole arm at once, it is lifted in segments. This creates less impact on the rest of your body. From a one-arm handstand with fingertip support, you would first lift the elbow of your free arm, extend your forearm, and then extend your hand. While doing this, you must focus on maintaining balance with your supporting arm. If you place too much focus on lifting your free

arm, you will most likely lose your balance and fall. For this reason, I recommend you practice lifting your arm from either a pushup or chest-to-wall handstand position. This will give you an understanding of the movement before you attempt it while simultaneously trying to balance your body in a handstand position.

While first holding one-arm handstands, it is safest to keep your free hand close to the ground, that way you can always steady yourself quickly if you lose control. As you develop your awareness and hold time, you can begin moving your arm up to horizontal position and, eventually, all the way up to your body. Many people have the goal of being able to hold a basic, one-arm handstand, but that is really just the beginning. Once you can hold it, it opens a world of movement opportunities that do not exist for the majority of the world's population.

This process will test your patience. You will learn a lot about yourself, regardless of whether you achieve the skill. For the truly dedicated, the process never ends. There is always so much to work on—whether it is new skills or refinement of existing ones. Hand balancing can keep you busy for many years. The one thing you cannot avoid is putting in the work.

One last piece of advice I can give is to get a teacher and have them critique you at some point. There are many issues that you simply will not catch or be able to fix on your own. This is a skill where you would benefit greatly from another pair of eyes once in a while. Even if it is something you already know, it is a helpful to hear someone else say it."

Note from Steven: Most of these techniques are best seen on video rather than in two-dimensional images. You can find many of the tips and techniques discussed by Yuri Marmerstein on his website, on YouTube, and in the video *Steps and Preparation to Achieving One-Arm Handstand.*

- **Website:** www.yuri-mar.com
- **YouTube:** www.youtube.com/user/bar8nmunchausen
- **Steps and Preparations for OAHS video:** www.youtube.com/watch?v=ytjIgIe5CVQ

Rings Handstands – Page 1, Column 2



RINGS SHOULDER STAND – LEVEL 5

Scapular Positioning: Keep your scapulas depressed (but neither retracted or protracted) in order to have a stable base for the shoulder stand.

Body Positioning: Keep your elbows slightly in front of your body and tucked in toward your sides. Your arms should be fully curled, with your hands at shoulder height in front of your shoulders. Keep your body straight. If this makes it is easier for you to keep control, your body can be slightly hollow.

Rings handstands are located on column two on page one of the charts. First up is the *rings shoulder stand* (which can be abbreviated *R Shld Std*). This basic rings skill sets the standard for inverted positions on the rings. All of the balancing for this and subsequent rings positions will occur solely at the wrists, much like handstands on the floor, parallettes, and hand balancers. You should never stop practicing these specific body positions, as the ability to maintain them will demonstrate your overall skill and, often, your ability to apply strength.

As you begin training this skill, lower the rings as close to the ground as possible and place some padded mats or pillows in front of you in case you fall over or need to roll out. If you must use high rings, a good forward roll out of any inverted rings position is a prerequisite to learning those inverted positions. Practice rolling out at least ten times before beginning to do any support inverted skills on the rings. Before learning to fly, you must learn how to land. You will make the most progress if you have a partner or coach spotting you.

The way to roll out of a shoulder stand is to implement the fetal position, like you would to roll out of a handstand on the floor. Bring the rings in toward your chest, tense your arms so they do not flare out, and tuck your body into a ball. This allows you to rotate in a manner similar to a forward roll on the ground. At the end of the roll, you will be at the top of the pull-up position in a tuck position.

To achieve a rings shoulder stand, begin with an L-sit. This allows you to swing for momentum to get your hips up over your head. You will eventually want to learn this strict, without momentum. As your hips begin rising in the back, lean forward and bend your arms. Two things must now happen simultaneously: your hips must begin to rise up between the straps at the same time that your elbows stop bending. This transition is critical because if your arms bend too fast and leave your hips behind you end up at the bottom of the dip position, which is almost impossible for most beginners to press out from. The timing of the hip drive and the arm bend must be precise to actually get up into this position. It is in your best interest to have a solid familiarity with deep ring dips before beginning to learn this skill.

Once your hips are up and between the rings, control the shoulder stand position with your wrists. The rings should be squeezed into your chest tightly, but not so much that they tilt significantly inward. You want to pull the rings in and stabilize them so they are as much like parallettes as possible. This will allow you to execute the skill with minimal wobbling. Make sure you are gripping the rings as tightly as possible and are using your grip to control the position as you bring your feet above your head.

The pike position is recommend while learning to execute this movement. Most people will find it easier to raise their feet from the tuck position, but the tuck balance is very hard to control in the forward/backward plane with the wrists of a beginner. Piking—though slightly harder to execute initially—will allow your pelvis to act as a fulcrum for balance as you transition your legs up. Because rings are inherently unstable, adding components that help with the balance aspect will speed up your rate of progress by allowing for a higher volume of correct training.

Once you get your feet up and your body straight you should be slightly under-balanced. Your feet should not be directly overhead compared to the shoulder position, as the rings will be located slightly in front of your chest. If you are not accustomed to this, try spreading your legs out in a straddle position to allow them to hit the cables or straps. Even if you are proficient with the safety protocols, tipping over while in a handstand or shoulder stand is not conducive to proper learning.

After your legs have gone up and hit the straps, slowly bring them together. If you need more balance, you can place them on the inside of the cables at first, but your end goal is to have your feet touching. Remember, when you bring your feet together, you want to hit the proper body position (straight body) as soon as possible. Your wrists are the control mechanism, so engage them aggressively as soon as you take away the extra balance from the straps.

The key to this movement is keeping your body as still as possible while using your wrists to manipulate the movement. Because your hands are much closer to your body than in a handstand, you have the mechanical advantage through your wrists. Remember this and the rings shoulder stand will become a simple position to learn.





If you are having difficultly performing this skill on the rings, transfer it to a set of parallettes or parallel bars (shown above) if you have the appropriate equipment. The main difference with a shoulder stand on parallel bars compared to rings is your elbows will be out and wide. As you hold your body straight, your hands will control the movement in order to prevent you from tipping over or falling from the position. You can also use this method to learn the inverted position for the freestanding handstand.

RINGS STRAP HANDSTAND – LEVEL 6



Scapular Positioning: Your scapulas should be elevated maximally and slightly retracted in order to lock in the position. If your shoulder angle is not completely open (which may happen on the rings) due to a lack of strength, work on it.

Body Positioning: Your body should be completely straight—stacked through your hands, shoulders, hips, knees, and feet. Initially, you will turn the rings in and keep your arms on the straps. From there, work to turn the rings parallel and then completely out.

The best way to find the proper *rings strap handstand* position (which can be abbreviated *R Strap HS*) is through the shoulder stand. Note that the deeper your arms are bent when you begin, the harder it is to get into the full handstand position. With your legs bent and feet hooked onto the cables, push out from the bent-arm semi-handstand position. Move into the final position by using your hamstrings to bend your knees and wrap around the cable while walking your feet up the cable.

In this handstand position, look for a few key markers. Straight-body positioning is a necessity. Any bend in the elbows, however slight, makes the movement much easier to perform but emphasizes the wrong muscle set. Thus, the first thing you must do in the top position is lock your elbows out and push your shoulders out toward your ears. This centralizes the major strength component into your shoulders and the major balance component into your wrists. Shoulder strength is the base of all upper-body strength. Adaptations at the shoulders will support hand balancing aspirations as well as general strength. From a one-arm handstand to a barbell overhead press, a stronger shoulder girdle is important for all pressing movements. Press handstands, handstand pushups, planches, dips, and movements like these will also benefit from shoulder strength and coordination.

After a straight-arm handstand is achieved, your next focus should be your legs. As in the shoulder stand, instead of wrapping your legs around the outside of the cables, you want to move them to the inside. This will help promote a straight, better-aligned body, and push more of the workload to your shoulders rather than relying on the cables for balance.

These first two points should be familiar; you should have practiced both by this point. If this is the case, your primary focus will shift to the rings position, which will be a new challenge. Most beginners allow the rings to turn in while pressing. This allows the straps to ride up against your arm, which reduces the difficulty

of the handstand. While this helps beginners get their feet to the top, it actually makes the movement more difficult once they get there. Thus, it is important that you learn to turn the rings out while pressing, much like the standard support position. At first, it will be difficult to force your arms off the straps. However, doing so will lead to greater balance and strength adaptations, which will be of great benefit in the long run. You will have to work toward this progressively, with the intermediate aim of having the rings reach parallel to one another.

The goal that most gymnastics coaches emphasize is to start to turn the rings out while in a handstand, from parallel to forty-five degrees past the parallel rings position. This provides an optimal amount of control and sets up large rings swinging moves like giants. These and similar moves are beyond the scope of this book, but you are encouraged to work with the rings turned out to a parallel position at minimum. This will afford you more control and the additional benefits of the stabilization factors.

RINGS HANDSTAND – LEVEL 7



As you can see, the first image looks like straight body positioning until it is compared to the second image.

Scapular Positioning: As you might expect, your scapulas should be elevated maximally and retracted slightly in order to lock in the position. Even if you can obtain correct scapular positioning with the *rings strap handstand* you will probably regress a bit to bent arms and decreased scapular elevation once you progress to the *freestanding rings handstand*. Take care to correct this.

Body Positioning: Your body should be completely straight—stacked through your hands, shoulders, hips, knees, and feet. Initially, turn the rings in and keep your arms on the straps. From there, work to turn the rings parallel and then completely out. Much like with scapular positioning, you will regress and the rings will begin to turn in. Work on turning them back out and be sure to correctly align the handstand. It may be helpful to film yourself doing this so you can review and make corrections as needed.

The *rings handstand* (which can be abbreviated *R HS*) is an extension of the rings strap handstand, with two new goals. Instead of pressing into a shoulder stand and inching your way up to the top position, it is best to attempt to press into the full handstand position. Even if you do not hit it on the press alone, you will be

working your way up from a higher start position and reinforcing a harder press until you can achieve the full handstand position. Your second goal is actually more important: as you work to improve this top position of the handstand, aim to use the straps for assistance less and less.

As in the shoulder stand press, aim for a nice pike or straddle body position in order to offer hip control during your ascent. Modulate the forces accordingly to get your body into the correct position as soon as technically feasible, as you would in the kick-to-handstand position on the floor. Do you see how skills you have previously acquired begin to work together as you move into more advanced levels?

Remember, balance and control the movement with your wrists, especially when you are near the top position. Use the cables for assistance when you must, but try to cut down on your use of them. As you progress, you may only need to tap the cables with the inside of your toes rather than wrapping your legs around them. The fewer progressions you make, the more consistent the position. The more consistent the position, the faster you will progress.

As soon as you reach the rings handstand position, make sure to turn the rings out and make an effort to open up your shoulders, and squeeze your abdominals and glutes. Performing a handstand on the rings will tempt you to arch your back significantly more than performing a handstand on the floor. Obtaining a straight-body position is quite difficult, requiring impressive shoulder and core strength, as well as patience and practice.

This is an A-level skill in the Gymnastics Code of Points.

Handstand Pushups – Page 1, Column 3

The key to the handstand pushup series is to emphasize good body positions. If you are wobbly or have poor body position, it is stunting your development.

PIKE HEADSTAND PUSHUP – LEVEL 1



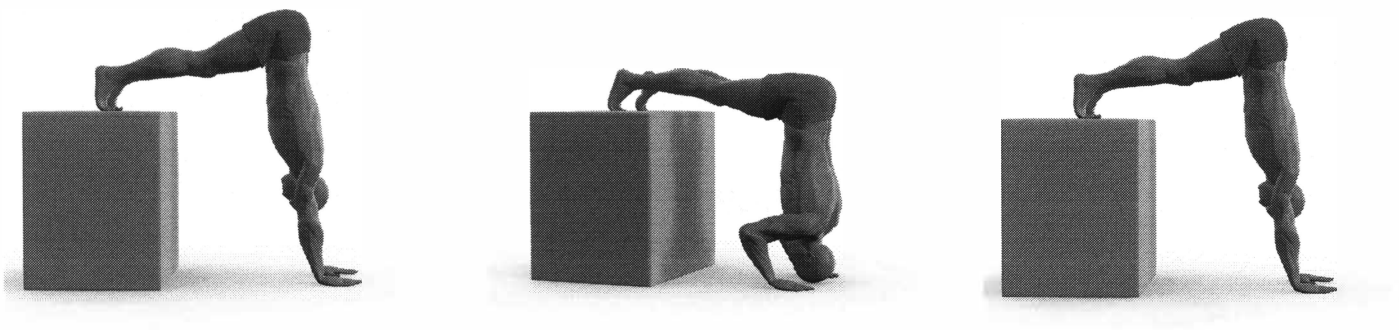
Scapular Positioning: Begin with your scapulas elevated. As your head comes toward the ground, they will naturally begin to depress. Once your head touches the ground and you start pushing back up, seek to end with your scapulas elevated.

Technique: Place your hands and feet on the ground and move into the pike starting position. Bend your arms and place as much weight as possible over your hands. As you bend your arms, be sure to tuck your elbows in line with your body, rather than flaring them out to the sides. Keep your head in line and allow it to touch the ground. Once it touches the ground, repeat the same process backward and push out to the starting position.

The key to proper development of the *pike headstand pushup* (which can be abbreviated *Pike HeSPU*) is to add as much of your weight as possible onto your hands without toppling over. This will bias strength to your anterior shoulders, triceps, and the upper portion of your chest. It is important to keep your shoulder angle as open as possible. Think of it in terms of reaching up toward the sky, only upside down.

Do not allow the elbows to flare outward during the pressing phase. Your upper arm should remain parallel with your body (that is, your elbows should stay glued to the imaginary plane with your sides). If you allow your elbows to flare the movement will feel substantially easier, but it removes your forward-backward stability and hinders the development of advanced skills. It is especially easy for your elbows to flare when you are fatigued, so be mindful.

BOX HEADSTAND PUSHUP – LEVEL 2



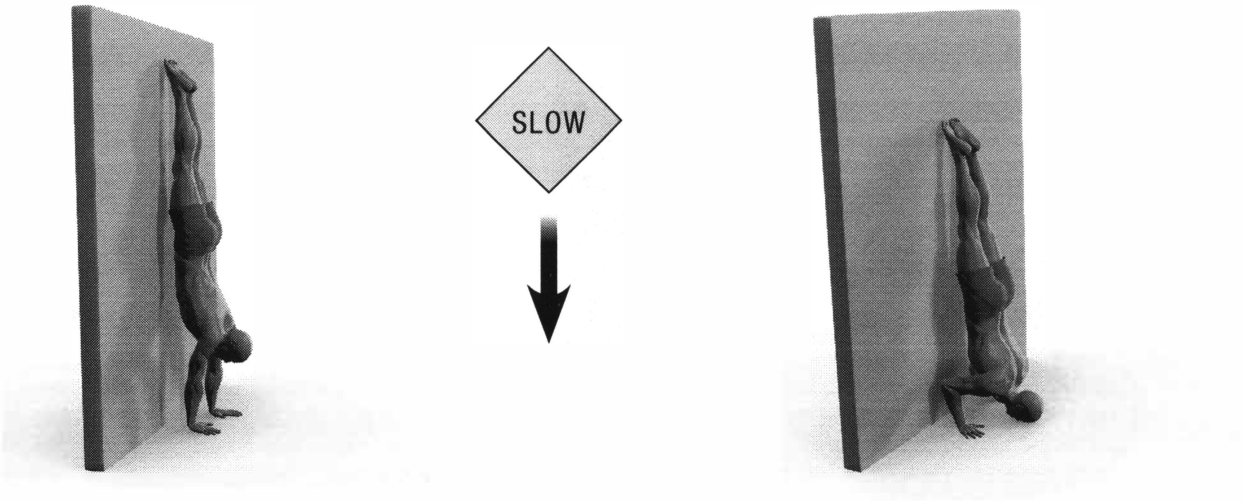
Scapular Positioning: Begin with your scapulas elevated. As your head comes toward the ground, they will naturally begin to depress. Once your head touches the ground and you start pushing back up, seek to end with your scapulas elevated.

Technique: Place your hands and feet on the ground and move into the pike starting position, with your feet elevated on a block, box, chair, counter, or any other sturdy surface. Bend your arms and place as much weight as possible over your hands. As you bend your arms, keep your elbows tucked in (rather than flaring them out to the sides). Keep your head in line and allow it to touch the ground. Once it touches the ground, repeat the same process backward and push out to the starting position.

A *box headstand pushup* (which can be abbreviated Box HeSPU) utilizes boxes of varying heights to increase the bias of weight onto your arms and the openness of the shoulder angle. The remaining execution of this movement mirrors a standard headstand pushup.

While performing this movement, your body will have a tendency to keel over frontward if you lack adequate strength in your shoulders or triceps. Conversely, if you are slightly under-balanced, your body will want to push more weight toward your feet to alleviate weight on your arms. If possible, you should not allow either of these scenarios to occur. Additionally, do not allow your head to come out too much, as this will cause your back to arch, creating further issues.

WALL HEADSTAND PUSHUP ECCENTRIC – LEVEL 3



Scapular Positioning: Begin with your scapulas elevated. As your head comes toward the ground, they will naturally begin to depress and come forward as your elbows move in that direction.

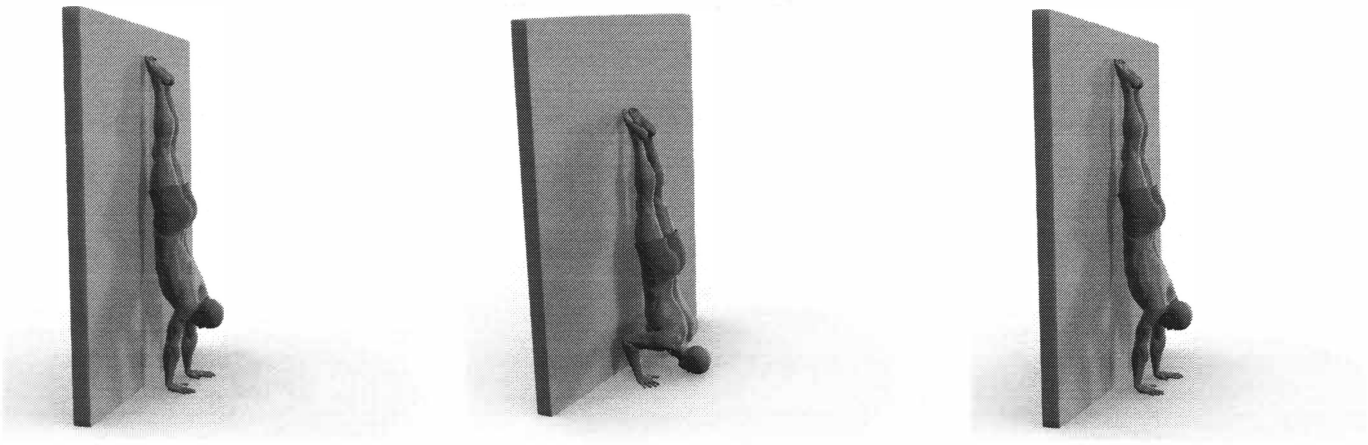
Technique: Begin in a wall handstand position, with your body completely straight and your feet barely touching the wall. Initiate the movement as illustrated above by allowing your shoulder angle to close while bending at the elbow. Slowly lower to the ground in a uniform movement. Make sure to keep your body straight as your head descends toward the ground. Do not arch.

The *wall headstand pushup eccentric* movement (which can be abbreviated *Wall HeSPU Eccen.*) is a step up from box headstand pushups. With this movement, you are controlling your entire body weight, but still receive assistance from the wall as a balance component.

To emphasize proper body positioning, use the stomach-to-the-wall position that you would use for a handstand. If you are not yet comfortable in this position, the back-to-the-wall variation can be used, but this can cause your back to arch since your heels are against the wall. Keep your hands as close to the wall as possible to avoid further arching when you descend.

Since this is an intermediate eccentric movement between the piked box headstand pushup and full wall headstand pushup, use a 5-10s eccentric phase. Your goal while performing the movement should be control and consistency. Avoid flaring your elbows.

WALL HEADSTAND PUSHUP – LEVEL 4



Scapular Positioning: Begin with your scapulas elevated. As your head comes toward the ground, they will naturally begin to depress and come forward as your elbows move in that direction. Once your head touches the ground and you start pushing back up, seek to end with your scapulas elevated.

Technique: Begin in a wall handstand position, with your body completely straight and your feet barely touching the wall. Initiate the movement as illustrated above by allowing your shoulder angle to close while bending at the elbow. Slowly lower to the ground in a uniform movement. Make sure to keep your body straight as your head descends toward the ground. Do not arch. Once your head lightly touches the ground, push back up to the starting position. Push through your triceps and shoulders, eventually covering your shoulders like earmuffs.

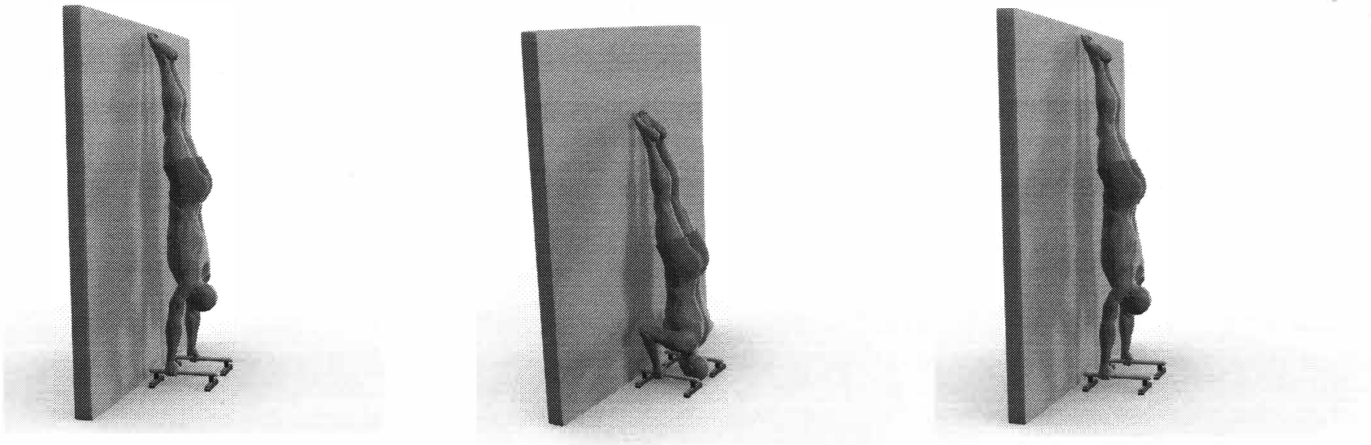
This is what most people think of when they hear the term "handstand pushups." While *wall headstand pushups* (which can be abbreviated *Wall HeSPU*) are not true handstand pushups (because the range of motion is stopped by your head touching the floor), they are still a feat of overhead pressing strength and body control.

The key to this movement is the same as the eccentric portions of the movement: control and maintaining correct body positioning. Your goal should be to build up awareness and strength in your primary movers, not obtaining as many repetitions as possible each set.

Arching of the back is typically a huge problem with headstand pushups, and it is multifaceted. Fatigue is the biggest culprit. As your body fatigues, it is tempting—almost natural—to do what is necessary to bring in other muscles to aid with the movement. When this happens, incorrect neural strength patterns are established. This should be avoided.

Handstand pushups and their variations are built through proper position, control, and strength through the shoulders. When you arch, you let the trapezius and pectoralis muscles become prime movers as the shoulder angle closes. This not only emphasizes incorrect neural patterns, but builds general strength in the wrong muscles. Additionally, arching makes the body less aware of its position in space as tension is lost through the core and hips.

WALL HANDSTAND PUSHUP – LEVEL 5



Scapular Positioning: Begin with your scapulas elevated. As your head comes toward the ground, they will naturally begin to depress and come forward as your elbows move in that direction. Allow this to happen all the way through to the bottom. Your scapulas will then be in a neutral, depressed position. Once your head touches the ground and you start pushing back up, seek to end with your scapulas elevated.

Technique: Begin in a wall handstand position, with your body completely straight, your feet barely touching the wall, and your hands raised on parallettes or other elevated materials. Initiate the movement illustrated above by allowing your shoulder angle to close while bending at the elbow. Slowly lower to the ground in a uniform movement. Make sure to keep your body as straight as possible as your head descends toward the ground. Do not arch. Once your head lightly touches the ground, push back up to the starting position. Focus on pushing through your triceps and shoulders, eventually covering your shoulders like earmuffs.

Wall handstand pushups (which can be abbreviated *Wall HSPU*) require placing your hands on a raised surface to fully hit the bottom of the movement. This position creates an extreme mechanical disadvantage, as your shoulder muscles and especially your triceps end up significantly lengthened. Keep your elbows glued to your side; do not let them flare out.

You can use almost anything to raise your hands, but taking safety and consistency into consideration. Most people default to parallettes, but other solutions could include mats or panel mats (if you are in a gymnastics gym). You can also use wood blocks, boxes, or chairs, but this is more dangerous. Whatever you do, do it safely, and be consistent.

Perform this movement with your body against the wall. Given the elevated nature of this movement, it is understandable to use back-to-the-wall positioning because it is easier to get down safely, especially as a beginner. You should also practice how to pirouette or roll out of movements to save your body if you begin to fall.

The key to wall handstand pushups is to maintain full tension in your shoulders and triceps while in the bottom of the movement. If you relax when you reach the bottom, it will not be easy to re-create tension while holding the position. Strength-wise, this movement is quite a jump from headstand pushups. Many people are not able to perform the full movement initially. To combat this, you have two options. The first

(and preferred) is the use of negatives/eccentrics. If you cannot press out of the bottom of this movement, lower yourself as slowly as possible until you can safely exit the movement. This will allow you to gain strength throughout your full range of motion. The second option is to place your head above an elevated surface that is the right height to allow you to go as deep as you can handle without going any deeper. This will allow both lowering and pressing back up. Because these will be partial range of motion movements, you must increase the height of the surface to deepen your range of motion as you are able, until the full movement is obtained.

FREESTANDING HEADSTAND PUSHUP – LEVEL 6



Scapular Positioning: Begin with your scapulas elevated. As your head comes toward the ground, they will naturally begin to depress and come forward as your elbows move in that direction. Allow this to happen all the way through to the bottom. Your scapulas will then be in a neutral, depressed position. Once your head touches the ground and you start pushing back up. Seek to end with your scapulas elevated.

Technique: Begin in a handstand position, with your body completely straight. Initiate the movement illustrated above by allowing your shoulder angle to close while bending at the elbow. Slowly lower to the ground in a uniform movement. Make sure to keep your body straight as your head descends toward the ground. Do not arch. Once your head lightly touches the ground, push back up to the starting position. Focus on pushing through your triceps and shoulders, eventually covering your shoulders like earmuffs. End with your body completely straight.

The next phase of the progression is the *freestanding headstand pushup* (which can be abbreviated *Free HeSPU*). You will have issues if you have been working handstand pushups without the accompanying handstand holds, since you must be strong with both of these to work Free HeSPU's. Having a sense for both the still-hold and moving aspects of the handstand is critical in order to progress with freestanding handstand pushups. If this is a problem, take a step back and practice handstands; they are classified as skill work and can be practiced every day if necessary. You should be able to bring up your sense of balance very quickly if you have emphasized correct body positions all along. Technical considerations of this skill are the same as the previous variations. Correct body alignment continues to be vital.

The difficulty of this skill lies in balancing the dynamic movement. If your shoulder muscles and triceps are not strong enough to handle the small corrections that must be made during the movement, you will tip over. Even if the movement is failed, it can still be completed (though poorly) by losing core tension and arching your back in the movement. Arching your back in the movement compensates for a lack of shoulder and triceps strength in an attempt to add chest and trapezius strength to the movement. You want to avoid this. Maintaining strict body positioning pays dividends in the long run.

Along the same vein, if you flare your elbows you do not have good forward and backward control. If you find yourself guilty of flared elbows often, make a stronger effort to keep your elbows in during all movements. You may need to drop a progression or two until you can perform the movement without flaring your elbows.

You also do not want to put weight on your head when you touch the ground. It does stabilize the headstand position before pushing out, but it ignores the need for proper control near the bottom of the

movement. If you cut corners now, it will cost you later. The proper form is to allow your head to simply brush the ground as you maintain correct arm, elbow, and body positions.

It may take time to achieve the strength and balance necessary for this movement. If you need assistance, practice against a wall and remove your feet at different points during the movement with the eventual aim to remove them altogether.

FREESTANDING HANDSTAND PUSHUP – LEVEL 7



Scapular Positioning: Begin with your scapulas elevated. As your head comes toward the ground, they will naturally begin to depress and come forward as your elbows move in that direction. Allow this to happen all the way through to the bottom. Your scapulas will then be in a neutral, depressed position. Once your head touches the ground and you start pushing back up, seek to end with your scapulas elevated.

Technique: Begin in a handstand position on raised implements like parallettes, with your body completely straight. Initiate the movement illustrated above by allowing your shoulder angle to close while bending at the elbow. Slowly lower to the ground in a uniform movement. Make sure to keep your body as straight as possible as your head descends toward the ground. Do not arch. Once your head lightly touches the ground, push back up to the starting position. Focus on pushing through your triceps and shoulders, eventually covering your shoulders like earmuffs. End with your body completely straight.

The *freestanding handstand pushup* (which can be abbreviated *Free HSPU*) is a beast of a skill that requires serious dedication. Like wall handstand pushups, this movement should be performed on implements that raise your hands. Parallettes are strongly recommended. They are stable and consistent, assuming that their surface is not slippery. Additionally, the force you can exert through your hands via a tight grip assists with balance during performance of this movement.

Your biggest enemies, as with previous progressions, will be arching your back and flaring your elbows. If the sheer intensity of pressing out of the bottom is too much for you, you can use same approach that was suggested for headstand pushups—slow eccentrics or varying the height of your hands for progressive partial repetitions.

This position and movement should now be extremely familiar; all that is left is to drill it correctly. If you are still having problems with your body positioning, go back to a progression where you can maintain proper positioning throughout the entire movement.

It is absolutely imperative that you learn the body positions correctly. You will not be able to perform any of the more advanced movements correctly without proper body positioning. It is that important.

Rings Handstand Pushups – Page 1, Column 4

RINGS WIDE HANDSTAND PUSHUP – LEVEL 7



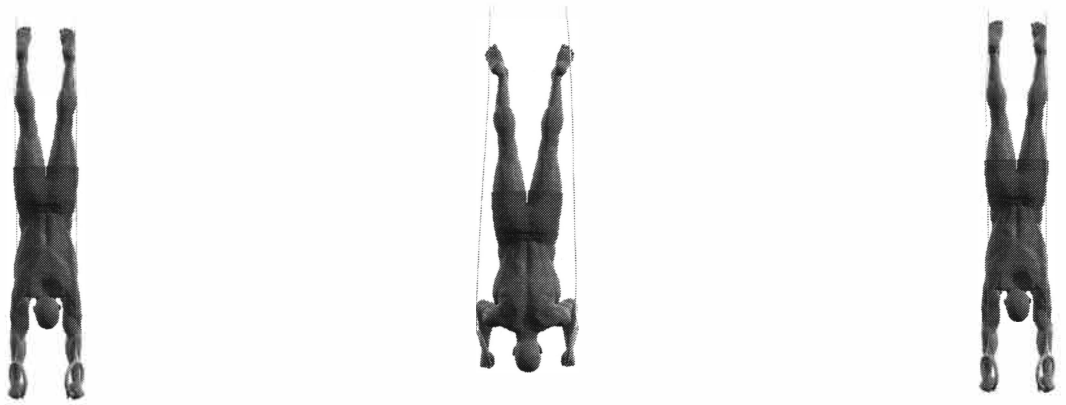
Scapular Positioning: Your scapulas should be fully elevated and very slightly retracted to lock in this position. As you bend your elbows out wide, with your feet on the straps, your scapulas will naturally depress and protract slightly. Allow this to happen to the bottom of the movement. Then, reverse the whole process when pushing up from the bottom.

Technique: Begin in a rings handstand position, with feet on the straps. Keep your feet on the straps for the entire movement. To start the movement, allow your hands to start to move out wider while simultaneously allowing your elbows to bend. This will bring the rings wider and distribute force through your traps, triceps, and shoulders. Once you hit the bottom of the movement, contract your shoulders and push through your hands, bringing them back underneath your shoulders and allowing your feet to slide along the cables. Finish in the rings handstand position with your feet on the straps. In this movement, the rings may rotate from the parallel position to a position where your forearms are on the straps. This is fine to start, but eventually you will want to keep the rings parallel the entire time.

With *rings wide handstand pushups* (which can be abbreviated *R Wide HSPU*) your aim should be to maintain proper straight-body positioning. The primary difference between this and rings handstand development is that you will aim to keep your feet inside the cables and stabilize the movement with just your wrists.

In this instance, allow the elbows to flare out in order to generate additional mechanical advantage while maintaining proper form, especially at the top of the position. Here, you will want to pause in the arms-straight, rings-turned-out, [proper] handstand position. From then on, it is all shoulder and triceps strength, so make sure you have obtained this strength from the previous progressions before attempting this or any other advanced exercise that carries a greater risk of injury.

RINGS STRAP HANDSTAND PUSHUP (WITH ELBOWS IN) – LEVEL 8



Scapular Positioning: Your scapulas should be fully elevated and very slightly retracted to lock in the position. As you bend your elbows out wide, with your feet on the straps, your scapulas will naturally depress and protract slightly. Allow this to happen to the bottom of the movement. Then, reverse the whole process when pushing up from the bottom.

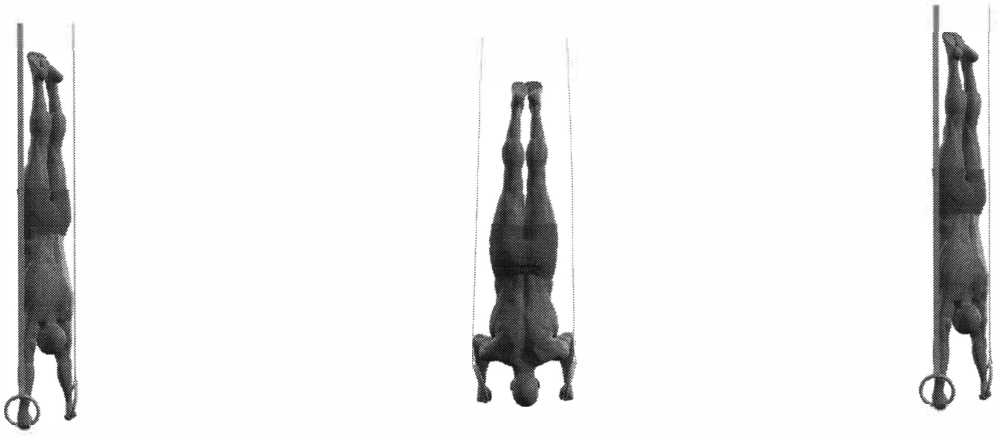
Technique: Begin in a rings handstand position, with feet on the straps. Keep your feet on the straps for the entire movement. To start the movement, allow your hands to start to move out wider while simultaneously allowing your elbows to bend. This will bring the rings wider and distribute force through your traps, triceps, and shoulders. Once you hit the bottom of the movement, contract your shoulders and push through your hands, bringing them back underneath your shoulders and allowing your feet to slide along the cables. Finish in the rings handstand position with your feet on the straps. The rings may rotate from the parallel position to a position where your forearms are on the straps. This is fine to start, but eventually you will want to keep the rings parallel the entire time.

Rings strap handstand pushups (with elbows in) are where your grit is truly tested. This movement can be abbreviated *R Strap HSPU*. To make this more difficult, remove your feet from the cables while in the shoulder stand position at the bottom of the movement. This will require your shoulder stand to be slightly underbalanced, which presents problems with maintaining proper body positioning, especially near the bottom of the movement. Do your best and use the straps as little as necessary to avoid compromising body position. As you ascend, your feet will naturally move back in line with the straps or cables.

This movement is very much like the freestanding handstand pushup on parallettes (or another raised implement). You have to maintain tension at the bottom of the movement, and you should make it your goal to fire out of the bottom position right away.

Some of the finer technique points are to keep the elbows in and your core tight. Allowing your body to arch to any degree will push your center of gravity toward your back, which may cause you to tip over. If you have a tendency to do this, focus on squeezing your abdominals and glutes during the movement. Keeping your core tight is important for all aspects of handstand pushups.

RINGS FREESTANDING HANDSTAND PUSHUP – LEVEL 9



Scapular Positioning: Your scapulas should be fully elevated and very slightly retracted to lock in the position. As you move into the bottom position of the movement keep your elbows in, which will cause your scapulas to depress. Allow this to happen to the bottom of the movement. Then, reverse the whole process when pushing up from the bottom.

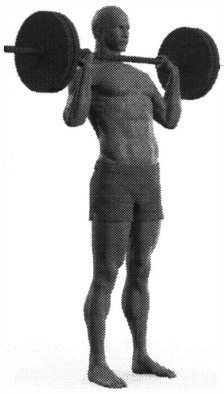
Technique: Begin in a rings handstand position, with feet on the straps. Remove your feet from the straps, balancing in the handstand position. To start the movement, allow your hands to move in front of you, toward the front of your shoulders. Once you hit the bottom position—with your hands level at your shoulders—contract your shoulders and push through your hands to move them up and over your head, back into alignment with your body. Finish in the rings handstand position. In this movement, the rings may rotate from the parallel position to a position where your forearms are on the straps. This is fine to start, but eventually you will want to keep the rings parallel the entire time.

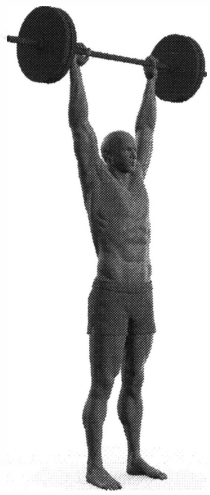
The *rings freestanding handstand pushup* (which can be abbreviated *R Free HSPU*) is a milestone of strength for most people, and this is the first rated B skill on the chart. Performing this movement builds on all of the time, sweat, and energy you have put into the previous handstand progressions. Always focus on correct body positioning. Hit the handstand, lower with control, then push explosively out of the bottom and maintain proper body positioning all the way up.

The biggest issue that you will run into is locking out your elbows at the top of the skill. This the most difficult moment during rings freestanding handstand pushups. Obviously, locking out the rings is very difficult, so hopefully you have focused on this aspect of the skill in previous progressions. If you have not done this and you have developed the strength for the rings handstand pushup, you may find that your elbows are bent at the top of the movement. If this is the case, your primary focus must be on locking your arms at the top of the movement. It may actually build more strength in your shoulders than the handstand pushup itself—!

As with most of the handstand variations, you may also have difficulty maintaining a straight or slightly hollowed body during the movement. You may also have to work on the rings parallel (or turned out) position, as the tendency is often to allow them to turn in.

Press / Overhead Press / Military Press – Page 1, Column 5





The *press* appears right after the handstand pushups progressions because it strongly relates to these types of skills. A true freestanding handstand pushup will typically be about 85-95% of a bodyweight press. This is because the weight of your arms is not factored into the weight of a handstand pushup.

Both skills require good core strength and control, but they are a bit different. Obviously, pushing your bodyweight in an inverted position is not exactly like pushing your bodyweight overhead. You will get better at whatever you practice the most. There is some crossover between skills because they both involve pressing weight over your head. But there are no hard-set numbers that correlate from one to the other. This placement on the charts and strength "connection" is just to give you an idea of what you may expect in regard to pressing strength if you were to train both simultaneously. Individual anthropometry will also play a role. Those with longer bodies may have a harder time controlling a freestanding handstand pushup.

The most important factor in how skilled you can become at an exercise is how much you practice it. In this respect, you will be better at what you do more often. But if you need some supplementary work for one skill or the other, these two progressions relate fairly well to each other.

Bent-Arm Press to Handstands – Page 1, Column 6

BENT-ARM, BENT-BODY PRESS TO HANDSTAND – LEVEL 5



Scapular Positioning: Initially, your hands will be placed on the ground and your scapulas will be elevated as much as possible, although they will be closer to neutral at the start. Elevate them as you progress through the movement until they are maximally elevated at the end of the handstand position.

Technique: Place your hands on the ground with your arms slightly bent and your legs straight. Slowly shift your weight from your toes to your hands. Once all of the weight is on your hands, lift your feet off the ground. Do not allow your shoulders to drop down further, as this will make the press to handstand more difficult. Bring your hips directly over your shoulders. Straighten out your hips while at the same time pressing through your hands in order to straighten your elbows and shoulder angle. Finish in the freestanding handstand position.

A proficient handstand is a prerequisite to learning the *bent-arm, bent-body press to handstand* (which can be abbreviated *BA BB Press*). If you cannot hold a handstand, you will not make it to the ending position of this skill without falling over. That being said, this position is best learned from either a bent-arm straddle or a bent-arm pike position. Tucking is not preferred; though it makes the beginning of the movement slightly easier, once your legs start to extend it is much more unstable than straight legs throughout. In the context of progression and consistency, ignoring straight leg positioning now will mean needing to learn it later when the intensity is inherently higher and risk of injury greater. If you have to switch to a lower progression, bite the bullet now and put in the work required.

Wrist control is crucial in any hand-balancing feat, and this movement is no exception. Begin by firmly planting your hands on the floor with your fingers extended, ready to give feedback and control. Initially, balancing this skill will be difficult, and it is likely that forward rolling out of the skill will occur. Your aim should be to completely avoid this, but be prepared for it to happen if you lose your forward balance.

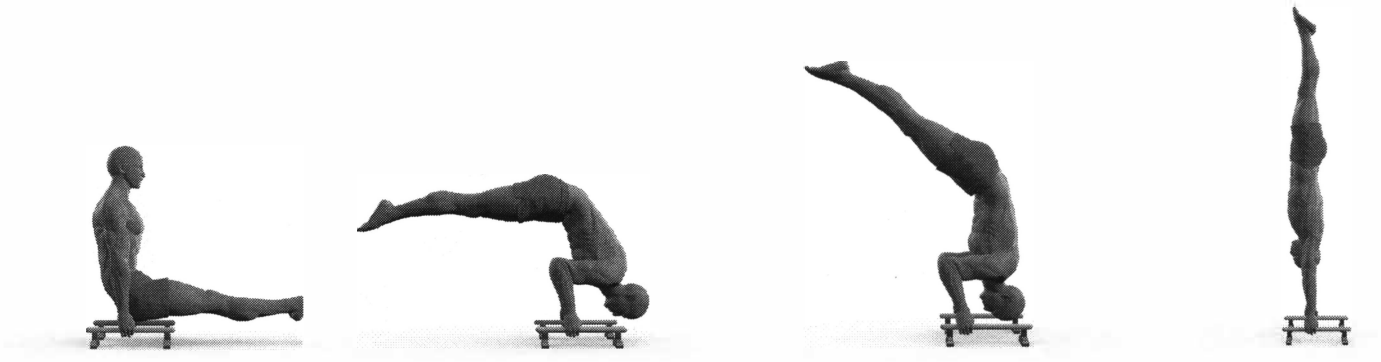
You can begin in either the pike or straddle position. Bend your arms slightly. (Do not bend your arms more than ninety degrees, as this places too much force on your triceps and you may not be strong enough

to push out of the position while your elbows are bent. This applies for this progression and every one from this point forward.) As your arms bend, tension is created from your hands to your shoulders, which provides a stable base for your hips to rise overhead. Once your hips are aligned over your head, begin to straighten the handstand by bringing your legs up. Difficulty level will vary depending on which position you use. Each position has its own difficulties to overcome, so it is difficult to say which is the most difficult.

- *Straddle Position* is usually more difficult at first because of the flexibility requirements and lack of awareness in this position. If you desire to work on these issues, use this position.
- *Pike Position* is cleaner looking and more comfortable, but has its own share of difficulties. Once your legs begin making their way up, they make a longer lever than the straddle. This shifts your center of gravity closer to your feet and further away from your wrists. To compensate, your shoulders have to lean forward more, thus decreasing your shoulder musculature's leverage and effectively increasing the intensity of forces on your shoulders.

Whichever position is chosen, it is just a matter of practice once you have adequate strength to perform this skill. With a solid handstand, this should not take longer than a month or two. Given the basic nature of this skill and its applicability into most other progressions, you might want to practice both variations.

L-SIT BENT-ARM, BENT-BODY PRESS TO HANDSTAND – LEVEL 6



Scapular Positioning: In the L-sit position, your scapulas will be maximally depressed. As you begin to move your head forward and down, your legs back, and your hips up, you will elevate your scapulas as you progress through the movement until they are maximally elevated at the end of the handstand position.

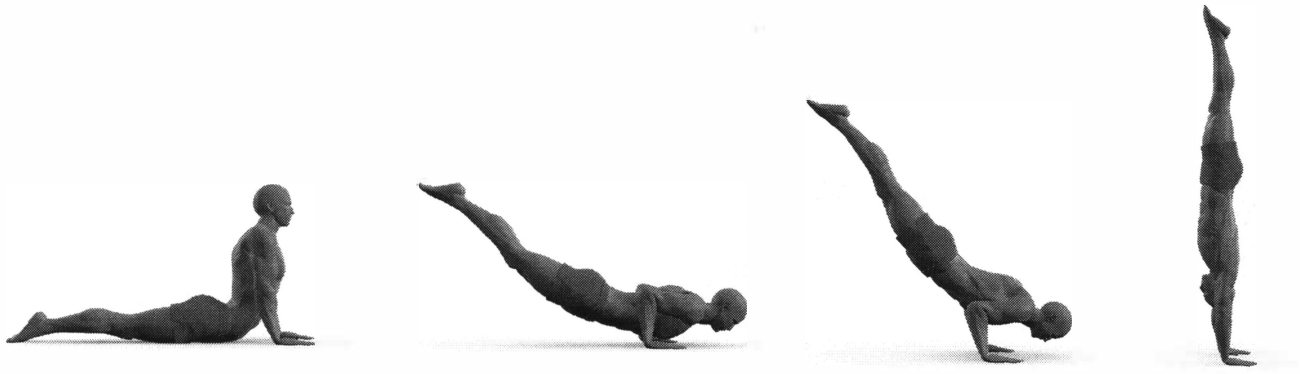
Technique: Place your hands on the ground or parallettes and push through them while performing the L-sit position. Then, begin to lean forward and allow your legs to drop and move backward. Your hips will begin to rise up behind you as you push through your hands. Do not allow your shoulders to drop down further, as this will make the press to handstand more difficult. Bring your hips directly over your shoulders. Straighten out your hips while at the same time pressing through your hands in order to straighten your elbows and shoulder angle. Finish in the freestanding handstand position.

The *L-sit bent-arm, bent-body press to handstand* (which can be abbreviated *L-sit BA BB Press*) progression takes the *bent-body press* a step further. Instead of beginning with your body behind your arms, begin with your body in front of your arms and use your upper-body strength to press the skill through your arms, ending in a handstand position.

If you are on the floor, there are two main ways to get your legs through your arms. The tuck position is recommended, though some people like crossing their legs as they bring them through the arms. If you are strong and have long arms, the pike position could work as well. Moving your legs through your arms requires active shoulders and pushing your hands as far out as possible to help build strength for handstand positions. Once your legs get through, the skill is similar to the previous progression. Remember to focus on pushing your hips above your head without bending your arms more than ninety degrees.

It is easier if you use parallettes as you raise your body off the ground. This is not recommended; however, if you are just beginning to learn this skill and do not have the ability to get your legs through, this is an okay method to use. Pretend that there is an imaginary plane at the parallettes' height and try not to break that plane as you perform the skill. Take the skill to the floor as you progress.

CHEST ROLL, STRAIGHT-BODY PRESS TO HANDSTAND – LEVEL 7



Scapular Positioning: Begin with your scapulas protracted and depressed. Elevate them through the movement. Keeping them protracted through the movement is acceptable, but they will eventually end up in elevation with slight retraction as you move into the handstand.

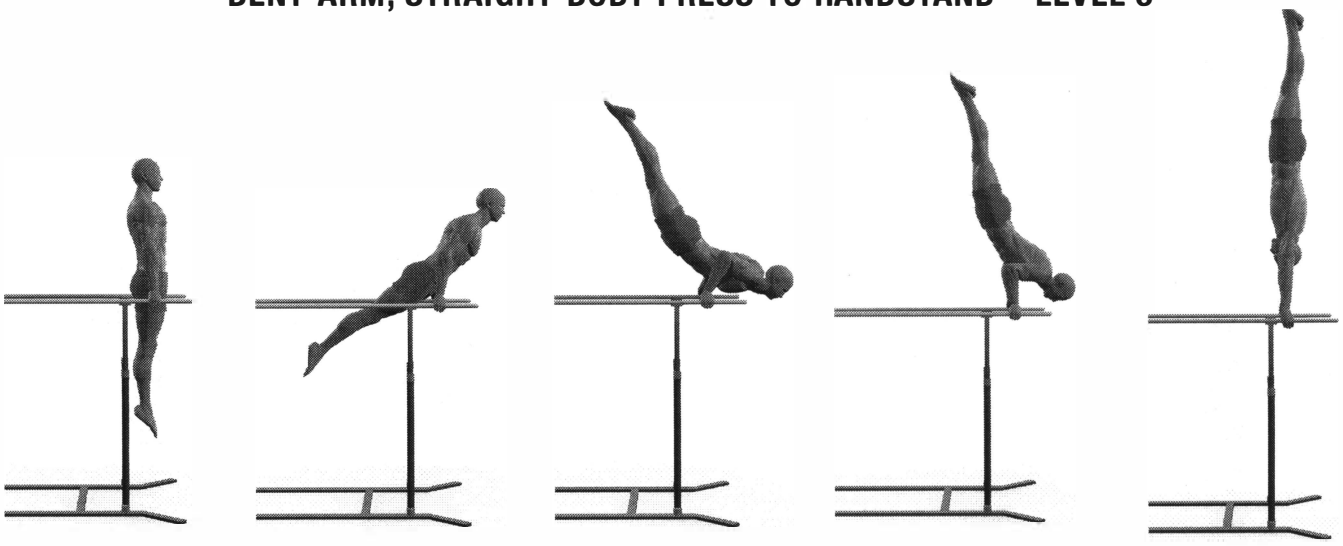
Technique: Begin in a seal position, with your hands on the ground and body arched. Bend your arms and allow the front of your body to gain a bit of momentum as you roll on the ground. Arch your back and allow your feet to rise up behind you. As more weight is shifted onto your hands, your hips will start to rise up behind you. As your head reaches the ground, push strongly through your hands. Do not allow your shoulders to drop down further, as this will make the press to handstand more difficult. Bring your hips directly over your shoulders. Straighten out your hips while at the same time pressing through your hands in order to straighten your elbows and shoulder angle. Finish in the freestanding handstand position.

As you begin to work the *chest roll, straight-body press to handstand* skill (which can be abbreviated *CR SB Press*), you may notice that it is not uncommon for your body to arch significantly. As you get stronger, eliminate this arch and complete the skill with a straight-body position that relies on shoulder and arm strength. Doing this will help prepare you for the next progression.

This skill requires a solid amount of back flexibility, so it can be difficult for those who are less flexible. Even though this skill may not be your cup of tea, developing the bridge is an important part of training. However, it is possible to avoid this skill altogether and build up strength through other movements until you can progress to the next press progression.

Alternatively, you can think about this movement in two parts. First, you want to be able to press into a headstand position. Second, you want to be able to press from said headstand position into a handstand. When you think about it in this manner, this exercise becomes much less daunting. You can work on both components individually and eventually pair them if you are having trouble doing both in one continuous movement.

BENT-ARM, STRAIGHT-BODY PRESS TO HANDSTAND – LEVEL 8



Scapular Positioning: Begin with your scapulas depressed. They will start to protract through the movement and become elevated as you move toward the handstand. You will end with your scapulas elevated and slightly retracted.

Technique: Begin in a support position on parallel bars or parallettes. Bend your arms and lean forward, controlling the descent of your shoulders as your feet rise behind you. As your head reaches the height of your hands, push strongly through your hands. Do not allow your shoulders to drop down further, as this will make the press to handstand more difficult. Bring your hips directly over your shoulders. Straighten out your hips while at the same time pressing through your hands in order to straighten your elbows and shoulder angle. Finish in the freestanding handstand position.

A *bent-arm straight-body press to handstand* (which can be abbreviated *BA SB Press*) is also referred to as a *hollowback press handstand*. The difficulty level of this movement can vary significantly depending on how much momentum is used. If your overarching goal is increasing your level of strength, you should strive to reduce the amount of momentum necessary to hit the final handstand.

This skill is most easily performed on parallettes or an actual set of parallel bars. It can be performed on the floor, but it is significantly harder because the floor blocks any movement of the legs that would be lower than the ground. If you do not have access to parallel bars, use parallettes and begin from the kneeling position. As you lean forward, straighten your legs as soon as possible to execute this skill as close to the parallel bars as you can. Alternatively, you start in an L-sit position: Allow your legs to drop so that your body is straight. As your legs pass through the bottom of the movement, lean forward and bend your arms simultaneously.

The key to this skill is not to bend over or lean too fast; you want to make a controlled pendulum with your body. You will move through three landmarks near the following positions: elbow lever, shoulder stand, and freestanding handstand pushup from the bottom of the shoulder stand position.

While the movements are similar, this skill requires more strength than a freestanding handstand pushup. This is why it is one level higher in difficulty, making it the logical next step after you have mastered freestanding handstand pushups.

Note that the illustrations show this skill performed with an arch. This is fine when you are learning; however, as you improve, perform it with a hollow position. This will increase strength in your shoulder girdle more effectively.

HANDSTAND TO ELBOW LEVER TO HANDSTAND – LEVEL 9



Scapular Positioning: Your scapulas will be elevated at the top of the handstand position. As you begin to lower, they will protract and depress. This will continue to the elbow lever position. From there, your scapulas will move in the opposite direction as you press back to the handstand position.

Technique: Begin in a handstand position. Bend your elbows and shoulders, allowing your chest and head to come forward and your feet to drop backward. Lower in a slow and controlled manner to the elbow lever position. From this position, lean forward slightly to allow your feet to rise. Then, push through your hands with your shoulders and elbows to move back to the handstand position.

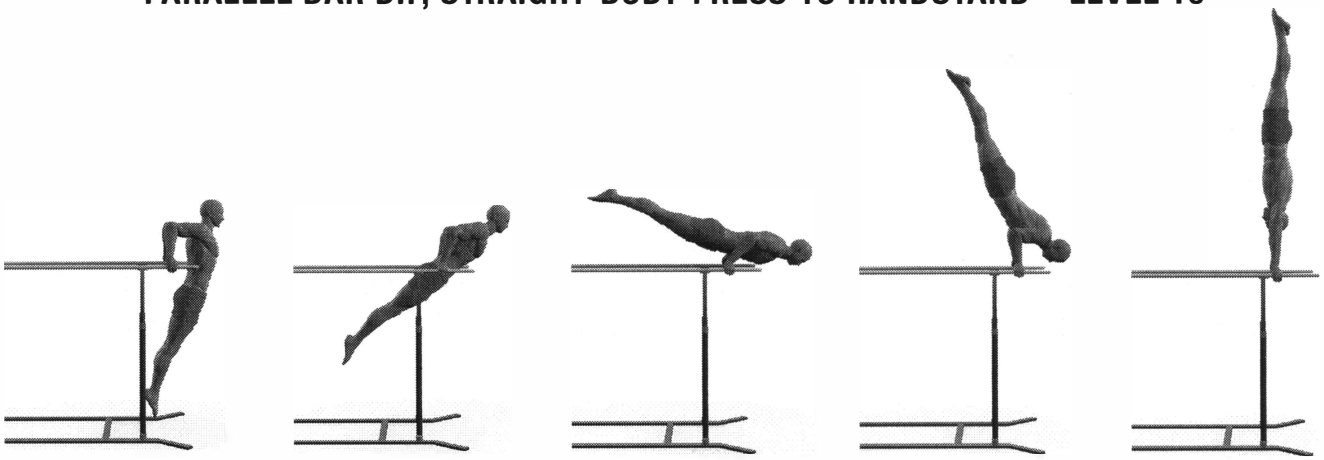
Handstand to elbow lever to handstand (which can be abbreviated *HS, EL, HS*) is a strength move that is known as a *90-degree pushup*, and it is all about impressive pressing strength in multiple planes. Perform this skill with a straight body; a good handstand is a prerequisite. You should also be proficient in freestanding handstand pushups and the bent-arm, straight-body press.

Think of your hands as the fulcrum on which your body balances. Allow your elbows to come tight to your sides in order to help balance the body. The angle of your elbows must then be opened and closed to balance the skill. If you attempt to balance the skill with just your shoulder or hands it will not work. The angle of your elbows will help control the skill and keep it in a static position. Your elbow can then be opened or closed to help initiate the ascent or descent of the skill, respectively.

The lack of momentum in this movement is what makes it so difficult. With previous skills, you could get some momentum rolling from the support or L-sit position in the initial lean. However, in this skill, you must control your body as you come down from a handstand so that you stop statically in an elbow lever position. Then, starting in this static elbow lever position, you must create your own movement from strength and control it all the way back up to a handstand.

Do not try to make this skill easy by bending your legs and arching your back. Keep your body straight. Develop a sense of balance for getting in and out of the elbow lever position. If you are having difficulty, review the section on elbow lever statics for advice on how to balance this intermediate position.

PARALLEL BAR DIP, STRAIGHT-BODY PRESS TO HANDSTAND – LEVEL 10



Scapular Positioning: Begin in a relaxed position at the bottom of a dip with your scapulas elevated and retracted. Activate your shoulders and depress and protract your scapulas. As you move through the various positions, your scapulas will stay protracted and begin to elevate. Continue the elevation until you reach the handstand position; they will naturally move out of protraction.

Technique: Begin in a support position and lower into a dip. (Alternatively, you can start in a dip.) At the bottom of the dip, activate your shoulders and lean forward. As you do this, push through your hands. Your body will begin to rotate, causing your feet to rise. Keep your body straight and continue to lean forward so your hips and feet will rise further to a shoulder stand position. From there, press out into a handstand.

The *parallel bar dip, straight-body press to handstand* (which can be abbreviated *PB Dip SB to HS*) is a feat of strength that tests the body through the full range of pushing movements. This move requires a set of parallel bars. From the bottom of the dip position, keep your body straight (do not arch your back!) and lean forward to press into a handstand.

This movement can be performed with parallettes if you start from the third frame in this sequence. You will not get the full range of motion to build strength, but starting from a static position in the third frame is sufficiently difficult to challenge your strength.

Initiate the movement by leaning your body forward while straightening your arms so that your shoulders "slide" along the rails. This will help place your hands closer to your hips, necessary to get the rest of your body leaning forward to push out of the deep dip position into the ascent.

As your body approaches being parallel to the bars, you will be in a deep semi-elbow lever position. Do not stop in this position, as it is much more difficult than a regular elbow lever. You want to keep leaning forward and open your elbow angle so that your feet keep rising until you come close to hitting a shoulder stand on the parallel bars. From there, all that is left is the bottom portion of the freestanding handstand pushup movement.

The first phase—the dip to approximately a shoulder stand—is the hardest. At this level, handstand push-ups are typically comfortable for trainees and they are less of a problem. However, it should be noted that this will be slightly more difficult because you are taxing yourself in the first phase, before the handstand pushup. From there, the next step is to develop the necessary strength and learn how to manipulate your elbow angle to allow you to change the angle of your body so that it is set up for a press.

Rings Bent-Arm Press to Handstands – Page 1, Column 7

In order to keep the progression charts as simple as possible, *rings bent-arm press* movements have not been given their own category, instead they come after *chair handstands*.

The upper level chair handstand—the illusion—requires a lot of the stability and strength needed when learning rings bent-arm press handstand movements. It makes a good segue into rings handstands.

While other work on rings, such as rings handstand pushups, may ultimately be more useful, it is best to learn some movements concurrently. It is beneficial to learn rings handstands, rings handstand pushups, and straight-arm/bent-arm press handstands on PB/FX before rings bent-arm press movements.

CHAIR HANDSTAND – LEVEL 6



Scapular Positioning: As you begin this movement, the scapula on your *down arm* will be protracted and elevated, while the scapula on your *up arm* will be in a neutral position. Through the movement, the scapula on your down arm will become elevated to a final handstand positioning, while the scapula on your up arm will remain in place.

Technique: First, squat on a chair. Find the correct hand placements—your *down arm* should be on the front corner of the seat of the chair and your other arm (the *up arm)* should be on the backrest of the chair. To initiate the movement, raise your butt in the air and begin leaning forward. The chair handstand is a two-step process. The first part involves moving your hips directly overhead of your shoulders. The second part involves slowly extending your legs overhead while keeping your shoulders, core, and hips stable. This will prevent you from falling forward or backward.

Your *down arm* should be kept straight when the press begins. (This is why it is useful to already have a straight-arm press.) If your arm bends more than about twenty to thirty degrees, your body will rotate and you will fail the press. Your *up arm* can support some weight, but since it is bent you will not have much leverage or strength to support any significant weight on that arm. Continue to lean forward and put weight on your down arm: think about pushing upward in a straight line to your head. This will help counteract force as you lean forward and lift your hips up.

Your legs can be in either a tuck or straddle position when you attempt this press. Many people prefer the tuck position, but straddle can be easier if you have been practicing straddle presses. Be aware that your feet will hit the backrest of the chair if you use straddle.

Now that you have gotten your hips above your head, slowly extend your legs overhead. If you do this too quickly, you are likely to arch your back and lose your balance. If you do not yet know how to pirouette out of a handstand, you are strongly advised to learn this against a wall first. You absolutely do not want to fall straight over and land on your back on the ground!

After you have reached the handstand position, keep your body tight. Roughly 75% of your weight will shift to the arm that is planted against the ground, so any core or leg movement can easily de-stabilize your press. Apply force to keep yourself planted, and place your up arm on the backrest for control when coming down. Your body may twist when you are first learning this, but the twist will go away once you get the hang of the skill.

Before attempting a chair handstand, you should have the ability to hold a thirty-second handstand and perform a bent-arm press handstand or a near-straight-arm straddle press handstand. Executing this skill requires being able to press to a handstand and hold a handstand. Performing handstand pushups may help, but they are not a prerequisite.

The chair handstand is actually not a very difficult skill, even though it looks impressive. Keep in mind the differences between chair handstands and regular handstands: in order to correctly execute a chair handstand, the placement of your down arm must be biased toward the front of the chair, while your up arm is placed higher on the back of the chair, creating a staggered hand position for the execution of the handstand. The horizontal distance between your hands should be roughly shoulder width, while the vertical distance between your hands can vary (though the length of the space from elbow to shoulder is typically good). Your down arm will bear most of the weight of the handstand (typically 70-80%), while your up arm will stabilize it. Optimally, your up arm will be bent at 90-degree angle at both your shoulder and your elbow, which will help bias the weight toward your down arm.

Be sure that the elbow of your planted arm does not flare out; keep it lined up with your body as you press up and while you are in the handstand position itself. If your body keeps twisting, the cause may be a flared elbow.

There is a high potential that you may fall out of the chair press when you are learning this movement, so learning these against a wall is advised. When you take the movement away from the wall, make sure there is a soft surface in front of you in the event that you fall forward. Make sure you practice pirouetting out of a handstand.

Coming down out of the chair press is exactly like going up. First, bring your legs down slowly until you are in a straddle or tuck position with your hips up. Next, use your arms to slowly bend and support your weight. You can then bring your hips down from overhead. Ideally, you will be able to execute this without wobbling, slamming your feet onto the chair or falling over. Keep practicing!

After you have achieved a chair handstand, work toward holding it for longer time periods in order to improve your stability, just as you would a regular handstand. You will eventually be able to perform it from a starting position of being seated sideways on a chair, much like the L-sit press handstand variation. The toughest part of this skill is getting your lower body overhead from the position of being seated on the chair.

Do not forget to practice both sides. You will often see inequality in straight-arm and bent-arm strength while working this movement. Work your weaker arm first.

ILLUSION CHAIR HANDSTAND – LEVEL 7



Scapular Positioning: Same as the chair handstand.

Technique: Same as the chair handstand, except there is more instability in your *up arm* because it is resting on the backrest of a different chair.

The illusion chair handstand uses two chairs. You will not place your hand on the first chair, as the back legs of the second chair will be where you would place your planted arm. Instead, place your down arm hand on the back of the chair, and your up arm on the back of the other chair. While this press is basically the same as the previous chair press movement, it is more difficult for two distinct reasons:

- Your up arm must stabilize the rest of the body by controlling any twisting and lateral motion, which means even less support can be put on that arm.
- Your down arm will have more weight placed on it, as you cannot place as much weight on the other arm for control.

Aside from the increased weight distribution, you have stabilized the chair with your up arm. Your elbow must not be allowed to flare out. If you are having issues keeping your elbow in, you may need to go back to working press movements on the floor or parallettes.

As you begin the press to a handstand, your down arm should remain straight. If your arm bends more than twenty degrees, your body will rotate and the movement will fail. While your up arm can support some weight, you do not have much leverage because it is bent. Keep your elbow from flaring out and isometrically squeeze the shoulder of your up arm in order to support some weight and prevent it from wobbling. Put most of your weight on your down arm, and think about to pushing through it so that your hand is in a direct straight line with your head. Take care not to lean too far forward as it is easy to lose balance. This will allow you to lift your hips up and over your head.

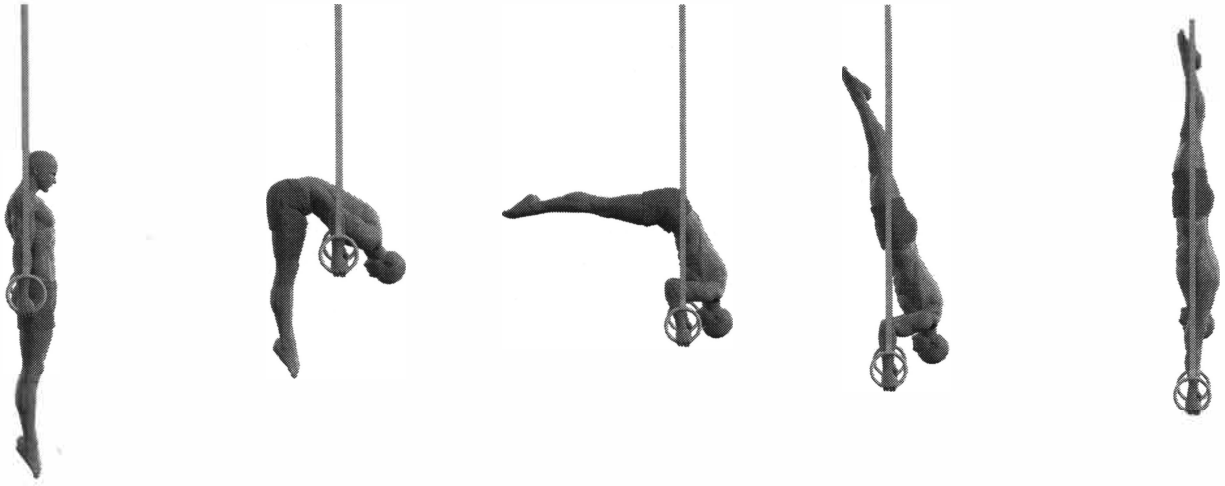
Your legs can be in either a tuck or straddle position when attempting this press; it is a matter of personal preference. Like with the chair handstand, most people prefer the tuck position, as your feet may hit the back of the chair if you use the straddle position.

Once your hips are above your head, slowly extend your legs overhead. If you do this too quickly, you are likely to arch your back and lose your balance. After you have reached the handstand position, keep your body tight. Roughly 75% of your weight will shift to the arm that is planted against the ground, so any core or leg movement is likely to de-stabilize your press. Apply force to keep yourself planted, and place your up arm on the backrest for control when coming down. Your body may twist when you are first learning this, but this will go away once you get the hang of it.

There is an intermediate position that can be utilized to practice this skill. Using three chairs, start with the top chair resting on two bottom chairs. After you perform the chair press handstand, take control of the chair and pull it up so that it is not resting on the third chair. If there is another person around, they can pull out the third chair as well. This is where the "illusion" comes in—because the third chair is useless.

As always, this skill can be practiced against the wall or next to a soft surface in case you fall over. Once it is obtained, there are some things you can do to increase the challenge, such as straightening your supporting arm. You can also go higher if you have access to stackable chairs.

RINGS BENT-ARM, BENT-BODY PRESS TO HANDSTAND – LEVEL 8



Scapular Positioning: Begin in the support position, with your scapulas depressed. As you move into this skill, your scapulas will begin to elevate and protract. As you move closer to the handstand position they will protract less and elevate more. As you reach the handstand position they will be fully elevated and slightly retracted.

Technique: This skill should be approached much like the *rings shoulder stand* and other bent-arm, bent-body presses. From a support or L-sit position, bend your arms and rotate your torso forward to get your hips above your head. From there, you can either straddle or pike to get your hips all the way over your head. Finally, push through your arms and simultaneously straighten your hips to move into a rings handstand position.

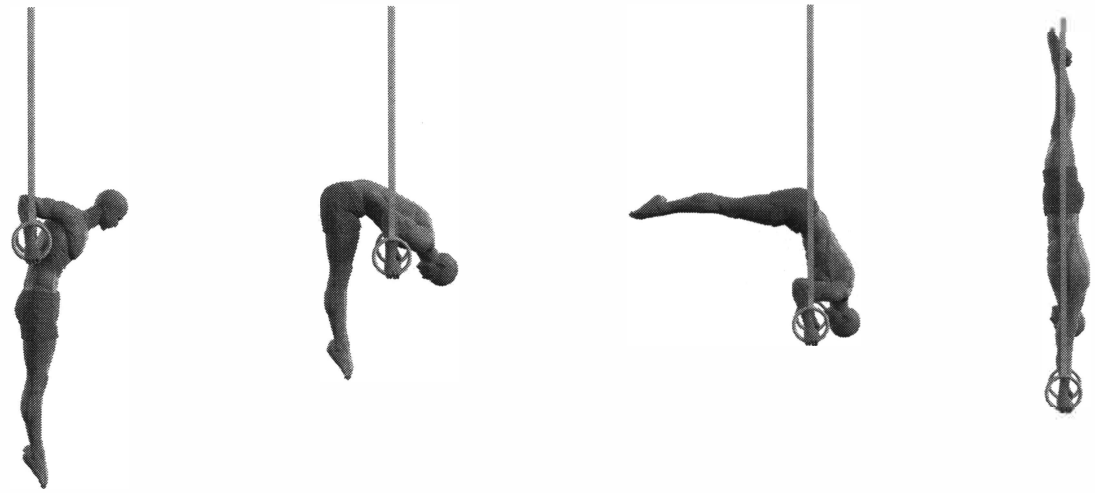
Achieving the support position variation of the *rings bent-arm, bent-body press to handstand* (which can be abbreviated *R BA BB Press*) will be significantly harder, as you have no momentum from a swing. Remember to keep your arms bent as much as is necessary to get your hips overhead. Aside from this, bend your arms as little as possible because it is very difficult to press out of the bottom of the movement with a closed elbow angle. As your hips rise in the back, put as much force as necessary into the rings to ensure that your elbow positioning does not drop below a 90-degree angle.

At first, you will likely have to use the straps for balance. Most beginners do not have the stability required to complete the full range of motion with no assistance. Your goal, however, should always be to use as little assistance as possible, and to wean yourself away from using assistance as you make progress with the movement. Fight to get as high as you can without using the straps. If you are unable to gain control, you can *then* use the straps for assistance.

Once you have reached the top of the handstand, the same points discussed in the rings strap handstand section apply:

- Straight-body positioning is a necessity. Focus on squeezing your glutes and core; arching your body will cause you to lose your balance and fall.
- Lock your elbows straight and shrug your shoulders.
- Wrap your legs around the cables as little as possible. Move them to the inside as you progress, and eventually off of the cables entirely.
- Turn the rings out, to the point where they are at least parallel.

RINGS DIP TO HANDSTAND – LEVEL 9



Scapular Positioning: Begin in a dip position, with your scapulas elevated. To begin the movement, depress your scapulas. As you move into this skill, your scapulas will begin to elevate and protract. As you move closer to the handstand position they will protract less and elevate more. As you reach the handstand position they will be fully elevated and slightly retracted.

Technique: This skill should be approached much like the *rings shoulder stand* and other bent-arm, bent-body presses. From the dip position, lean forward and rotate your torso to get your hips all the way over your head. Finally, push through your arms and simultaneously straighten your hips to move into a rings handstand position.

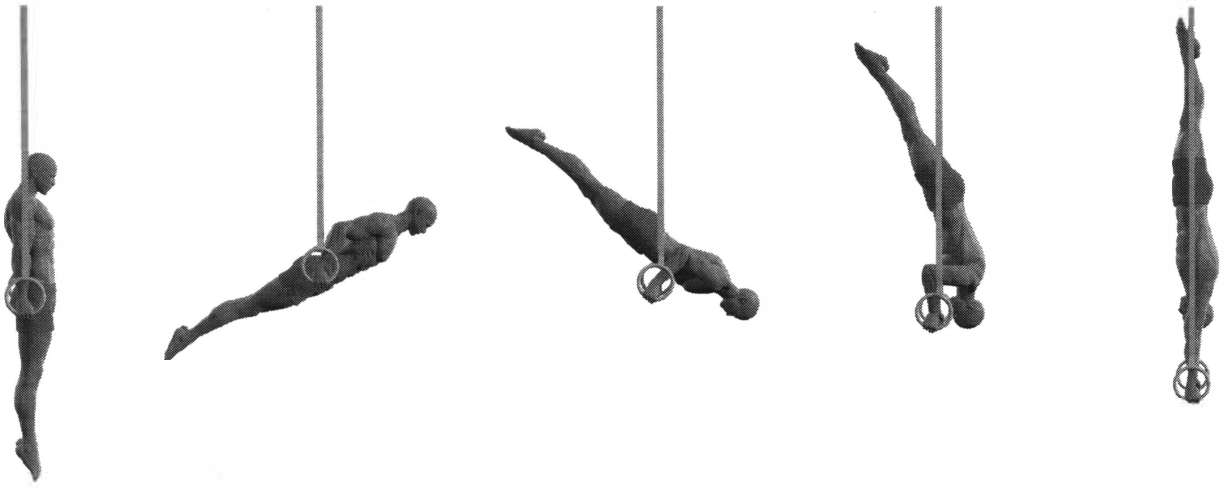
Like on the parallettes, the main difference with the *rings dip to handstand* (which can be abbreviated *R Dip to HS*) is that you are devoid of any momentum that can be generated from the L-sit or lean forward. All of the strength from the dip must be applied to help get your hips overhead.

It is cheating to make this movement much easier by using a tuck position or bending your legs during the dip phase. Your focus is to get stronger. Therefore, use the straddle or pike position and avoid the tuck position. It is acceptable to use the tuck position as an intermediate progression if needed, but once you have the necessary strength you should move on to either the straddle or pike position.

The key here is the lean forward from the bottom portion of the dip. This opens your elbows and allows your torso to rotate forward. As discussed, rotating your torso will help you get your hips overhead. Adding intensity to the dip is conducive to strength gains as well.

This is a good intermediate skill for muscle-up directly into press handstand, which looks very impressive. If you are interested in combining skills or working on routines, this is a good combination to use with the muscle-up or any other type of dip variation.

RINGS BENT-ARM, STRAIGHT-BODY PRESS TO HANDSTAND – LEVEL 10



Scapular Positioning: Begin in the support position, with your scapulas depressed. As you move into this skill, your scapulas will elevate and protract. As you move closer to the handstand position they will protract less and elevate more. As you reach the handstand position they will be fully elevated and slightly retracted.

Technique: From the support position, lean forward and bend your arms to exert pressure into your hands and cause your feet to rise. Keep your body straight as you do this. As your head passes below the rings, bring the rings in to hit the shoulder stand position. From there, push your hands overhead to reach the handstand position.

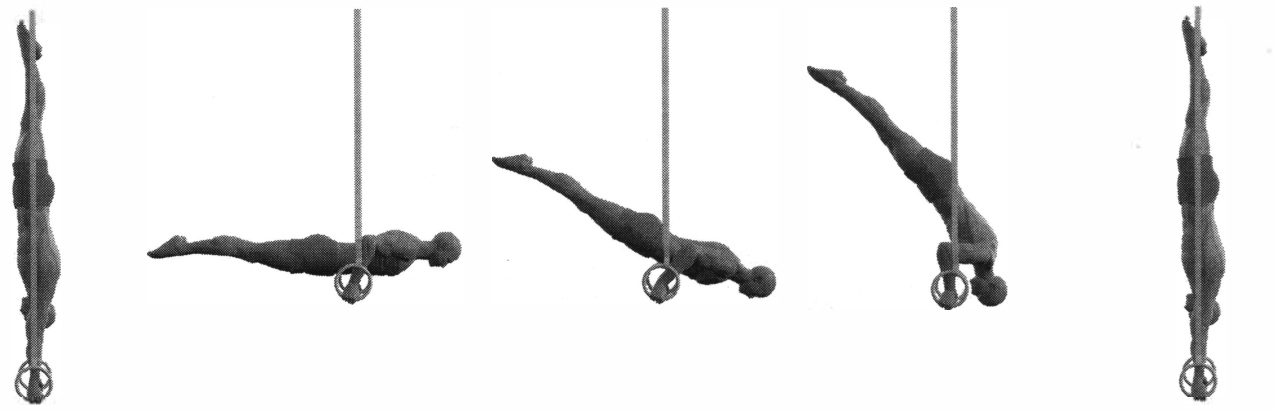
The key for the *rings bent-arm, straight-body press to handstand* (which can be abbreviated *R BA SB Press* and is also known as the *hollowback press*) is to turn your palms forward into the rings-turned-out position—much like the elbow lever, bent-arm press progression. This allows you to have more control over the skill. Try to keep the rings turned out as much as possible during the entire skill, even the handstand. This will be difficult.

If your elbow angle is not closed fast enough, you will rotate too far and forward roll or crash out of the skill. Remember to practice bailing if you are not yet comfortable with this. If you bend your arms too soon you will get stuck, and your body will not rotate. A fine line of strength and control is essential to achieve this skill. It will take a lot of practice to get it right.

If you look on the progressions charts you will find that this skill is one level above rings freestanding handstand pushups. Work that skill as well if you have not already done so. The charts were designed so that lateral skills of all levels are approximately on the same difficulty plane, making this somewhat of a continuation of the freestanding handstand pushups line.

This is a B-level skill in the Gymnastics Code of Points.

RINGS HANDSTAND TO ELBOW LEVER TO HANDSTAND – LEVEL 11



Scapular Positioning: Begin in a handstand position with your scapulas fully elevated and slightly retracted. As you move into the skill, your scapulas will begin to depress and protract as you move toward the elbow lever position. Once you hit this position, your scapulas will be fully depressed and protracted. As you make your way toward the handstand position, they will begin to elevate again. You will end with your scapulas fully elevated and slightly retracted.

Technique: From a handstand position, lean forward and bend your arms and shoulders. Maintain straight-body positioning. Slowly lower your elbows into your waist area, maintaining pressure through your hands. Once you hit the elbow lever position, lean forward to bring your feet and hips back up. Close the elbow angle to reach a shoulder stand position, then press out of the shoulder stand into a handstand position.

The *rings handstand to elbow lever to handstand* skill (which can be abbreviated *R HS, EL, HS*) is exactly the same as the one you would execute on the floor, parallettes, or parallel bar. The key to successfully achieving this skill is maintaining a straight-body position. Focus on controlling the handstand down by leaning forward and using your wrists to control the rings, and your shoulders and elbow angle to control your body angle.

The elbow lever portion on the rings is much harder than on the floor because it is difficult to pull the elbows in if the rings are regulation width, and the hands must be stabilized while the elbows pull in as well. Try to lock your elbows hard against your sides, but do not forget that the position is controlled with the opening and closing of the elbow angle and the wrists. Once this is working smoothly, the rest is simply ascending and descending a handstand pushup.

The rings must be turned out when coming down from the handstand to the elbow lever. This will probably happen automatically. If your head arches out, it may encourage the arching of the back during the movement. Try to avoid this. To develop the greatest level of strength, keep the nice hollow body position the entire time. Stabilizing and moving in and out of the elbow lever position to and from handstand makes this skill difficult. It requires much more control over the rotation of the skill than the previous progression.

RINGS DIP, STRAIGHT-BODY PRESS TO HANDSTAND – LEVEL 12



Scapular Positioning: Begin in a dip position, with your scapulas elevated. Depress them as you start the movement. As you lean forward into the movement, your scapulas will elevate and protract. As you move closer to the handstand position they will protract less and elevate more. As you reach the handstand position they will be fully elevated and slightly retracted.

Technique: From a dip position, lean forward and bend your arms to exert pressure into your hands and cause your feet to rise. Keep your body straight. As your head passes below the rings, bring the rings in to hit the shoulder stand position. From there, push your hands overhead to reach the handstand position.

The *rings dip, straight-body press to handstand* skill (which can be abbreviated *R Dip SB to HS*) is exactly the same as the previous variation (dip, straight-body press to handstand) except it is performed on the rings. The rings must be turned out in the ascent phase for control purposes.

As your body approaches being parallel with the bars, you will be in a deep semi-elbow lever position. This is a hybrid between a planche pushup and a maltese pushup. At this point, you want to continue leaning forward and opening your elbow angle so that your feet continue to rise, until you hit close to a shoulder stand on the rings. From there, move into the bottom portion of a freestanding handstand pushup. This is the most difficult part of the skill, so be sure to maintain good form.

Once you learn the basics of this skill, focus on developing strength and manipulating your elbow angle so that you can bring your body overhead. Once you achieve this you can add a weight vest to make the skill more difficult and gain even more strength.

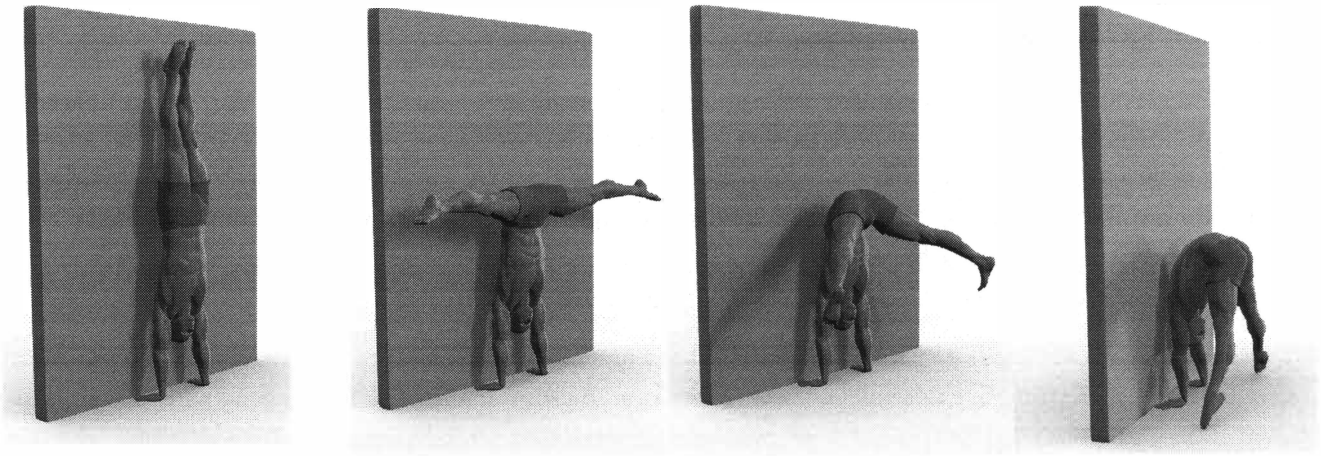
Straight-Arm Press to Handstands – Page 1, Column 8

The *straight-arm press to handstand* variations are extremely underutilized in non-gymnastics scenarios. Everyone wants to obtain cool skills like *handstand pushups* and static holds like the *planche*, but very few have the dedication to achieve the strength and flexibility for the straight-arm press to handstand skill-set progression.

It is unfortunate, since the strength and control you can gain from these skills will help significantly in the development of other skills like the planche.

If you have any aspirations for planche skills (and even most of the bent-arm pressing skills), it is strongly advised that you develop this set of progressions for pressing first. Learning to control your body from just your shoulders is very important, and you will see the benefits from learning this set of progressions not just in your pressing skills, but also in most of the pulling skills that require straight-arm stabilization, such as back levers, front levers, and even the iron cross.

WALL STRADDLE PRESS TO HANDSTAND ECCENTRICS – LEVEL 5



Scapular Positioning: Your scapulas will be elevated when you are in a handstand position. They will stay elevated for the entirety of this movement. All of the motion will come from your hips.

Technique: Begin in a handstand position with your back against the wall and hands a few inches further from the wall than usual. Next, straddle your legs as wide as possible. Slowly bend at your hips while keeping your back and butt against the wall. Bring your feet closer to the ground and keep your butt against the wall as long as possible. If you are not fully compressed, your butt and back will likely come off the wall before your feet reach the ground. This is fine when you are starting out, but you will need to correct it to progress in the skill.

This is the first progression in the series of progressions that will significantly improve your active flexibility and shoulder strength. *Wall straddle press to handstand eccentrics* (which can be abbreviated *Wall Str. Press Ecce.*) can be performed either on the floor or with parallettes placed against a wall. To make this skill easier, move your hands further away from the wall, at a more oblique angle. To make this skill more challenging (and thus gain greater strength), move your hands closer to the wall.

This skill is best thought of as a two-step process. (The actual press handstand will be a three-step process.) Here are the two steps for this movement:

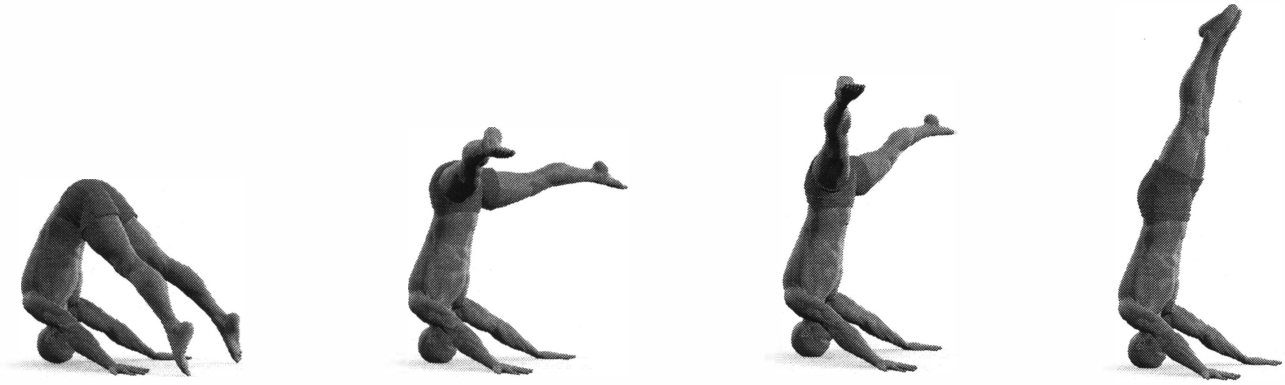
- Begin with your back against the wall in a handstand position. Maintain core tension and do not arch your body. From there, to initiate the movement, straddle your legs as far as possible.
- Slowly rotate your hips so that your feet begin dropping toward the ground and your groin moves toward your abdominal region. Continue slowly until your feet touch the ground. Keep your back straight against the wall the entire time; otherwise, you will likely fall out of the movement.

You need to practice these two transitions thoroughly before progressing to the next skill. While this skill may seem relatively easy, it requires a high level of concentration, strength and control. Most trainees will experience cramping and break into a heavy sweat after performing just a couple of repetitions. Though this is only a Level 5 skill, it is probably the most difficult Level 5 skill on the progression charts. It is also one of the most critical for developing straight-arm strength.

It requires a lot of core control and shoulder strength to keep your back against the wall during this movement. The difficulty of this skill lies in having enough active flexibility in your legs to perform the straddle and in the groin to close your hips, and being able to control the movement while simultaneously being able to drive your shoulders hard into the wall to keep your back in position. Here are two ways you can improve the quality of this skill once you have learned the basic movements:

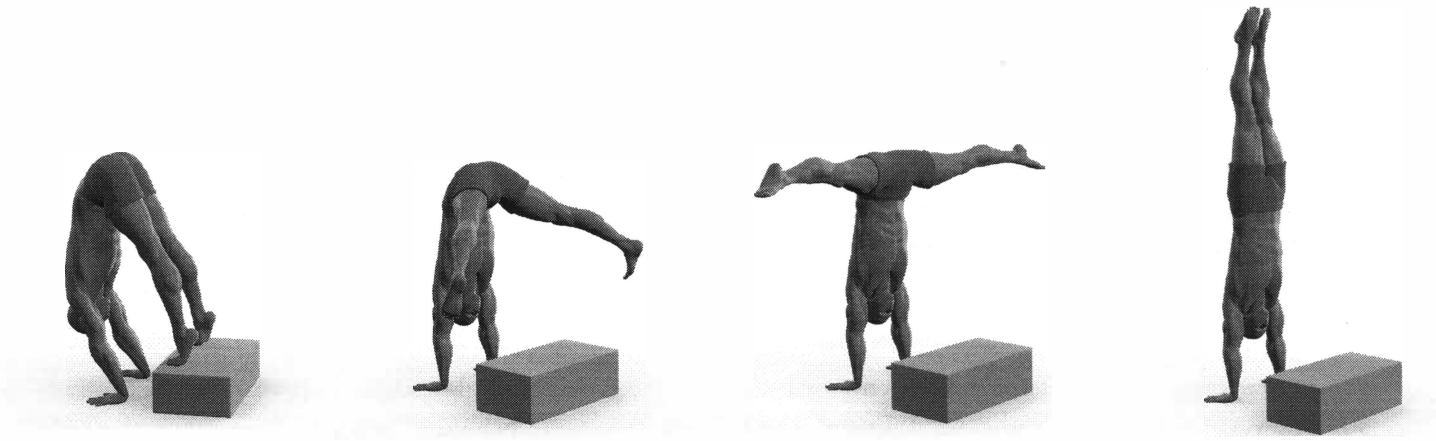
- Once your legs reach your current flexibility limit (as far down as they can go), bring them back up, focusing on the reverse of what you just did. Rotate your hips and legs up to hit a solid core position before bringing them together. All of this should be done without arching your back.
- Use parallettes to allow your legs to drop lower than the floor (as long as we are flexible enough). From there, they can be brought back up. The lower you are able to drop your legs and control them before coming back up, the more challenging this skill becomes.

Remember, even a "small" five to ten degree bend in your elbows will make the movement about ten to thirty percent easier—and strength gains will be fewer. Therefore, you should resist the urge to bend your elbows. This is why most gymnastics coaches do not teach bent-arm pressing until straight-arm pressing is learned.



Pictured above is one of the ways you can begin to practice the hip movement away from the wall, without relying on it. Since this is a headstand position, take precautions to ensure neck safety. If you have any form of neck injury or suspect you may have issues putting pressure on your head, do not attempt this position. If you choose to use this method, you do so at your own risk.

ELEVATED STRADDLE STAND, STRADDLE PRESS TO HANDSTAND – LEVEL 6



Scapular Positioning: Your scapulas begin elevated. They will stay elevated for the entirety of this movement. All of the motion will come from your hips.

Technique: Grab a block, stool, gymnastics mat, or other slightly raised implement. The higher the object, the easier the movement will be. Begin with your hands on the ground and lean forward, keeping your shoulder angle open. As your weight shifts to your hands, lift your hips over your head. Once you begin to feel that your feet are barely supporting your weight, slowly rotate your hips to a straddle handstand position. Bring your legs together and you will reach a handstand position.

Switching from wall eccentrics to this full movement called the *elevated straddle stand, straddle press to handstand* (which can be abbreviated *Ele Str Std Str Press*) represents the point where you should be able to control a press handstand movement beginning from the ground. If you have difficulty performing this skill, you can use another object with the wall until you are familiar with the concentric portion of the movement.

While this skill is categorized on the same level as the *bent-arm, bent-body press to handstand*, it is inherently more difficult. Few people have much experience with straight-arm skill or strength work, and the increase in intensity brings a substantial increase in muscle adaptation with it. You can adjust the difficulty level by changing the height of the implements, so select a height for the block that suits your experience/skill level. Most people start with a block that is twelve to seventeen inches tall. If you have a gymnastics mat that folds out (like a panel mat), you can systematically decrease the height as you progress.

The main idea is to open your shoulders as far as you can without opening your hips at all. This will help you avoid the common tendency of trying to lift your feet before your hips get all the way up, which would result in a planche press—an exponentially harder skill that you may not be ready for.

You will immediately be able to gauge the difficulty of this new position. Once your feet are in the air, the burden of work falls primarily on your shoulders. It will feel like there is a heavy weight on your shoulders that makes you want to fall forward on your face. Therefore, you must continually and aggressively push your arms over your head, in order to generate enough force at your shoulders to keep your body from tipping over. Your palms and fingers should feel like they are digging hard into the ground.

Most people will get "stuck" on this progression for some time. Because your shoulders end up in a very disadvantaged angle, they must be strong in order to hold this position. You will also need significant active

flexibility in your legs and groin to give your shoulders as much mechanical advantage as possible by drawing the center of gravity closer to your body. Even with many years of training under your belt, nailing this move may seem impossible. Stick with it, as it will build a foundation to achieve a high level of pressing strength. If truly needed, get someone to help spot the skill from behind at your hips. They can brace your shoulders with their knees and move your hips to get your legs up while forcing you to maintain proper body positioning.

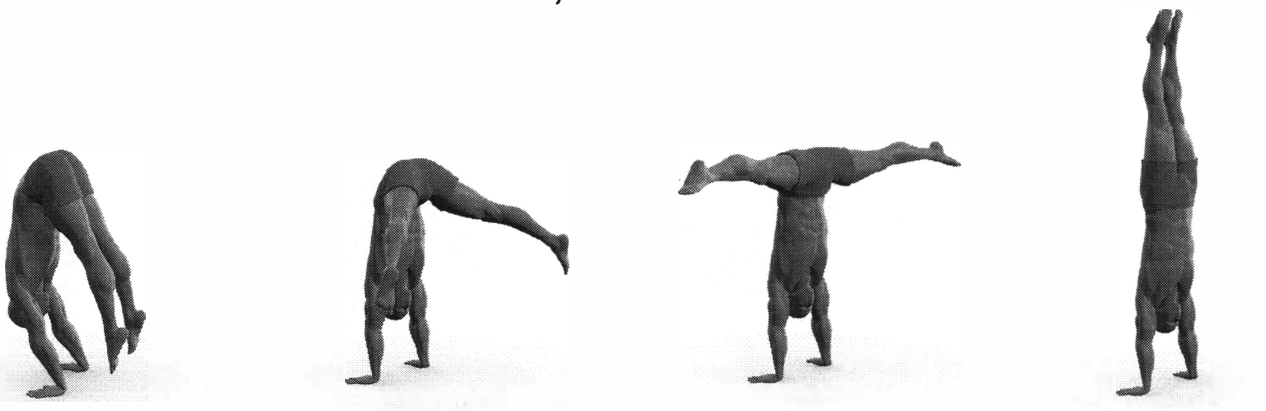
Continue to lower the height of the implement (and, consequentially, your feet) as your strength and flexibility allow. When you are able to lift your feet from the floor, be sure to lift slowly. Use your lower back to help control the ascent of your legs, and make sure to keep your chest open and stomach tight. This will keep your back aligned properly.

When the angle of your arms to your torso matches the angle of your thighs to your torso perfectly, you are approaching the top of the movement. At this point, exert your shoulders even more to complete the straight vertical straddle handstand position. Top this off by cleanly bringing your legs together from the straddle position.

If everything is falling into place but you are having trouble bringing your legs together from a straddle handstand to full handstand position, you have options to help seal the gap. You can perform negatives of this movement away from the wall, or possibly practice straddle handstands.

Keep in mind that even a five to ten degree bend in your elbows will make the movement about ten to thirty percent easier—and you will not see that strength gain as quickly. Resist the urge to bend your elbows.

STRADDLE OR PIKE STAND, PRESS TO HANDSTAND – LEVEL 7



Scapular Positioning: Your scapulas begin elevated. They will stay elevated for the entirety of this movement. All of the motion will come from your hips.

Technique: Begin with your hands on the ground and lean forward keeping your shoulder angle open. As your weight shifts to your hands, lift your hips over your head. Once you begin to feel that your feet are barely supporting your weight, slowly rotate your hips to a straddle handstand position. Then, bring your legs together and you will reach a handstand position.

When performing the *straddle or pike stand, press to handstand* (which can be abbreviated *Str./Pike Std. Press*), lowering the level of your feet will make the movement significantly more challenging. More often than not, your hips will not be directly stacked over your shoulders when executing this skill. Let's break this skill down into two phases:

- For the first phase, forward lean onto your shoulders. After your weight is fully on your shoulders you must not allow the angle to close; if it does, the skill becomes significantly harder due to the extra forward lean or planching. Next, your torso and hips must rotate up while you keep your legs down, so that they are as directly over your shoulders as possible. This is called compression (a form of active flexibility) and it will keep your center of mass centered over your hands.
- For the second phase, raise your legs all the way up, through your hips, while pressing your shoulders back into place underneath your torso. Careful control of your core and hips will ensure proper form and balance.

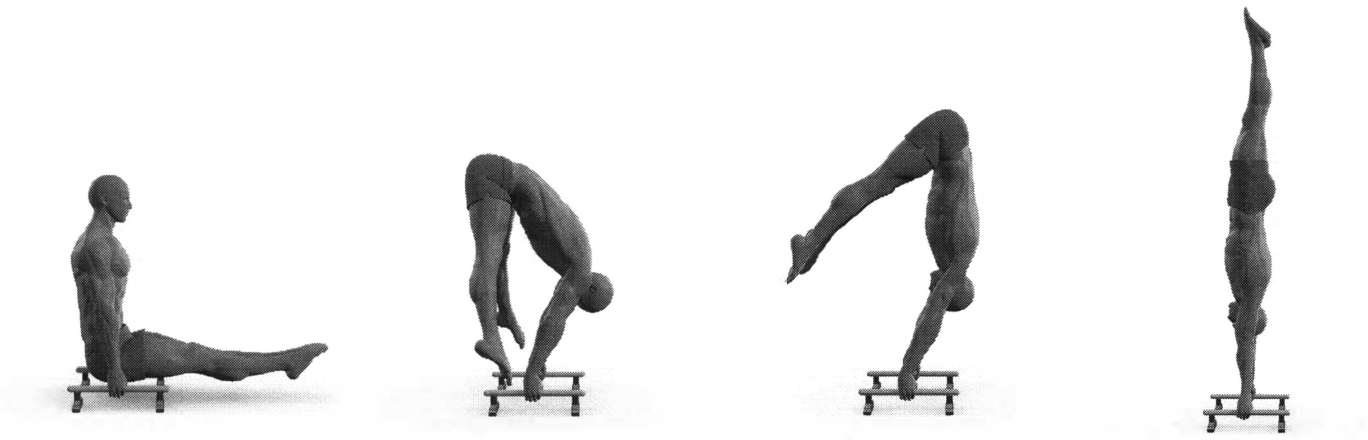
You must be careful to get these distinct phases correct, as most beginners typically blend them together. If you lift your legs too soon (i.e. before your hips are above your shoulders), your shoulders will lean too far forward and you will fall on your face. Similarly, the control through your shoulders and core must remain constant; wobbling can also cause forward lean.

The pike variation is a bit harder because it requires extra forward lean at your shoulders, as your center of gravity is further away from your upper body. After you obtain the straddle straight-arm press to handstand, upgrading to the pike is a good way to progress the intensity.

Remember, even a "small" bend in your elbows (five to ten degrees!) will make the movement about ten to thirty percent easier. In order to gain the maximum from this movement, you should resist the urge to bend your elbows.

This is an A-level skill in the Gymnastics Code of Points.

L-SIT / STRADDLE-L, STRADDLE PRESS TO HANDSTAND – LEVEL 8



Scapular Positioning: Begin in an L-sit position, with your scapulas depressed. As your hips begin to move overhead, your scapulas will protract and elevate. When your hips end up moving over your shoulders vertically, your scapulas will be fully elevated from there to the ending handstand position.

Technique: Begin in an L-sit position, with your arms straight. Allow your legs to drop and your shoulders to move slightly forward while lifting your hips in back. Keep your arms straight and contract your shoulders to prevent yourself from falling forward. Start to straddle as soon as your toes pass the bars. As your hips arrive to vertical above your shoulders, start to bring your legs up toward a straddle handstand position. Finally, bring your legs together to end in the handstand position.

Since you are starting from a lower position with the *L-sit / straddle-L, straddle press to handstand* (which can be abbreviated *L-Sit / Str-L Str. Press*), your range of motion will be increased, placing a greater demand on your shoulders. This forces you to apply much more strength, making you stronger. In this technique, compression is the key. You will need to maintain compression in order to keep your shoulders from planching too far forward. This must be achieved as soon as your hips begin to ascend. Essentially, once your hips start moving backward, you will squeeze your abdominals and immediately bring them as close to your face as possible.

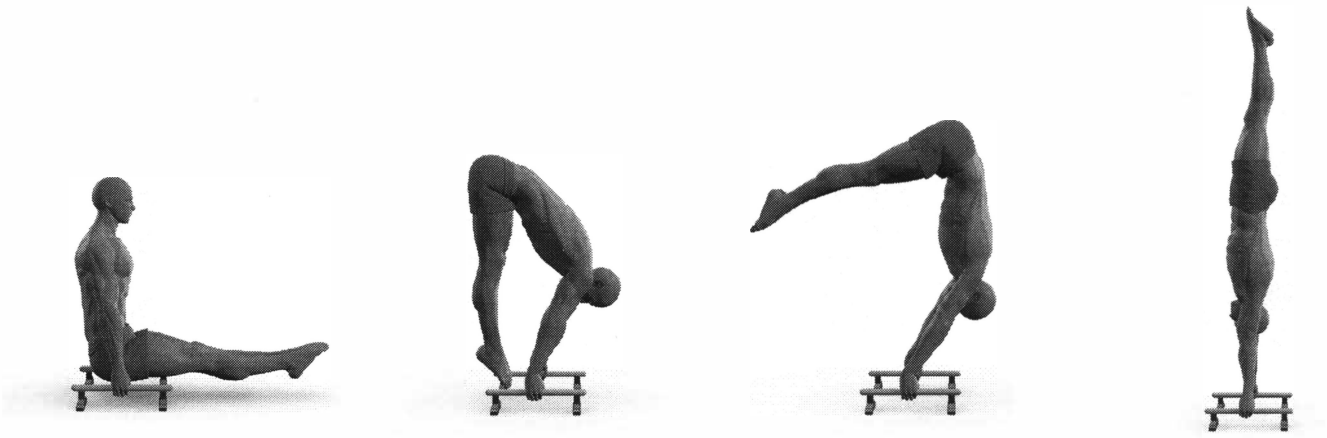
As your proficiency increases, begin with a straddle L-sit. Doing this position from the start will make the movement more difficult in two ways: it nullifies most of the momentum you can build from swinging your legs backward from the L-sit position, and it also warrants a greater need for active flexibility and compression.

All of the L or straddle-L press variations have three components:

1. Raise your hips from a lower level, over your shoulders.
2. Bring your legs up to a straddle position overhead.
3. Finish in a handstand by opening your shoulders, closing your hips, and bringing your legs together.

This is an A-level skill in the Gymnastics Code of Points.

L-SIT / STRADDLE-L PIKE PRESS TO HANDSTAND – LEVEL 9



Scapular Positioning: Begin in an L-sit position, with your scapulas depressed. As your hips begin to move overhead, your scapulas will protract and elevate. When your hips end up over your shoulders vertically, your scapulas will be fully elevated from there to the ending handstand position.

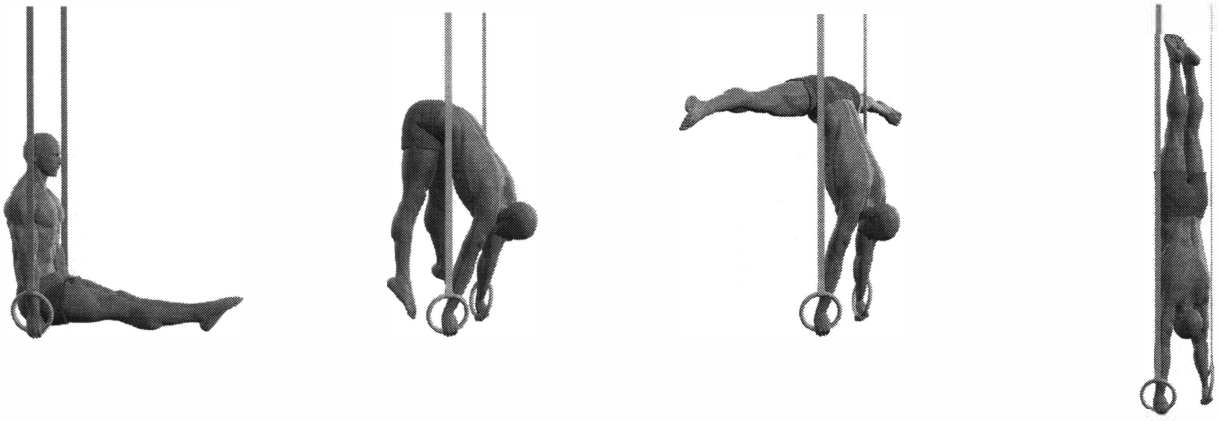
Technique: Begin in an L-sit position, with your arms straight. Allow your legs to drop and your shoulders to move slightly forward while your hips lift in back. Keep your arms straight and contract your shoulders to prevent yourself from falling forward. Since the straddle allows more compression with the pike, you will need to lean forward more with your shoulders as your hips rise. As your hips arrive to vertical above your shoulders, start to bring both of your legs up by opening up your hips. Finally, end in a handstand position.

The *L-sit / straddle-L pike press to handstand* (which can be abbreviated *L-Sit / Str-L Pike Press*) is an extension of the previous presses. Because this movement involves keeping your legs together and straight, it requires more forward lean to execute. This requires more strength. To execute this movement, begin from the L-sit position and push your hips directly overhead before bringing your legs up to a handstand.

Alternatively, this can be performed from the straddle-L position. Once the legs clear the arms they need to come together to hit the pike position before the rest of the press can be finished. Technique is exactly the same as the other press techniques. Each of the phases should be separated as much as possible to prevent excessive planching and to allow active compression to develop further.

This is a B-level skill in the Gymnastics Code of Points.

RINGS STRAIGHT-ARM, L-SIT, STRADDLE PRESS TO HANDSTAND – LEVEL 10



Scapular Positioning: Begin in an L-sit position, with your scapulas depressed. As your hips begin to move overhead, your scapulas will protract and elevate. When your hips arrive over your shoulders vertically, your scapulas remain fully elevated from there to the ending handstand position.

Technique: Begin in an L-sit position, with your arms straight on the rings. The rings can be either parallel or turned out. Allow your legs to drop and your shoulders to move slightly forward while lifting your hips in back. Keep your arms straight and contract your shoulders to keep from falling forward. Since the straddle allows more compression than the pike, you will need to lean forward more with your shoulders as your hips rise. As your hips come to vertical above your shoulders, start to bring both of your legs up by opening up your hips. Finally, end in a handstand position. Keep the rings in the starting position the entire time (either parallel or turned out).

Executing a *rings straight-arm, L-sit, straddle press to handstand* (which can be abbreviated *R SA L-Sit Str. Press*) requires an enormous amount of strength and balance. It helps to have previously worked numerous variations of rings bent-arm press to handstands and rings handstands.

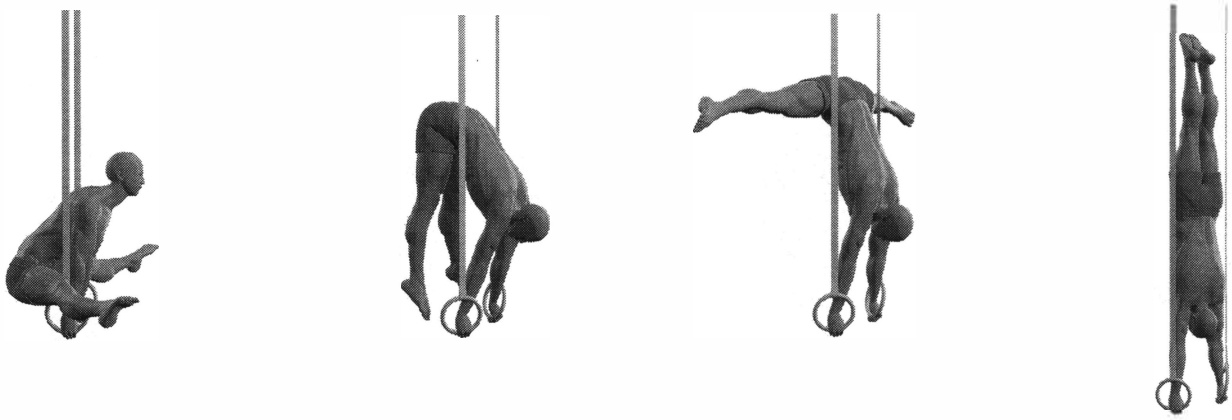
The technique for this skill centers on controlling the movement by turning the rings out. The necessity of locking your arms straight on the rings makes this skill very difficult due to the inherent instability with rings movements. Sufficient strength and control, coupled with turning out the rings should provide the adequate stability to perform this movement.

As soon as you turn out the rings, you must get your hips directly overhead. This will be the hardest part of the movement, as the instability of the rings makes it tricky. The instability will cause you to naturally lean forward and planche the movement, even though this ultimately makes it more difficult. Resist this urge by forcing your hips up while keeping your abdominals tight.

The bulk of the difficulty is in the first phase, where you must get your hips overhead. The second phase is relatively easy by comparison, as it entails simply bringing your legs up and together. Overcompensation is common; avoid it if at all possible, as it will cause you to fall forward. Since the difficulty level of this movement is so great, you can use a bit of momentum from the L-sit. This will be eliminated in the next progression.

This is a B-level skill in the Gymnastics Code of Points.

RINGS STRAIGHT-ARM, STRADDLE-L, STRADDLE PRESS TO HANDSTAND – LEVEL 11



Scapular Positioning: Begin in a straddle L-sit position on the rings, with your scapulas depressed and slightly protracted. As your hips move overhead, your scapulas will protract and elevate. When your hips arrive over your shoulders vertically, your scapulas will be fully elevated. They remain fully elevated through the ending handstand position.

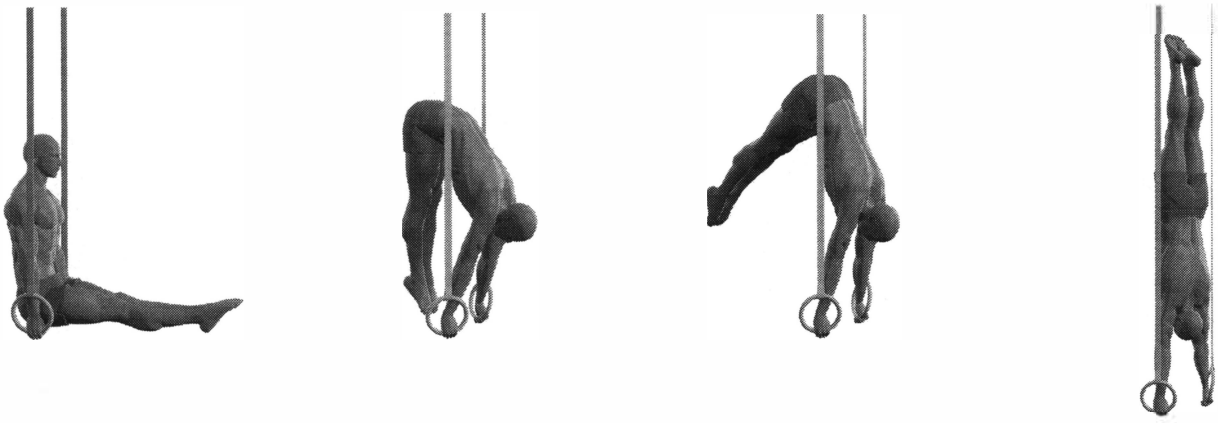
Technique: Begin in a straddle L-sit position on the rings with straight arms. The rings can be parallel or turned out. Allow your legs to drop and your shoulders to move slightly forward while lifting your hips in back. Keep your arms straight and contract your shoulders to keep from falling forward. Since the straddle allows more compression than the pike, you will need to lean forward more with your shoulders as your hips rise. As your hips become vertical above your shoulders, start to bring your legs up by opening up your hips. Finally, end in a handstand position. Keep the rings in the starting position the entire time (either parallel or turned out).

Momentum that can be generated from the previous skill is all but eliminated when performing the *rings straight-arm, straddle-L, straddle press to handstand* (which can be abbreviated as *R SA Str-L Str. Press*). One must have a tremendous amount of pressing strength in order to perform this movement correctly. The technique is exactly the same as the previous skill except you straddle from the start. Since the rings are already turned out you do not have to worry about that. Simply lean forward slightly and focus on pushing your hips up and overhead. From there, bring your legs together.

This movement performed cleanly, without momentum, is nearly as difficult as a full planche on parallettes or the floor. When you have reached this level, your pressing strength is extremely advanced.

This is a B-level skill in the Gymnastics Code of Points.

RINGS STRAIGHT-ARM, PIKE PRESS TO HANDSTAND – LEVEL 12



Scapular Positioning: Begin in an L-sit position on the rings, with your scapulas depressed. As your hips begin to move overhead, your scapulas will protract and elevate. When your hips arrive over your shoulders vertically, your scapulas will be fully elevated. They should remain that way through the ending handstand position.

Technique: Begin in a straddle L-sit position on the rings with straight arms. The rings can be parallel or turned out. Allow your legs to drop and your shoulders to move slightly forward while lifting your hips in back. Keep your arms straight and contract your shoulders to keep from falling forward. As your hips become vertical above your shoulders, start to bring both of your legs up by opening up your hips. Finally, end in a handstand position. Keep the rings in the starting position the entire time (either parallel or turned out).

The *rings straight-arm, pike press to handstand* (which can be abbreviated *R SA Pike Press*) is as far as this book goes with straight-arm presses. While it is not as difficult as some of the variations of the planche on rings, when executed correctly it is almost or as difficult as a full planche on parallettes or the floor. The technique is exactly the same, except you perform this movement from the pike position. The most difficult part is keeping your arms locked straight during the movement.

You must lean forward when performing this skill, as the pike position displaces your center of mass backward. There is a tendency to bend your arms to compensate because it requires less strength. However, you must not allow this to happen. Instead, keep your elbows locked and let your shoulder take the brunt of the force. This will strengthen your shoulders for many of the higher-skilled rings strength moves like the full planche, inverted cross, and maltese.

This is a B-level skill in the Gymnastics Code of Points.

- Chapter 25 -

PULLING EXERCISES

L-Sit / Straddle-L / V-Sits / Manna – Page 1, Column 9

There are four different phases to training the V-sit and Manna, with different concepts to focus on in each phase. In order to avoid vague coaching advice like *just go higher*, these skills are grouped into phases for each step in the progression.

If you are following the charts you will see that varying angles are marked somewhat subjectively. Knowing your angles will give you a decent measure of where you are on the A-C range in your development. This is helpful since the V-sit is an A-Level skill and the manna is a C-Level skill in the Gymnastics Code of Points. The difficulty on the progression charts is true to their respective gymnastics origins while simultaneously presenting indicators for progress between each phase. This applies to all of the exercises listed, not just this specific progression.

You will notice on the charts that there is a lot of variation in the angles per level. You'll see a big jump to 100 degrees near the beginning and it slowly decreases from there. This is because as the angle decreases, torque increases exponentially. When your muscles move outside of the optimal range of motion, the force output of your muscles decreases in that range. Every 30-degree increase essentially doubles the level of difficulty for execution. This is especially true with similar skills like the iron cross and planche.

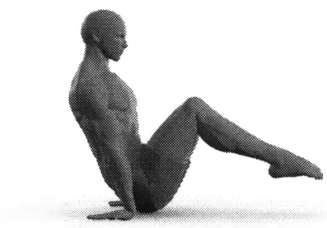
Anyone who wants to begin serious bodyweight strength training should at least *attempt* to learn the V-sit and manna progression. Not only are these skills pleasing to the eye, they are also excellent for working the muscles in your posterior shoulder and scapular areas, which are necessary to shoulder health.

Because gymnastics-based bodyweight strength training is a very "hands in front of the body" endeavor, it lends itself to building muscular imbalances in the front of your body that often lead to a "caveman" look (shoulders hunched forward, neck craned out). This is called upper-crossed syndrome, which not only looks bad, but also increases your chance of injury. Training this series of progressions will help keep your shoulders healthy and lead toward a longer training career in which you will accomplish great feats (including these).

Note that your hands will be held backward in all of these skills. Most beginners will have to start with their hands sideways. However, try to train some with the hands backward to get used to the position. When you transition from the V-sit progression to the manna progression, hands held backwards will be a requirement, which is why practicing it at the lower levels of L-sit training is recommended. Until that time, your hands should face sideways as opposed to forward because you will probably want to perform this skill on rings or parallettes at some point.

Phase I

TUCK L-SIT – LEVEL 1



Scapular Positioning: Your scapulas will be fully depressed and neutral. There is a tendency in some of these positions to allow your shoulders to drift forward so that your chest rounds, or to force scapular retraction. Avoid this.

Technique: Place your hands backward. While on your toes or butt, lean back so that your weight shifts to your hands and slowly lift off the ground.

The *tuck L-sit* is a very simple hold. Execute it on the floor to ensure proper shoulder activation. If you are unable to perform this hold on the floor, you can use an elevated surface like parallel bars, parallettes, a few chairs, or a set of mats.

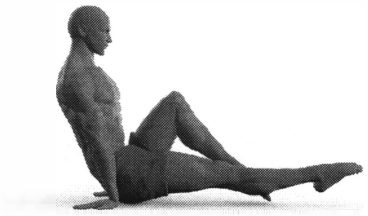
1. Make sure your arms remain locked straight.
2. Depress your scapulae as far as possible (so your shoulders do not rise up toward your ears).
3. Your thighs should be at a 45-degree angle with your torso, and your legs should be at a 90-degree angle with your thighs.

Your legs may be extended to make the exercise more challenging; however, if you find you are progressing very quickly you may have the strength to move to the next level immediately.

If you do not yet have the ability to raise the legs this high, a variation of this skill uses raised implements to do a "chair" L-sit hold. In this variation, the thighs are held at 90 degrees to the torso and the legs are held at 90 degrees to the thighs—exactly like a seated chair position except your hands provide the only support.

This is an A-level skill in the Gymnastics Code of Points.

ONE-LEG-BENT L-SIT – LEVEL 2



Scapular Positioning: Your scapulas will be fully depressed and neutral. There is a tendency in some of these positions to allow your shoulders to drift forward so that your chest rounds, or to force scapular retraction. Avoid this.

Technique: Place your hands backward. While in a seated position with one leg bent, lean back and place your weight on your hands. Next, lift your legs off the ground completely.

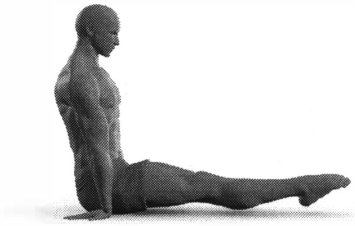
This progression is the transition sequence between the *tuck L-sit* and *full L-sit*. If you have never performed a full L-sit you may feel some cramping in your abdominals, hip flexors, or the quadriceps muscle groups in your extended leg. Additionally, if your hamstrings lack the proper flexibility for this skill, they may feel tight and pull on the back of your leg. If this is the case, implement some hamstring mobility drills into your warm-up, workout, or post-workout routine.

Muscle cramping is uncomfortable, but a fairly normal bodily response. Cramping is addressed in Chapter 21, which talks about common bodyweight training injuries. For the most part, cramping only occurs in fatigued, oxygen-deprived muscles. This often occurs near the end of a workout, when you are tired.

If you experience cramping in your muscles, massage it out and then continue to work the affected area. Do not be afraid of this type of pain, as it dissipates quickly with higher training frequency and consistency. Working out twice, preferably three times per week, will rid this nuisance quickly. Additionally, try to practice your L-sit and other associated skill work while you still feel fresh.

This is an A-level skill in the Gymnastics Code of Points.

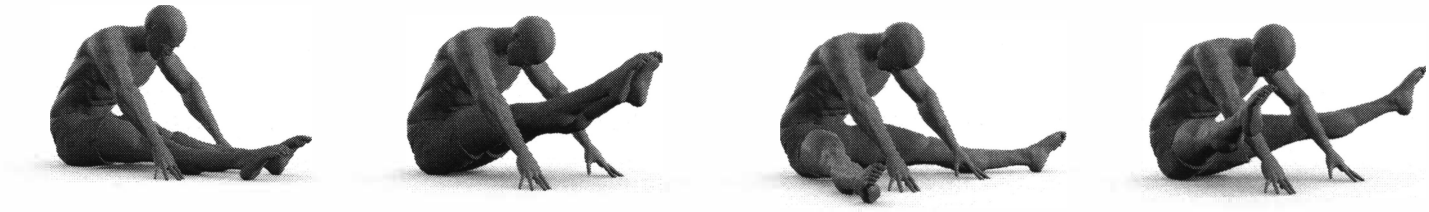
L-SIT – LEVEL 3



Scapular Positioning: Your scapulas will be fully depressed and neutral. There is a tendency in some of these positions to allow your shoulders to drift forward so that your chest rounds, or to force scapular retraction. Avoid this.

Technique: Place your hands backward. While in a seated position with both legs straight, lean back and place your weight on your hands. Next, lift your legs off the ground completely.

The *L-sit* is executed by supporting your body only with straight arms and raising your legs to a parallel position with the ground. You should keep your shoulder girdle depressed to prevent your shoulders from rising up close to your ears. Depressing your shoulders keeps them "active" and in a good position for other techniques that transition out of the L-sit, such as straight-arm press to handstands. If you are seeking to transition to this skill from the previous progression, focus primarily on getting your legs out straight while still being able to hold them at a 90-degree angle. There are two ways to do this.



Compression work. Instead of trying to lift your toes up, which will often tilt your torso back, focus on lifting your knees to your chest without bending your legs. To do this, squeeze your quadriceps muscle group tightly and use your hip flexors and abdominals to pull as hard as possible. You can also improve through specific compression work (covered in programming with specific core work, in Chapter 9). Focus on contracting your quadriceps, hip flexors, and abdominals, much like the previous exercise. However, instead of supporting your body with your arms, you will place your legs on the ground with your hands next to them. Apply pressure through your hands while lifting only your legs (think knees toward your face) to isolate the specific muscles in question. This allows a stronger contraction and thus more efficient compression. Compression work is critical to good bodyweight strength development. The challenge level can be raised by moving your arms out, closer to your feet, while keeping them in contact with the floor in order to push through them.

Depending on your goals, split volume 50/50 between L-sit holds and compression work. You have to practice both the skill and compression to excel in the long run. As you improve and your knees get closer to your chest and head, you will begin to do more compression and hamstring flexibility work. When you are already proficient with body positions and the static holds you want to achieve, you will need more specific compression work to progress with the skills that require extreme compression like the press handstands and manna.

This is an A-level skill in the Gymnastics Code of Points.

STRADDLE L-SIT – LEVEL 4



Scapular Positioning: Your scapulas will be fully depressed and slightly protracted. Unlike the L-sit, you begin the *straddle L-sit* leaned over slightly, which means you will have to protract your scapulas.

Technique: Place your hands between your legs while sitting in a straddle position with your legs on the floor. Push down on the floor to lift your body up, and simultaneously contract your abdominals and hip flexors to lift your legs off the floor.

While the *straddle L-sit* is visually similar to the *L-sit*, it is actually a completely different exercise. If you want to become good at both of these skills, you will need to practice each of them extensively. It is often the case that the straddle L-sit needs to be practiced significantly more than the L-sit.

To execute the straddle L-sit, begin by straddling your legs at least 90 degrees while seated on the ground. Next, place your hands inside of your legs, approximately shoulder-width apart. This will put you in a more disadvantaged position than the L-sit, as your hips will likely impair you from shifting your weight forward onto your hands. To compensate for this and execute the skill, depress your shoulders and lean forward to shift more pressure onto your hands. This is a bit more difficult than it would be with your arms outside of your legs, but persevere.

After your weight has shifted forward, lift your legs off the ground. This is difficult because your legs are an oblique angle to your torso. Your abdominals will not have a good line of pull on your pelvis. Focus on rotating your groin up, toward your stomach. Note that your hip flexors will also be in a disadvantaged position due to their line of pull. This makes everything much harder and makes cramping much more likely, especially in your quadriceps and hip flexors. When cramping occurs, stop, shake, and rub out the cramps. Then continue with your training. With continual practice, cramping will eventually cease. If you are experiencing great difficulty, you can work one leg at a time or do compression work. If you need more strategies to treat cramping, see Chapter 21.

There is a variation of this skill which is easier. This is with one hand on the inside of both legs and one hand on the outside of one leg. If you are having trouble holding yourself off the ground, you can start with one hand inside and one hand outside approach to get used to the position. Then work toward both hands between the legs as you improve.

This is an A-level skill in the Gymnastics Code of Points.

RINGS-TURNED-OUT L-SIT – LEVEL 5



Scapular Positioning: Your scapulas will be fully depressed and neutral. There is a tendency in some of these positions to allow your shoulders to drift forward so that your chest rounds, or to force scapular retraction. Avoid this.

Technique: Lift yourself up on the rings with your arms straight. Next, bring your legs up into an L-sit position. (For the *straddle L-sit*, bring your hips behind your hands and bring your legs up into a straddle position with your hands placed between your legs and pushing down.) Work on turning the rings from the turned-in position where your forearms are on the straps, to the parallel position, to the turned-out position where your palms are pointing forward. Maintain your legs at parallel or higher.

Going from a stable surface to the rings increases difficulty due to the lack of stability. For both the L-sit and straddle L-sit, the technique is the same on the rings as on the floor, except you must squeeze the rings as tight to your body as possible. Aside from that, the skill is exactly the same.

Keep your shoulder girdle depressed and squeeze your abdominals, hip flexors, and quadriceps. Remember to squeeze every muscle in your body as hard as possible—the extra tension will help stabilize the rings.

Along with simply practicing on the floor, holding yourself in ring support a few times per week is usually all that is needed to obtain this skill. If you cramp, shake it out, massage your muscles, and try again. If you need more strategies to treat cramping, see Chapter 21.

These are an A-level skill in the Gymnastics Code of Points.

Phase II

TRAINING TOWARD THE V-SIT AND MANNA

As a beginner, working toward the V-sit is a waste of time because your hands will typically be pointed forward or to the side. Instead, focus on the manna, as it will give you the corresponding V-sit angle(s) that you desire. This is why you have been practicing hands-backward positioning. These angles are approximate, but the reference points are solid:

45-degree V-Sit – Level 6
75-degree V-Sit – Level 7
Rings-Turned-Out Straddle-L – Level 6
Rings 45-degree V-Sit – Level 7
Rings 75-degree V-Sit – Level 8
Rings 90-degree V-Sit – Level 9

Quick Note: Rings V-sits are not included on the charts, however they are rated in this phase because of the inherent instability of the rings. The optional rings-turned-out positions will help you get your hips up, although they are unstable.



Scapular Positioning: Your scapulas will be fully depressed and neutral. There is a tendency in some of these positions to allow your shoulders to drift forward so that your chest rounds, or to force scapular retraction. Avoid this.

Technique: You will begin in a straddle position, with your hands on the floor behind you. Your hands should be positioned at the back of your hips, with your fingers facing away from your body. First, load as much weight as possible onto your hands. Second, depress your shoulder girdle as much as possible by pushing your shoulders away from your ears. Third, tense your abdominals and curl your pelvis as if you are trying to touch your shoulders with your toes. (You want your hips/groin to point upward as much as possible.) Now lean back on your arms while pushing your hands backwards into the ground. Spread your legs as far apart as possible and lift them off the ground to the furthest angle you are able. You should eventually be able to move them close to vertical. Consistently depress your shoulder girdle and keep rounding your back and pelvis.

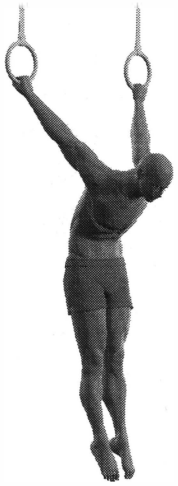
Get proficient with this position; it will be vital all the way up to the manna itself.

At first it appears as if these angles can be achieved simply through specific abdominal compression work. While this is true, it misses the key point of working toward the manna. The backward-hands technique plays a significant role in skill development. Once this position has been established and reinforced, the progression of the manna is about pushing your hips forward. There are two mental cues you can use to achieve this:

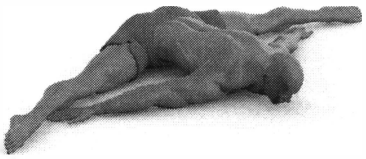
- Simply focus on pushing your hips forward in order to create space between your forearms and hips. This will allow you to get higher into the position. You do not want to focus on pushing your hips upward, as this tends to cause you to lean back on your hands, which will not actually lift your hips off the hands.
- Shove your palms and fingers into the floor, directly backward, as hard as possible, in order to propel the rest of your body forward. Simultaneously resist this by compressing your body as tightly as possible. This will also keep you from uselessly leaning back.

Depending on your compression abilities, you might be able to lift your legs up into the V-sit to 45 or 75 degrees right away. Do not practice this now. Instead, focus on progressing into the next phase. Couple compression work with the hips-forward training shown above. Think of this phase in terms of terms of two important concepts: You want to focus on this hold to reinforce your hip push, and you want to improve your core compression. Each of these factors is crucial, not only for the development of the V-sit and manna, but for core strength and control.

Supplementary work will help tremendously since this is such an inherently difficult progression. Here are two recommended supplements to use while training for the manna:



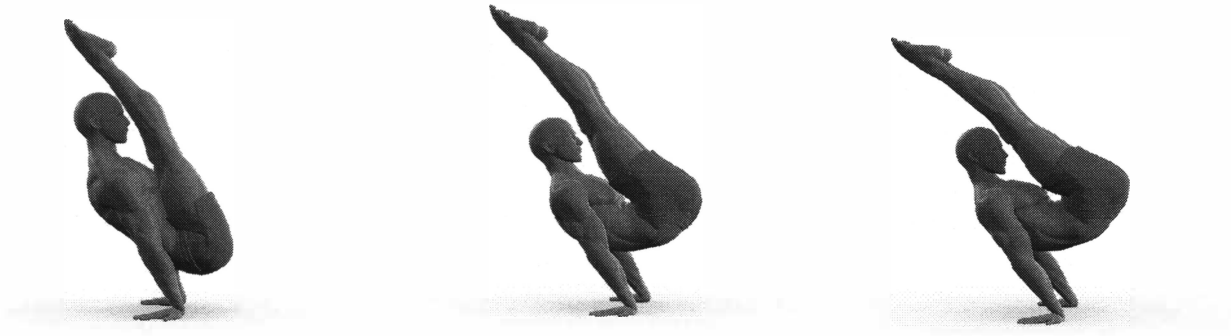
German Hang / Skin the Cat – This is an excellent shoulder stretching exercise that puts your shoulder into extreme hyperextension. The manna requires excellent shoulder mobility in that range. *German hangs* work well, especially right before any manna training attempts, because stretching out your opposing muscles (pectorals, latissimus dorsi, and anterior deltoids) statically for a period of thirty seconds or more helps inhibit force generation in those muscles. It is possible to get a ten to fifteen degree greater angle of improvement in the next manna attempt after a German hang.



Hamstrings Stretching – The manna involves pushing up into a compressed straddle position, and stretching in the straddle position is preferable. Therefore, any hamstring stretching will help. Once you advance to the next phase of manna training by pushing your hips significantly forward, the inhibition (looseness) in your hamstrings will allow a deeper compression by allowing your quadriceps, hip flexors, and abdominals to pull your knees closer to your face with less resistance. This allows you to achieve a higher angle and improves the balance of the skill. Compression moves your center of mass closer to your hands, which allows the torque generated on your arms and shoulders to lessen.

Phase III

100-degree V-Sit – Level 8
120-degree V-Sit – Level 9
140-degree V-Sit – Level 10

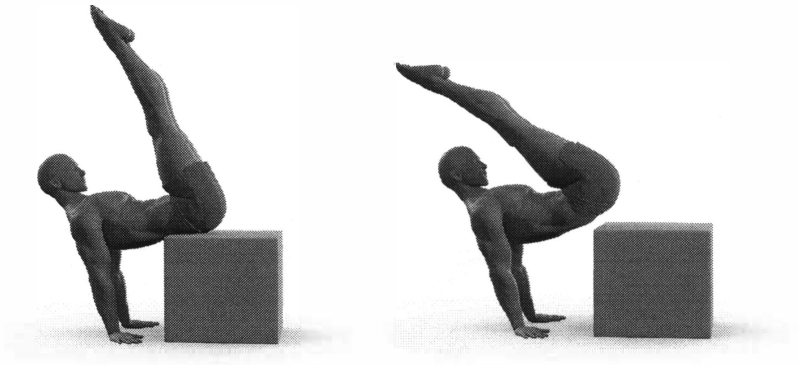


Scapular Positioning: As your legs begin to move past a vertical position and your hips rotate in front of your body, your scapulas will elevate your rib cage. They may also retract slightly because your hands are close together and your shoulder flexibility is being pushed to the limit. This is normal.

Technique: Begin in a straddle position, with your hands on the floor behind you. Your hands should be positioned at the back of your hips, with your fingers facing away from your body. First, load as much weight as possible onto your hands. Second, depress your shoulder girdle as much as possible by pushing your shoulders away from your ears. Third, tense your abdominals and curl your pelvis as if you are trying to touch your shoulders with your toes. (You want your hips/groin to point upward as much as possible.) Now lean back on your arms while simultaneously pushing your hands backwards, into the ground. Spread your legs as far apart as possible and lift them off the ground to the furthest angle you are able. Once your legs are almost vertical, push your hips forward aggressively. You can think of this in terms of either pushing your hips forward, or pushing your hands behind you as far as you are able.

The third phase is entered when you gain the strength to push your hips up to shoulder height. Use everything in your ability to cue the aggressive forward drive of your hips. In this phase, you should notice that all of the muscles in the back of your shoulders are becoming much stronger. The strength that is built in this phase comes to fruition as your whole posterior shoulder girdle becomes extremely strong. Problems with pain or stiffness from shoulder imbalance should ultimately disappear because of the incredible shoulder mobility and strength gained from this exercise.

At this point, switch to supplementary work to progress further. Here are some examples:



High Holds with or without Eccentrics – Use high holds to acclimate your body to positions that are impossible to achieve just by pressing into them. For instance, if your progress is stalling at the 120-degree V-sit mark you can use a chair, couch, mat, or spotter to prop up your hips and part of your lower back. From there, shove your hands back and lean back slightly in order to attempt to hold the higher position. If you get your hips in the right position you can perform slow eccentric lowers from this higher position down to positions you can already hold. (Note: If using a spotter, allow them to minimally assist you in balancing in that higher position, rather than immediately letting go.)

Speed Pushes – Use speed pushes as a power building exercise through full range of motion. When you push up into the manna progression in a slow and controlled manner, you will reach the limit of your abilities rather quickly. A powerful push can allow you to get higher than you can if you push slowly, but it is hard to control yourself at this speed and higher position, so falling backward onto your butt is a likely scenario. The reason why this actually helps is due to the relationship between power and strength. Building raw strength increases potential for speed, but building power (via the same movement, performed quickly) increases both speed and strength. However, quick movements avoid building static stability and sacrifice total volume because less time is spent holding the position.

A combination of presses, high holds, and speed pushes contribute best to success with achieving the manna. Presses into the top holds and high holds should compose most of your training volume. With most end range of motion skills, the best way to build the skill is through training in that end range of motion. There are three reasons for this:

1. Flexibility is best attained at the end of your range of motion.
2. Isometric contraction strength correlates the best within 30 degrees of the specific angle of the joint(s).
3. Applying force in decreased leverage positions at the end of your range of motion builds great strength.

Phase IV

155-degree V-Sit – Level 11
170-degree V-Sit – Level 12
Manna – Level 13



Scapular Positioning: Your scapulas will be fully depressed and neutral. There is a tendency in some of these positions to allow your shoulders to drift forward so that your chest rounds, or to force scapular retraction. Avoid these.

Technique: Perform the earlier technique. Begin in a straddle position with your hands on the floor behind you. Your hands should be positioned at the back of your hips, with your fingers facing away from your body. First, load as much weight as possible onto your hands. Second, depress your shoulder girdle as much as possible by pushing your shoulders away from your ears. Third, tense your abdominals and curl your pelvis as if you are trying to touch your shoulders with your toes. (You want your hips/groin to point upward as much as possible.) Lean back on your arms while simultaneously pushing your hands backwards, into the ground. Spread your legs as far apart as possible and lift them off the ground to the furthest angle you are able. Once your legs are almost vertical, push your hips forward aggressively. You can think of this in terms of either pushing your hips forward, or pushing your hands behind you as far as you are able. Now, dig your fingers into the ground and focus on pushing your hips toward the ceiling and pulling your knees toward your face as hard as you can to maximize compression.

Getting your hips above shoulder height is by far the most difficult part of the manna. You may be able to hold the manna if you jump into it or kick up into it—even if you cannot press into it. If your compression and hamstring flexibility has progressed sufficiently and merely needs to be maintained, make sure you do that from this point forward.

Continue working on your press into the manna. The strength built from this technique will assist in injury prevention, continue to improve your strength in extension, reinforce proper fundamental positions, and aid you with working progressions beyond this. Speed pushes and regular, slow, controlled pushes should make up the majority of your work at this point. If you need a little more help, you can use a spotter to help your hips get that last little bit, or do eccentrics from the high holds.

Getting the last 25 degrees will probably be the most frustrating work you will do compared to all of the other holds. Keep plugging away—if you obtain it, you will have one of the most rare static strength skills in the world (and healthy shoulders).

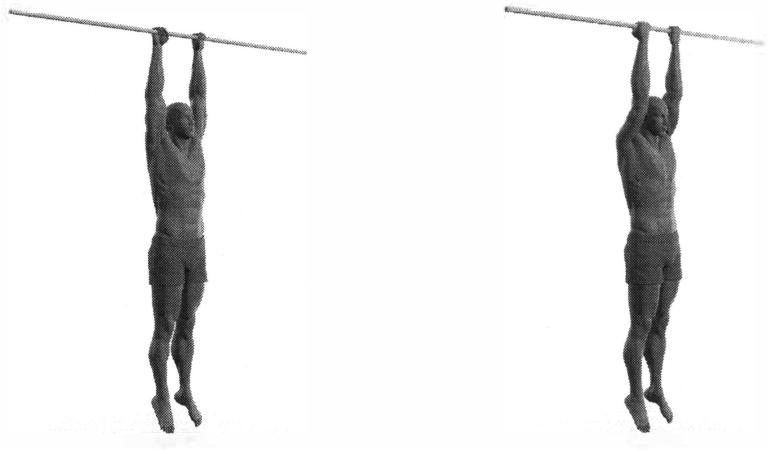
This is a C-level skill in the Gymnastics Code of Points.

Back Lever – Page 2, Column 1

Grip

In gymnastics-based strength training, the *back lever* is one of the first static strength-based movements you will learn. Working toward a solid back lever will prepare your body for many of the higher-level strength progressions, such as the iron cross.

You can execute the back lever on either a pull-up bar or rings. The difficulty level is roughly the same, so the choice is yours based on personal preference and availability of equipment. When using the bar, remember to set your hands correctly from the start since they are fixed. The recommended hand position is the chin-up position (hands facing toward you). You can modify your grip on the rings during the movement as needed.



Pronated Grip (Overhand) vs. Supinated Grip (Underhand)

When using a fixed bar, grab the bar with a palms-facing-you grip (supinated grip). Slide your body up (between your arms) and back down, flipped around. When using the rings, your hand positioning does not matter until after you are inverted. (Your palms will naturally face your body.) Once you begin to lower into a back lever position, supinate your grip and have your palms face the same direction as your body.

Supinated grip improves strength in your elbow connective tissues and allows you to recruit more of your biceps, both of which will be important in later progressions. Even if you do not have any pre-existing injury conditions you may at first experience discomfort in your elbows. This is normal. To counteract this and help protect your joints, strongly tense your biceps during the hold.

When beginning with this isometric tree some elbow soreness is to be expected from the stress mentioned above, but if you have elbow injury issues like excessive hyperextension or previous injuries that may be aggravated, you may need to back off and perform extra prehabilitation.

In regard to prehabilitation and overuse injuries, always first eliminate the offending exercise(s) and replace it/them with non-painful mobility work and isolation biceps work for a week or two. This is often enough time to fix the issue and you can continue from there. Second, understand that your ego might be

in the way, and you may need to lower the intensity by stepping down in the progression. This is important if you have not been using supinated grip or have been progressing too fast (in which case the pain is likely caused by too much intensity). Thirdly, realize that isolation work may be necessary, typically biceps curls, which will strengthen your biceps and connective tissues at your elbow. For connective tissue soreness, higher repetitions seem to be most advantageous—specifically in the range of twenty to fifty repetitions. Aim for two to four sets as supplementary work.

If your injury condition or concerns are extreme enough and the benefits of supination in back lever do not align strongly with your goals, simply do not use the supinated grip.

GERMAN HANG – LEVEL 1



Scapular Positioning: When relaxed, your scapulas will be elevated and retracted. If you activate your shoulders, they will be either depressed and neutral or slightly retracted.

Technique: When on the bar or rings, pull yourself through your arms and slowly lower into the German hang position. Ideally, your hands should be supinated the entire time.

The *German hang* is one of the fundamental positions in gymnastics. It is primarily used to extensively stretch out your shoulders for more advanced skills like the manna. It is one of the primary starting positions used to condition elbow and shoulder connective tissues for more advanced rings and bar skills. If you can become accustomed to using a supinated grip, you will benefit greatly in the long run. It is also a good stretch if your shoulders are inflexible.

Sometimes a German hang may be too much for beginner's shoulders or elbows to take. If this is the case, try performing it with a raised implement to take some of the weight, such as a box to rest your feet upon. Alternatively, if you are using rings, you can lower them so your feet are on the floor. Both of these options are effective to reduce the weight on your upper body by assisting your lower body. Slowly work your way into the full hang position without any lower-body assistance.

SKIN THE CAT – LEVEL 2

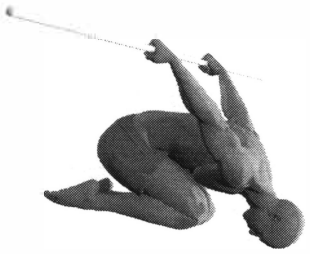


Scapular Positioning: Your scapulas will begin protracted in an inverted pike position, or depressed in an inverted hang position. They will elevate as you move into the German hang position, but will not elevate all the way if you keep your shoulders active. As you move back up to the inverted hang or inverted pike position, your scapulas will begin to depress again.

Technique: Begin on the rings or bar in an inverted pike or inverted hang position (straight-body inverted pike). Enter the German hang position by bending at your hips in a slow and controlled manner. You may need to bend your knees for more control. When you reach the bottom of the movement, relax and feel the stretch. Next, activate your shoulders and pull yourself back up to the inverted pike or inverted hang position with your legs in a pike position. You can tuck to make this easier.

Skin the Cat is a colloquial term used in gymnastics for moving in and out of the German hang. It builds flexibility and strength in your shoulders for the back lever and other upper-level movements. Adding this to the back lever progression with the German hang makes it more beginner-friendly. This movement will enable you to build flexibility and strength in your shoulders and elbows and will condition your connective tissues as you build up to the back lever and more advanced movements.

TUCK BACK LEVER – LEVEL 3



Scapular Positioning: The scapulas will begin depressed and neutral—neither protracted nor retracted. Protracting your scapulas tends to round your chest, while retracting them tends to arch your back. Both of these positions are undesirable.

Technique: Your knees should be tucked against your chest, using your abdominals and hip flexors to pull them up. As soon as your hips reach exactly shoulder level (specifically your greater trochanter—the hard bone on the outside of your hip), hold the position. If you are moving into a tuck back lever from another position, lower yourself into the position and tense your body harder to hold the position.

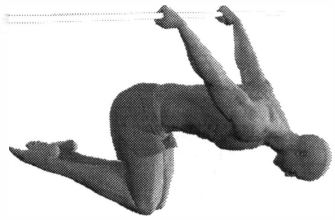
The *tuck back lever* (which can be abbreviated *Tuck BL*) is the simplest of the back lever progressions. This isometric hold can also be turned into a movement to work your muscle range of motion. You can slowly lower from an inverted hanging position into the tuck back lever position. From the inverted tuck position, begin to tense your pectorals, latissimus dorsi, and anterior shoulder. This should allow you to control your body as you allow yourself to slowly descend backward. This will also prime important muscles to stay tense during the movement for control purposes.

There are two common faults during this movement that hinder proper strength development:

1. Making the movement easier by pulling your arms in toward your body and squeezing your lats harder. This may help if you are weak starting out and cannot hold the position well. However, you will want to eliminate this habit as you improve, as it tends to retract your scapulas and cause your back to arch.
2. Allowing your chest to round forward. This contributes to a curled torso in later progressions and provides a mechanical advantage that ignores building strength properly in the first place. Additionally, this caveman-like posture is not aesthetically pleasing. Eliminate it now so you will not have to correct it down the road

If you are having issues holding the position, you can work negatives from an inverted hang to a German hang, as well as full-range movements like pulling out from the German hang position, back to an inverted hang position. Working pull-ups and rowing progressions may also ease the development of back lever isometrics. Essentially, if you are having trouble holding the static position, supplement it with dynamic work.

ADVANCED TUCK BACK LEVER – LEVEL 4



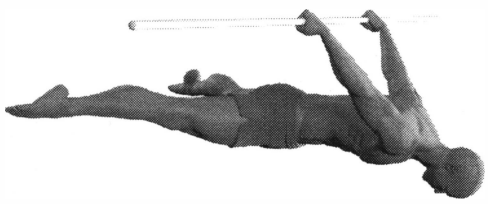
Scapular Positioning: The scapulas will begin depressed and neutral. They will not be protracted or retracted. Protracting your scapulas tends to round your chest, while retracting them tends to arch your back. Both of these positions are undesirable.

Technique: This skill is performed by contracting your back muscles to straighten out your rounded torso. For the standard tuck back lever, you pull your knees to your chest and allow your back to round. However, for the advanced tuck back lever, you need to straighten your core—from your shoulders, through your body, to your hips. Aim for a 90 degree angle made by your torso and thighs.

The *advanced tuck back lever* (which can be abbreviated *Adv. Tuck BL*) is a continuation of the advanced tuck. Since you are straightening out your torso, you will increase the difficulty by pushing your center of mass slightly farther away from your shoulders, increasing torque at your joints. If this progression becomes easy for you to hold, open your hip angle by moving your knees further away from your chest. You want to work up to hip and knee angles of ninety degrees each. The technique to perform this skill is the same as the tuck back lever. Remember to keep a supinated grip, a proud chest, and do not squeeze your hands closer to each other. The increased torque at your shoulder will put more torque at your elbow. This increased stress may lead to soreness. Fixing the issue is the same as previously described for the tuck back lever.

To make the skill slightly easier or slightly harder you can use ankle weights, or a weighted vest, or vary your thigh positioning with a straight back. This will help you regress (if you need to) or advance to reach the next level of the progression.

STRADDLE BACK LEVER – LEVEL 5



Scapular Positioning: The scapulas will begin depressed and neutral. They will not be protracted or retracted. Protracting your scapulas tends to round your chest, while retracting them tends to arch your back. Both of these positions are undesirable.

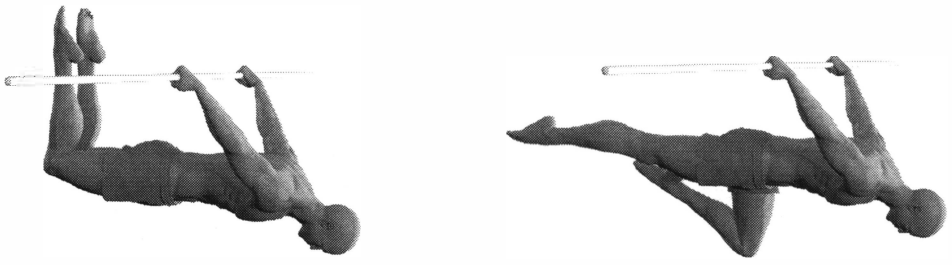
Technique: To execute this skill, you will straddle while in an inverted hang position and then lower into a back lever. Alternatively, you can lower into one of the tuck positions and then extend your body out into a straddle position. While your previous goal was to align your hips with your shoulders, you now want to facilitate alignment of your entire body—from your hips, to your knees, to your toes.

The quality of the *straddle back lever position* (which can be abbreviated *Straddle BL*) depends greatly on the quality of your straddle. By now, you should be working compression, straddle-L, and perhaps various press handstand progressions that require better flexibility.

If you have not been practicing your straddle position under stress like this, it is likely that your hip region will cramp. Tolerate as much as you can while performing the hold, until you reach the point where you are at risk of falling. The cramps will dissipate quickly as you train. (See Chapter 21 for more about muscle cramps.)

Technique remains the same as you are simply moving your center of mass further out. This will increase the torque at your shoulders, which makes the movement harder, and it will also increase the torque at your elbows, which will put more pressure on your joints. Fixing this issue is same as previously prescribed, although it may take longer with the increased stress.

HALF LAYOUT / ONE-LEG-OUT BACK LEVER – LEVEL 6



Scapular Positioning: The scapulas will begin depressed and neutral. They will not be protracted or retracted. Protracting your scapulas tends to round your chest, while retracting them tends to arch your back. Both of these positions are undesirable.

Technique: In the half layout position, all of your joints are aligned—except your knees, which are bent at a ninety-degree angle. As opposed to the straddle position, your legs are drawn in and touching one another. For the one-leg-out position, you will have one leg out and fully straight from hip to toe, while your other leg is tucked in as tightly as possibly without compromising the position of your torso. The toe of your bent leg should touch the knee of your straight leg.

Both of these positions approximate a center of mass that is further out than the straddle back lever. Depending on your body awareness you can go with one of these positions to increase difficulty before transitioning to the full back lever. The half layout position is preferred, provided you can keep good body positioning. Aligning both knees with your hips is important for maintaining good body awareness, which will come in handy in other techniques. This position is harder to maintain, though, so most beginners will use the one-leg-out position. When possible, work both to progress toward the full back lever.

Remember, increases in torque at your shoulders make the movement harder, and increased torque at your elbows will put more pressure on your joints. To address this issue, see the recommendation given in the previous back lever sections.

FULL BACK LEVER – LEVEL 7



Scapular Positioning: The scapulas will begin depressed and neutral. They will not be protracted or retracted. Protracting your scapulas tends to round your chest, while retracting them tends to arch your back. Both of these positions are undesirable.

Technique: Hold your body straight and squeeze all of your muscles in order to generate tension—especially your core, glutes, and quads. Lock your scapulas in place and pull your hands toward your hips while keeping your head in a neutral position. You may find that if you squeeze your glutes too hard, they may appear slightly arched (like in one of the images above). Try to avoid this.

Technique for the *full back lever* (which can be abbreviated *Full BL*) is just like the straddle back lever, only your legs are closed and touching. Your shoulders should line up with your hips, which should line up with your knees, which should line up with your ankles, which should line up with your pointed toes. Your body should be perfectly parallel with the ground.

At this point, the most common technique flaw is rounding your back and hunching your shoulders. Ideally, you are working out with a partner or have a camera to view this so you can self-correct. A mirror can also work if you have one available.

You have now progressed far enough to hold a static position that facilitates healthy shoulder flexibility and body awareness in a disadvantageous position. Also, you have acquired a great amount of both pulling and pressing strength. Congratulations!

This is an A-level skill in the Gymnastics Code of Points.

BACK LEVER PULLOUT – LEVEL 8



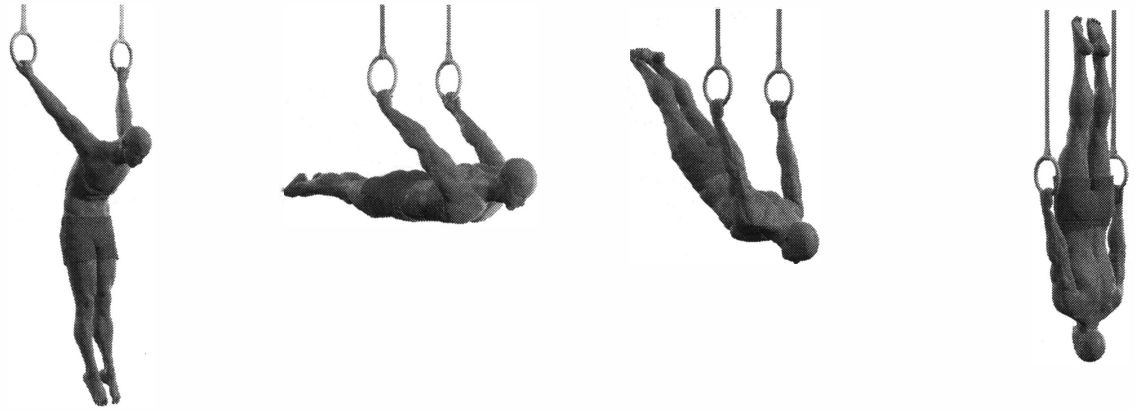
Scapular Positioning: Your scapulas will begin depressed and neutral. They will not be protracted or retracted. Protracting your scapulas tends to round your chest, while retracting them tends to arch your back. Both of these positions are undesirable. Your scapulas should stay depressed and neutral throughout the entire pull.

Technique: Begin in a straight-body back lever position by lowering into it, jumping into it, or moving into it from a German hang or from one of the previous progressions. Keep your body straight as you pull your hands toward your hips. Your feet will begin to rise toward the inverted hang position. Keep pulling until you reach that position. The technique above is shown with a neutral grip. Start with this grip and transition to a supinated grip once you get the hang of it, as the supinated grip is good for your biceps and elbow connective tissues.

You are now in a transition from holds to movements. Your muscles are strongest in eccentric movements, weaker in isometric movements, and weakest in concentric movements. Training the concentric portion of a movement after learning an isometric will require more strength of you and subsequently build more strength.

When performing a *back lever pullout* (which can be abbreviated *BL Pullout*), try not to tense all of your back muscles without doing the same for your chest and abdominals, as doing so may cause your spine to arch. You want to avoid this kind of pulling and rely solely on the strength from your pectorals, lats, and anterior shoulder to move your body. It may help to think about moving your center of mass (around your hips) above your head. Thinking about moving your toes above your head will typically cause your back to arch, so remember to move from your center of mass.

GERMAN HANG PULLOUT – LEVEL 9



Scapular Positioning: Your scapulas will begin elevated. Contract your muscles to depress them and initiate the movement. They will stay depressed and neutral throughout the entire pull.

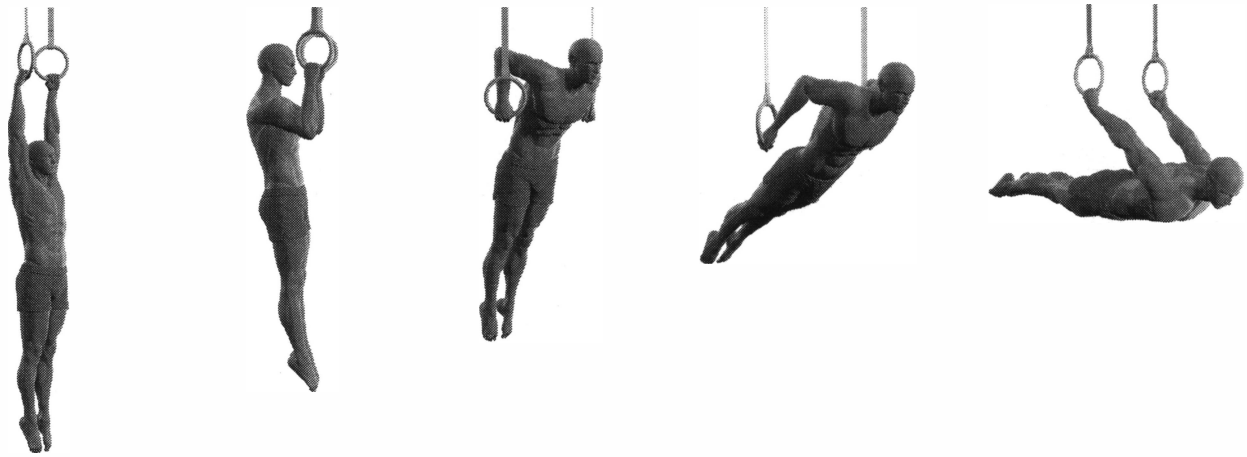
Technique: Begin in the German hang position. Next, straighten your body so that your upper back is not rounded. Keep your body straight as you pull your hands toward your hips. Your feet will begin to rise toward the inverted hang position. Keep pulling until you reach that position. The technique above is shown with a neutral grip. Start with this grip and transition to a supinated grip when you are able to, as the supinated grip is good for your biceps and elbow connective tissues.

The *German hang pullout* (which can be abbreviated *GH Pullout*) takes the back lever pullout to another level by increasing the range of motion. This skill begins from a full German hang, with your shoulders relaxed. From this point straighten your body and then initiate the strength portion of the skill. After your body is straight and rigid, use that disadvantaged shoulder angle to pull—slowly and controlled—all the way back to an inverted hang.

It is very common to use the bit of momentum from initially straightening your body to assist in accelerating the bottom portion of this movement, thus making it easier and losing strength gains. Avoid this and pull through the movement with your shoulders alone.

It may help to think about moving your center of mass (found near your hips) to above your head; thinking about moving your toes typically causes your back to arch.

BENT-ARM PULL-UP TO BACK LEVER – LEVEL 10



Scapular Positioning: Your scapulas will begin elevated, in the hang position. They will depress and retract slightly as you initiate the pull-up and begin rotating. As you complete the half muscle-up position, they want to naturally retract further. Do not allow this to happen. Once you descend to the back lever position, your scapulas will end depressed and neutral.

Technique: Begin in the hang position on the rings. Perform a pull-up and the muscle-up transition by rowing your elbows back behind you. Subsequently, lean forward and slowly extend your arms until they are straight as you move toward the back lever position.

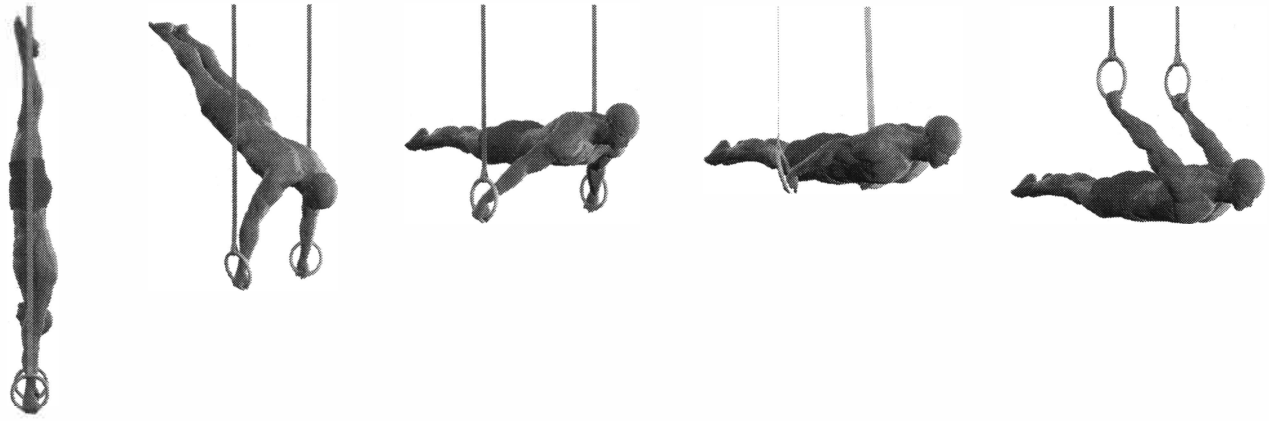
The *bent-arm pull-up to back lever* (which can be abbreviated *BA Pull-up to BL*) is slightly different from the traditional back lever progressions, however, it ends in a back lever position and is an authentic pulling skill progression that uses strengths that the back lever fosters.

First, pull up to the top position of a pull-up (elbows can be in or out; your choice). Begin leaning forward into the transition of a muscle-up. At this point, rotate your hands out and backward so that your palms face straight behind you. While you are rotating your hands, allow your feet to move backward so that your body moves closer to being parallel with the ground. From there, use your chest and lats to control the skill as your body straightens and extends into the back lever position.

This skill is not particularly difficult to comprehend or perform. The main issues that come with this skill is the level of force it places on your shoulders and elbows, especially during the rotation of the rings outward and the straightening of your arms into the back lever position. If you experience significant discomfort or pain you should avoid this skill until you have increased your level of strength or conditioned your joints and connective tissues.

This is a B-level skill in the Gymnastics Code of Points.

HANDSTAND LOWER TO BACK LEVER – LEVEL 11



Scapular Positioning: Your scapulas begin elevated, in a handstand position. As you move through the planche and maltese positions they transition to depressed and protracted. When you end in a back lever, they will be depressed and neutral.

Technique: The handstand lower to back lever begins in a rings handstand. As you lower, push your shoulders forward. You will then reach a semi-elbow lever position on the rings. From there, lower with your body parallel to the ground at rings height. Your arms should be bent while you do this. Slowly extend your arms until they are straight and you hit the back lever position. Essentially, this skill involves lowering to an elbow lever, then straight through a bent-arm maltese position (straight body, level with the rings), down into a back lever.

The *handstand lower to back lever* (which can be abbreviated as *HS Lower to BL*) is an interesting skill. It is a dual pushing/pulling skill, but it fits here with the back lever progressions.

Like the previous skill, one thing that may cause problems is the "fall." If you are not strong enough to lower slowly under control, your body will jerk when you reach the back lever position. This movement can be tough on your shoulders and elbows. If this is the case it may be a good idea to back off and focus on more on strength work, and use assistance devices or a spotter.

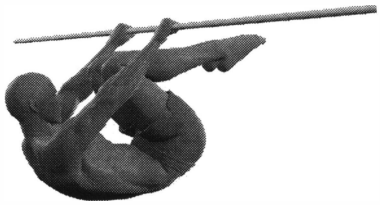
This is a B-level skill in the Gymnastics Code of Points.

Front Lever – Page 2, Column 2

The front lever is a secondary static skill. These progressions will be a bit more difficult as denoted on the strength progression charts. This is because your lats are lengthened slightly, and your pectoral muscles are in a shorter position than normal. As you know, muscles are strongest around the middle of their range of motion.

The front lever should be trained with or after the back lever. It will build a solid foundation for advanced rings strength skills. (It looks pretty cool, too.)

TUCK FRONT LEVER – LEVEL 4



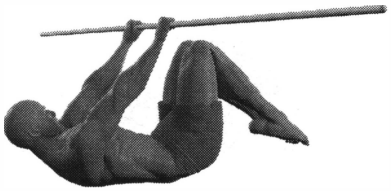
Scapular Positioning: There is often confusion with scapular positioning for the front lever. In the front lever position, your scapulas will be in a depressed and neutral position. To prevent them from being depressed and protracted you will need to pull hard until they are depressed and retracted. The result of this is that they will end in a depressed and neutral position.

Technique: Begin in a hang position and pull up into a front lever position with straight or bent arms. Level off your hips with your shoulders while your knees are tucked to your chest. Push your hands forward toward your hips to hold this position.

When performing the *tuck front lever* (which can be abbreviated *Tuck FL*), you can apply pressure from your hands with either a parallel or pronated grip. Though it is entirely a personal preference, using a pronated grip will allow you to practice on a wide variety of surfaces (bars, stairwells, doorposts, tree limbs, and the like). This will make it much easier to find a place to practice in the event that you go out of town, for example, and this can help you stay consistent in your training.

As noted in the technique section above, one of the key points is to pull your shoulder blades down and together while you apply downward pressure on the rings or bar. This creates a good "packed shoulder" position and activates all of your musculature through your torso, giving you a leverage advantage.

ADVANCED TUCK FRONT LEVER – LEVEL 5



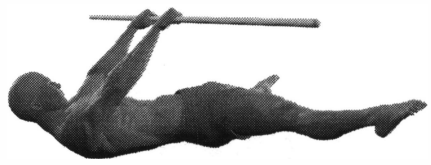
Scapular Positioning: There is often confusion with scapular positioning for the front lever. In the front lever position, your scapulas will be in a depressed and neutral position. To prevent them from being depressed and protracted you will need to pull hard until they are depressed and retracted—they will end up in a depressed and neutral position.

Technique: This is performed like a standard tuck front lever, but you straighten out your back to increase torque on your shoulders. Once you can do this efficiently, move your knees off of your chest and get them out to a ninety-degree angle at your hips, and eventually a ninety-degree angle at your knees as well. This is the same torso position that you will use for the front lever.

The next progression is the *advanced tuck front lever* (which can be abbreviated *Adv. Tuck FL*). If you are not strong enough to perform this yet, you can use eccentric exercises or concentric pullouts with the previous movements to help build enough strength for this isometric. (This will probably be unnecessary.) The pull is similar to the feeling of trying to force the bar to your hips or knees with your hands. Remember to squeeze your scapulas together while performing this movement.

Specific scapular work may be beneficial, however. You can hang from a bar or rings and shrug your shoulders up and down to work scapular depression. Likewise, *scapular pulls* are an exercise where you perform the shrugging motion and then try to tilt your chest toward the ceiling. These can be effective for strengthening your scapulas for the front lever positions.

STRADDLE FRONT LEVER – LEVEL 6



Scapular Positioning: There is often confusion with scapular positioning for the front lever. In the front lever position, your scapulas will be in a depressed and neutral position. However, to prevent them from being depressed and protracted you will need to pull hard until they are depressed and retracted. The result of this effort is that they will end in a depressed and neutral position.

Technique: This skill is performed by straddling your legs as far apart as possible, and then aligning your shoulder joint with your hip joint, knees and ankles while you keep your back straight. Your body will appear straight from the side. Beginners may find that their torso rounds – a position that makes the hold wrong. You must keep your torso flat. If this increases the difficulty too much, work on eccentrics or concentric pullouts from the previous progression in order to move up to this skill.

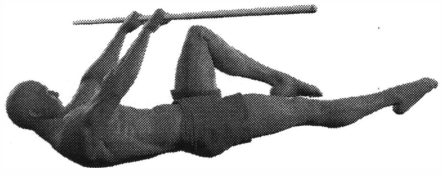
Proficiency with the *straddle front lever* (which can be abbreviated *Straddle FL*) depends a lot on how well you can perform the straddle. If you have not yet begun to work compression and the straddle L-sit, start them now. If you have not been practicing a straddle position under stress, it is likely that you will experience cramping in your hip region. Tolerate the cramps as best as possible while performing the hold. They are a terrible annoyance and you might curse the world, but stick with it and get back up into the position. The cramps will dissipate as you continue training.

Key weaknesses seen in people trying to progress beyond advanced tuck front lever are usually not found in their primary muscles (the pectorals and lats). Instead, problems arise from their stabilizers in the posterior shoulder and scapulas. If these muscles are weak, as they typically are, they can limit force output at the shoulders. The body will inhibit force production if it deems that extra force will cause a joint to become unstable.

Specific attention to the back of the shoulder is usually needed to solve this issue (and in any event, it helps keep your shoulders healthy). Manna progressions are a wonderful training tool, as they strengthen the musculature in your posterior shoulder and train compression, both of which are needed for the straddle front lever and many other movements/holds as well. If you have started working toward the manna but have not paid much attention to it, or have not started yet, take a step back on front lever work and focus on the manna.

HALF LAYOUT / ONE-LEG-OUT FRONT LEVER – LEVEL 7





Scapular Positioning: There is often confusion with scapular positioning for the front lever. In the front lever position, your scapulas will be in a depressed and neutral position. However, to prevent them from being depressed and protracted you will need to pull hard until they are depressed and retracted. The result of this effort is that they will end in a depressed and neutral position.

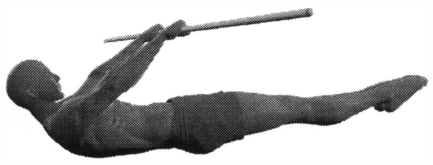
Technique: In the half layout position, all of your joints are aligned—with the exception of your knees, which are bent at a ninety-degree angle. As opposed to the straddle position, your legs are drawn in and touching one another. For the one-leg-out position, you will have one leg out and fully straight from hip to toe, while your other leg is tucked in as tightly as possibly without compromising the position of your torso. The toe of your bent leg usually touches the knee of your straight leg.

Both of these positions push your center of mass farther out than the straddle back lever, so depending on your body awareness, you can go with one of these positions to increase difficulty before transitioning to the full front lever.

The half layout position is preferred provided you can keep good body positioning, since aligning both knees with your hips is important to maintaining good body awareness and will come in handy in other techniques. This position is harder to maintain, so most will use the one-leg-out position. When possible, work both to prepare for the full front lever.

The most common technique flaws in this position are the same ones you will encounter with the straddle front lever—sagging or bent hips, a rounded chest, or weakness in the back near your scapulas. Target the areas where you are weak in order to progress to the next level in your training.

FULL FRONT LEVER – LEVEL 8



Scapular Positioning: There is often confusion with scapular positioning for the front lever. In the front lever position, your scapulas will be in a depressed and neutral position. However, to prevent them from being depressed and protracted you will need to pull hard until they are depressed and retracted. The result of this effort is that they will end in a depressed and neutral position.

Technique: This hold requires a straight body from shoulders to torso to hips to knees to ankles and to toes (which should be pointed). It is important to get full-body tension before sliding into this skill, as it will help make this hold easier and more consistent.

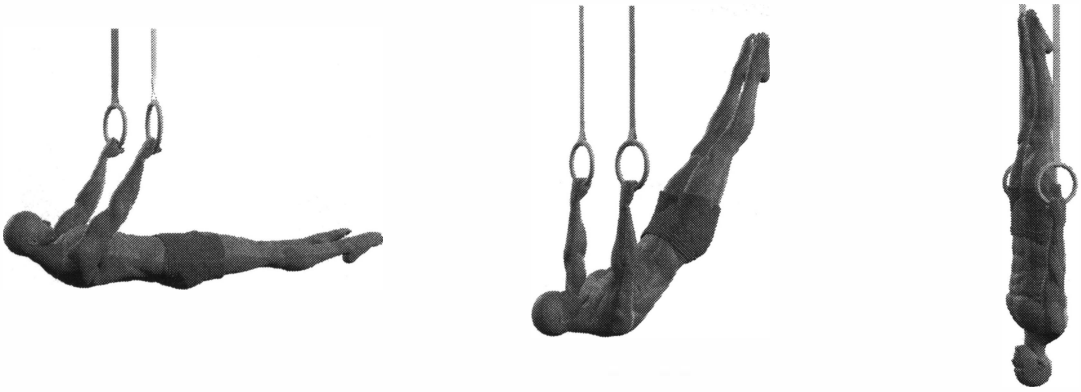
Like the previous progressions, the most common technique flaw when performing the *full front lever* (which can be abbreviated *Full FL*) is rounding your back—including your shoulders—to unknowingly obtain mechanical advantages. Ideally, a partner or camera can provide insight so you can improve your form, but a mirror is also a viable option. Here are some other tips that may be valuable:

- Consider utilizing eccentric movements. For example, inverted hang slow eccentrics to front lever or hang position can build strength for the front lever.
- Front lever responds particularly well to supplementary posterior shoulder strengthening, as well as a wide combination of overall strengthening. This may include specific scapular and rotator cuff work.
- Front lever pull-ups are another good supplementary exercise.
- Very heavy deadlifts work the front lever movement fairly well. Pinning the bar into your shins while you are rising up from the start of the deadlift translates very well. Very strong athletes from other sports have been able to perform a front lever without any practice at all.
- Dragon flags may help if you have particular torso or core weakness. It can help improve shoulder strength to keep your arms straight while performing dragon flags.

Unlike the front lever, there are many different exercises that help develop the full front lever, so you can approach it from many different pathways and be successful.

This is an A-level skill in the Gymnastics Code of Points.

FRONT LEVER PULL TO INVERTED HANG – LEVEL 9



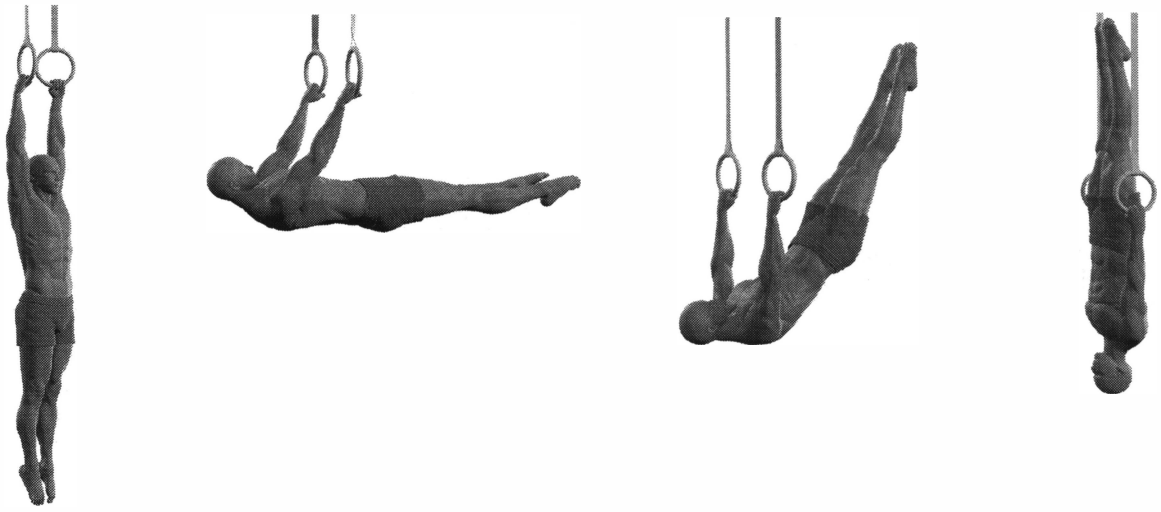
Scapular Positioning: There is often confusion with scapular positioning for the front lever. In the front lever position, your scapulas will be in a depressed and neutral position. However, to prevent them from being depressed and protracted you will need to pull hard until they are depressed and retracted. The result of this effort is that they will end in a depressed and neutral position. As you move into the inverted hang position, your scapulas should stay neutral and depressed the entire time; only your shoulder should move.

Technique: Begin in a front lever position. Squeeze your entire body tightly, especially your core, glutes, and legs. Then, pull your hands toward your hips as hard as you can while maintaining straight-body positioning. End in an inverted hang position.

Contrary to the back lever, the difficulty with the *front lever pull to inverted hang* (which can be abbreviated *FL to Inv.*) lies in trying to overcome the tendency to tense the muscles on the front of your body. This will round the torso and close your hip angle. You want to avoid this type of pulling and rely solely on the strength from your pectorals, lats, and posterior shoulder to move your body.

Working this movement in conjunction with the eccentrics can help you bridge the gap even after you have obtained the front lever isometric itself. Work the movement in reverse with the eccentric and you will eventually get strong in the concentric portion. Other tips from the front lever section will also be effective.

HANG PULL TO INVERTED HANG – LEVEL 10



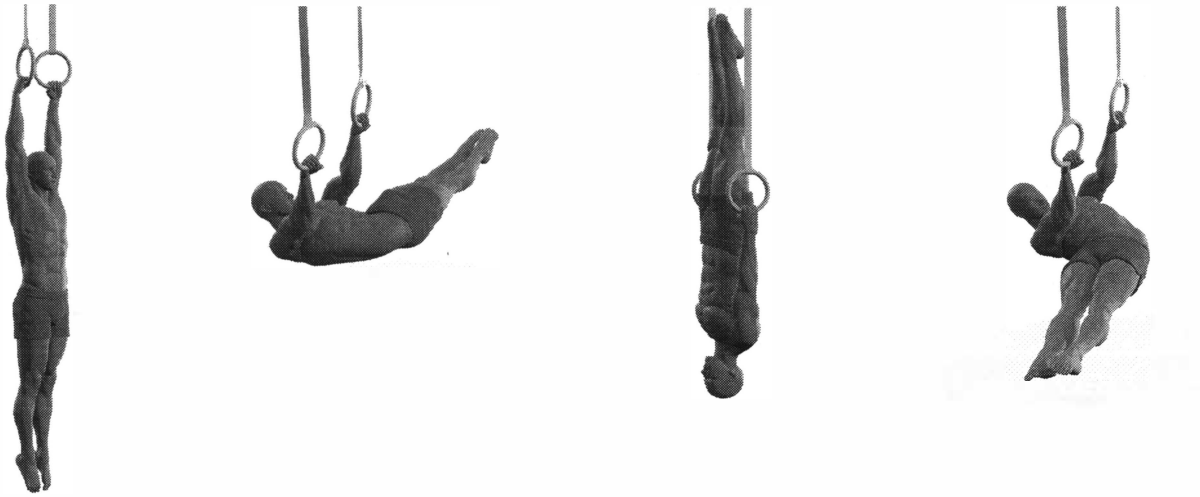
Scapular Positioning: Begin in a hang position, with your scapulas elevated. Then, depress your scapulas to activate your shoulder. As you begin to ascend to the front lever and inverted hang positions, focus on keeping your scapulas depressed and strongly retracted. It is likely that they will look depressed and neutral because of the pull, which is fine.

Technique: Begin in a hang position. Squeeze your entire body tightly, especially your core, glutes, and legs. Then, pull your hands toward your hips as hard as you can while maintaining straight-body positioning. End in an inverted hang position.

It is very tempting to use the bit of momentum from the initiation of the *hang pull to inverted hang* (which can be abbreviated *Hang Pull to Inv.*) to assist you in accelerating out of the bottom of the movement. You can do this at first if needed, but work toward phasing it out. Your goal is to strengthen your shoulder muscles to the point where you do not need momentum.

Scapular pulls are extremely useful when training this exercises because they focus on pulling with your shoulders in the correct position. The movement is typically limited by a lack of scapular strength, so address this area of weakness if you are having trouble performing this movement without momentum.

CIRCLE FRONT LEVERS – LEVEL 11



Scapular Positioning: Begin in a hang position, with your scapulas elevated. Then, depress your scapulas to activate your shoulder. As you begin to ascend to the front lever and inverted hang positions, focus on keeping your scapulas depressed and strongly retracted. It is likely that they will look depressed and neutral because of the pull, which is fine.

Technique: Begin in a hang position and imagine a human-sized clock in front of you. Your feet will act as the hands on this clock. Keeping your body aligned in the same plane as your arms, pull your legs to one side. If doing the left side, move your feet with a straight body to the 7:00 position. Continue to 8:00, 9:00, 10:00, 11:00 and finally the inverted position at 12:00. Next, lower all the way to 6:00 in a slow and controlled manner. Make sure to perform both sides of the clock for balanced development.

As a potential intermediate step before working *circle front levers* (which can be abbreviated *Circle FLs*), you can move side to side in the front lever position. This may be more accessible than a circular motion at first. Essentially, you will draw a horizontal line across the horizon with your feet.

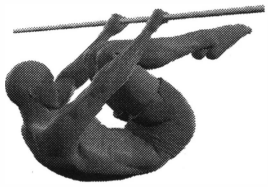
Overall, this movement is most useful as a further progression past the full front lever hang to inverted hang pull. At that point, your body cannot be straightened any further to decrease leverage, and a full movement is already possible, so this is the next feasible way to increase the challenge factor. While it can be done with a lower level progression, it is unnecessary at those levels.

As you improve at these, you can go out wider to the sides. Alternatively, a weight vest or ankle weights may be used to increase difficulty.

Front Lever Rows – Page 2, Column 3

Front lever rows are a favorite horizontal pulling exercise and are highly recommended to keep your shoulders balanced. Performed in combination with the L-sit/V-sit/manna progression (and potentially adding in a horizontal rowing exercise), this movement will easily keep your shoulders well balanced.

TUCK FRONT LEVER ROWS – LEVEL 5





Scapular Positioning: Begin in a tuck front lever position, with your scapulas depressed and neutral. You will have to retract them in order to keep them in a neutral position. As you pull your hips toward the bar, keep your scapulas depressed and retract them further, moving all the way to the fully retracted position. As you lower back down to the starting position, keep your scapulas fully depressed but allow them to protract back to a neutral position.

Technique: The tuck front lever row starting position is identical to the tuck front lever static position. Align your hips with your shoulders and keep them parallel to the ground. In the tuck position, your torso will be rounded and your knees will be tucked to your chest. Continue to keep your hips and shoulders aligned and parallel to the ground as you initiate the pull. Drive your elbows down until the bar reaches your shins, then return to the start position in a controlled manner.

When performing *tuck front lever rows* (which can be abbreviated *Tuck FL Pull*), your range of motion will be short because your shins will hit the bar. You can avoid this by performing this movement on parallel bars instead. Do not fall victim to the most common mistake: dropping your hips. Be extra sure to keep your shoulders and hips in a straight line, and that line parallel with the ground. The second most common mistake is allowing your shoulders to protract all the way, which generally signals weakness in your scapular retractors. This happens to almost everyone, but specific scapular retraction placed at the end of your routine when working this progression can help.

Some people will tell you to think about the pulling motion as pulling your hands toward your hips—or, in this progression, to your shins. The elbows analogy is preferred because the common fault is to allow your hips to drop and your torso to become more upright. Thinking about your elbows forces your torso to stay parallel to the ground. It is an easy way to stay on track to performing the technique correctly.

ADVANCED TUCK FRONT LEVER ROWS – LEVEL 6



Scapular Positioning: Begin in an advanced tuck front lever position, with your scapulas depressed and neutral. You will have to retract them in order to keep them in a neutral position. As you pull your hips toward the bar, keep your scapulas depressed and retract them further, moving all the way to the fully retracted position. As you lower back down to the starting position, keep your scapulas fully depressed but allow them to protract back to a neutral position.

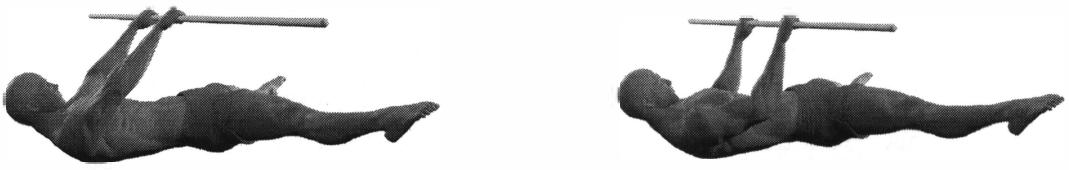
Technique: Begin in an advanced tuck front lever position. Align your hips with your shoulders and keep them parallel to the ground. In the advanced tuck position, your torso will be straight and your hips bent at a ninety-degree angle. From there, continue to keep your hips and shoulders aligned and parallel to the ground as you initiate the pull. Drive your elbows down until the bar reaches your hips, and then return to the start position in a controlled manner.

The *advanced tuck front lever rows* (which can be abbreviated *Adv Tuck FL Pull*) progression affords a greater range of motion than the previous tuck front lever row progression because your shins are not in the way of the pull. This means that you may be on this progression longer. As you get stronger you will continue to increase your range of motion in this skill. Attempt ultimately to bring the bar to your stomach.

When you start this progression, it is common to have difficulty getting to or maintaining full range of motion. If you find yourself stalling out a couple inches from the bar, it is likely due to a lack of strength—either because of weak scapular muscles or weak biceps. If you have issues with maintaining the height of your hips, this is a problem with maintaining consistent pull toward your hips with your hands during the entire movement.

As you progress, you will slowly improve your ability to pull higher and more consistently over sets. Continue to work on this. Pull explosively using a 10x0 tempo. If you need specific scapular, back, or biceps work to supplement the rows, add some near the end of your workouts.

STRADDLE FRONT LEVER ROWS – LEVEL 8



Scapular Positioning: Begin in a straddle front lever position, with your scapulas depressed and neutral. You will have to retract them in order to keep them in a neutral position. As you pull your hips toward the bar, keep your scapulas depressed and retract them further, moving all the way to the fully retracted position. As you lower back down to the starting position, keep your scapulas fully depressed but allow them to protract back to a neutral position.

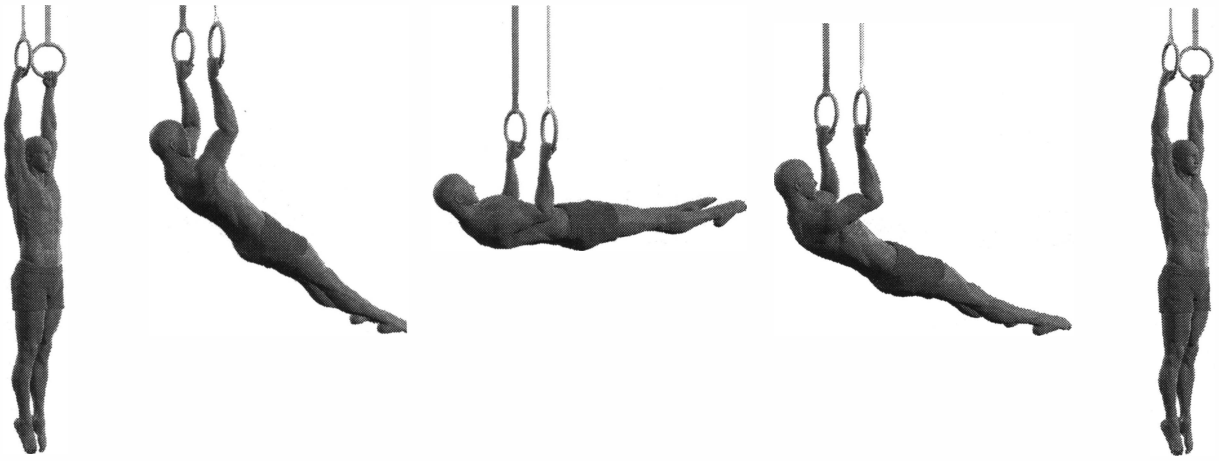
Technique: Begin in a straddle tuck front lever position. Align your hips with your shoulders and keep them parallel to the ground. In the straddle position, your shoulders will be in line with your hips and knees, but your legs will be spread apart. Keep your hips and shoulders aligned and parallel to the ground as you initiate the pull. Drive your elbows down until the bar reaches your hips, and then return to the start position in a controlled manner.

There are two common faults when attempting *straddle front lever rows* (which can be abbreviated *Straddle FL Pull*). The first is rounding your back during execution of the skill. The second is not keeping your legs in line with your body. Instead of a straight line, your body becomes more of a curved shape, like a C.

Additional core compression or L-Sit/V-Sit/manna progression work may be needed to strengthen your abdominals if your legs cannot be held out parallel to the ground with your torso. If proper work has been established previously, this should not be a problem.

Range of motion to the hips can be very difficult with this movement. Even when you become very strong you may have trouble performing this exercise with your hands to your hips. Work up to the point where you can perform at least a couple repetitions with your hands to your hips, with your hands coming within a couple of inches from your hips for the remainder of the repetitions. Continue working your scapular retractors and back muscles to become stronger.

HANG TO FRONT LEVER ROW – LEVEL 9



Scapular Positioning: Begin with your scapulas relaxed and elevated. Initiate the movement by depressing your scapulas. As your body comes up to the horizontal position, keep them depressed while retracting them. Then, as you move back down into the hang position, allow them to protract to neutral. Relax your scapulas at the bottom of the position before allowing them to elevate.

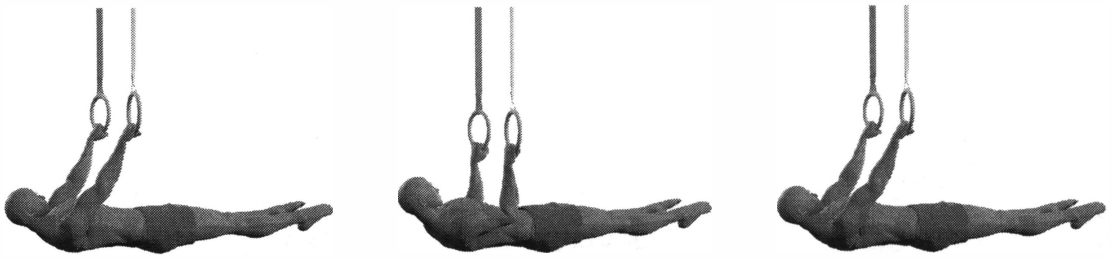
Technique: From a hang position, rotate your toes and hips forward as you bend your arms to lift your body up toward the rings. Continue leaning back while you bring your hands to your hips to hit the parallel position. Repeat these steps in reverse and under control to return to the hang position.

To perform the *hang to front lever row* (which can be abbreviated *Hang to FL Row*), begin from the hang position and perform a pull-up while simultaneously moving your body into the full front lever row position, ending with bent arms and your hands near your hips. Once you have pulled as far as possible, lower back to the point where you have the hang under control.

Normally, you want to avoid the use of momentum in any of your movements; however, this is one of a few exceptions. In the full or near-full front lever, pulling as it has been done in the previous progressions has very little range of motion. This approach allows more power and range of motion to be used, leading to a higher ending position than would be possible without momentum and an overall stronger back.

This approach is preferred over the half lay or one-leg-bent front lever row progression because of the multiple planes of movement it uses. It builds a greater awareness for hitting a good front lever row ending position, and it gets your posterior shoulder extensively involved in strength building.

FULL FRONT LEVER ROWS – LEVEL 10



Scapular Positioning: Begin in a front lever position, with your scapulas depressed and neutral. You will have to retract them in order to keep them in a neutral position. As you pull your hips toward the bar, keep your scapulas depressed and retract them further, moving all the way to the fully retracted position. As you lower back down to the starting position, keep your scapulas fully depressed but allow them to protract back to a neutral position.

Technique: Begin in a front lever position. Align your hips with your shoulders and keep them parallel to the ground. In the full front lever position, your shoulders will be in line with your hips and knees. From there, continue to keep your hips and shoulders aligned and parallel to the ground as you initiate the pull. Drive your elbows down until the bar reaches your hips, and then return to the start position in a controlled manner.

While performing *full front lever rows* (which can be abbreviated *Full FL Pull*), bend your torso or hollow your chest up toward the bar. You can eliminate this as you get stronger and more proficient in the movement, but it is to be expected for beginners. Your range of motion may not be that great—perhaps six to eight inches at best. However, if you have the strength to hold the isometric front lever position long enough, doing pulls in this position can act as a next-step-up.

Continue to progress the range of motion as much as possible. Alternatively, you can begin working this entire progression with a weighted vest, or move on to higher-level strength progressions.

ROPE CLIMB FRONT LEVER ROWS

Rope climbs are a very good exercise for building grip strength and facilitating the development of overall pulling strength. They very well could have their own category on the charts but as most bodyweight enthusiasts are likely going to be training from home, and acquiring a rope and finding a good place to put it can be tough, these exercises were folded into the *front lever rows* progression, which is one of many core exercises for horizontal pulling. If you do have access to a rope at a gymnastics gym, CrossFit gym, or any other facility that has ropes for use, adding in rope climbing in your strength and conditioning training is highly recommended, and more important for developing overall posterior shoulder girdle strength than every exercise aside from the *L-sit → manna* progression. (The *rowing to one-arm row* progression is a close third.)

The rope climb progression interweaves very well with the front levers, as your hands are moved inward and additional grip strength is required. Just as the front lever row is one level of difficulty harder than the front lever isometrics by one progression, the rope climbing front lever row progression is one level of difficulty harder than the *PB/SR front lever row* progression.

One the chart, since there is not enough space for the tuck front lever row, only the advanced tuck, straddle, and full front lever row progressions are included.

Fortunately, the technique for the rope climb front lever row progressions are the same as their counterparts. The only difference is the position of the rope. The rope will typically be pulled from in front and will move off to the side of your body instead of going through your legs. (If you try it through your legs you may cause some very unpleasant sensations in your groin.)

Here are the approximate difficulty levels for the progressions:

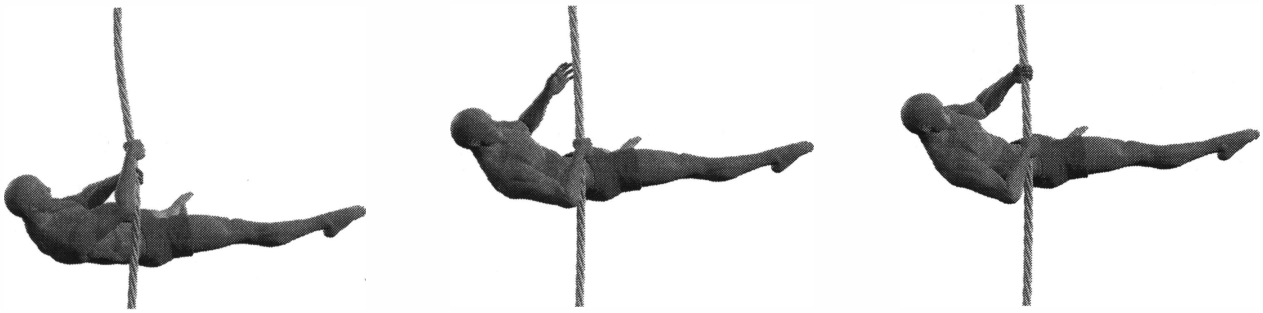
Tuck Front Lever Row Rope Climb – Level 6

Not shown.

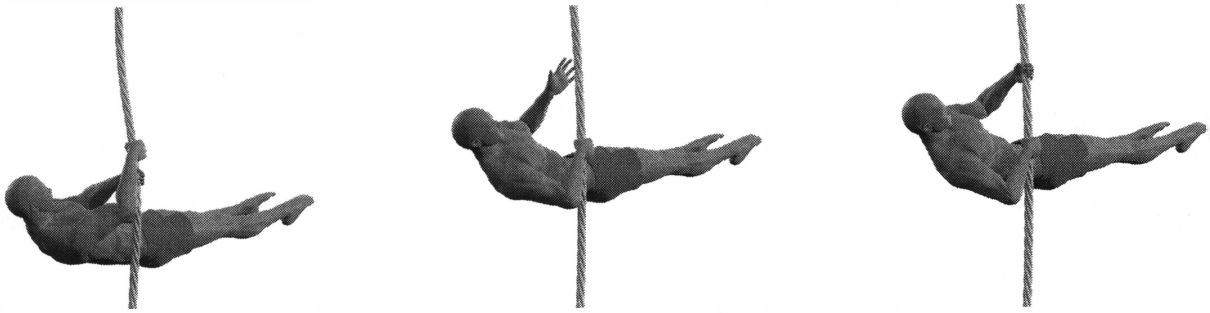
Advanced Tuck Front Lever Row Rope Climb – Level 7



Straddle Front Lever Row Rope Climb – Level 9



Full Front Lever Row Rope Climb – Level 11

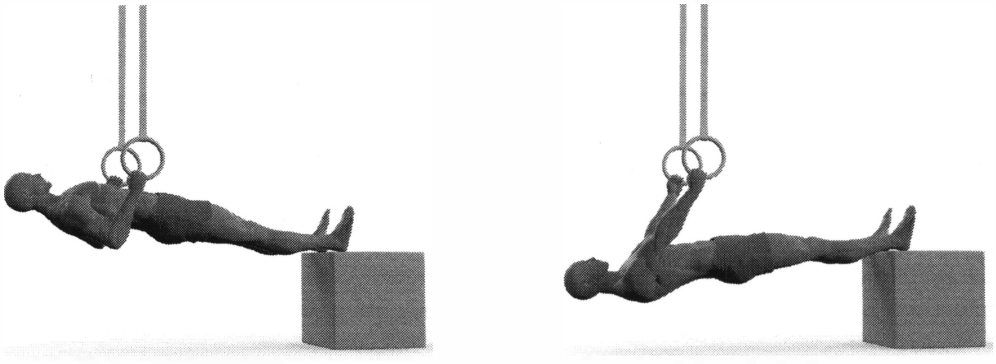


Rowing – Page 2, Column 4

Rowing progressions are useful when your ability is at a lower level. Rowing can easily build pulling strength and maintain balance within your shoulder girdle. They are wonderful for increasing strength until the front lever and manna progressions are built up. Plus: horizontal pulling is essential to keep your shoulders healthy.

Important Note: Those with any type of imbalance should focus on the upper portion of the row, where you are pulling your hands to your body. If you have weakness in the back of your shoulder, it is a good idea to hold the top of the position for five to ten seconds in order to stimulate your posterior deltoids, rhomboids, external rotators, traps and make them stronger.

RING ROW ECCENTRICS – LEVEL 1



Scapular Positioning: Begin in the top portion of the row position, with your scapulas retracted and depressed. As you slowly lower to the bottom of the row position, allow your scapulas to protract fully.

Technique: Begin in the top portion of the row position and slowly lower to the bottom of the position.

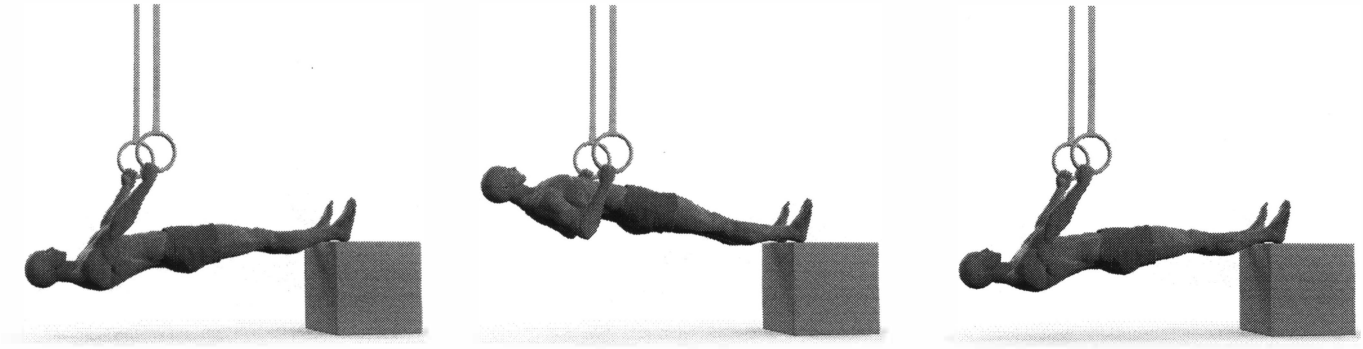
This is the beginning of the rowing progressions. Most beginners will be able to start with ring row eccentrics. If you are having trouble, here are some ways to make the movement easier:

- Instead of positioning your body parallel with the ground, stand more upright and have your feet on the ground. Raise the rings or bar and remove the block from your feet if needed.
- Perform ring row eccentrics in a position with a straddle or bent legs, or from the hips. This will take weight off your arms, which will make the movement easier.
- Put a band through the rings or bar and underneath your back.
- Have another person assist you through the movement.

Some people will have issues maintaining a good range of motion at the top of the movement, or starting the movement from the bottom at level two. Specific scapular retraction work can be worked in these positions with straight arms by focusing on pulling the shoulder blades together. You could also add specific band or other scapular retraction or biceps isolation work at the end of your routine.

Rows tend to respond well to four or five sets. If you are not progressing well, add additional sets to your routine.

RING ROWS – LEVEL 2



Scapular Positioning: Begin at the bottom position, with your shoulders relaxed in a protracted position. Initiate the movement by retracting and depressing your scapulas and end the movement with fully retracted scapulas.

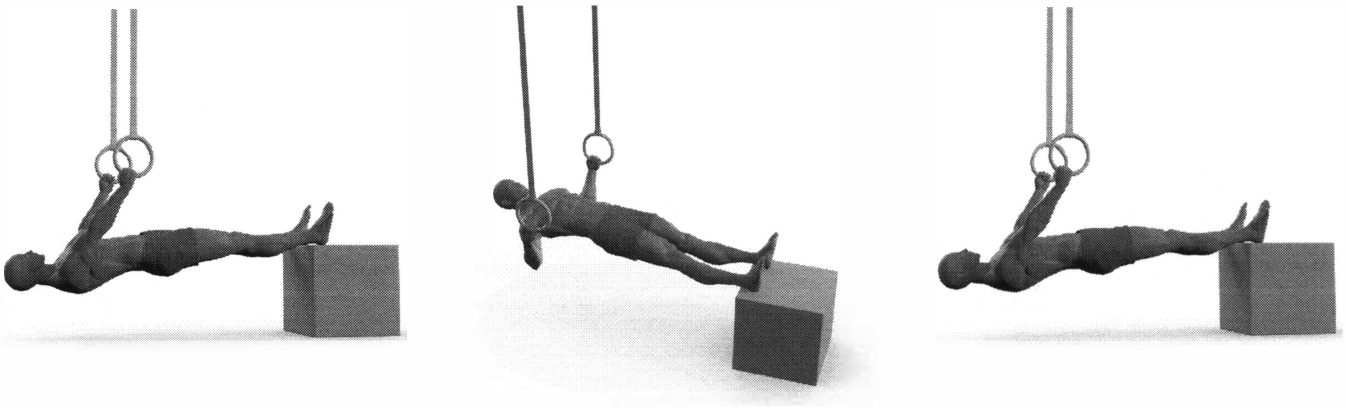
Technique: *Ring rows* are performed by hanging from the rings and elevating your feet to shoulder height while your body is held straight or slightly hollow. Keep your elbows either next to your sides and tight or within a thirty-degree angle (or less) of your armpit. During the movement, pull the rings to your body. Aim to get the rings to chest-level at the top position of the movement.

Your scapulas can retract and depress either at the start of this movement or across the total movement. Beginners are advised to retract and depress them at the start of the movement to have them act as a stable base throughout the movement and help you perform it better. However, as you get more comfortable performing ring rows you can begin to do it unconsciously, which will lead to movement of the scapulas across the total movement.

If you are having trouble with scapular strength in this movement, try holding the top position of the movement for a few seconds between repetitions. Perform this hold with your scapulas maximally contracted and depressed. This will work your scapular retractors, which should improve your strength overall.

The most common fault during this skill is to let your body sag from the straight-body position into a hollow or saggy C-shaped position. Focus on squeezing your glutes and core to keep your body straight and perform the movement with your arms alone.

WIDE RING ROWS – LEVEL 3



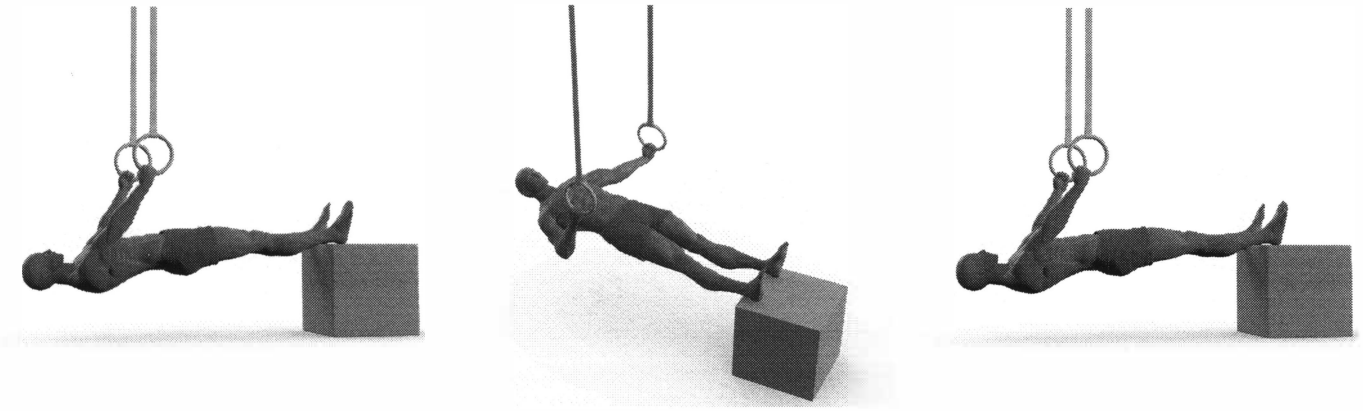
Scapular Positioning: Begin at the bottom position with your shoulders relaxed in a protracted position. Initiate the movement by retracting and depressing your scapulas and end the movement with fully retracted scapulas and your arms wide.

Technique: *Wide rings rows* are performed by hanging from the rings and elevating your feet to shoulder height while your body is held straight or slightly hollow. From this position, allow your elbows to move wide to a sixty to ninety degree angle with your torso. Sixty degrees (shown in the images above) is the easiest, but you can work your way up to ninety degrees as you become more proficient with the skill. During the movement, allow your hands to drift away from your body and aim to pull your elbows in line with your body, preferably behind you to bring your torso to hand-height.

The most common fault during this skill is again to let your body sag from the straight-body position into a hollow or saggy C-shaped position. Focus on squeezing your glutes and core to keep your body straight and perform the movement with your arms alone.

If the posterior part of your shoulder is particularly weak, wide ring rows (if you are able to perform them) will pull your elbows out significantly. This will target your posterior deltoids better than the hands-in variation.

ARCHER RING ROWS – LEVEL 4



Scapular Positioning: Begin at the bottom position, with your shoulders relaxed in a protracted position. Initiate the movement by retracting and depressing your scapulas and end the movement with fully retracted scapulas. Even though your arms are performing different motions, your scapular positioning will be the same for both arms.

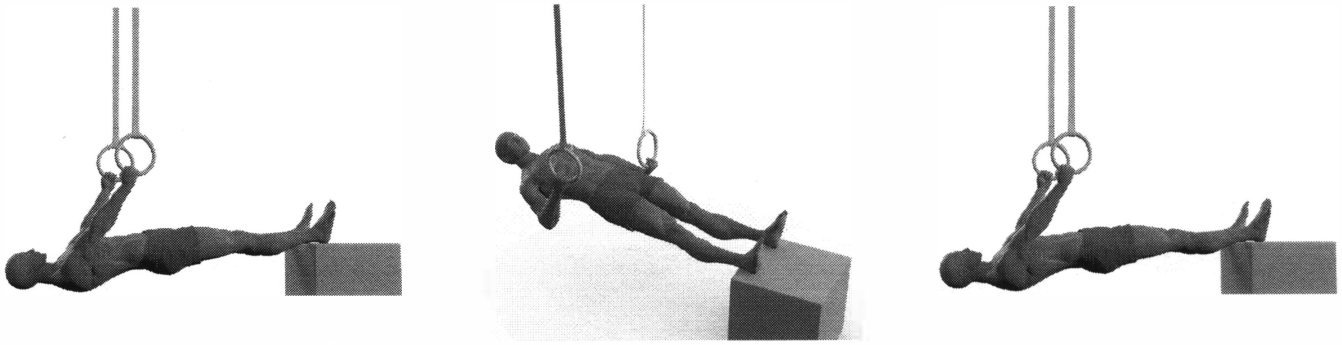
Technique: *Archer rings rows* are performed by hanging from the rings and elevating your feet to shoulder-height while holding your body straight. From this position, pick one arm to bend and one arm to hold straight. Your bent arm will be pulled either in or out with your elbow so it becomes level with your body. (Pulling it in closer to your body better relates to FL rows.) Your straight arm should be pulled out in a ninety-degree angle with your body, such as in a reverse fly exercise so your scapula retracts and your arm ends level with your body. From this point, lower in a controlled manner and repeat the movement with your other arm.

Once again, the common fault during this skill is to let your body sag from the straight-body position into a hollow or saggy C-shaped position. Focus on squeezing your glutes and core to keep your body straight and perform the movement with your arms alone.

Some people have a lot of difficulty progressing to the archer ring rows from wide ring rows. This is usually due to scapular weakness, as your straight arm only pulls with the posterior shoulder muscles and scapular muscles. Weaknesses there will manifest in an inability to pull high, if at all. To counteract this, some of the same concepts that applied to ring row eccentrics can help you bridge the gap:

- Perform wide ring rows to the top of the movement and then perform a straddle archer row eccentric to the bottom of the movement. This combines the two movements, so you are able to work the eccentric portion partially. If you choose this, your eccentrics should be at least five seconds.
- Instead of positioning your body parallel with the ground, stand more upright and have your feet on the ground. Raise the rings or bar and remove the block from your feet if needed.
- Perform ring row eccentrics in a position with a straddle or bent legs, or from the hips. This will take weight off your arms, which will make the movement easier.
- Put a band through the rings or bar and underneath your back.
- Have another person assist you through the movement.

ARCHER-ARM-IN RING ROWS – LEVEL 5

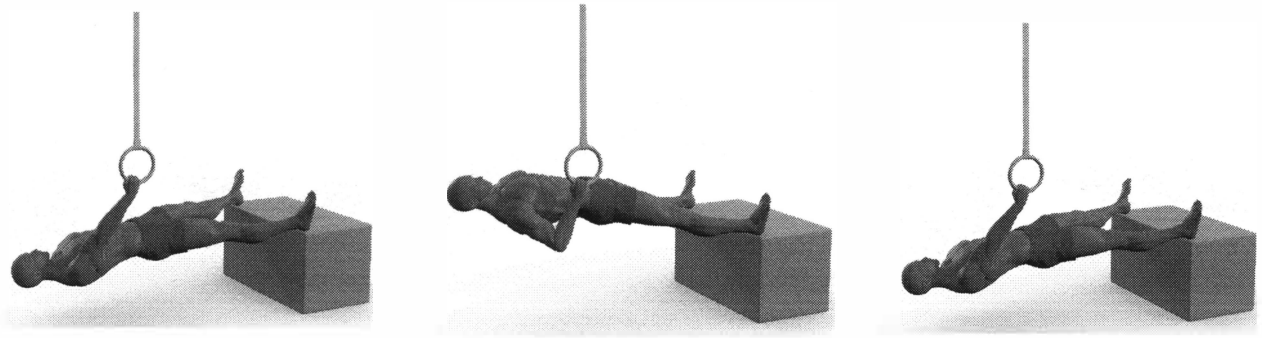


Scapular Positioning: Begin at the bottom position, with your shoulders relaxed in a protracted position. Initiate the movement by retracting and depressing your scapulas and end the movement with fully retracted scapulas. Even though your arms are performing different motions, your scapular positioning will be the same for both arms.

Technique: *Archer-arm-in ring rows* are performed by hanging from the rings and elevating your feet to shoulder-height while holding your body straight. From this position, pick one arm to bend and one arm to hold straight. Your bent arm will be pulled either in or out with your elbow so it becomes level with your body. (Pulling it in closer to your body better relates to *FL rows*.) Your straight arm should be pulled in line with your body, which will cause it to end at your side. From this point, lower in a controlled manner and repeat the movement with your other arm.

This movement helps you build more posterior shoulder strength in your straight arm so that you can more easily move to one-arm rows. Since you can assist less with your straight arm at that angle, it makes your bending arm pick up more of the work. This is a pretty solid bridge between archer ring rows and the straddle one-arm row progression. *This "in" position will also help strongly work your posterior shoulder, which will be beneficial to stave off any shoulder imbalances.*

STRADDLE ONE-ARM ROWS – LEVEL 6



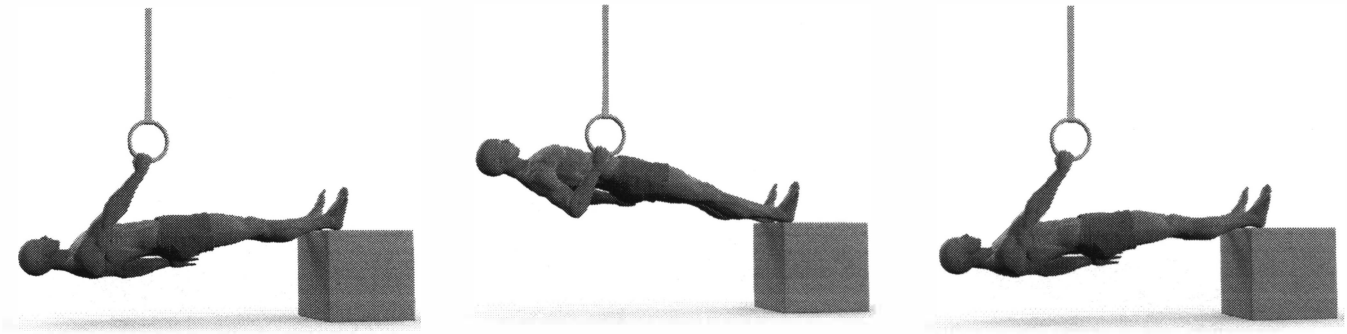
Scapular Positioning: Begin at the bottom position, with your shoulders relaxed in a protracted position. Initiate the movement by retracting and depressing your scapulas and end the movement with fully retracted scapulas.

Technique: *Straddle one-arm rows* are performed by gripping a ring with one arm and putting your feet on a block in the straddle position. Your feet should be at shoulder-height. Keep your body straight by maintaining a tight core and hips. With straight-body positioning and one arm on a ring, pull while keeping your elbow in so that your hand comes as close to your body as possible. You will probably not be strong enough to pull all the way to your body with one arm, but get as close as possible. To "finish" this movement it is also possible to go one step further and rotate your body in toward your pulling arm so that your opposite shoulder touches the ring or bar.

When performing single-arm or single-leg movements like *straddle one-arm rows* (which can be abbreviated *Str OA rows*), always begin with your weak arm during sets. You can either perform alternated repetitions (where you trade off repetitions to the opposite arm every one) or full sets first before switching. As long as you work your weak arm first to equalize your strength, both are good options. You should always limit the number of repetitions on your strong arm to what your weak arm can handle.

While performing the one-arm row portion of this movement, you may notice a torque or twisting feeling. This is a common issue, and should be fought. Typically, it will manifest as a lot of pressure in the arm that is doing the work, as well as the opposite foot. Your body may want to rotate, twist, or move out of alignment, but you must tense up your core and hip muscles to stop it.

ONE-ARM ROWS – LEVEL 7



Scapular Positioning: Begin at the bottom position, with your shoulders relaxed in a protracted position. Initiate the movement by retracting and depressing your scapulas and end the movement with fully retracted scapulas.

Technique: *One-arm rows* are performed by gripping a ring with one arm and putting your feet up on a block with your legs together. Your feet should be at shoulder-height. Keep your body straight by maintaining a tight core and hips. Pull while keeping your elbow in so that your hand comes as close to your body as possible. You will probably not be strong enough to pull all the way to your body with one arm, but get as close as possible. To "finish" this movement, go one step further and rotate your body toward your pulling arm so that your opposite shoulder touches the ring or bar.

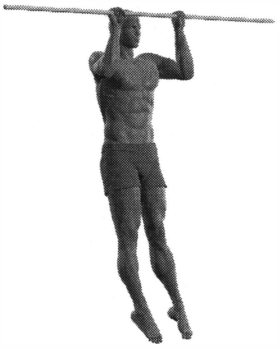
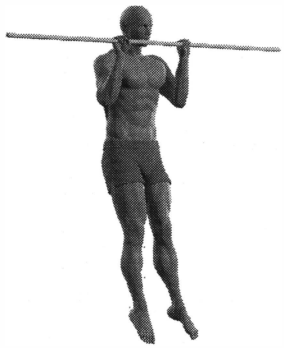
The torque or twisting feeling from the previous progression (*straddle one-arm rows*) will be much more prevalent when performing one-arm rows. Fight against it in the same manner as advised in the previous progression.

This is the final progression in this series. Once you reach this level of strength, move to the previous series of progressions (*front lever rows*) or add a weight vest to this series of progressions (*rowing*) to make them more challenging.

Pull-ups – Page 2, Column 5

This book does not address a wide array of bar pull-ups because pull-ups and chin-ups tend to work best for developing basic level strength. Once that strength is developed, you will typically move on to more difficult movements like weighted pull-ups or one-arm chin-ups. Front lever progressions and other pulling-based static and dynamic exercises tend to be more effective that pull-ups for overall progress.

JUMPING PULL-UPS – LEVEL 1

Scapular Positioning: Begin with your scapulas relaxed and elevated. Initiate the movement by depressing your scapulas as you rise to the top of the position and pull down with your arms and chin over the bar.

Technique: Begin with your arms straight, your shoulders open, and your knees slightly bent. (You can put a box or other object under your feet if you cannot lower a pull-up bar or rings enough to perform this movement.) Jump with as little force as possible so that your arms perform most of the work to pull your chin up and over the bar. If you can, work the movement so your clavicles or chest touch the bar instead. Keep your elbows narrow and in front of you.

Jumping pull-ups use your legs to adjust for insufficiency in pulling strength. Even though the force from the jump will make the pull-up easier during both the ascending and descending portions, you should use your arms to do as much of the work as possible and minimize contribution from your legs. Your aim is to increase pulling strength in your arms.

Try to get your clavicles to the bar for chin-ups. The reason why you do not want to focus on getting just your chin above the bar is because most people will crane their necks to do so. From a performance perspective, this is poor execution. Remember, you will eventually be working skills with a much greater range of motion. Practice this skill with the greatest range of motion possible.

Craning your neck can also inhibit force generation as it narrows the passages in your spine where your nerves come out, which can pinch some of the nerves that innervate the muscles required to do the pull-up. This pinching and craning/straining motion on your neck may also cause tension headaches and tight muscles.

BAR PULL-UP ECCENTRICS – LEVEL 2



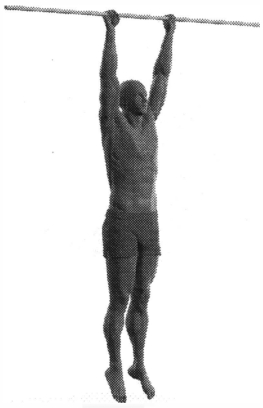
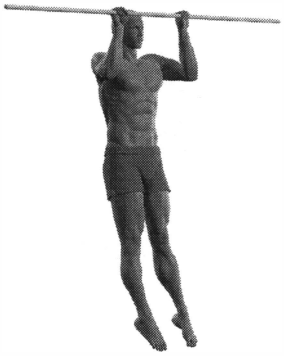
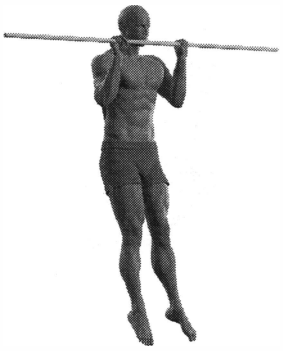
Scapular Positioning: Begin at the top of the bar with your scapulas depressed and slightly retracted. Slowly lower to the bottom, allowing your scapulas to progressively elevate so you finish in a relaxed position.

Technique: Begin at the top of the bar and slowly lower to a full hang position.

Eccentrics are one of the best ways to increase strength for movements that you cannot yet perform, when you have enough strength to control the descending portion. Aim to work up to holding the negative portion of the pull-up for six to eight seconds and perform two to three sets of two to three repetitions per set. Eventually, you may need three to five sets of seven to ten seconds pull-ups in order to perform full repetitions. Focus on activating your lats and biceps as much as possible.

Assistance can be used to gain strength at this level. This could come in the form of a Gravitron machine, pulley system, a spotter lifting your hips or legs, or placing a resistance band at your feet to reduce the load for the ascending portion of the movement. A combination of unassisted slow negatives and assisted positives are invariably effective for attaining pull-ups.

BAR PULL-UPS – LEVEL 3

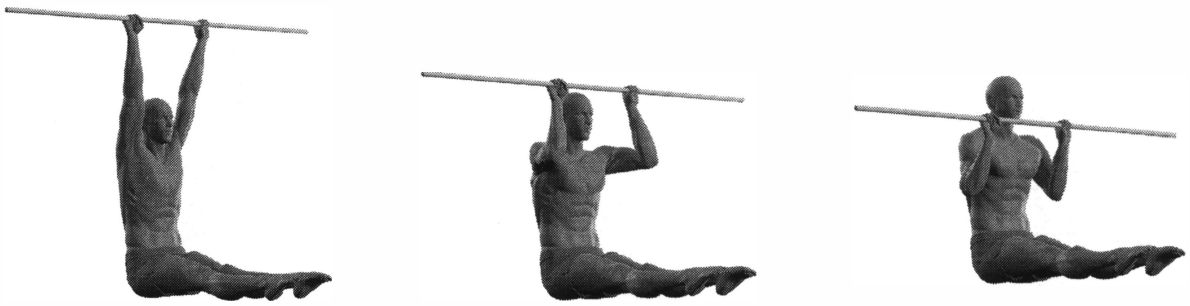
Scapular Positioning: Begin from a hang position, with your shoulders fully relaxed and scapulas elevated. Initiate the movement by depressing your scapulas. As you move through the position, they will naturally rotate and retract slightly until you reach the top position.

Technique: Begin from a hang position. Pull your chin over the bar by driving your elbows toward and past your sides. Aim to get your clavicles to the height of the bar without craning your neck. Then, lower back down to a hang position in a controlled manner. Your elbows should remain in line with your body, not flared out.

Bar pull-ups are the typical pull-ups you see performed in elementary school gym class. You do not want to have your elbows out wide while performing this movement, as this will limit your vertical pulling ability as your shoulder closes. Learning the position wrong will eventually make it difficult to move your chest past the bar in subsequent progressions. Keep your elbows in.

If you are having problems, you can work negatives, assisted pull-ups, or use a Gravitron machine if you have access to one at your local gym. Remember to tense your core and entire shoulder girdle before pulling, as doing so will help transmit the force needed to lift your body.

L-SIT PULL-UPS – LEVEL 4



Scapular Positioning: Begin from a hang position, with your shoulders fully relaxed and scapulas elevated. Initiate the movement by depressing your scapulas. As you move through the position they will naturally rotate and retract slightly until you reach the top position.

Technique: Hang from the bar in an L-sit position. Your hands will be pulled four to six inches in front of your body, past your chin to your clavicles. As you unlock your shoulders at the beginning of the movement, focus on pushing your hands forward (like the front lever position) and pulling your arm into your shoulder socket. Once your shoulders are stabilized, perform the pull-up portion of the skill with your hands in front of you. Do not allow your legs to drop lower than parallel with the ground in the L-sit position. Finish with your clavicles or chest against the bar and slowly lower back to the starting position.

The most difficult portions of *L-Sit pull-ups* are at the beginning (when you are unlocking your shoulder joint) and at the top (where your muscles are short and therefore disadvantaged—especially if you are aiming to get further over the bar). L-Sit pull-ups are more difficult than standard pull-ups due to an increase of torque at your shoulder. Since bringing your legs up in front of the body pushes your center of mass forward, your shoulders have to push forward to keep your center of mass under the bar. Therefore, when hanging in the L-position your hands should be slightly in front of your torso. Obviously, this does not have too much of an effect while you are just hanging; however, when you start to perform a pull-up it can be difficult.

As you fatigue, you may run into issues with your rotator cuff muscles. (This is also the case with *wide-grip pull-ups*.) Since your rotator cuff helps keep your humeral head from riding up into your acromion, your muscles lose their ability to exert force as you fatigue. Since L-Sit pull-ups increase torque at your shoulder (due to constantly pushing your hands forward), your rotator cuff muscles will fatigue much faster. This can lead to impingement.

Do not place this progression near the end of your routine, as this is when you will be most fatigued. It may also be a good idea to perform supplemental rotator cuff muscle work, such as LYTPs, side-lying external rotations, the middle portion of the Cuban press, or band external rotation.

PULLOVER – LEVEL 5



Scapular Positioning: Begin from the hang position, with your shoulders fully relaxed and scapulas elevated. Initiate the movement by depressing your scapulas. As you move through the position, they will naturally rotate and retract a bit until you reach the top of the position. As you bring your legs through the L-sit and over your head, keep your scapulas depressed and retract them strongly to keep your torso close to the bar as you rotate over the top.

Technique: The *pullover* is a basic gymnastics movement that involves manipulating your body upside down, around, and over the bar. This movement can be broken into three different parts for coaching.

1. The first part of the movement is a clavicle-to-bar pull-up. It is better if your chest is brought to the bar, so try to pull as high as possible.
2. The goal of the second phase of the movement is to invert your body and get your hips to the bar. Do this by leaning back and allowing your arms to straighten out. While your arms are straightening, your hips must be spun up to the bar. This is easier to perform in the tuck or pike positions, but should eventually be performed with straight-body positioning.

After your hips are brought to the bar, the third phase of the movement includes a partially inverted pull-up, as well as pushing your hips and legs further over the bar. From there, your body will begin to rotate, as more of your body mass is on the opposite side of the bar. Ultimately, your body will end up on top of the bar. Your arms should be straightened, which will cause you to end up in the support position when you are on top of the bar.

This skill may be difficult to figure out by yourself. It is much easier if you can get a spotter to spot your hip motions. You can also perform this skill in reverse, starting from over the top of the bar. This will help you develop strength and awareness for this skill.

This is an A-level skill in the Gymnastics Code of Points.

Ring Pull-ups + One-Arm Chin-ups – Page 2, Column 6

RINGS L-SIT PULL-UPS – LEVEL 4



Scapular Positioning: Begin from the hang position, with your shoulders fully relaxed and scapulas elevated. Initiate the movement by depressing your scapulas. As you move through the position, they will naturally rotate and retract a bit until you reach the top of the position.

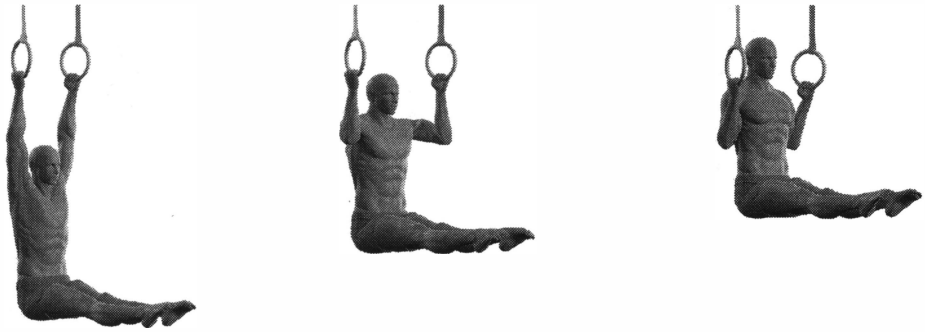
Technique: Hang from the bar in an L-sit position. Your hands will be pulled four to six inches in front of your body, all the way to clavicle-height and eventually chest-height as you grow stronger. The most difficult portions of this movement are at the beginning (when you are unlocking your shoulder joint) and at the top (where your muscles are short and therefore disadvantaged—especially if you are aiming to get further over the bar).

Rings L-sit pull-ups are no harder than the variation on the bar. If rings are not available, switching to the bar is perfectly acceptable. For the unlocking of your shoulders at the beginning of the movement, focus on pushing your hands forward (similar to the front lever position), and pulling your arm into your shoulder socket.

RINGS WIDE GRIP PULL-UPS – LEVEL 5



RINGS WIDE GRIP L-SIT PULL-UPS – LEVEL 6



Scapular Positioning: Begin from the hang position, with your shoulders fully relaxed and scapulas elevated. Initiate the movement by depressing your scapulas. As you move through the position, they will naturally rotate and retract a bit until you reach the top of the position.

Technique: Begin in a hang position on the rings with your hands neutral or facing forward (pronated grip). From there, pull your elbows out. Attempt to keep the forearms as vertical as possible during the movement.

The *rings wide grip L-sit pull-up* is the same movement, but in the L-sit position starting at the beginning of the movement and maintaining it throughout. As with the prior L-sit movements, it may be useful to push the rings slightly forward first and tense your shoulders to initiate the movement.

It is certainly possible to get the rings to clavicle or chest level, but most people will not get this high when first attempting these movements. This is a lats-dominated exercise with less emphasis on the biceps, so it will be useful for many different rings progressions.

Wide grip pull-ups and archer pull-ups may bother your shoulders and cause discomfort or pain as your rotator cuff muscles fatigue. Do not place this progression near the end of your routine when you will be most fatigued. It may also be a good idea to perform supplemental rotator cuff muscle work, such as LYTPs, side-lying external rotations, the middle portion of the Cuban press, or band external rotation.

Generally speaking, be careful with wide grip pull-ups when you are fatigued, as your shoulder will be vulnerable while in a fully externally rotated state with a distraction force like pull-ups. You should avoid this movement if you have shoulder subluxation or shoulder dislocation issues. Performing wide grip pull-ups with the rings, however, allows for movement of your shoulders into a position of lower resistance. This should help avoid soft tissue impingements or other such injuries.

RINGS ARCHER PULL-UPS – LEVEL 7



Scapular Positioning: Begin from the hang position, with your shoulders fully relaxed and scapulas elevated. Initiate the movement by depressing your scapulas. As you move through the position, they will naturally rotate and retract a bit until you reach the top of the position.

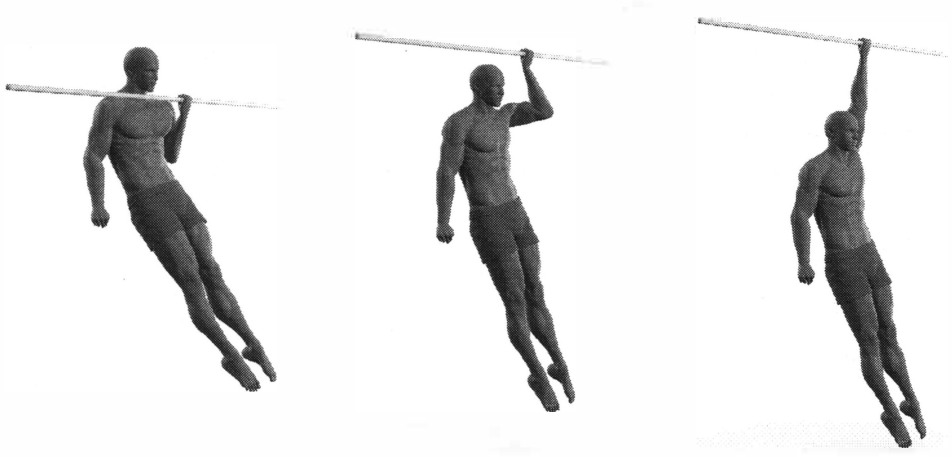
Technique: From the hang position, one of your arms will pull down (like a regular pull-up), while your other arm will remain straight and move into a cross position. Since your straight arm will not be able to provide much assistance, there will be a significant amount of weight on your bent arm. This will make the movement similar to a pseudo one-arm pull-up. You may use a false grip to begin learning this skill, but you will eventually want to be able to perform it without a false grip.

A false grip is attained by shifting your hands up on the side of the ring, so that the crook of your wrist on the pinky side of your hand sits on the rings or bar. Your hand should then be wrapped around the bar or rings and held as tight as possible. From there, the movement may begin. The false grip position will be difficult to attain and/or to maintain if your wrist flexibility is poor, or if you lack grip strength. If this is the case for you, adding supplemental work to correct both of these problems should be included in the warm-up and cool down.

This is the first phase of the one-arm-straight muscle-up and can be used as a progression for building up strength for the cross and one-arm chin-up as well. Emphasis can be placed on either the straight arm (to reinforce the iron cross) or the arm that is bending (for the one-arm chin-up).

Like the previous progressions, this may cause some shoulder issues. Do not place this progression near the end of your routine when you will be most fatigued. It may also be a good idea to perform supplemental rotator cuff muscle work, such as LYTPs, side-lying external rotations, the middle portion of the Cuban press, or band external rotation.

ONE-ARM CHIN-UP / PULL-UP ECCENTRICS – LEVEL 8



Scapular Positioning: Begin at the top of the movement with one hand on the bar and your scapula depressed. Keep your scapulas depressed as you slowly lower to the bottom of the movement. Once you reach the bottom, your arm should be straight. Allow your scapula to slowly elevate at the end of the movement.

Technique: Hold the top of the one-arm position with your hand close to your chest to maximize muscle tension when your chin is over the bar. Slowly lower to a hang position. Control your body as you lower with your shoulder, as well as with the pronation and supination of your forearm.

The best training for the *one-arm chin-up* or *pull-up* is to use their eccentrics or negatives. Here are some prerequisites that are recommended for this movement:

- A chin-up and/or pull-up with an added 50% bodyweight
- At least fifteen strict chin-up/pull-up repetitions to the chest
- Full back lever with hands supinated
- Rings tuck planche

It is critical to be able to do at least a weighted pull-up or chin-up with +50% bodyweight and at least fifteen strict repetitions to the chest, as this ensures both adequate muscular and connective tissue strength. It is also strongly recommended that you have obtained at least a full back lever and a rings tuck planche. These holds also help to build muscular and connective tissue strength from your hands through your forearms, elbows, and biceps area—all the way through to your shoulders and chest.

Having these prerequisites will help prevent overuse injuries—namely tendonitis at your elbows and shoulders. It is also recommended that you can perform a one-armed hang for at least twenty seconds because you will be frequently hanging on one arm as you acquire the one-arm chin-up/one-arm pull-up. If your grip strength is lacking, build it up with farmer's walks, grippers, or other forearm strength exercises.

There are multiple ways to train this skill. This book presents a method acquired based on years of personal experience in training and coaching others. If you want to check out some other sources, you can find great tutorials on beastskills.com and dragondoor.com.

How to achieve a one-arm chin-up/one-arm pull-up:

- Two to three sessions per week of eccentrics
- Zero to one session per week of weighted pull-ups or assisted concentrics

Lets examine a four days per week training schedule over the course of three weeks. With this schedule, there will generally be two days for eccentrics and one day for weighted pull-ups, or one day for assisted concentrics. Programming for a three days per week schedule is similar. It simply spans the exercises over the course of four weeks, accomplishing in a month what is done in three weeks with the four day per week schedule.

Eccentrics are extremely effective with bodyweight exercises, especially pulling movements. Try to perform the movements with as little outside help as possible. Unassisted negatives with one arm should always take precedence over two-arm weighted pull-ups. Assisted concentrics work the whole of the movement to get in some extra practice, but still rely on outside help to be completed. At this point in your journey it is likely that you will have been training for at least a year or two. Even so, intense negatives like these should be limited to two times per week because they are particularly taxing on the central nervous system.

The one-arm chin-up responds best to six to ten second negatives, typically, in two to three sets of two to three repetitions each. Remember, the descent of these movements should be uniform. The top of the movement will be your strongest part; your muscles are in an advantageous position and everyone is freshest at the beginning, so avoid working that first or you will get unbalanced in the skill. The end of the negative is often the most difficult part. Take care not to speed through the eccentric movement before you have reached the fully extended one-arm-hang position.

As a side note, weighted pull-ups and assisted concentrics respond best to three sets of five to eight repetitions. Progress can often be made at about five pounds per workout or every other workout.

You can approach assisted concentrics a few different ways. You can use a pulley system and hang weights that you can hold in your other hand or in a belt. Alternatively, you can hang a rope from the bar and progressively grab lower and lower, forcing your opposite hand to assist less and less. Whatever you choose, know that spotters are not advised for this skill because they tend to help too much and their help is inconsistent.

Here is a list of techniques, starting from the best:

- Eccentrics – They take you through the full range of the motion unassisted, so they tend to work the best. They are particularly good for pulling exercises, of which the one-arm chin-up is one.
- Assisted Pulley Concentrics – Get a pulley and put weight on one end and your hand on the other end. This will assist you measurably, as you can weight it with fifteen pounds, then fourteen pounds, then thirteen pounds, and so forth until you reach one pound. This method is extremely reliable and works well if you want to decrease the amount of eccentrics used.
- Assisted Other Concentrics – You can use another human to assist or finger assist. This works, but not as effectively as the methods listed above.
- Frenchies – Moving up and down within your available range and strength. These are good for solidifying strength within a particular range, but they often do not work the range you are weakest in.
- Isometric Holds – Isometric holds in the range of where you are weak in the movement can be effective at breaking plateaus, but are only minimally effective as a training method.
- Weighted Pull-ups – These are good as a requirement for building strength so that you can safely begin eccentrics, but they are not at all useful in training one-arm exercises because they do not work any specifically one-arm pulling motions.

Finally, you can use progressively fewer fingers on your opposing hand for assistance. Here is a way to work down from the index to pinky fingers, listed from most to least assistance:

- All four fingers
- Index, middle, ring
- Middle, ring, pinky
- Index, middle
- Index, ring
- Index alone
- Middle alone
- Pinky alone
- Ring alone

Occasionally the last progression will be your ring finger then your pinky, but for most people their ring finger is slightly weaker than their pinky. You can also move into these from the archer progression.

One-arm chin-up eccentrics and assisted concentrics will vary from person to person. From the top, you can either face the bar or face it lengthwise. The majority of athletes feel more comfortable looking down the bar (lengthwise) so that their hand is in the "hammer grip" position between pronation and supination. Most people naturally gravitate toward this position. It keeps you from having to actively twist to keep your body facing one way or the other. Likewise, it allows for better squeezing of your arm to your chest, which will help generate more tension for performing the movement.

Whatever your preference, make sure that you practice your chosen technique constantly to achieve the full movement—unless you chose to take the long route to become good at many different types simultaneously. If you are a rock climber, it may be a good idea to practice the one-arm pull-up (with your hand facing away from you) instead, because your hands need to be pronated for performing this movement on climbing holds or ledges. Specificity is king.

Isometric holds at the top, middle, and bottom of the movement may also be of assistance. These are great if you have "sticking points" or "rough patches" that need to be strengthened. Otherwise, they are not particularly useful. For instance, "Frenchies," in which the negative exercise is performed but the athlete stops and holds in isometric positions along the way, can have a solid place in a program to break "sticking points."

Grip strength is also an important factor. The stronger you can hold onto the bar, rings, or other surface, the more innervation you can get to your proximal pulling muscles, which will result in a stronger, more concerted pull. If grip strength is limiting you, be sure to add supplemental work to address the issue.

Like the previous progressions, the one-arm chin-up / one-arm pull-up creates significant torque at your shoulder. Like the L-pull-up, wide pull-up, and archer pull-up variations this may cause shoulder discomfort. Do not place this progression near the end of your routine when you will be most likely to be fatigued. It may also be a good idea to perform supplemental rotator cuff muscle work, such as LYTPs, side-lying external rotations, the middle portion of the Cuban press, or band external rotation.

ONE-ARM CHIN-UP – LEVEL 9

ONE-ARM CHIN-UP +15 LBS. – LEVEL 10

ONE-ARM CHIN-UP +25 LBS. – LEVEL 11



Scapular Positioning: Begin in a one-arm hang position, with your shoulder relaxed. Initiate the movement by depressing and slightly retracting your shoulder blade. As you raise your body to the bar, keep your scapula depressed. You will end with your scapula depressed and close to neutral.

Technique: Get a feel for the rotation by pronating and supinating your forearm. Activate your shoulders by depressing your shoulder blades. Begin the pull and ascend toward the bar. You may notice that you begin to rotate into the bar a bit, with your elbow coming toward your chest. This is acceptable, as it allows your chest contract better. Focus on either pulling your hands down or driving your elbow toward your side—whatever works best for you. Finish with your chin or (preferably) your chest above the bar.

Begin in a hang position with only one arm holding the implement. For the one-arm chin-up, your palm will face you. It is important to get the feeling of controlling your body while only using one arm, before the actual pull is initiated. You can pronate and supinate your forearm to spin around in a circle. Knowing when and how to control this will be extremely helpful during the movement itself. During the movement, your body will naturally want to rotate (depending on individual strengths).

The next step is to tense your shoulder and pull it into the socket to activate it. From there, the initial pull can be thought of in one of two ways: either pulling the point of your elbow down toward your hips, or trying to pull your hand to your shoulder like a biceps curl. These approaches will predominantly activate your lats and biceps, respectively. The best one to use will be whichever feels more natural and stable. This will also let you know the area where you are lacking. While you can always train one-arm chin-ups with the stronger approach, you should also put an effort into correcting the area where you are weaker.

If you started with the pronated hand position (pull-up hand position), you will likely twist ninety degrees as you ascend. If you are using your left hand you will twist ninety degrees to the right. If you are using your right hand you will twist ninety degrees to the left. Go with this movement and really squeeze your arm

against the side of your body to create a lot of tension and improve the overall contraction of your pulling muscles. Tense your core strongly. Sometimes raising your legs or performing this movement in an L-sit or semi-L-sit position makes it easier because of the additional tension from your core. If you started with a supinated hand position (chin-up hand position), keep facing the bar the entire time you are ascending.

If you have a specific weakness, perform supplemental work. Biceps curls can be added to correct the imbalance if you feel too shoulder/lats dominant in this movement. Strength in your biceps and weakness in your lats, on the other hand, requires more straight-arm pulling work like front lever variations, back lever variations, or weighted work like straight-arm lat pull-downs and dumbbell weighted pullovers. Isolation exercises are usually improperly used and overdone, but if there were ever a time to use them, it would be in situations where imbalances need to be corrected.

Once weight is added to a one-arm chin-up or one-arm pull-up, the strength required rivals that of the iron cross. Based on observation, there are similarities in the strength correlation of one-arm chin-ups, one-arm pull-ups, weighted pull-ups, and the iron cross. Understanding this transference to other skills will help you program more competently to achieve your goals as efficiently as possible.

Congratulations on this achievement!



As you improve, you can add weight. Using a weight belt or weight vest is easiest. However, you can just as easily hold a dumbbell in your free hand (and look awesome curling it).

To add challenge, the alternatives to adding weight are: using fewer fingers on your pulling hand, working the other variation (such as one-arm pull-ups if you obtained one-arm chin-ups, or vice versa), or working more range of motion like pulling your chest to the bar as opposed to only getting your chin over the bar. Feel free to work any or all of these variations if they interest you.

Weighted Pull-ups – Page 2, Column 7

There are some interesting correlations among the pulling exercises. The back lever, front lever, one-arm chin-up/pull-up, iron cross, and many other pulling exercises have similar levels of strength that carry over between each of the strength progressions. Here are some estimates on the translation of one to the other:

- Straddle Front Lever = ~50% Bodyweight Pull-up = ~ Full Back Lever
- Front Lever = ~70-80% Bodyweight Pull-up
- One-Arm Chin-up = ~80-90% Bodyweight Pull-up
- 3 One-Arm Chin-ups = +15 lbs. One-Arm Chin-up = 3-4s Iron Cross Hold
- 5 One-Arm Chin-ups = +25 lbs. One-Arm Chin-up = ~10s Iron Cross Hold

Referring back to the progression charts, some of these associations are on the same level on the skill and strength charts. This is what makes the skill and strength progressions charts useful; they allow identification of skills that are at a similar level of ability.

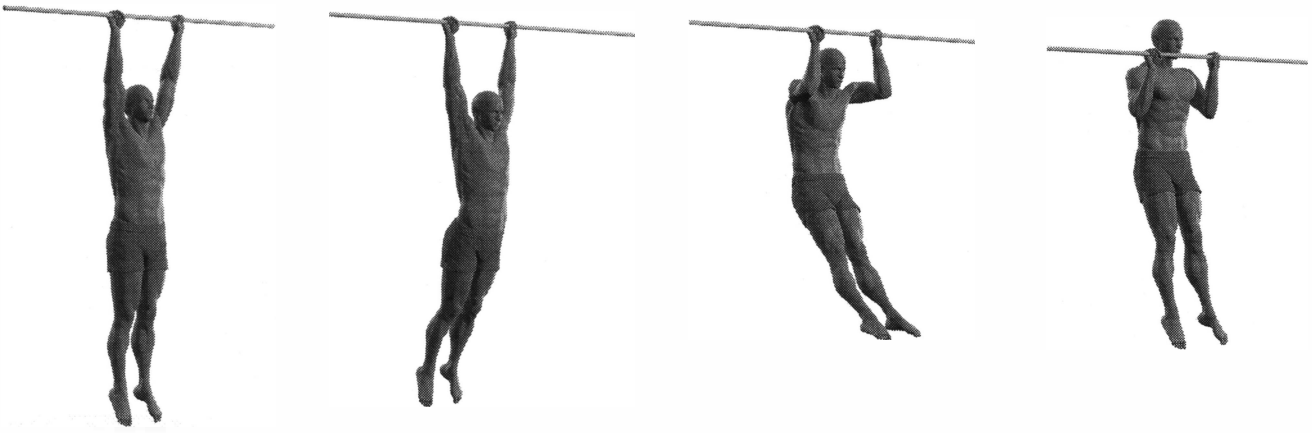
Regarding the translation to the full back lever, it is a bit more variable. The full back lever can be achieved more or less around the straddle FL progression. The straight-arm pulling variations build the shoulder strength to execute the one-arm chin-up, but the front lever does *not* build bent-arm pulling strength due to the high level of biceps stress, whereas the back lever does.

Of course, there is still some level of specificity needed to achieve each of these skills, even when they are ranked at similar levels of strength. Practice what you want to achieve, but in doing so know that supplemental exercises from all of these categories have some carryover to each other.

Explosive Pull-ups – Page 2, Column 8

Explosive pull-up variations can be fun and exciting feats. However, it takes a fair amount of dedication with both explosive and strength work to achieve the higher-level skills. Be diligent when working these progressions and, most importantly, be safe. It is easy to miss and fall so always practice on a soft landing surface. If your strength is lacking, avoid these progressions until you reach level three or four.

KIPPING PULL-UPS – LEVEL 2



Scapular Positioning: During the arch-hollow movement, your scapulas should be relaxed and elevated. During the explosive pull-up portion of the skill, they will be activated to be depressed. At the top of the movement, they will be depressed and slightly retracted. Reverse the process as you descend.

Technique: You will begin in a hang position. Initiate the movement by pushing your shoulders and hips forward. As your abdominals, shoulders, and hips begin to stretch, relax and allow them to contract to pull you backwards, into the hollow position. Repeat this in order to gain more momentum. This time, as you begin to hollow after the arch phase, initiate a pull-up. This should coincide with the closing of your shoulder angle. When your clavicles reach bar-height, do not relax and drop down immediately. (It is preferred that you get your chest to the bar if you have the strength to do so.) Use your muscles to control the movement as you drop back down. From the top of the movement, push away from the bar and allow your arms and shoulders to open in a controlled eccentric motion. This will leave you in the arched starting position.

Kipping pull-ups are a basic movement that utilizes the body's horizontal momentum from below the bar and converts it into vertical momentum to assist with the pulling movement.

Many people consider kipping pull-ups to be a form of cheating; however, they are really their own movement and should be used as such. Compared to regular pull-ups they definitely require less strength, which is why they are ranked lower on the charts, but they can be used fairly effectively as a conditioning movement. They are also important to learn for gymnastics because they translate to many different skills. Even if the added momentum were not needed to compensate for a lack of strength, it is a good idea to at least occasionally practice this movement anyway.

Do not try to learn this movement until you can perform strict dead-hang pull-ups. Additionally, if you have any shoulder issues do not attempt this progression until they are resolved. Very high repetitions of these exercises under fatiguing conditions can lead to injury. If you have any doubts as to whether you are strong enough or sufficiently recovered from an injury, avoid them for now.

If you are having problems getting the movement, or even stringing it together, it may be a good idea to get some coaching by a gymnast or anyone else who knows how to perform the kipping technique. If your shoulders begin to hurt from this movement, take a break. Similarly, if you are jerking around a lot, take a break and just practice the arch to hollow phase.

One of the ways to learn this movement without any abuse on your shoulders is to do it with your feet on the ground to get the feel of the shoulder movements. The key to learning this movement is simply to practice—while it requires some strength, it is mainly the coordination and technique that will need attention.

BAR PULL-UPS – LEVEL 3



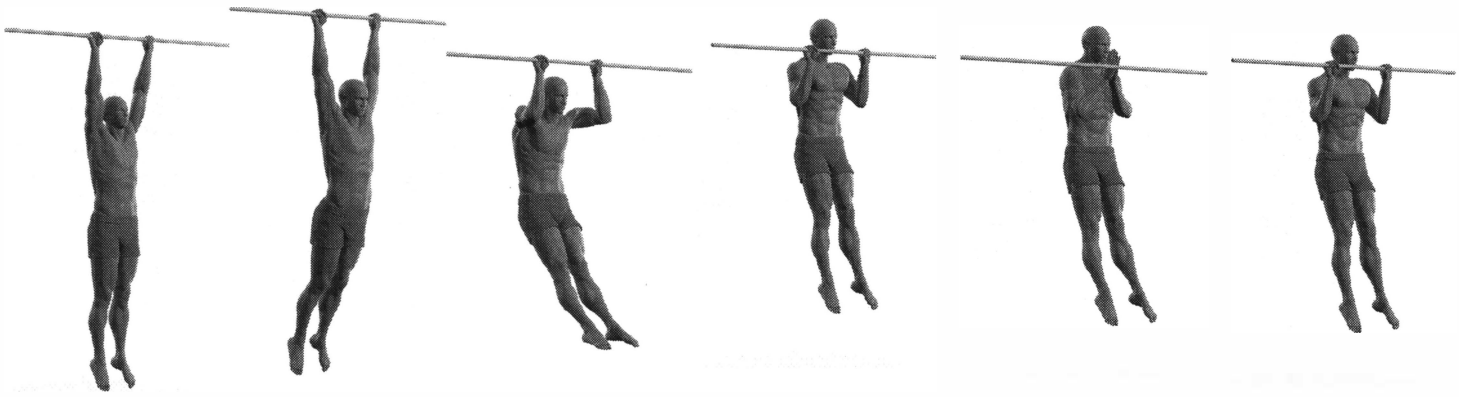
Scapular Positioning: Begin from a hang position, with your shoulders fully relaxed and scapulas elevated. Initiate the movement by depressing your scapulas. As you move through the position they will naturally rotate and retract slightly until you reach the top position.

Technique: Begin from a hang position. Pull your chin over the bar by driving your elbows toward and past your sides. Aim to get your clavicles to the height of the bar without craning your neck. Then, lower back down to a hang position in a controlled manner. Specific elbow technique is elbows in-line with your body, not flared out.

Bar pull-ups are the typical pull-ups you see performed in elementary school gym class. You do not want to have your elbows out wide while performing this movement, as this will limit your vertical pulling ability as your shoulder closes. This will eventually make it difficult to move your chest past the bar in subsequent progressions. Thus, you should keep your elbows in.

If you are having problems at this stage, you can work negatives, assisted pull-ups, or use a Gravitron machine if you have access to one at your local gym. Remember to tense your core and entire shoulder girdle before pulling, as doing so will help transmit the force needed to lift your body.

KIPPING CLAPPING PULL-UPS – LEVEL 4



Scapular Positioning: During the arch-hollow movement, your scapulas should be relaxed and elevated. During the explosive pull-up portion, your scapulas should be activated to be depressed. At the top, your scapulas will be depressed and slightly retracted. They will still be depressed after you clap and re-grab the bar. As you descend for the lower part of the movement, elevate them again.

Technique: The kip technique requires an "arch-hollow" technique. During this technique, the oscillation of your body rotates around two points: your hands and your knees. Between your hands and knees are two major fulcrums where the movement will occur. Your hips and shoulders should be thrust forward and backward at the same time, thus moving your body into an arch-hollow rocking motion. During your body's transition to the hollow phase (when you are ready to begin the movement), pull your hands forward to close your shoulder angle. As your shoulder angle begins to close, pull your hands down strongly to initiate the pull-up with momentum. As your chin ascends over the bar, your hands should be released into the clapping motion as quickly as possible. Likewise, you should re-grab the bar as quickly as possible to avoid plummeting. Lower in a controlled manner if you desire to perform additional repetitions.

The kipping movement allows your body to generate horizontal momentum, which can then be applied vertically in an explosive, full-body contraction that makes upward movement much easier. In many fitness circles kipping is considered cheating; however, kipping can also help develop full-body coordination, develop explosive movement, and can be used as a metabolic conditioning tool. Here it is used as an explosive intermediate to bridge explosive pull-ups to non-kipping clapping pull-ups.

When you first attempt this exercise, be sure to grab some padding or a spotter to make sure you do not slip off and hurt yourself. Never perform this on a surface that may cause your grip to slip.

NON-KIPPING CLAPPING PULL-UPS – LEVEL 5



Scapular Positioning: Begin from a hang position, with your shoulders fully relaxed and scapulas elevated. Initiate the movement by depressing your scapulas. As you move through the position they will naturally rotate and retract slightly until you reach the top position. Next, clap and re-grab the bar. Reverse this process as you descend.

Technique: Begin from a hang position. Pull your chin over the bar by driving your elbows toward and past your sides. Aim to get your clavicles to the height of the bar without craning your neck. Pull explosively, aiming to get the bar approximately three to six inches from your chest as you move behind it. This slight backward motion will help you avoid hitting your head on the bar. After you clap and re-grab the bar, lower back down to a hang position in a controlled manner. Keep your elbows in-line with your body, not flared out.

The technique for this skill requires significantly more brute pulling power than the *kipping clapping pull-up*. Like with the kipping clapping pull-ups, the clap should be initiated just as your chin clears the bar. In some cases, if the pull is explosive enough, the release can happen once your head or eyes reach the plane of the bar, provided that enough momentum has been generated to allow your chin to be over the bar for the clap. Re-gripping the bar should be quick to avoid falling. Catch the bar and lower yourself in a controlled fashion for additional repetitions.

L-SIT CLAPPING PULL-UPS – LEVEL 6



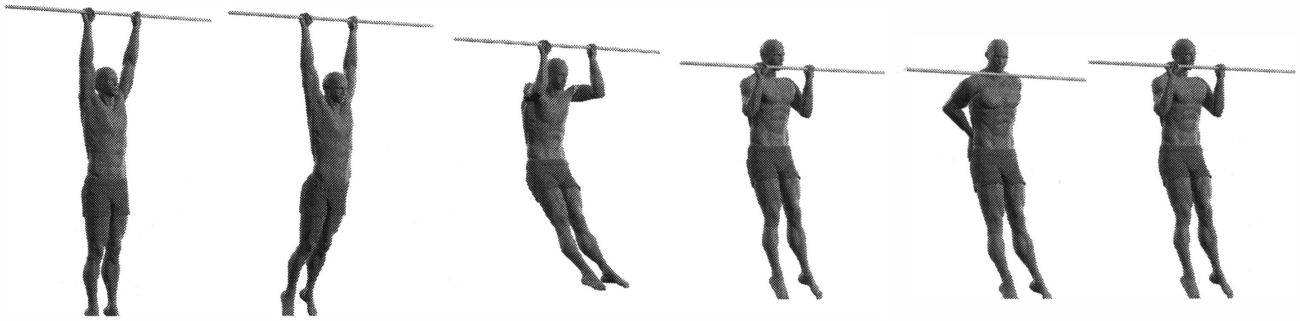
Scapular Positioning: Begin from an L-sit hang position, with your shoulders fully relaxed and scapulas elevated. Initiate the movement by depressing your scapulas. As you move through the position they will naturally rotate and retract slightly until you reach the top position. Clap and re-grab the bar. Reverse this process as you descend.

Technique: Begin from an L-sit hang position. Pull your chin over the bar by driving your elbows toward and past your sides. Aim to get your clavicles to the height of the bar without craning your neck. Pull explosively, aiming to get the bar approximately three to six inches from your chest as you move behind it. This slight backward motion will help you avoid hitting your head on the bar. After you clap and re-grab the bar, lower back down to a hang position in a controlled manner. Keep your elbows in-line with your body, not flared out.

L-sit clapping pull-ups are the first generation of explosive pull-ups that add the L-sit to decrease leverage at the shoulder, thus increasing the difficulty level. Since the L-sit forces your center of mass forward, the angle at your shoulder is increased, so that it will require much more force to generate the same vertical momentum used to propel your body upward.

In this specific technique there is no need to focus on pulling a few inches in front of your chest. Your hands will already be in front of your chest by a couple of inches, which decreases the leverage. The main focus is keeping your toes elevated in the L-sit position by keeping your abdominals contracted, and pulling your hands down and your elbows to your sides as quickly as possible. It is a much different movement than the explosive pull-ups previously described; therefore, it will require a bit more practice. This is the first movement in this progression without a kip, besides the standard pull-up.

KIPPING, BEHIND-THE-BACK CLAPPING PULL-UPS – LEVEL 7



Scapular Positioning: During the arch-hollow movement, your scapulas should be relaxed and elevated. During the explosive pull-up portion, your scapulas should be activated to be depressed. At the top, your scapulas will be depressed and slightly retracted. They will still be depressed after you clap and re-grab the bar. As you descend for the lower part of the movement, elevate them again.

Technique: The technique for initiating the kip is the same. Create the "arch-hollow" rocking motion and build it as much as you comfortably can for the transition into the pull-up. When the hollow phase begins, pull aggressively in a downward direction. Let go four to six inches before the apex of the movement is reached (the point at the top of the movement where gravity will slow you down). This can be gauged from the speed of ascent and takes a bit of practice to master. You will have a bit of extra time to perform the clap, as your body will continue to rise until it hits the apex and begins descending. This works better than releasing at the top of the movement and descending immediately. Once you clap and re-grab the bar, lower in a controlled manner if you desire to perform additional repetitions.

Kipping, behind-the-back clapping pull-ups allow you to harness kipping explosively. By exploiting a huge kip, this movement is potentially easier to perform than the previous progression. However, because it is harder for those with very little kipping experience, it has been given a higher difficulty level.

After the release, move your hands behind your back to clap and quickly get them back around to the front of your body. This will require a significant amount of coordination. Not only do your hands have to be removed from the bar to clap, they must also be returned to the bar as you begin to fall. When you begin training this skill, make sure there are soft mats beneath you!

L-SIT, SLAP-THE-ABDOMINALS PULL-UPS – LEVEL 8



Scapular Positioning: Begin from an L-sit hang position, with your shoulders fully relaxed and scapulas elevated. Initiate the movement by depressing your scapulas. As you move through the position they will naturally rotate and retract slightly until you reach the top position. Next, slap your abdominals and re-grab the bar. Reverse this process as you descend. The scapulas should be fully depressed at the top and while slapping.

Technique: Begin from an L-sit hang position. Pull your chin over the bar by driving your elbows toward and past your sides. Aim to get your clavicles to the height of the bar without craning your neck. Pull explosively, aiming to get the bar approximately three to six inches from your chest as you move behind it. This slight backward motion will help you avoid hitting your head on the bar. After you slap your abdominals and re-grab the bar, lower back down to an L-sit hang position in a controlled manner. Your elbows should remain in line with your body, not flared out.

With *L-sit, slap-the-abdominals pull-ups* you will begin to increase the distance of the target of your hands, as it requires a more explosive pulling phase to create the necessary additional time in the air for your hands to reach their target and return to the bar. The ability to pull significantly above chin height will likely be required before you can execute this skill. This is because the higher you pull, the closer your hands will already be to the target area that is to be slapped/clapped. Normally, this would be considered cheating; however, since it requires a stronger and more significantly higher pull (which in turn ensures explosiveness), it is in line with your ultimate goal.

You will probably find it easier to pull up to approximately the nipple area of your chest. With your hands already close to your abdominals, apply a quick slap and re-grip the bar as soon as possible. This movement requires an extremely strong pulling ability. I would estimate that a beginner who can complete this technique can likely also perform weighted pull-ups with an additional 60-75% of bodyweight.

L-SIT, SLAP-THE-THIGHS PULL-UPS – LEVEL 9



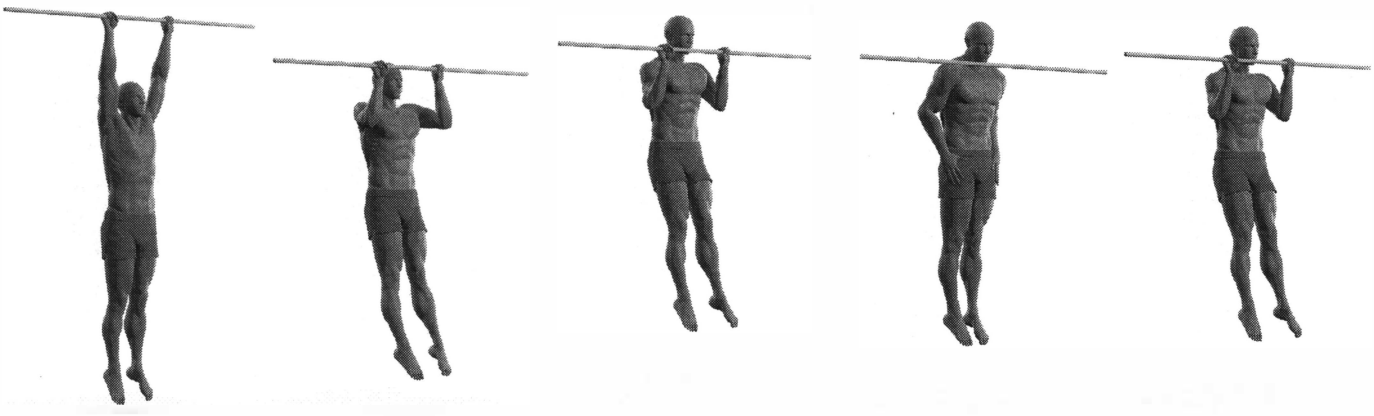
Scapular Positioning: Begin from an L-sit hang position, with your shoulders fully relaxed and scapulas elevated. Initiate the movement by depressing your scapulas. As you move through the position they will naturally rotate and retract slightly until you reach the top position. Next, slap your thighs and re-grab the bar. Reverse this process as you descend. The scapulas should be fully depressed at the top and while slapping.

Technique: Begin from an L-sit hang position. Pull your chin over the bar by driving your elbows toward and past your sides. Aim to get your clavicles to the height of the bar without craning your neck. Pull explosively, aiming to get the bar approximately three to six inches from your chest as you move behind it. This slight backward motion will help you avoid hitting your head on the bar. After you slap your thighs and re-grab the bar, lower back down to an L-sit hang position in a controlled manner. Specific elbow technique is elbows in-line with your body, not flared out.

L-sit, slap-the-thigh pull-ups take the previous skill one step beyond the abdominals and require an extra four to six inches of hand movement while airborne. At this point, your strength level can be compared to performing a pull-up with an additional 75-90% of your bodyweight. It is also around this point that a one-arm chin-up or pull-up can also be acquired.

There are two ways to execute this technique. Choose the one that you prefer. First, you can pull more explosively and let go at approximately chest/nipple height, much like the previous slap-abs exercise, and afterward simply move your hands very quickly. The alternative is to aim to do a more explosive pull-up and grip the bar until your middle abdominal area reaches the bar before letting go.

STRAIGHT-BODY, SLAP-THE-THIGHS PULL-UPS – LEVEL 10



Scapular Positioning: Begin from a hang position, with your shoulders fully relaxed and scapulas elevated. Initiate the movement by depressing your scapulas. As you move through the position they will naturally rotate and retract slightly until you reach the top position. Next, slap your thighs while keeping your arms straight and re-grab the bar. Reverse this process as you descend. The scapulas should be fully depressed at the top and while slapping.

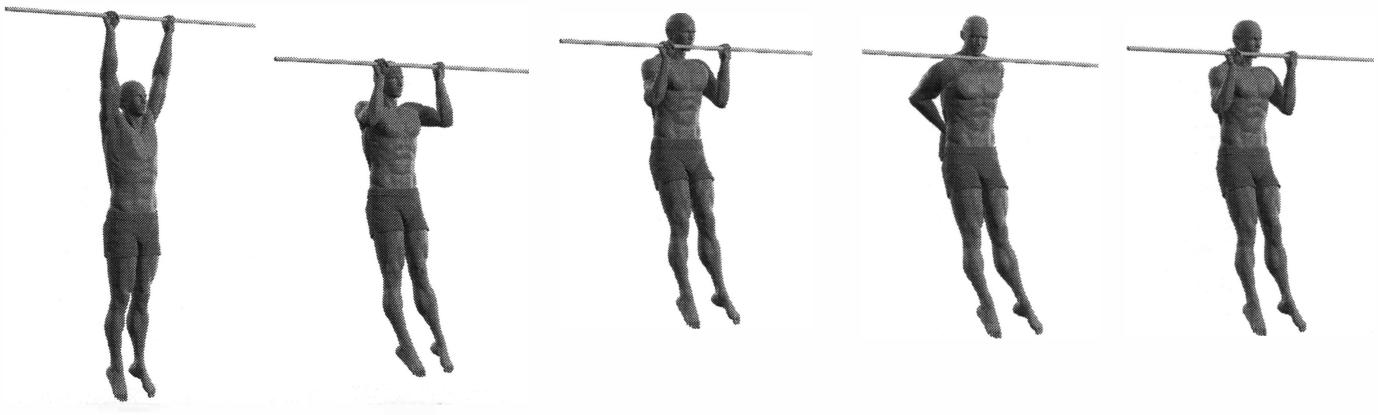
Technique: Begin from a hang position. Pull your chin over the bar by driving your elbows toward and past your sides. Aim to get your clavicles to the height of the bar without craning your neck. Pull explosively, aiming to get the bar approximately three to six inches from your chest as you move behind it. This slight backward motion will help you avoid hitting your head on the bar. Next, slap your thighs while keeping your arms straight and re-grab the bar, then lower back down to an L-sit hang position in a controlled manner. Keep your elbows in line with your body, not flared out.

There are two ways you can perform *straight-body, slap-the-thigh pull-ups*. The advisable way is to explosively pull up to at least abdominal height. The alternative, although it is a valid method is to "game the system." You could technically perform a full-muscle up, hop up off the bar, slap, and re-grip. This is actually fairly easy, especially if you pause after the muscle-up and before the hop.

But you're an athlete. The objective of this movement is to develop superior pulling strength and not to "game the system" to obtain a really cool skill. Pausing after a muscle-up before hopping to perform a clap or slap does not develop explosive pulling strength.

If you can execute this movement correctly, your pulling strength is probably around what is needed to complete a pull-up with an additional amount of weight equal to 95-105% of your bodyweight. And it's honest strength, not a visual trick.

NON-KIPPING, BEHIND-THE-BACK CLAPPING PULL-UPS – LEVEL 11



Scapular Positioning: Begin from a hang position, with your shoulders fully relaxed and scapulas elevated. Initiate the movement by depressing your scapulas. As you move through the position they will naturally rotate and retract slightly until you reach the top position. Clap behind your back and re-grab the bar. Reverse this process as you descend. The scapulas should be fully depressed at the top and while clapping.

Technique: Begin from a hang position. Pull your chin over the bar by driving your elbows toward and past your sides. Aim to get your clavicles to the height of the bar without craning your neck. Pull explosively, aiming to get the bar approximately three to six inches from your chest as you move behind it. This slight backward motion will help you avoid hitting your head on the bar. Next, quickly clap behind your back and re-grab the bar, then lower back down to an L-sit hang position in a controlled manner. Your elbows should stay in line with your body, not flared out.

Non-kipping, behind-the-back clapping pull-ups are one of the ultimate expressions of explosive pulling strength. As of this writing, no one has succeeded in performing this skill. Cisco, who is known for his one-arm rope climb and 7+ OAC/OAP in a row has attempted it on YouTube. Achieving this skill would surely earn you some notoriety.

Based on previous progressions and some reasonable assumption, the key here will be an extremely aggressive, explosive pull-up to approximately mid-abdominal height. Very quick hands will be a necessity in order to clap and return to the bar before you crash into the ground. As such, practicing the arm movement for the clap would also be suggested, because fast hand movement is absolutely a must before you even consider attempting this skill.

If you are at the point of attempting this skill, good luck. You already have impressive explosive pulling ability! Only the best wishes in your pursuit of this incredible feat.

Iron Cross – Page 2, Column 9

The *iron cross* could really have its own chapter. The technique and demands of this position, especially on your connective tissues, is high and can easily lead to overuse injuries if you do not approach it properly.

In the skill progressions chart, the recommended prerequisites that will help develop adequate connective tissue and joint preparation for iron cross training are shaded. These are as follows:

1. Rings Strap Handstand Pushups
2. L-Sit / Straddle-L Straight-Arm Press Handstands
3. Full Back Lever (with Supinated Hands)
4. Half Layout / One-Leg-Extended Front Lever
5. Rings Advanced Tuck Planche
6. Rings Dips (Deep and Rings-Turned-Out to 75 Degrees Past Parallel)

Having this base amount of strength is crucial because the iron cross is executed with your body in an extremely disadvantaged position, more so than any of the moves above. You do not want any potential injuries to develop, and having enough base strength to safely begin iron cross progressions is key.

All of the listed skills have a couple of things in common. Rings handstands ensure proper development of pressing strength, especially of your anterior shoulder (which takes a lot of force during iron cross training). All of the straight-arm work from straight-arm press handstands, full back lever, front lever, and the planche will ensure that the connective tissues in your shoulders and forearms are able to safely support your bodyweight under conditions of disadvantaged leverage.

The rings-turned-out dips in particular have a stress component on your elbows and chest that mimic much of the stress that is experienced in the iron cross position. For rings-turned-out dips, you must first be competent in holding the rings for at least thirty seconds while they are turned out to the ninety-degree position (palms fully forward). This causes a lot of strain on your inner elbow, biceps, and chest. This stress is a driver for the adaptation needed to protect your body from the harshness of iron cross training.

IRON CROSS PROGRESSIONS – LEVEL 9

Methods of Training

Four common methods of training toward the iron cross are listed below. They are ordered from most to least effective. It is preferable to simulate the cross position as best as possible, including keeping yourself on the rings.

1. Partner-assisted crosses are the best. They require your muscles to be at or near maximum effort the whole time, which is extremely good for developing strength and muscle mass (provided that you are eating enough). Additionally, a training partner makes workouts more effective through encouragement and friendly competition.
2. The second best option would be Theraband cross pullouts with weighted progressions or a dream machine device with pulleys connected to weights (or your bodyweight). It simulates the cross position very well and is scalable with weights to mark continual strength progress. For the weighted progressions, dumbbells, weighted vests, or other implements can be used provided there is a system to consistently add or subtract weight from your body.
3. Block cross pullouts tend to place a bit more stress on your lats as opposed to your pecs. For this single reason they are rated third of these methods. On the other hand, block cross pullouts can be effective because your progress can be measured either by how much of your legs are on the block or by the height of the block itself.

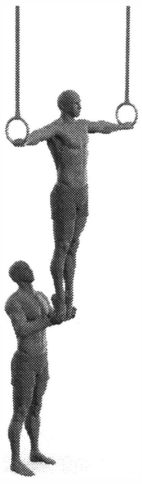
Last, but not least is the Theraband-assisted cross (with therabands of different colors). It is rated last because the force is less measurable, making progress less consistent. If using a block feels unnatural you can switch to these instead, but do your absolute best to keep everything consistent to ensure steady progression. If using this method, pick something that makes you struggle but allows you to eventually push through.

Pressing the rings into your forearms to decrease leverage is a valid method; however, performing iron cross exercises this way does not sufficiently prepare your connective tissues. It is often the case that strength training for the iron cross may be limited by the ability of your connective tissues to adapt to the stress. The connective tissues that are most affected are the ones at your elbow (medial epicondyle) and shoulder (rotator cuff and surrounding muscular stabilizers).

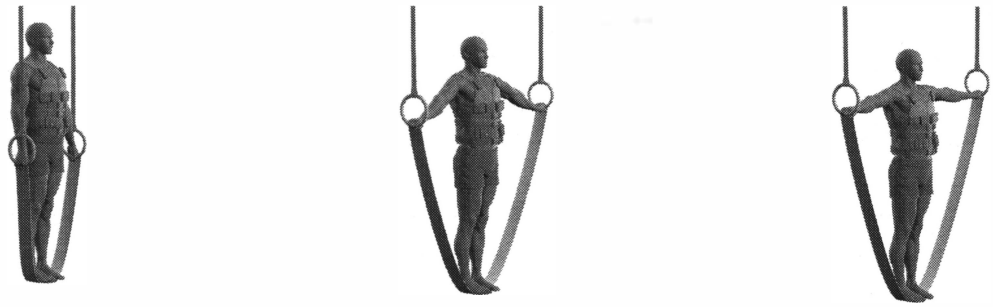
Another alternative for exercises is using a dream machine.

Assisted Crosses





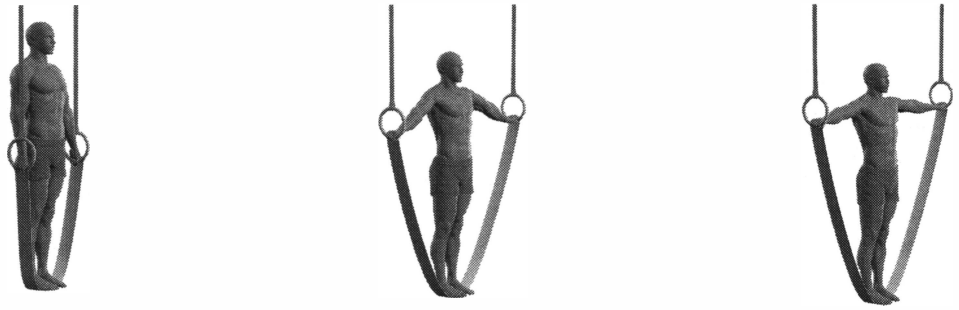
Theraband Cross Pullouts with a Weighted Vest



Block Cross Pullouts



Theraband Cross Pullouts



Dream Machine



The Technique

- Begin in a support hold position with your elbows locked and shoulder girdle depressed.
- Turn the rings out (*RTO—rings-turned-out*) by rotating your palms so they face completely forward.
- When lowering, rotate your shoulder forward while keeping your elbows oriented in a forward direction. They may begin to spin and face the ground. This is fine.
- As you get lower and enter the cross position, make sure you are constantly depressing your shoulder girdle and locking all of the muscles around your shoulder tightly in order to prevent scapular destabilization.

You must eliminate the two biggest flaws that occur during this process, lest bad habits develop:

- Your elbows must be locked straight at all times. It is a common bad habit to bend your arms, because doing so lessens torque at your shoulder. However, also puts more tension on your latissimus dorsi, which is stronger than your pectoralis muscle groups. Avoid this at all costs.
- As your latissimus and pectoralis muscle groups become fatigued it is common to see your shoulder girdle elevate. This is a sign that your musculature can no longer safely support your shoulders and greatly increases your chances of shoulder injury. If you feel your shoulders starting to get closer to your ears, terminate the set immediately because it is very easy to aggravate the soft tissues there which may lead to rotator cuff tendonitis, strains, or shoulder impingement.

If rolling your shoulders forward aggravates them, it is possible to keep your shoulder in a neutral position with depressed scapulas, though this is a bit tough on your elbows. For those who have had previous shoulder issues, this technique may be worth considering. If you would like to attempt this technique, make sure your elbows are safe before going all-out on exercises, as you will lose the ability of your shoulders to naturally lock themselves when in the cross position.

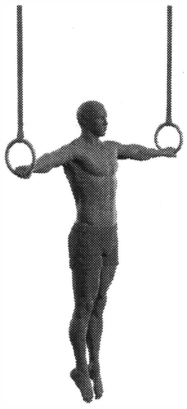
When training the actual movement, make sure to warm up thoroughly. Any of the prerequisites are solid for warming up your elbows for the iron cross. Specific scapular drills like those found in the prehabilitation section of this book (Chapter 22) are also effective. Basically, you want to warm up every part of your shoulder before attempting to train this movement because it can be rough on the connective tissues in your shoulder. If you have not added rotator cuff training with internal and external rotations to your routine, do so now.

The current official Gymnastics Code requires you to not have a false grip when performing the cross because it makes it easier to obtain the position. However, while you are learning, it is acceptable to slide into a false grip while turning the rings out and lowering into the position.

Please note: the cross can cause damage to your shoulder and elbows if your muscles and connective tissues are not adequately prepared. *If you have not obtained all of the prerequisites listed on the charts, do not attempt any of the progressions in this section.*

For an extensive article on the iron cross originally published on Catalyst Athletics, see this link: stevenlow.org/ironcross

HOLD IRON CROSS – LEVEL 10



Scapular Positioning: Depending on the technique you are using, your scapulas will either be depressed and slightly protracted or depressed and neutral as you lower into the iron cross position.

Technique: Your arms will be held straight out in line with your body at a ninety-degree angle. Lock them in this position and keep your shoulders down. You will be pulling the rings downward toward your hips to hold this position.

Now that you are very close to the iron cross or can momentarily pause in the position, it is time to integrate more assisted holds into your program in order to neurologically prime your body to hit the exact hold you want. You will begin your training with mostly eccentric/concentric movements. Upon these you can build a base of strength that encompasses all ranges of motion.

If you are training this position alone it may be very difficult to move your body from any type of support or movement into the hold. Strengthening the full movement helps extensively with most other corollary pulling movements like back lever, front lever, and one-arm chin-ups.

More information on recommended programming can be found in the online article referenced in the previous section. The sample programming section of this book also discusses some specific programming. Traditional light/heavy days work well in a comprehensive program. A system with daily-undulated periodization also works well.

This is a B-level skill in the Gymnastics Code of Points.

IRON CROSS TO BACK LEVER – LEVEL 11



Scapular Positioning: Depending on the technique you are using, your scapulas will either be depressed and slightly protracted or depressed and neutral as you lower into the iron cross position. As you move into the back lever position, your scapulas will naturally retract but end neutral.

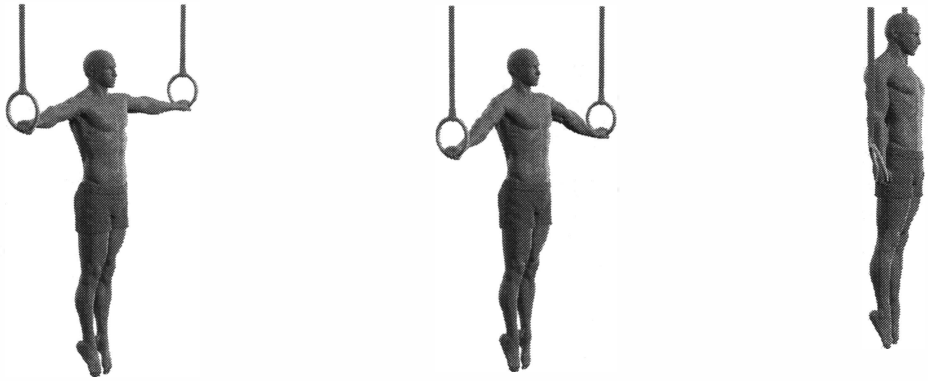
Technique: For the iron cross, your arms will be held straight out in line with your body at a ninety-degree angle. Lock them in this position and keep your shoulders down. You will be pulling the rings downward toward your hips to hold the iron cross position. To initiate the movement into the back lever position, begin to lean forward and pull the rings back slightly. Continue to exert downward force on the rings as you do this. As you lean forward, you will eventually reach a tipping point where gravity takes over. Control the transition as much as you can.

The key with this skill is to get the feel of maintaining the downward force on the rings from the cross as you transition into a back lever. You must continually contract your lats, especially as you lean your upper body forward. Try to get a feel for it in the dream machine or with a spotter before attempting it yourself.

One thing that may cause problems is the "fall." If you are not strong enough to lower slowly and under control, your body will jerk when you get into the back lever position. This can be tough on your shoulders and elbows. If this is the case it may be a good idea to back off and focus on strength work. Or, you can utilize the dream machine or spotter.

This is a B-level skill in the Gymnastics Code of Points.

IRON CROSS PULLOUTS – LEVEL 13



Scapular Positioning: Depending on the technique you are using, your scapulas will either be depressed and slightly protracted or depressed and neutral as you lower into the iron cross position. During your ascent, your scapulas will remain slightly protracted and depressed or neutral and stay that way in support.

Technique: Your arms will be held straight out in line with your body at a ninety-degree angle. Lock them in this position and keep your shoulders down. You will be pulling the rings downward toward your hips to hold this position. Next, push down extremely hard, keeping your arms straight as you bring them in to your sides while your hands remain in the rings-turned-out position.

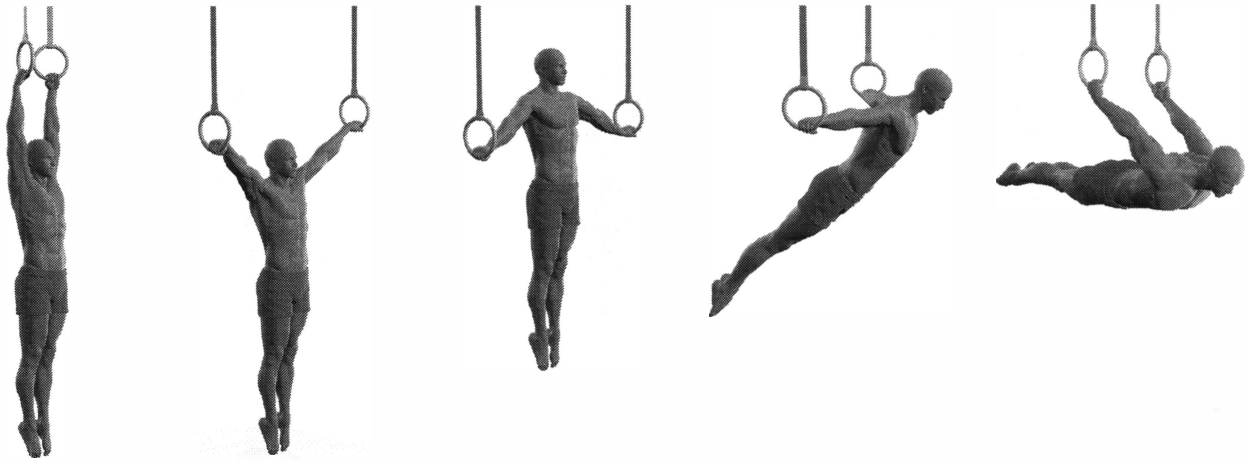
A significant amount of strength is required to pull oneself out of the iron cross from a static position. It may be useful to continue with regular assisted cross pullouts and slowly decrease the resistance until you can perform them without assistance.

There are two different ways to think about moving your hands. You can pull your arms down to the side, or you can push your hands downward. You should use whichever concept helps you focus best. Do note that since your center of mass moves toward your hands and this movement focuses on working your pecs and lats (both pulling muscles), this is classified as a pulling exercise.

The pullouts require a significantly greater amount of strength than the isometric portion of the movement. This is where adrenaline and the supramaximal 120% 1 RM come into play.

This is a C-level skill in the Gymnastics Code of Points.

HANG PULL TO BACK LEVER – LEVEL 14



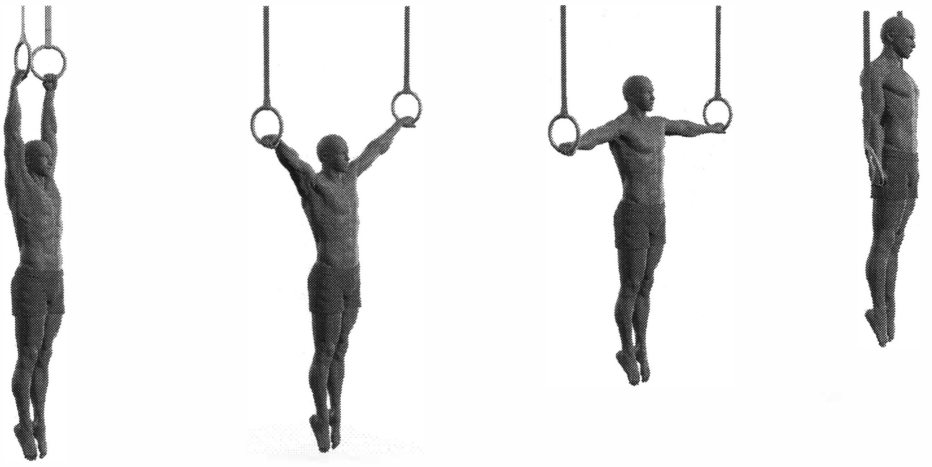
Scapular Positioning: Begin with your scapulas elevated and relaxed. Initiate the movement by activating your shoulders and depressing the scapulas. Your scapulas will protract slightly through the pull to the cross. They will retract as you pass the cross position and begin to lean forward. When you end in the back lever position your scapulas will be neutral.

Technique: Begin in a hang position with straight arms and a false grip. From there, perform a straight-arm pull by forcing your hands downward. Keep your hands slightly in front of your body for more leverage. As soon as you are near the cross position, lean forward while maintaining straight-arm positioning. As you are falling forward into the back lever position, engage your lats further to slow down your descent; otherwise you will strain your shoulders and elbows.

This skill is difficult because it begins from a dead hang. If you are struggling to pull out of the bottom of the skill, one of the ways to build momentum involves pulling the rings in before forcing them outward. This provides your arms a bit of momentum before the pull initiation. You could also raise your legs into a semi-L-sit position to generate a bit of upward force to help initiate the strength movement. Ultimately, you will want to eliminate the assistance of momentum from this skill.

This is a C-level skill in the Gymnastics Code of Points.

BUTTERFLY MOUNT – LEVEL 15



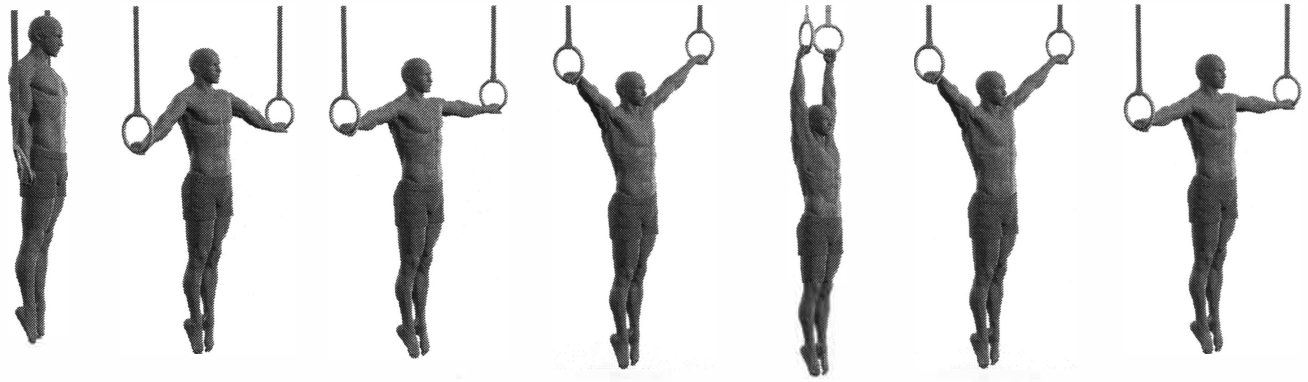
Scapular Positioning: Begin with your scapulas elevated and relaxed. Initiate the movement by activating your shoulders and depressing the scapulas. Your scapulas will protract slightly through the pull to the cross. As you pass the cross position, they will stay either depressed and neutral or slightly protracted all the way to the support position.

Technique: Begin in a hang position with straight arms and a false grip. From there, perform a straight-arm pull by forcing your hands downward. You will want your hands to be slightly in front of your body for more leverage. As you approach the cross position, keep forcing the rings downward to maintain any momentum you may have. If you slow down or pause, you will likely get stuck and not have enough strength to complete the skill.

This skill is essentially a straight-arm muscle-up-to-support hold. It is an amazing feat of pulling strength. Like the previous skill, the difficult part is beginning from a dead hang. If you are struggling to pull out of the bottom of the skill, one of the ways to build momentum is to pull the rings in before forcing them outward. This provides your arms a bit of momentum before the pull initiation. You can also raise your legs into a semi-L-sit position to generate a bit of upward force to help initiate the strength movement. Ultimately, you will want to eliminate the assistance of momentum from this skill.

This is a C-level skill in the Gymnastics Code of Points.

SUPPORT HOLD TO HANG TO IRON CROSS – LEVEL 16



Scapular Positioning: Begin with your scapulas depressed. Initiate the movement by lowering through the cross position to a hang position. Once you reach this position, reverse your downward motion by relaxing your scapulas—elevating and depressing them again. As you move up to the cross position, your scapulas will remain either depressed and neutral or slightly protracted.

Technique: Beginning from the support position, slowly lower through the cross position to a hang position. Use a false grip, since you will be pulling straight out of the position once you reach the bottom. When you reach the hang position, immediately pull your arms out and down. This will raise your body up to the support position.

This is an extension of the previous skill. It bridges the gap between the *butterfly mount* and the *butterfly cross*, which is a *hang pull to cross*. This skill requires a significant amount of energy to control the lowering movement from a support hold, through the cross, and down to the hang position. This subsequently makes the pull out of the bottom of the movement difficult, in spite of the fact that you may get momentum from your hands.

Like the previous skills, you can use this momentum (or the momentum from moving your body into the semi-L-sit position) to assist you in moving out of the bottom of this strength movement. Remember, you will ultimately want to eliminate the assistance of momentum from this skill.

This is a C-level skill in the Gymnastics Code of Points. The butterfly cross, which is not addressed in this book, is approximately a Level 17 skill and has a D-rating in the Gymnastics Code of Points. That skill begins from a hang position and pulls to a cross.

- Chapter 26 -

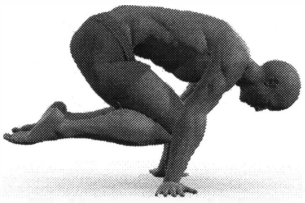
PUSHING VARIATIONS

Planche – Parallel Bars and Floor – Page 3, Column 1

The *planche* requires an unfathomable amount of straight-arm pushing strength. While it can sometimes seem that everyone engaging in bodyweight training is striving for this skill; however, those who can perform it well are few and far between.

Many Internet videos now feature this skill and suggest methods for training toward it. However, in most every case, you will find that the subjects in these videos have an extremely arched spine and slightly bent arms. These form errors do more than make the skill less aesthetically appealing; they also make the skill much easier to perform, thus sacrificing overall strength gains. You may hear of people obtaining a "planche" in under a year, but it is likely not a pure variation of this skill.

If an authentic planche is one of your primary goals, avoid form errors, as you would only be cheating yourself out of proper strength development. While it will take longer to achieve an authentic planche, your body positioning and overall level of strength will be significantly better, which will transfer to other bodyweight strength skills as well.


There are a few different hand positions you can use for the planche, each with its own pros and cons. *Hands forward* makes the skill easier because you have more leverage in your fingers but the movement is harder on your wrists than the following positions. *Hands to the side* easily transfers from the floor to parallettes or from parallel bars to rings, but it makes the skill more difficult than the previous position. *Hands backward* makes the skill the most difficult but directly works your biceps to build large muscles and connective tissue strength.

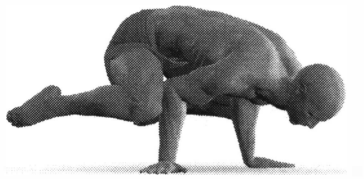
Unless you have other reasons for desiring the first or third option, *hands to the side* is recommended—being the most applicable and causing the least amount of wrist irritation—but any of these positions will

work. Those who want to work the planche as quickly as possible will probably find the *hands forward* position is best for them, while those who will perform a lot of specific work on the rings would benefit from using the *hands backward position.* (If you choose the *hands forward* position, make sure to include extra wrist work in your routine to prevent overuse injuries.)

You will likely get frustrated while working toward the planche, simply because it takes so long to get there. Remember, you do not know the strength and condition of those who claim they were able to achieve the position in a short amount of time; they may have had five to ten years of other strength training under their belt, thus speeding up their rate of progress. The key to training for the planche is *consistency*—even in your supplemental work. If you keep changing up your routine, do not expect to excel at this skill.

For the planche position, your shoulders should be tight and active, and your scapulas should be protracted and depressed as far as possible. This is done by pressing deep into the ground with your hands, arms, and shoulders as one unit, thus resisting all of the downward force on your body. This active position is essential to keep your shoulders safe from impingement, to allow better leverage, and to correctly position your body. This same position is used in many other movements and holds like L-sits, dips, and rings support work.

FROG STAND – LEVEL 3



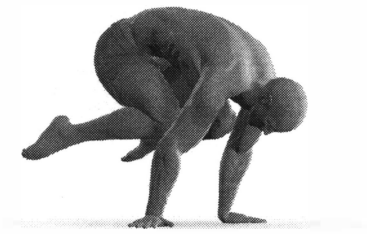
Scapular Positioning: Your scapulas will be protracted and depressed without rounding your upper back.

Technique: Grip the ground or parallettes firmly and lean forward with bent arms until most of the weight is on your hands. Slowly place one knee at a time on the shelf created by your slightly bent elbows. Once you can balance in this position, lean forward until your shoulders and hips are level.

The *frog stand* is less of a strength skill and more of a balance skill. That is not to say it does not require any strength, but most of your focus will be on getting a feel for the position. One of the alternative ways to move into this position is to begin in a tripod position with your hands and head on the ground, like in a headstand. You then bring down your knees to your elbows and slowly shift your weight backward onto your hands for balance.

As with all the planche skills from here on out, you should prepare your body for the "I'm going to face plant!" sensation. This is normal and a big part of moving up from one progression to the next. You can fight this sensation with your shoulders. Do not bend your elbows (except in the frog stand). This is a bad habit that can be hard to break. The core of your pressing ability should be straight-arm strength through your shoulders.

STRAIGHT-ARM FROG STAND – LEVEL 4



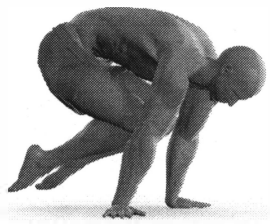
Scapular Positioning: Your scapulas will be protracted and depressed without rounding your upper back.

Technique: Lean forward with your arms straight (instead of bent), while maintaining active shoulders and a tight grip. As you lean forward, place your knees directly above your elbows. Unlike the previous progression, there is no longer a shelf to assist you. Therefore, you will have to rely on your shoulder and abdominal strength.

When you begin the *straight-arm frog stand*, you may find that you have to slightly bend your arms (as in the illustration above). This is acceptable initially, as this skill is primarily about balance. However, once you straighten your arms the position becomes more about shoulder strength. You will have to lean forward a bit more than you did in the previous progression, which increases the difficulty level. If you get a "face plant" sensation, you will want to fight it now to prepare for future skills.

This skill is somewhat of an intermediary position between the frog stand (which is performed with bent arms) and the tuck planche. Performing this skill with straight arms is fundamental in order to build the correct amount of strength for the planche. Do not move onto the next progression until you can perform this skill without bending your elbows even a little bit.

TUCK PLANCHE – LEVEL 5



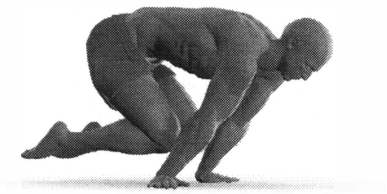
Scapular Positioning: Your scapulas will be protracted and depressed without rounding your upper back.

Technique: Begin in the bottom of a squat. Place your hands on the ground or parallettes and grip firmly. Keep your arms locked straight and your shoulders tight and active. Lean forward to shift your weight from your feet to your arms. From there, continue leaning forward and raising your hips until they reach shoulder height and you are in a tuck planche position. You should keep your knees to your chest as tightly as possible and your feet tucked toward your butt.

The *tuck planche* is the first skill in this series of progressions that relies solely on shoulder strength to support the body. Fear of face-planting is often an issue for beginners. It is important to reduce your fear so you can concentrate on properly performing the strength technique. Lay a pillow or other soft cushion on the floor in front of your hands, just in case you fall.

Another issue can arise when this skill is performed on the ground. You may find that you cannot get into a good tuck position with your knees and feet tight. This is an issue of core compression strength, and it can be improved in conjunction with your L-sit training. Concurrently train the tuck planche with your core compression work by using an implement like parallettes or two sturdy twin chairs. Aim to tuck hard and get your knees and feet as close as possible to your chest and butt, respectively. Finally, do not ever forget to keep your shoulders active and strong.

ADVANCED TUCK PLANCHE – LEVEL 6



Scapular Positioning: Your scapulas will be fully protracted and depressed without rounding your upper back.

Technique: Begin in the bottom of a squat. Place your hands on the ground or parallettes and grip firmly. Keep your arms locked straight and your shoulders tight and active. Lean forward to shift your weight from your feet to your arms. From there, continue leaning forward and raising your hips until they reach shoulder height and you are in a tuck planche position. You should keep your knees to your chest as tightly as possible and your feet tucked toward your butt. Slowly straighten out your back and extend your legs to the ninety-degree hip angle.

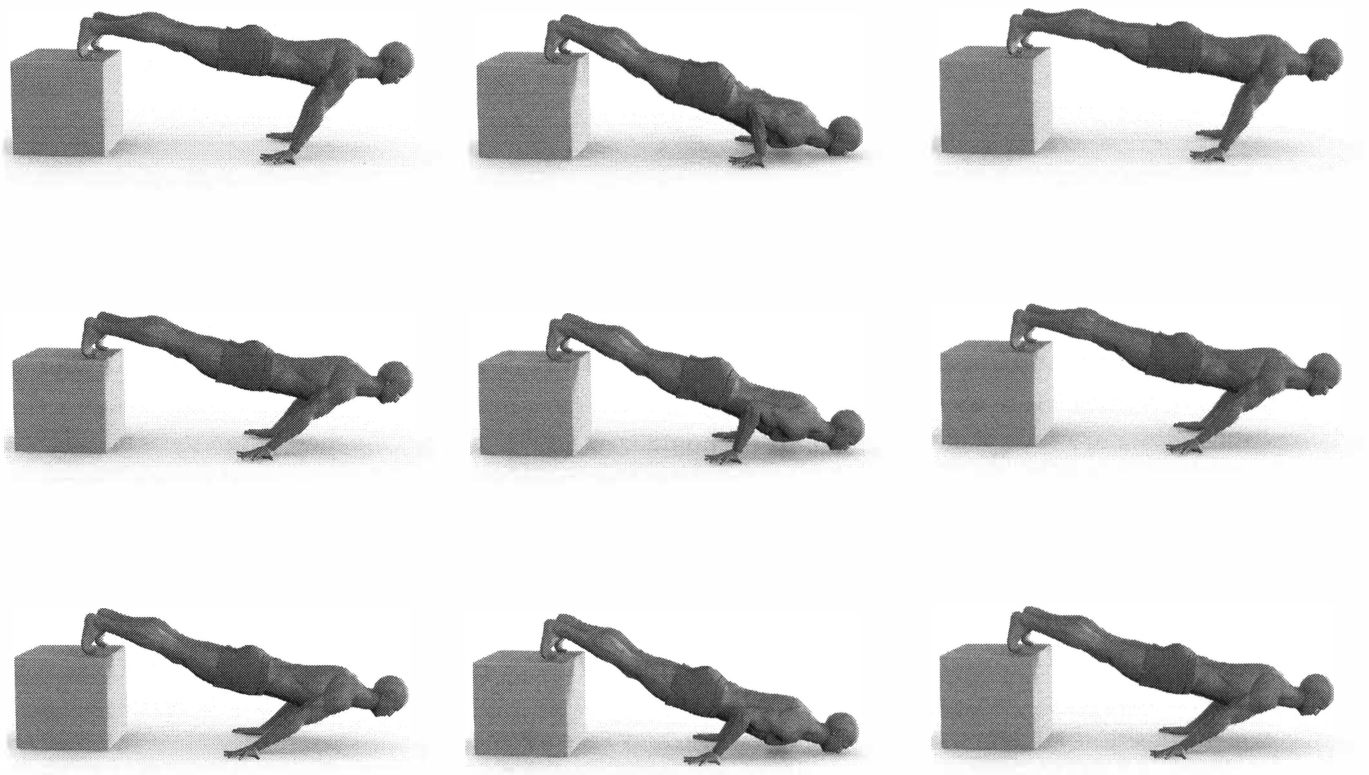
The *advanced tuck planche* takes the tuck planche and flattens out the back while continuing to keep the hips and shoulders in line and parallel with the ground. At this point, you should have fairly good command over your tuck position. Dragging your feet will not be an issue when training on the floor. Lock your arms and shoulders and lean forward, placing your weight on your hands while gripping the ground hard. From the tuck planche position, straighten your back until you achieve the advanced position.

At first, you may have a difficult time figuring out how to straighten your back. A lack of back control can typically be corrected by training straight-arm press handstand progressions. Both the planche and straight-arm press handstands are straight-arm pressing skills that work synergistically to increase shoulder strength. They also facilitate core strength and awareness.

To increase the difficulty of the skill, straighten your back. This will cause you to lean forward more and this increases the torque at your shoulders. If your feet start to sag toward the floor as you straighten out, you are likely facing one of two problems: Either you simply need to lean forward more, or your level of strength is inadequate and you should return to the previous progression until you are ready for this advanced skill.

As fatigue management allows, adding supplemental work will be extremely useful to help develop the strength needed to obtain a planche. Any other shoulder-based pressing movements can also act as drivers for better shoulder pressing strength, but specificity would be very helpful here. As such, pseudo planche push-ups and planche leans are a great choice; however, they are a bit hard to measure, which is why they are not listed on the progression charts.

PSEUDO PLANCHE PUSHUPS



Progressive pseudo planche pushups move your hands further back.

Pseudo planche pushups (which can be abbreviated *PPPUs*) are, in essence, a best attempt to simulate holding the planche position and completing a pushup in that position, but with some assistance. When progress is stalling, these can help significantly.

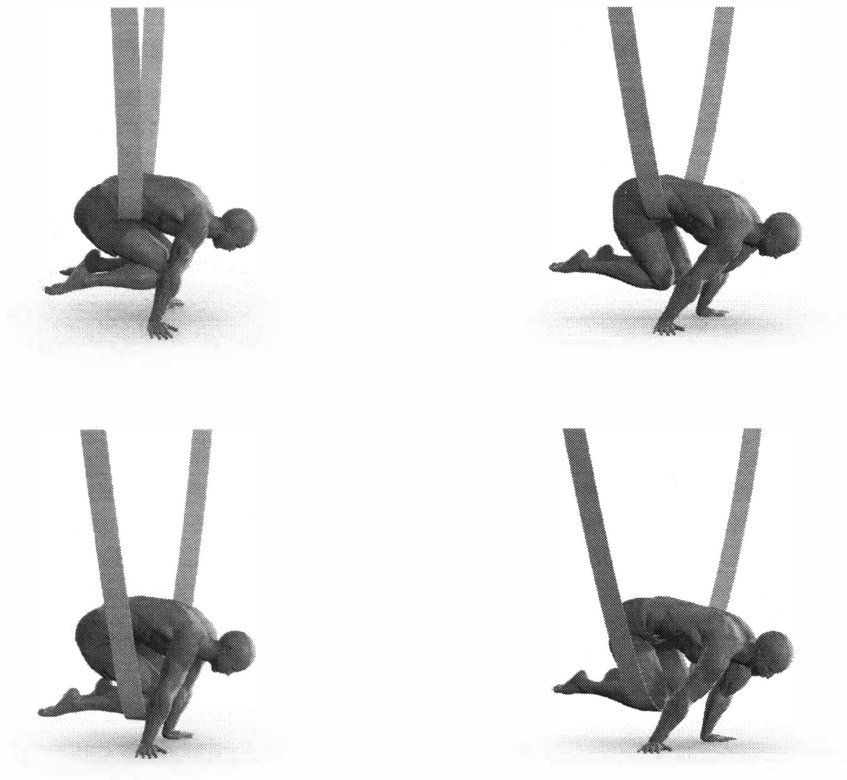
Begin in a standard pushup position, but place your feet on an implement instead of on the ground. The implement could be a box, mat, chair—anything that is high enough to align your feet with your shoulders horizontally. With a straight or slightly hollow body, lean forward as far as possible into the planche position and lower yourself so that your shoulders are at least as low as your elbows. Then, push back up to a feet-supported planche position.

A *planche lean* is exactly what it says it is. Prop your feet up to shoulder height and lean forward as far as possible without tipping over. Hold this position for a set amount of time.

From this progression onward, it is common to want to bend your arms slightly or have your hips slightly higher than your shoulders. These errors should be carefully avoided. The proper position will be difficult to hold, due to strength requirements as well as body awareness, but you want to ensure that you are holding it correctly. You should experience a "face plant" sensation, and your hips will likely feel lower than they actually are. Use a spotter or camera to check your form.

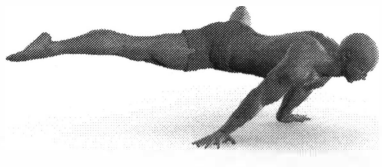
As a supplementary exercise for the planche, PPPUs are excellent. The way to make these measurable is to always place the block or chair or other elevated surface in the same place. You can mark it on the floor. Next, mark the distance for the hands progressively as you move them back. You can either mark it from the place where you regularly do pushups or the total distance from your feet. Whatever way you mark them, PPPUs are a great way to begin to gain the increased strength necessary for the planche.

BAND-ASSISTED PLANCHE



The *band-assisted planche* is one of the variations that has become recently popular. This variation allows you to hit the next isometric position in the planche with decreased strength requirements. The body is able to quickly get used to the position and the application of correct strength at particular angles, which may decrease the amount of time it takes to achieve the strength the planche requires. Pseudo planche pushups are preferred over this method, but try both and see which works best for you.

STRADDLE PLANCHE – LEVEL 8



Scapular Positioning: Your scapulas will be fully protracted and depressed without rounding your upper back.

Technique: Begin in the bottom of a squat. Place your hands on the ground or parallettes and grip firmly. Keep your arms locked straight and your shoulders tight and active. Lean forward to shift your weight from your feet to your arms. From there, continue leaning forward and raising your hips until they reach shoulder height and you are in a straight-body position with your legs apart. You should maintain a straight line from your shoulders through your hips/knees/ankles to your toes, but you should also have your legs spread as far apart as possible.

There are a few ways to achieve the *straddle planche* position, whether on the ground or parallettes. The most common method involves leaning into the skill with your hips slightly bent, and then lifting your legs off the ground once you are balanced on your hands. Another method is to jump into the position and attempt to balance it from there. While this is more difficult, some will prefer this method. Pick whichever feels more natural to you and maintain proper body positioning.

By now, your straddle should be proficient because you have practiced it in press handstands, abdominal compression work, and the back and front lever progressions. If your straddle is not proficient, make time for more straddle work before attempting this skill.

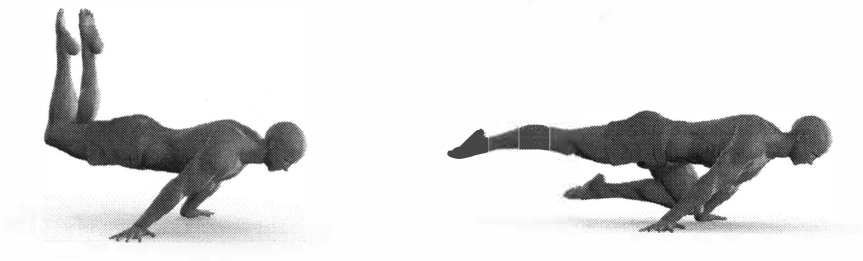
In most cases, supplemental work is required to attain a straddle planche. Commonly, three exercises are used in tandem. The first is the planche isometric, and the other two are supplemental dynamic pressing movements (like planche progression pushups and/or pseudo planche pushups with a dipping or handstand press variation).

To bridge the gap from the advanced tuck to the straddle position you can use the assisted straddle planche or any advanced tuck variation with a higher level of difficulty, such as adding ankle weights or a weighted vest while performing the advanced tuck position. Alternatively, you can use Therabands or other elastic bands to make the straddle planche easier.

Avoid the bent-arms and hips-too-high faults! Use a camera, mirror, or spotter to evaluate and correct your form.

This is an A-level skill in the Gymnastics Code of Points.

HALF LAYOUT / ONE-LEG-OUT PLANCHE – LEVEL 9



Scapular Positioning: Your scapulas will be protracted and depressed without rounding your upper back.

Technique for *Half-Layout*: Begin in the bottom of a squat. Place your hands on the ground or parallettes and grip firmly. Keep your arms locked straight and your shoulders tight and active. Lean forward to shift your weight from your feet to your arms. From there, continue leaning forward and raising your hips until they reach shoulder height and you are in a half-layout position: Your knees and legs are together and all of your joints are aligned—from your shoulders through your hips and knees through your legs—except your knees are bent at a ninety-degree angle.

Technique for *One-Leg-Out Planche*: Begin in the bottom of a squat position, with your hands firmly gripping the ground or parallettes. Lock your arms straight and keep your shoulders tight and active. Lean forward to shift all of your weight off your feet onto your arms. From there, continue leaning forward and raise your hips until they reach shoulder height and you are in a one-leg-out position, which is the same as the straight-body position except one leg is bent at both the hips and the knee, leaving it in a position that is similar to an advanced tuck.

The half layout position is preferred, as the form more easily transfers to the full layout position. However, if there is another position that feels more natural for you, use it. Regardless of which position you choose, your form must be flawless. If you notice any faults, correct them immediately.

This progression is an optional intermediate step between the straddle planche and the full planche. Most people will try to skip this stage and go straight to the full planche. If you can achieve the position, go for it. Or, you can use this progression to bridge the gap.

FULL PLANCHE – LEVEL 11



Scapular Positioning: Your scapulas will be protracted and depressed without rounding your upper back.

Technique: Begin in the bottom of a squat. Place your hands on the ground or parallettes and grip firmly. Keep your arms locked straight and your shoulders tight and active. Lean forward to shift your weight from your feet to your arms. From there, continue leaning forward and raising your hips until they reach shoulder height and you are in a full planche position with your body aligned straight from your shoulders through your torso/hips/knees/ankles to your toes. Your toes should be pointed and your body should be parallel with the ground.

The key with the *full planche* is—like every other skill in this progression—overcoming the face-plant sensation. You should be leaning far enough over that you feel very low to the ground and close to falling on your face. Make sure that you are generating full-body tension by squeezing all of the muscles in your core, glutes, and legs. One of the things that can help generate tension for this skill is to squeeze your hands together while pressing them forward. The extra tension generated from your pectorals and serratus anterior helps increase all of the muscle activity around your shoulder girdle. This can help you attain the last bit of strength needed to execute this skill.

Like the straddle planche, the full planche typically requires some specific supplementary work. By this point you should know what works best for you. What usually holds people back is a lack of musculature or potential imbalances. If you are weak with pulling movements and back strength, work on strengthening your scapular retractors, posterior deltoids, and rotator cuff muscles. If there is no imbalance, you may benefit from performing more high-repetition hypertrophy work in order to gain more muscle mass. Remember, *strength = neural adaptations * cross sectional area of muscle*. The small amount of weight added at your shoulder for more muscle mass is also beneficial for gaining strength and will not hinder you as much as you may think.

Once you have achieved clean, perfect straight-body positioning, be sure to take a photo—you are holding a planche! Congratulations! This is no easy feat.

This is a B-level skill in the Gymnastics Code of Points.

STRAIGHT-ARM STRADDLE PLANCHE TO HANDSTAND – LEVEL 12



Scapular Positioning: Your scapulas will be protracted and depressed without rounding your upper back. As your body rises, your scapulas will transition from protracted to neutral and from depressed to elevated. In the ending handstand position, your scapulas will be fully elevated.

Technique: Begin in a straddle planche position. To initiate the movement, lean forward slightly and increase pressure through your hands to begin lifting your hips. As you move toward the handstand and the torque on your shoulders lessens, the skill will become slightly easier.

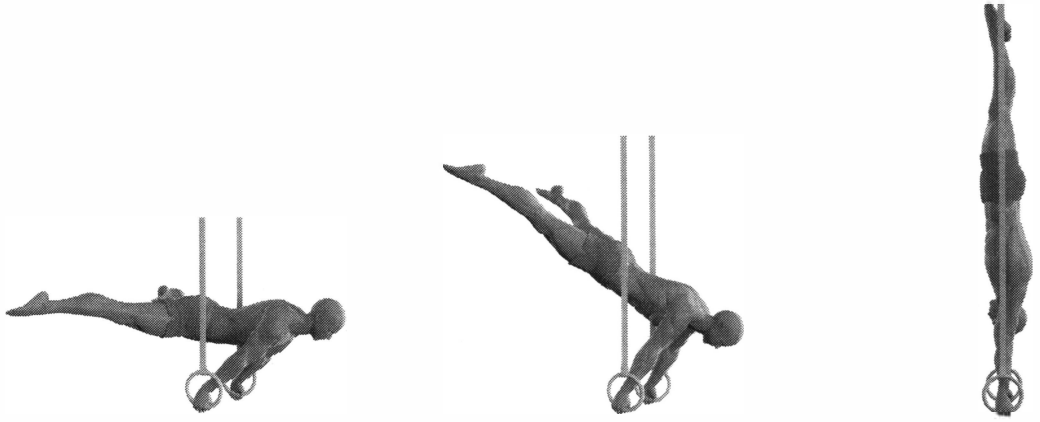
The *straight-arm straddle planche to handstand* skill (which can be abbreviated *SA Str PL to HS*) can be completed on the FX (ground) or PB (parallel bars). The illustration above depicts it on the FX. This skill is executed by leaning forward into the straddle planche position and then pressing out to a handstand. This technique requires brute strength, so if you are proficient with planches and handstands you can begin to work toward this skill. It is usually easiest to begin by doing it in reverse. Then, once you are stronger and more familiar with the skill, you can perform the full movement.

The main thing to keep in mind is to maintain active shoulders and a straight body. Once you begin leaning forward, it is much like a regular press handstand: You will need to force your hands overhead strongly. You will naturally want to arch your back but this must be avoided.

Avoid bending your arms and arching your back. (It is acceptable to arch your back a little initially, but you will want to eliminate this fault as you get stronger.)

This is a B-level skill in the Gymnastics Code of Points.

RINGS STRAIGHT-ARM STRADDLE PLANCHE TO HANDSTAND – LEVEL 14



Scapular Positioning: Your scapulas will be protracted and depressed without rounding your upper back. As your body rises, your scapulas will transition from protracted to neutral and from depressed to elevated. In the ending handstand position, your scapulas will be fully elevated.

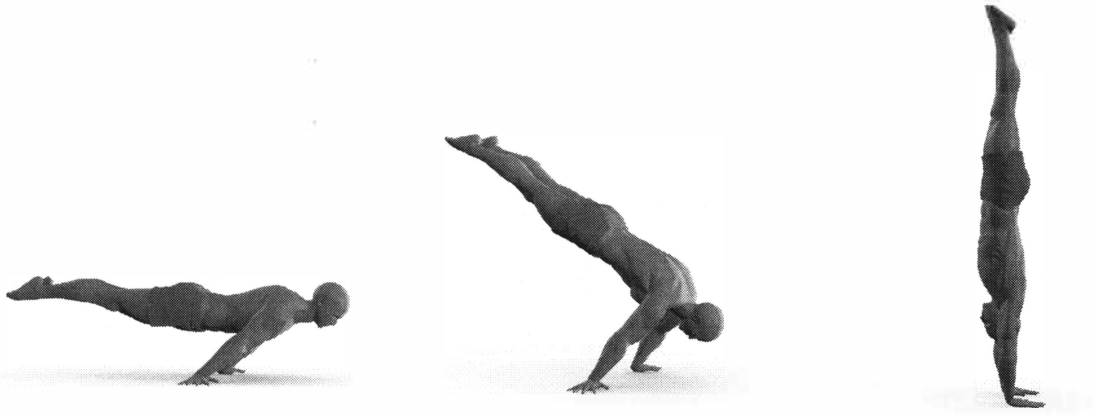
Technique: Same as the previous progression, but on the rings. Begin in a straddle planche position. To initiate the movement, lean forward slightly and increase pressure through your hands to begin lifting your hips. As you move toward the handstand position, the skill will become slightly easier as the torque on your shoulders lessens.

Brute strength is necessary to achieve the *rings straight-arm straddle planche to handstand* (which can be abbreviated *Rings SA Str PL to HS*). If you are proficient with planches and handstands you can begin to work toward this skill. It is usually easiest to begin solely in reverse. Then, once you are stronger and more familiar with the skill, you can perform the full movement.

The main thing to keep in mind with this skill is maintaining active shoulders and a straight body. Once you begin leaning forward, it is like a regular press handstand in that you will need to force your hands overhead strongly. You will naturally want to arch your back but this must be avoided.

This is a B-level skill in the Gymnastics Code of Points, though it is much more difficult than a typical Level 12 skill. Based on previous skills and progressions it should probably be rated Level 13 or 14, around the lower end of Level C on the Code of Points.

STRAIGHT-ARM, STRAIGHT-BODY FROM PLANCHE TO HANDSTAND – LEVEL 15



Scapular Positioning: Your scapulas will be protracted and depressed without rounding your upper back. As your body rises, your scapulas will transition from protracted to neutral and from depressed to elevated. In the ending handstand position, your scapulas will be fully elevated.

Technique: Begin in a full planche position. To initiate the movement, lean forward slightly and increase pressure through your hands to begin lifting your hips. As you move toward the handstand position, the skill will become slightly easier as the torque on your shoulders lessens.

The technique and approach here is the same as the *straddle planche to handstand*. Lean forward and allow yourself to rotate up to a handstand position, while maintaining enough force at your shoulder to prevent yourself from falling forward. Work this skill eccentrically, then concentrically.

This skill is more difficult than the previous two progressions because it begins statically, in the planche position. This means you will have no momentum to help you achieve the handstand position. If you can achieve this skill, you have achieved a rare and remarkable level of strength.

This is a C-level skill in the Gymnastics Code of Points.

RINGS STRAIGHT-ARM, STRAIGHT-BODY PRESS TO HANDSTAND – LEVEL 16



Scapular Positioning: Your scapulas will be either depressed and neutral or slightly protracted to start. As you lean forward and your body rises, your scapulas will transition from depressed to elevated and protracted to neutral. In the ending handstand position, your scapulas will be fully elevated.

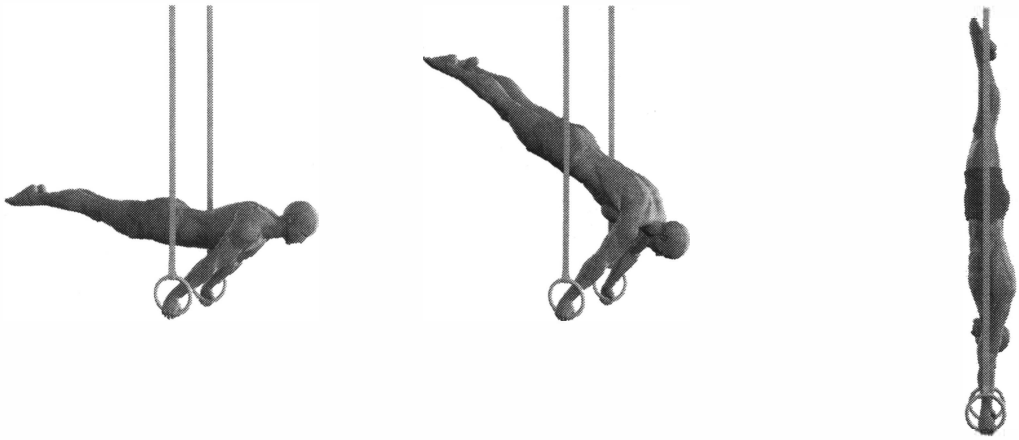
Technique: This skill is completed on the rings. Begin in the support position. To initiate the movement, lean forward slightly and increase pressure through your hands to begin lifting your hips. As you move up through a full planche toward the handstand position, the skill will become slightly easier as the torque on your shoulders lessens. Finish in a rings handstand position.

The *rings straight-arm, straight-body press to handstand* (which can be abbreviated *Rings SA SB to HS*) is essentially a *straight-arm hollowback press.* If you are proficient with the hollowback press and planche, you can begin to work toward this skill. This is a very difficult skill, so you may need to use some momentum when you are first learning it. As you increase in strength, decrease the amount of momentum used.

This skill can be practiced in reverse, beginning in a handstand. Additionally, you can swing on the rings a bit before initiating the movement if you cannot quite achieve it with strict form. Your body will naturally want to arch, but you must remember to keep your body straight for the entire duration of the movement.

This is a C-level skill in the Gymnastics Code of Points.

RINGS STRAIGHT-ARM, STRAIGHT-BODY FROM PLANCHE TO HANDSTAND – LEVEL 16



Scapular Positioning: Your scapulas will be protracted and depressed without rounding your upper back. As your body rises, your scapulas will transition from protracted to neutral and from depressed to elevated. In the ending handstand position, your scapulas will be fully elevated.

Technique: This skill is completed on the rings. Begin in planche position. To initiate the movement, lean forward slightly and increase pressure through your hands to begin lifting your hips. As you move toward the handstand position, the skill will become slightly easier as the torque on your shoulders lessens. Finish in the rings handstand position.

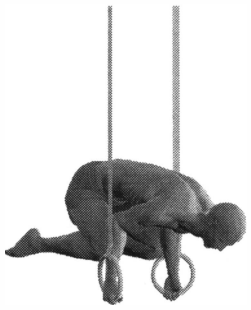
The technique is the same as two progressions before, but you will complete it on the rings. This skill should be worked eccentrically, then concentrically.

This is a C-level skill in the Gymnastics Code of Points.

Rings Planche – Page 3, Column 2

The rings planche positions are the same as the floor and parallettes variations. The only real difference is orienting your hands to maintain control and stability over the rings. Of course, this is the hard part. This is why all of the planche skills in the Gymnastics Code of Points are one letter grade more difficult on the rings as opposed to the floor and parallel bars. Strength gains from performing these holds on rings are phenomenal and carry over extensively to their floor and parallettes' counterparts.

RINGS FROG STAND – LEVEL 4



Scapular Positioning: Your scapulas will be protracted and depressed without rounding your upper back.

Technique: Plant your hands on the rings and grip tightly. Lean forward with bent arms and slowly place one knee at a time on the shelf created by your slightly bent elbows. Once you can balance in that position, lean forward until your shoulders are level with your hips.

Orient the rings to the parallel position. You do not want them turned out yet because you still need to use your elbow area as a resting point for your legs. From here, the approach will be the same as a frog stand performed on the floor or parallettes.

The rings will feel very shaky when you begin this skill. By this point, you should be proficient in RTO support work and, potentially, rings pushups as well. These two movements will help substantially as you learn how to stabilize the rings while they are in front of you.

RINGS STRAIGHT-ARM FROG STAND – LEVEL 5



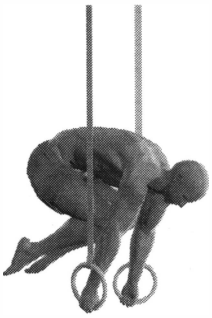
Scapular Positioning: Your scapulas will be protracted and depressed without rounding your upper back.

Technique: Plant your hands on the rings and grip tightly. Lean forward with straight arms and place your knees right above your elbows as you did in the previous progression. However, there will no longer be a shelf to assist you, which means this skill will require more shoulder strength.

When you begin the *rings straight-arm frog stand*, you may have to slightly bend your arms (as in the illustration above). This is acceptable initially, as this skill is primarily about balance. However, once you straighten your arms the position becomes more about shoulder strength. It is important to use straight arms for this movement in order to build the strength required for future progressions. Do not move onto the next progression until you can perform this skill without bending your elbows.

For the straight-arm frog stand, orient the rings to the parallel position. You do not want them turned out just yet because you still need to use your elbow area as a resting point for your legs. From here, the approach will be the same as a frog stand performed on the floor or parallettes.

RINGS TUCK PLANCHE – LEVEL 6



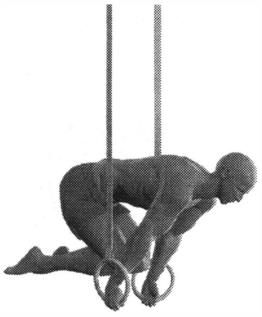
Scapular Positioning: Your scapulas will be protracted and depressed without rounding your upper back.

Technique: This skill is completed on the rings. Begin in a support position and lean forward, taking all your weight off your feet until they are airborne. From there, continue to lean forward and raise your hips until they reach shoulder height. Your knees should be held to your chest as tight as possible, and your feet should be tucked to your butt.

This is where the technique differs: Instead of orienting the rings in the parallel position like you would on the parallettes, turn them out to forty-five degrees past the parallel position. This will give you more control. Coaches may prefer anywhere from forty-five to ninety degrees past the parallel position, but this is not required unless you want to specialize in gymnastics.

The main difficulty will be keeping your hips at shoulder height and your arms tightly locked in a straight position. This will be the case for all of the following rings planche progressions.

RINGS ADVANCED TUCK PLANCHE – LEVEL 8



Scapular Positioning: Your scapulas will be protracted and depressed without rounding your upper back.

Technique: This skill is completed on the rings. Begin in a support position and lean forward, taking all your weight off your feet until they are airborne. From there, continue to lean forward and raise your hips until they reach shoulder height. Next, flatten out your back while continuing to keep your hips and shoulders in line and parallel with the ground and at a ninety-degree angle (where your hips meet your torso).

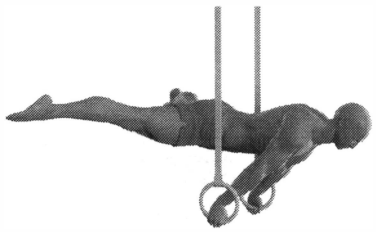
The rings should be turned out to at least forty-five degrees. The rest of the technique for this skill is the same as the variation performed on the floor or parallettes.

You will lean forward while locking your arms and shoulders. This will place your weight on your hands as you grip the rings tightly. Start from the tuck planche position and straighten your back until you achieve the advanced tuck position.

You may have a difficult time figuring out how to straighten your back. This lack of back control can be remedied by training the straight-arm press handstand progression. Both the planche and straight-arm press handstands are straight-arm pressing skills that work synergistically to increase shoulder strength. They also facilitate core awareness and strength; both of which help fix issues like this one.

Straightening out will cause you to lean forward more and thus increase the torque at your shoulders, which increases the difficulty of the skill. If your feet begin to sag toward the floor as you straighten out, it is likely caused by one of two problems: either you simply need to lean forward more, or your level of strength is not adequate and you should return to the previous progression.

RINGS STRADDLE PLANCHE – LEVEL 10



Scapular Positioning: Your scapulas will be protracted and depressed without rounding your upper back.

Technique: This skill is completed on the rings. Begin in a support position and lean forward, taking all your weight off your feet until they are airborne. From there, continue to lean forward and raise your hips until they reach shoulder height. Make sure the line from your hips through your hips/knees to your toes is straight and parallel with the ground. Keep your legs spread as far apart as possible.

Again, the rings need to be turned out to forty-five degrees or more. The rest of the technique for this skill is the same as the variation performed on the floor or parallettes. By now, you should be proficient with the straddle movement because of the practice you have gotten with press handstands, abdominal compression work, and back and front lever progressions. If your straddle still needs work, hone it before training this skill.

Once you are on the rings, there are two ways to move into position. You can either lean forward into the skill from the support position or begin from a tuck planche and extend your legs. You can also execute this skill from the floor or a mat near rings height by leaning into the position, similar to the floor and parallettes progressions. As long as proper body positioning is maintained, any of these will work.

Remember to avoid the bent-arms and hips-too-high faults! Use a camera, mirror, or spotter to evaluate and correct your form.

This is a B-level skill in the Gymnastics Code of Points.

RINGS HALF LAYOUT / ONE-LEG-OUT PLANCHE – LEVEL 12

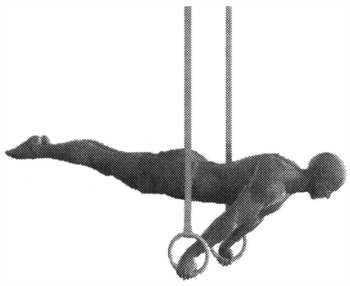


Scapular Positioning: Your scapulas will be protracted and depressed without rounding your upper back.

Technique: This skill is completed on the rings. Begin in a support position and lean forward, taking all your weight off your feet until they are airborne. From there, continue to lean forward and raise your hips until they reach shoulder height and move into a half layout position. This means your knees and legs are together and all of your joints are aligned—from your shoulders through your hips and knees through your legs—except your knees are bent at a ninety-degree angle. If you prefer to use the one-leg-out position over the half layout, it involves the same straight-body position except one leg is bent at both the hips and knee, similar to an advanced tuck position.

When you get to this point, you may want to turn the rings out a bit more in order to stress your biceps and create more tension in your upper body, resulting in increased stability. The rest of the technique for this skill is the same as the variation performed on the floor or parallettes. Use the position that works best for you, although the half layout position's form transfers more quickly to the full layout position. Maintain proper form and correct any faults immediately.

RINGS FULL PLANCHE – LEVEL 14



Scapular Positioning: Your scapulas will be protracted and depressed without rounding your upper back.

Technique: This skill is completed on the rings. Begin in a support position and lean forward, taking all your weight off your feet until they are airborne. From there, continue to lean forward and raise your hips until they reach shoulder height. Next, align your shoulders with your hips/knees/ankles to reach the full planche position.

On the FIG Gymnastics A-G scale, the *rings full planche* is a C-level skill. Though Level G is the highest level on the scale, by the time you reach Level C you have achieved an impressive amount of strength. To put it in perspective, a planche on parallel bars and an iron cross are both only B-level skills. If you have reached this level, you probably no longer need advice from this book.

Planche Pushups – Parallel Bars and Floor – Page 3, Column 3

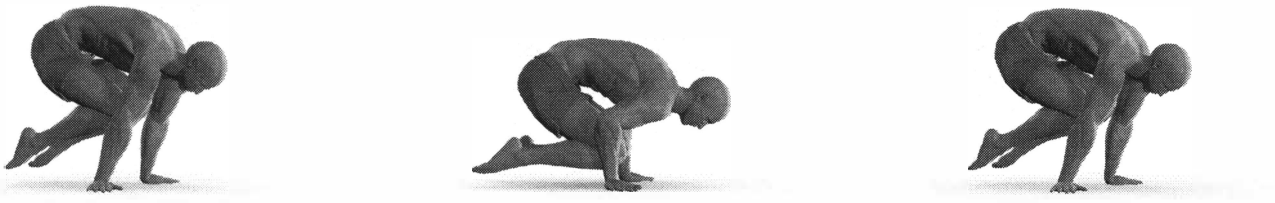
The planche pushup progression is an excellent supplement to build your strength for planche isometrics, as you will need to be able to control your body as you move in and out of the planche position and be able to pause in an isometric hold at the top of the movement. Even without the isometrics, this progression is excellent in its own right for building overall strength. Generally speaking, these pushup variations will typically lag one progression behind their isometric variations.

Three common faults with planche pushups (all variations) are delineated below:

1. It is common to not be aware of your body when beginning this movement, and it is easy to forget where you are in space. Dropping or elevating your hips will bring your center of mass closer to your arms. This will decrease the leverage against your shoulders and make the movement much easier to perform. Your body may tend to do this naturally, to compensate for weakness. It should be avoided. A spotter can tell you that you are too high or low, or you can use a camera to track your body positions from set to set so any faults can be corrected.
2. The hardest part of the movement is locking your elbows at the top and then pausing in a planche isometric position. It was mentioned earlier that bending your arms, even slightly, makes the isometric significantly easier. By extension, locking your arms straight is the most difficult position. It is common to see videos where people do not lock their arms while performing planche pushups. This flaw is fatal to your overall strength training. Not only are you reinforcing a fault while practicing the planche isometric, you are also missing out on hard-earned transitional strength that is acquired from moving from bent-arm to straight-arm strength.
3. The last fault has to do with your shoulders. When new trainees start to support themselves on their hands it is easy for them to be lazy with their scapulas. For instance, when you see a trainee attempting a planche they usually engage their shoulders as they lean forward, but they allow their scapulas to relax and stick out from the back. You should not allow this to occur. Focus on pushing your hands as far away from your body as possible at all times. This keeps your scapulas pinned against your rib cage. This increases their congruency with your rib cage and thus provides a more overall stable shoulder girdle. This will help increase force output from your shoulder and help stabilize the skill. If you are having issues with being able to keep your scapulas against your ribs, add some scapular pushups to your routine to work on your serratus anterior, which is the muscle responsible for this action.

Keep all of these common faults in mind when training these progressions.

TUCK PLANCHE PUSHUPS – LEVEL 6



Scapular Positioning: Your scapulas will be protracted and fully depressed without rounding your upper back. They will retract through the eccentric portion of the movement and be fully retracted at the bottom. As you rise back up to the starting position, your scapulas will protract. They will end protracted and fully depressed.

Technique: At this point, you should be able to perform a solid tuck planche. This skill begins in a tuck planche isometric hold, with the back rounded and hips at shoulder height. From here, lower your body in a slow and controlled manner. This may appear to be a dip position, with your elbows fully bent and hands near your shoulders, however, the significant difference is a forward lean—enough to keep your hips at shoulder height. Once you hit the bottom of the movement, you can pause (if desired), then begin the concentric movement back to a straight-arm tuck position. Emphasize the starting position by holding it for a few seconds before attempting another repetition.

You can perform this movement on the ground, but if you desire to increase your range of motion you can perform this movement on parallettes, chairs, or other implements that will increase the height of your body. This will make the movement much more difficult, but it will also increase strength and hypertrophy. Parallettes are recommended, if they are available to you.

Keeping your hips level with your shoulders during the entire movement is the hardest element of this skill. You must push forward and downward with your hands for the duration of the skill to maintain this position. Even if you have the strength to do this, you may be inconsistent. Practice with strict form; it will help you in subsequent progressions.

ADVANCED TUCK PLANCHE PUSHUPS – LEVEL 8

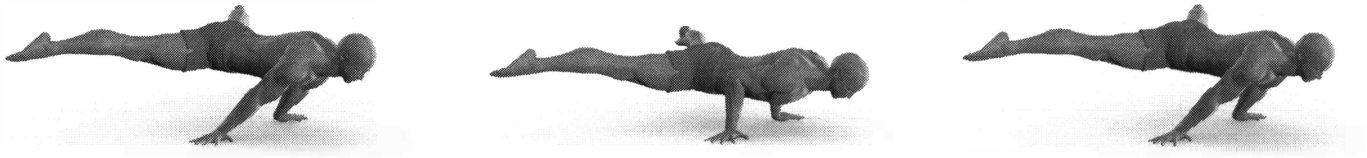


Scapular Positioning: Your scapulas will be protracted and fully depressed without rounding your upper back. They will retract through the eccentric portion of the movement and be fully retracted at the bottom. As you rise back up to the starting position, your scapulas will protract. They will end protracted and fully depressed.

Technique: For the advanced tuck planche position you want a flat back, your shoulders/hips aligned and parallel to the ground, and your hips/knees bent at ninety-degree angles. From here, lower your body in a slow and controlled manner. This may appear to be a dip position, with your elbows fully bent and hands near your shoulders, however, the significant difference is a forward lean—enough to keep your hips at shoulder height. Once you hit the bottom of the movement, you can pause (if desired), then begin the concentric movement back to a straight-arm tuck position. Emphasize the starting position by holding it for a few seconds before attempting another repetition.

You will likely not reach this level until you can execute a decent straddle planche. Be conservative with these progressions and try not to advance too rapidly. Executing these with perfect form is better than wobbling and constantly changing shoulder and hip angles due to advancing levels prematurely.

STRADDLE PLANCHE PUSHUPS – LEVEL 10

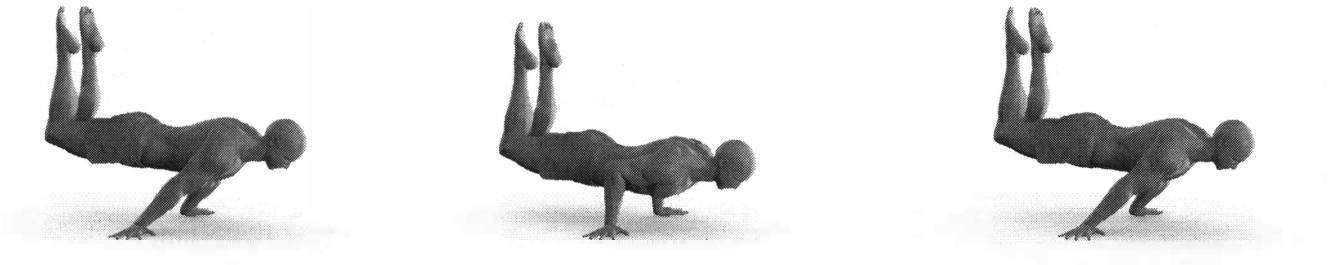


Scapular Positioning: Your scapulas will be protracted and fully depressed without rounding your upper back. They will retract through the eccentric portion of the movement and be fully retracted at the bottom. As you rise back up to the starting position, your scapulas will protract. They will end protracted and fully depressed.

Technique: The straddle planche is executed with a straight-body position and your legs apart. You should maintain a straight line from your shoulders through your hips/knees/ankles to your toes, but you should also have your legs spread as far apart as possible. From here, lower your body in a slow and controlled manner. It will look and feel like a dip position, with your elbows fully bent and hands near your shoulders, however, there is a forward lean—enough to keep your hips at shoulder height. Once you hit the bottom of the movement, you can pause (if desired), then begin the concentric movement back to a straight-arm tuck position. Emphasize the starting position by holding it for a few seconds before attempting another repetition.

The most difficult part of the *straddle planche pushup* is maintaining your hip height, especially at the bottom and top of the movement where it is most difficult. Focus on keeping a tight body to increase tension so you do not cheat the movement. You will be tempted to hollow or arch your body out of straight-body alignment. Resist this temptation.

HALF LAYOUT / ONE-LEG-OUT PLANCHE PUSHUPS – LEVEL 12



Scapular Positioning: Your scapulas will be protracted and fully depressed without rounding your upper back. They will retract through the eccentric portion of the movement and be fully retracted at the bottom. As you rise back up to the starting position, your scapulas will protract. They will end protracted and fully depressed.

Technique: In the half layout position, your knees and legs are together and all of your joints are aligned—from your shoulders through your hips and knees through your legs—except your knees are bent at a ninety-degree angle. The one-leg-out position is the same as the straight-body position except one leg is bent at both the hips and knee, similar to an advanced tuck position. Choose if you are doing one-leg-out or half-layout and then lower your body in a slow and controlled manner. Similar to a dip position, your elbows are fully bent and hands are near your shoulders, however there is also a forward lean—enough to keep your hips at shoulder height. Once you hit the bottom of the movement, you can pause (if desired), then begin the concentric movement back to a straight-arm tuck position. Emphasize the starting position by holding it for a few seconds before attempting another repetition.

If you are on the ground, the one-leg-out position can interfere with performing the planche pushup variation. Use the half layout position to perform this intermediate step between straddle and full planche pushups.

FULL PLANCHE PUSHUPS – LEVEL 14



Scapular Positioning: Your scapulas will be protracted and fully depressed without rounding your upper back. They will retract through the eccentric portion of the movement and be fully retracted at the bottom. As you rise back up to the starting position, your scapulas will protract. They will end protracted and fully depressed.

Technique: For the full planche, align your body straight and parallel with the ground from your shoulders through your torso/hips/knees/ankles to your toes. From here, lower your body into a descent in a slow and controlled manner. This is similar to a dip position, with your elbows fully bent and hands near your shoulders, however, you must add a forward lean—enough to keep your hips at shoulder height. Once you hit the bottom of the movement, you can pause (if desired), then begin the concentric movement back to a straight-arm tuck position. Emphasize the starting position by holding it for a few seconds before attempting another repetition.

Full planche pushups are incredibly advanced. Like full front lever rows, it will be difficult to truly obtain a full range of motion. With the full variations of these skills, you may only be able to move six to eight inches while performing the movement. However, if you continue working them, you should aim for a greater range of motion in order to build more strength.

Rings Planche Pushups – Page 3, Column 4

Rings planche pushups are extremely difficult, but are tremendously rewarding if you can build enough strength to begin training this progression. If you reach the advance tuck or straddle levels, you will have advanced beyond the usefulness of this book. All of these skills are the same as the previous progression but performed on the rings. Remember the following:

- Keep the rings turned out to at least parallel to ninety degrees for the duration of the skill.
- Keep your hips (and any other body part) level with your shoulders for the duration of the skill.
- Keep your elbow fully locked out in the top of the isometric position between repetitions.
- Keep the rings as steady as possible.

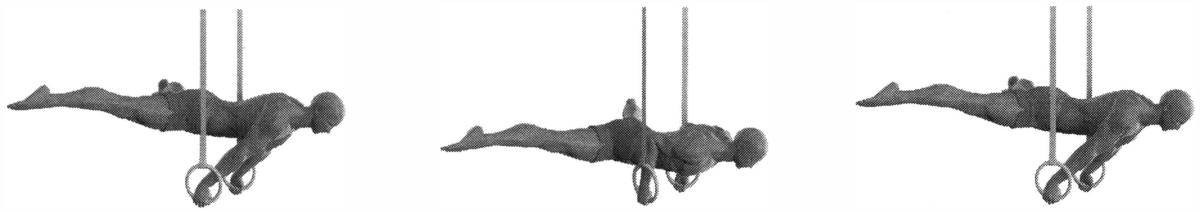
RINGS TUCK PLANCHE PUSHUPS – LEVEL 8



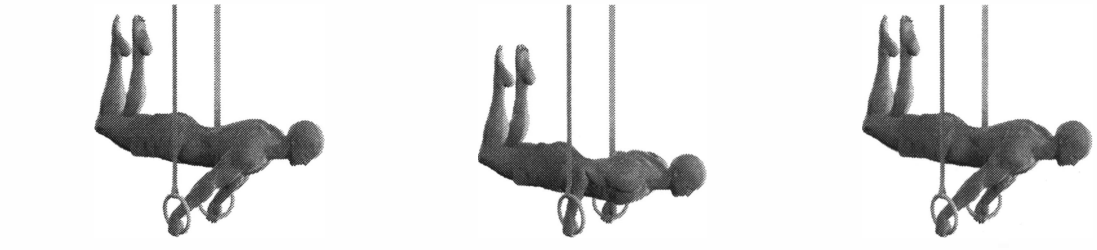
RINGS ADVANCED TUCK PLANCHE PUSHUPS – LEVEL 10



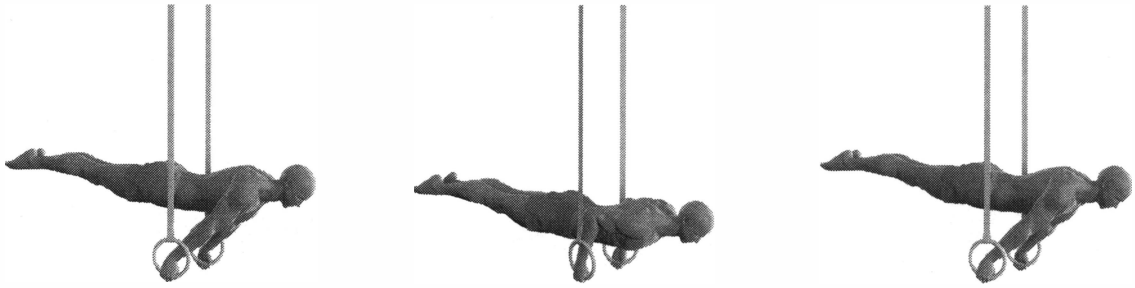
RINGS STRADDLE PLANCHE PUSHUPS – LEVEL 12



RINGS HALF LAYOUT / ONE-LEG-OUT PLANCHE PUSHUPS – LEVEL 14

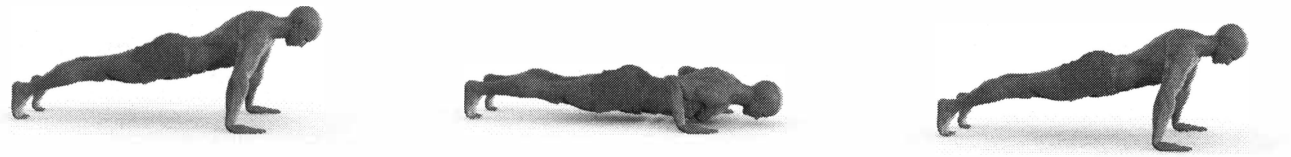


RINGS FULL PLANCHE PUSHUPS – LEVEL 16



Pushups – Page 3, Column 5

STANDARD PUSHUPS – LEVEL 1



Scapular Positioning: Your scapulas will be fully protracted and depressed at the top of the movement. During the motion, your scapulas will naturally retract. They will be almost fully retracted at the bottom. As you move back to the starting position, you will finish with your scapulas fully protracted and depressed.

Technique: Many articles have been written on correct technique for *standard pushups*. Here are the basics. You should be able to progress to more difficult skill rather quickly.

Here are a couple of key points for performing quality pushups:

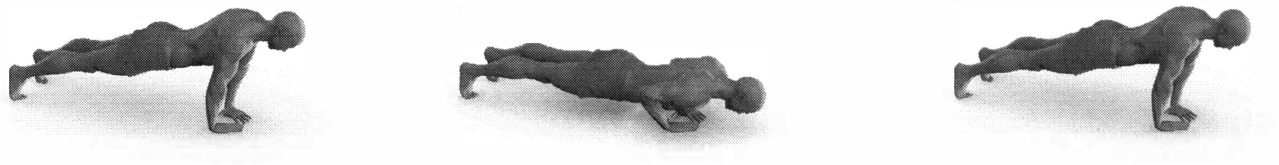
- Hold your body perfectly straight or in a slightly hollow position by squeezing your glutes and tensing your abdominals. All parts of your body should touch the ground at the same time.
- Your elbows should not flare out during the movement. Flaring your elbows out to a ninety-degree angle with the rest of your body is incorrect pushup technique, and this may lead to shoulder injuries. Flared elbows can be used in a few of the more advanced progressions, but not in any of the high-level progressions since this technique can be dangerous in the long run. Instead, tuck your elbows in toward your body from anywhere between a zero to forty-give degree angle.
- Do not shortcut your range of motion. This is true for all movements. It is not a race. Perform a controlled eccentric phase to the chest brushing the ground and a powerful concentric phase finishing with your elbows locking out at the top.

Pushups can sometimes cause back pain. If you arch your back during the movement, it activates your psoas muscles (which help keep your hips neutral) more than your abdominals. The psoas major muscle has its origin on your lumbar spine. Therefore, if your body is allowed to arch and the psoas muscle pulls on your lower back, pain can occur while performing any variation of pushups.

If the exercise is too difficult at first you can scale it by straddling or moving to your knees. You can also incline your body by placing your hands on stairs or an elevated surface.

Once you can perform sets of fifteen to twenty repetitions, move on to more difficult pushup progressions.

DIAMOND PUSHUPS – LEVEL 2

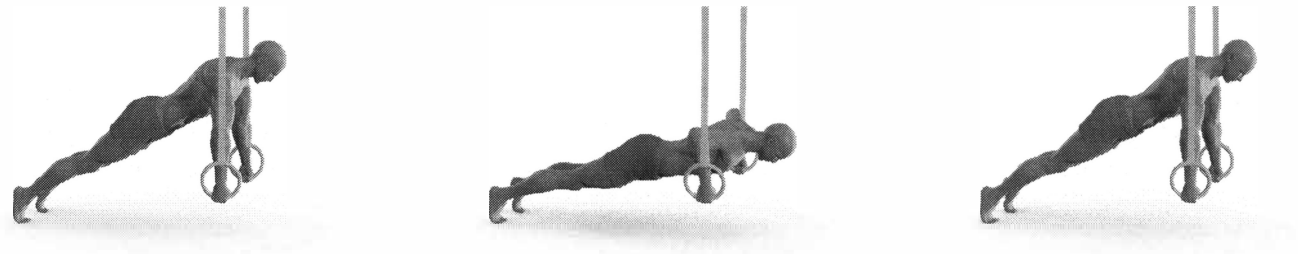


Scapular Positioning: Your scapulas will be fully protracted and depressed at the top of the movement. During the motion, your scapulas will naturally retract. They will be almost fully retracted at the bottom. As you move back to the starting position, you will finish with your scapulas fully protracted and depressed.

Technique: *Diamond pushups* take standard pushups a step further. They bring your hands closer together to make the pushup harder. Eventually your index fingers and thumbs will meet in the middle to form a diamond shape. During the movement, lower your chest to the middle of your hands and then return to the original position. A triceps-biased alternative is to touch your nose inside the diamond created by your index finger and thumbs.

This technique puts a lot of stress on your triceps and chest due to increased torque at your elbows and shoulders. Be cautious if your joints start to ache, especially between exercise sessions. This may be a signal of overuse. If this is the case, take a break from these exercises for a couple of days (if not more) to allow your body to fully recover before resuming. You do not want to have any nagging injuries as the progressions get more difficult.

RINGS WIDE PUSHUPS – LEVEL 3



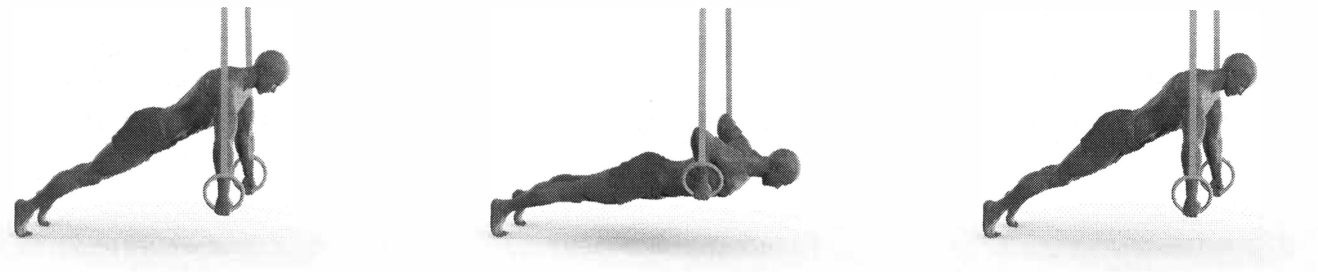
Scapular Positioning: Your scapulas will be fully protracted and depressed at the top of the movement. During the motion, your scapulas will naturally retract. They will be almost fully retracted at the bottom. As you move back to the starting position, you will finish with your scapulas fully protracted and depressed.

Technique: *Rings wide pushups* are performed by keeping your elbows in line with each other and your clavicles, allowing them to come out as the distance between your hands is increased while moving into the bottom of the position. From there, push out and bring your hands together.

These pushups place emphasis on the chest, which is critical to prepare for future training. If you jump too far ahead in progressions, you may experience twinges of pain in the origins of your pectoralis muscle groups resulting in injuries like costochondritis or tietze syndrome. Even if you are strong enough to perform these techniques, it may be wise to add them to your warm-up to ensure that your connective tissues are up to par. If you feel any type of pain or instability at your joints, skip this progression completely.

Note that the pushups progression started with elbows tucked in, but this progression utilizes elbows wide at the ninety degree angle. Widening the angle is often used as a progression method, but it is best to start with elbows tucked as it is safer for the shoulders. Skip this progression if you find that elbows wider bothers you.

RINGS PUSHUPS – LEVEL 4



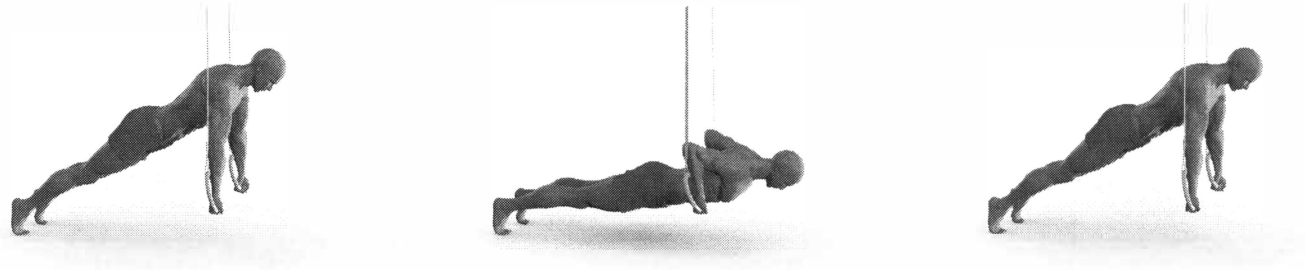
Scapular Positioning: Your scapulas will be fully protracted and depressed at the top of the movement. During the motion, your scapulas will naturally retract. They will be almost fully retracted at the bottom. As you move back to the starting position, you will finish with your scapulas fully protracted and depressed.

Technique: *Rings pushups* are like standard pushups, but performed on the rings. They are performed with your hands at the same level as your feet, so the rings must be lowered so that they are close to the ground. Alternatively, you can raise your feet on a box or block. For rings pushups, you want to emphasize keeping your elbows in—at a thirty-degree angle from your body (though anywhere from zero to forty-five degrees is acceptable). This puts most of the focus for developing strength on your shoulders and triceps. From there, the movement is just like a standard pushup.

For all of these pushup progressions, ensure that you are moving through full range of motion. It is very common to see individuals shortcut pushups by not going all the way down and not coming all the way back up. While this may yield more repetitions, it does not fully strengthen your muscles, which is your goal. Since bodyweight strength training puts your muscles in many different positions, it is important to perform everything through full range of motion. This is even more important when training on the rings.

For all pushups, your hands must meet your torso at the bottom of the position, your arms must be straight at the top, and proper body positioning should be maintained throughout.

RINGS-TURNED-OUT PUSHUPS – LEVEL 5



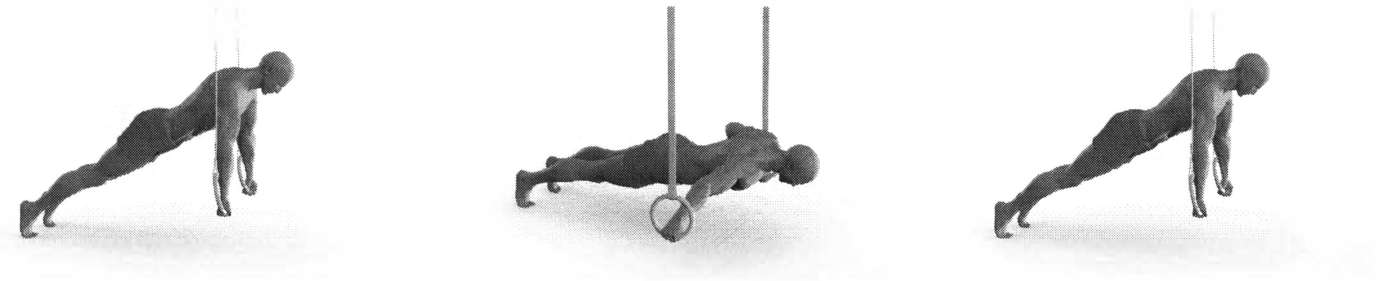
Scapular Positioning: Your scapulas will be fully protracted and depressed at the top of the movement. During the motion, your scapulas will naturally retract. They will be almost fully retracted at the bottom. As you move back to the starting position, you will finish with your scapulas fully protracted and depressed.

Technique: These pushups should be performed with your palms facing forward—at least forty-five degrees from the parallel position—with the optimal palm position being fully forward at ninety degrees from parallel. When you first attempt to turn the rings out, you may have difficulty stabilizing yourself. Persevere until you get the hang of it. From this point on, the movement is simply a standard pushup. When your hands are level with your torso, you are at the accepted bottom position. Push back up and make sure your arms are straight at the top position.

Rings-turned-out pushups (which can be abbreviated *RTO PU*) decrease leverage at your shoulders by lengthening your pectoralis muscles. Since your pecs are a stabilizer during the movement, a decrease in stabilization will require an increase in strength to perform the movement. In this position, your biceps are recruited to help, however, they are also elongated, making them relatively weaker. This is true for all RTO movements. Turning rings out will eventually give you more control over the movements.

Even after you have stabilized the support position for the pushup, there will be destabilization when you go down into the pushup position for the first time. Keep the rings turned out and stabilize them as best as possible. It will get easier with practice, and you will get stronger because of it.

RINGS-TURNED-OUT ARCHER PUSHUPS – LEVEL 6



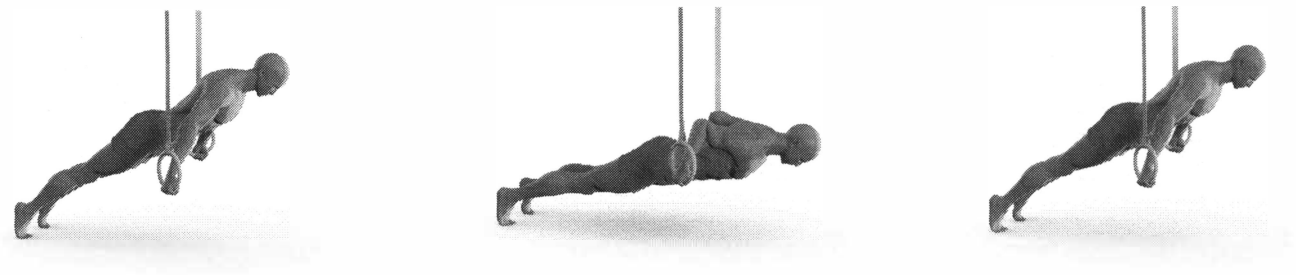
Scapular Positioning: Your scapulas will be fully protracted and depressed at the top of the movement. During the motion, your scapulas will naturally retract. They will be almost fully retracted at the bottom. As you move back to the starting position, you will finish with your scapulas fully protracted and depressed.

Technique: Archer pushups are similar to standard pushups, but one arm is kept straight for the duration of the movement. Select an arm to keep straight and turn the rings out in the pushup support position. Descend into the movement. When you reach the bottom position, your straight arm should be out wide. Next, push back up with your bent arm. You can assist your other arm, but it must be kept straight the entire time. Once you have accomplished this, switch to the other arm for a full workout.

When performing *rings-turned-out archer pushups* (which can be abbreviated *RTO Archer PU*), it is acceptable if you cannot immediately hold your arm fully straight. Work on progressively straightening your arm for the full archer pushup effect. This will help you increase the bias of strength onto each of your arms.

You can bias the movement more toward your straight or bent arm to varying effect by putting more weight on the arm that is straight or bent, respectively. Biasing toward the straight arm tends to work your chest and shoulder more, and biasing toward the bent arm tends to work your triceps and shoulders more. Focus on improving your weaknesses over favoring your current strengths.

RINGS-TURNED-OUT, 40-DEGREE-LEAN PSEUDO PLANCHE PUSHUPS – LEVEL 7



Scapular Positioning: Your scapulas will be fully protracted and depressed at the top of the movement. During the motion, your scapulas will naturally retract. They will be almost fully retracted at the bottom. As you move back to the starting position, you will finish with your scapulas fully protracted and depressed.

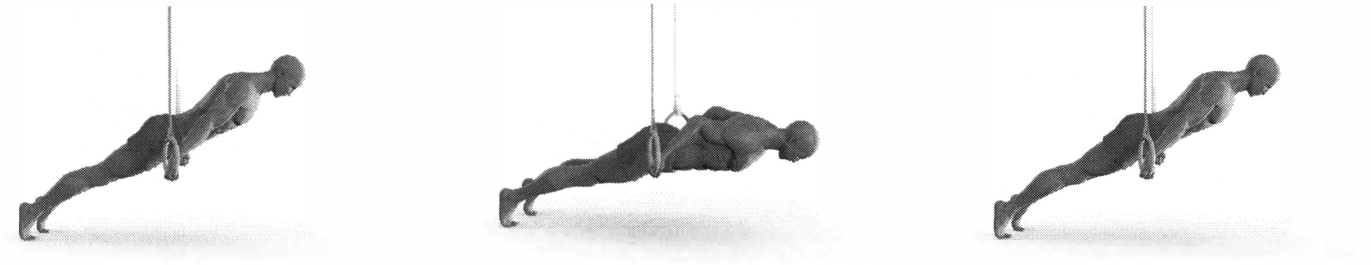
Technique: From the top of the movement, lean forward to obtain a forty-degree angle at your shoulders. The forty-degree lean forward refers to the angle created between an imaginary line running perpendicular to the ground through your hands and the line from your hands to the shoulders. The rings should be turned out. From there, descend into the bottom of the movement (your hands should reach your stomach/waist area) without allowing the rings to turn back in. Pause at the bottom before fully pressing out to the point where your arms reach a forty-degree forward position and are locked. Pause at the top for a few seconds before attempting another repetition.

This skill can be abbreviated *RTO 40 Deg PPPU*. The pseudo planche pushup and maltese variations focus heavily on forward lean (planche position) to decrease leverage. Contrary to popular belief, this requires immense strength in all of the musculature involved in this movement, not just specific muscle groups.

Your body must be locked in a straight or slightly hollow position, with your hips pointed straight down. Any type of pseudo planche pushup is more effective, albeit harder, when your feet are raised to shoulder height. If you have the strength to do this, go for it.

For all of the planche movements, the hardest parts of the movement will be at the ends of the range of motion. It is imperative to hold quality pauses at both the top and bottom of the movement in order to effectively develop the strength needed to move in and out of these positions. Make sure to keep the rings turned out, as well as straight-body positioning for the duration of the skill.

RINGS-TURNED-OUT, 60-DEGREE-LEAN PSEUDO PLANCHE PUSHUPS – LEVEL 8

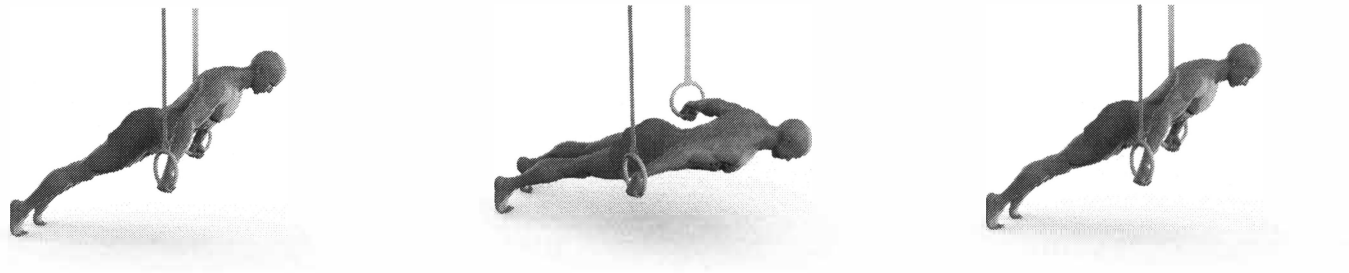


Scapular Positioning: Your scapulas will be fully protracted and depressed at the top of the movement. During the motion, your scapulas will naturally retract. They will be almost fully retracted at the bottom. As you move back to the starting position, you will finish with your scapulas fully protracted and depressed.

Technique: For this movement, you will lean forward to obtain a sixty-degree angle with the rings turned out (see previous exercise for explanation of angle). From there, descend into the bottom of the movement. Your hands should reach your stomach/waist area without allowing the rings to turn back in. Pause at the bottom before fully pressing out to the point where your arms are fully locked. Pause at the top for a few seconds before attempting another repetition.

This skill can be abbreviated *RTO 60 Deg PPPU*. The 60-degree lean forward is very close to the actual planche position, except some of your weight will be on your feet. By performing this exercise regularly, even without specific planche isometric work, it is possible to build up to a good straddle planche on the floor or parallel bars. It will take consistently applied technique over many months or even years. Make sure to keep the rings turned out, as well as straight-body positioning for the duration of the skill.

RINGS-TURNED-OUT MALTESE PUSHUPS – LEVEL 9



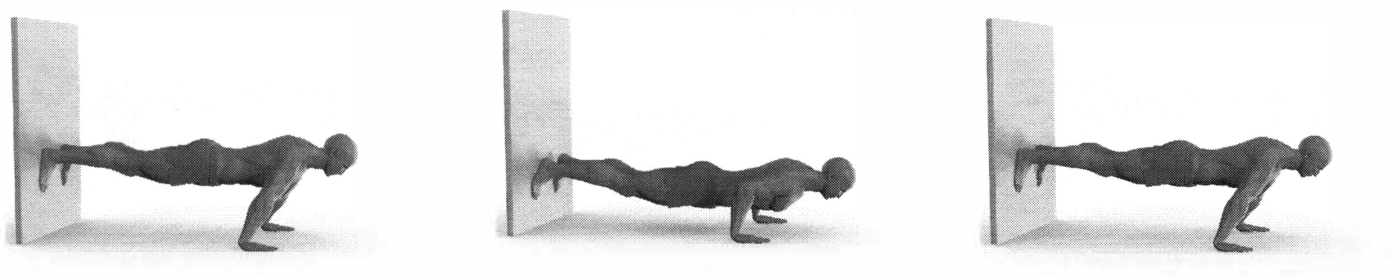
Scapular Positioning: Your scapulas will be fully protracted and depressed at the top of the movement. During the motion, your scapulas will naturally retract. They will be almost fully retracted at the bottom. As you move back to the starting position, you will finish with your scapulas fully protracted and depressed.

Technique: Begin with the rings turned out and descend into the bottom of the movement (until your hands become level with your torso) while attempting to bend as little as possible. As you descend, slide the rings out roughly a foot from your sides to create a thirty to forty-five degree angle from your torso to your arms.

This skill can be abbreviated *RTO Maltese PU*. If your strength is lacking, you will have to bend your arms a lot to prevent falling while performing this skill. As you get more proficient, you will not have to bend your arms as much. From the bottom of the movement, push back up into the semi-wide arm planche position.

With *maltese pushups*, slide the rings so that a thirty to forty-five degree angle is created by your armpit and body. This position decreases the leverage of your pectoralis and deltoid muscle groups, which makes the movement much more difficult. Lean your body forward and keep the rings turned out for the duration of the skill. Your body should be kept straight.

WALL PSEUDO PLANCHE PUSHUPS – LEVEL 10



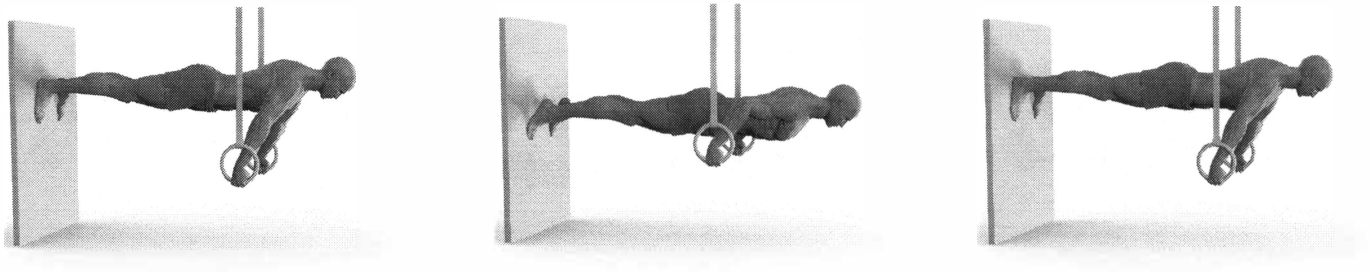
Scapular Positioning: Your scapulas will be fully protracted and depressed at the top of the movement. During the motion, your scapulas will naturally retract. They will be almost fully retracted at the bottom. As you move back to the starting position, you will finish with your scapulas fully protracted and depressed.

Technique: You should begin in a proper planche position (straight-body, level at shoulder height) with your feet on the wall and your body leaning forward over your hands. The majority of your support should come from your hands. From there, descend into a pushup. Go all the way to the ground without actually touching it, allowing your feet to slide down the wall. Pause at the bottom of the movement before pushing back to the top. You can slowly walk up the wall with your feet if sliding them back up proves too difficult.

There are many variations of *wall planche pushups* (which can be abbreviated *Wall PPPU*) on the Internet. A few of them are performed correctly. First, let us cover correct technique. If your back is arched at all and/or your hips are allowed to sag, the effectiveness of the exercise is decreased by as much as thirty percent (depending on how much you arch). Since your focus is gaining strength, do not perform this progression unless you can do so with perfect technique. It would be more beneficial to stick to previous progressions that you can perform correctly.

Your primary focus when performing this skill should be on minimizing your amount of foot support and assistance from the wall. In particular, you may want to change your footwear or reduce the wall resistance (if possible) as you get stronger. For example, if your wall is particularly sticky you can invest in smooth plastic or linoleum tiling to make the surface of the wall more slippery. Likewise, you can switch between shoes, bare feet, and socks or other slippery materials to make the movement more difficult.

RINGS WALL PSEUDO PLANCHE PUSHUPS – LEVEL 11



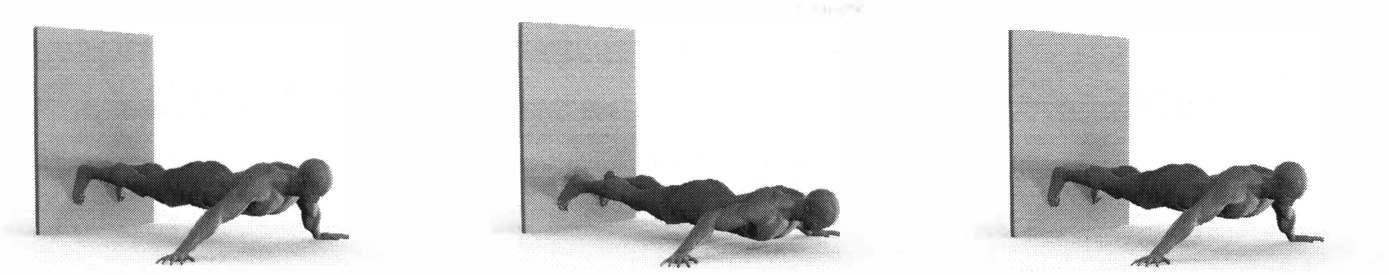
Scapular Positioning: Your scapulas will be fully protracted and depressed at the top of the movement. During the motion, your scapulas will naturally retract. They will be almost fully retracted at the bottom. As you move back to the starting position, you will finish with your scapulas fully protracted and depressed.

Technique: This skill is performed with the rings set close to the wall. This allows you to get your feet on the wall in a supported planche position. From there, turn the rings out and stabilize them. Perform a wall planche pushup, maintaining perfect form.

The rings add a significant amount of instability to *wall pseudo planche pushups* (which can be abbreviated *R Wall PPPU*). It should also be noted that the strength of a planche isometric is required to perform this movement correctly. You must keep the rings turned out and maintain straight-body positioning for the duration of the skill. However, when you are first learning this skill you can keep the rings parallel to your body, as shown in the first illustration above. If you do not have access to rings that can be mounted close to a wall, skip this progression as well as the Level 13 progression (rings wall maltese pushups).

Your primary focus should be on minimizing your amount of foot support and assistance from the wall. In particular, you may want to change your footwear or alter the wall resistance (if possible) as you get stronger. For example, if your wall has friction you can invest in smooth plastic or linoleum tiling to make the surface of the wall more slippery. Likewise, you can switch between shoes, bare feet, and socks or other slippery materials to make the movement more difficult.

WALL MALTESE PUSHUPS – LEVEL 12

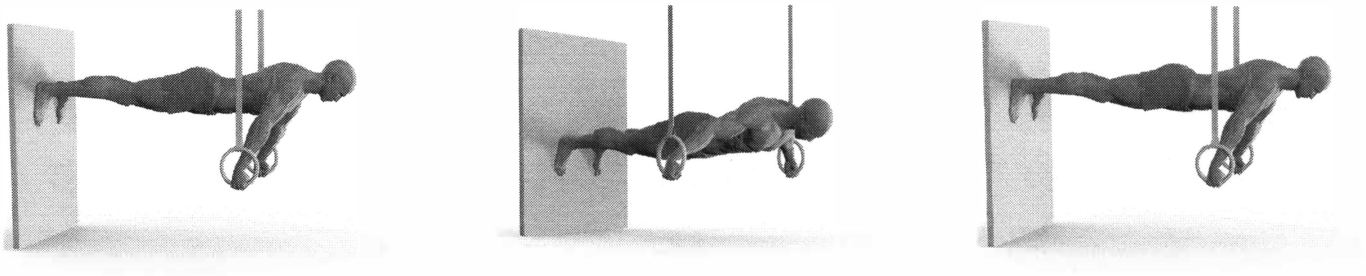


Scapular Positioning: Your scapulas will be fully protracted and depressed at the top of the movement. During the motion, your scapulas will naturally retract. They will be almost fully retracted at the bottom. As you move back to the starting position, you will finish with your scapulas fully protracted and depressed.

Technique: *Wall maltese pushups* are performed by moving your hands out from the supported planche position until a thirty to forty-five degree angle is made at the armpit. From there, lower to the ground (without actually touching it) and press back up. Make sure to keep your body straight for the duration of the skill. This will be difficult, as your body will be in a disadvantaged position.

Your primary focus when performing *wall maltese pushups* should be on minimizing the amount of foot support and assistance from the wall. As you get stronger, change your footwear or the wall resistance (if possible) to make the movement more difficult. For example, switch between shoes, bare feet, and socks or other slippery materials, or you can invest in smooth plastic or linoleum tiling to make the surface of the wall more slippery.

RINGS WALL MALTESE PUSHUPS – LEVEL 13



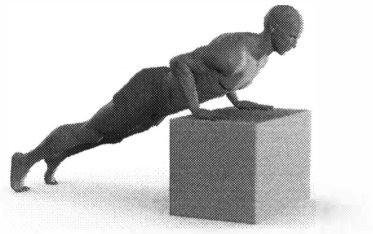
Scapular Positioning: Your scapulas will be fully protracted and depressed at the top of the movement. During the motion, your scapulas will naturally retract. They will be almost fully retracted at the bottom. As you move back to the starting position, you will finish with your scapulas fully protracted and depressed.

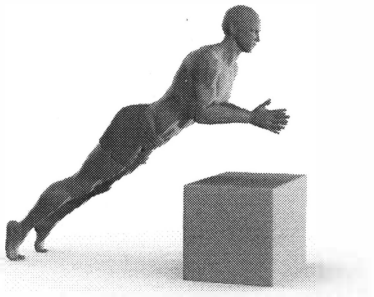
Technique: The *rings wall maltese pushup* combines and builds on the previous two skills. It is performed by moving your hands to a thirty to forty-five degree angle in the armpit. Keep the rings turned out, your body straight and perfectly parallel with the ground, and your feet on the wall. From there, bend your arms and lower to the ground without actually touching it before pressing back up. Pause at both the bottom and top of the movement before attempting another repetition.

Your primary focus when performing *rings wall maltese pushups* should be on minimizing your amount of foot support and assistance from the wall. As you get stronger, change your footwear or the wall resistance (if possible) to make the movement more difficult. For example, switch between shoes, bare feet, and socks or other slippery materials, or you can invest in smooth plastic or linoleum tiling to make the surface of the wall more slippery.

CLAPPING PUSHUP VARIATIONS – LEVEL N/A

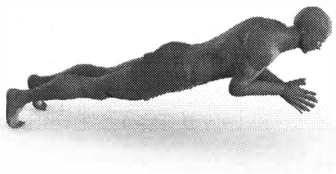
Here are some variations that you can work on if you desire.



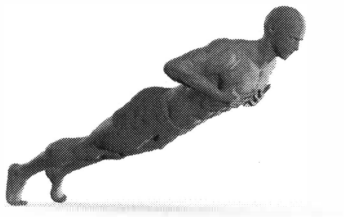


Box (or Stairs) Clapping Pushups

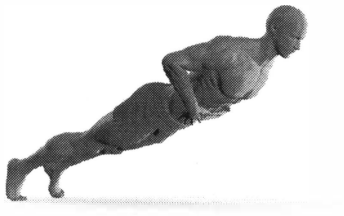




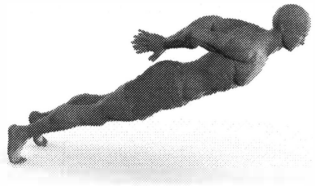
Ground Clapping Pushups



Slap Your Chest



Slap Your Stomach



Behind the Back

The simple variation where you clap your hands in front of your body is not shown in the illustrations above, but it is easier than the variations where you slap your chest or stomach.

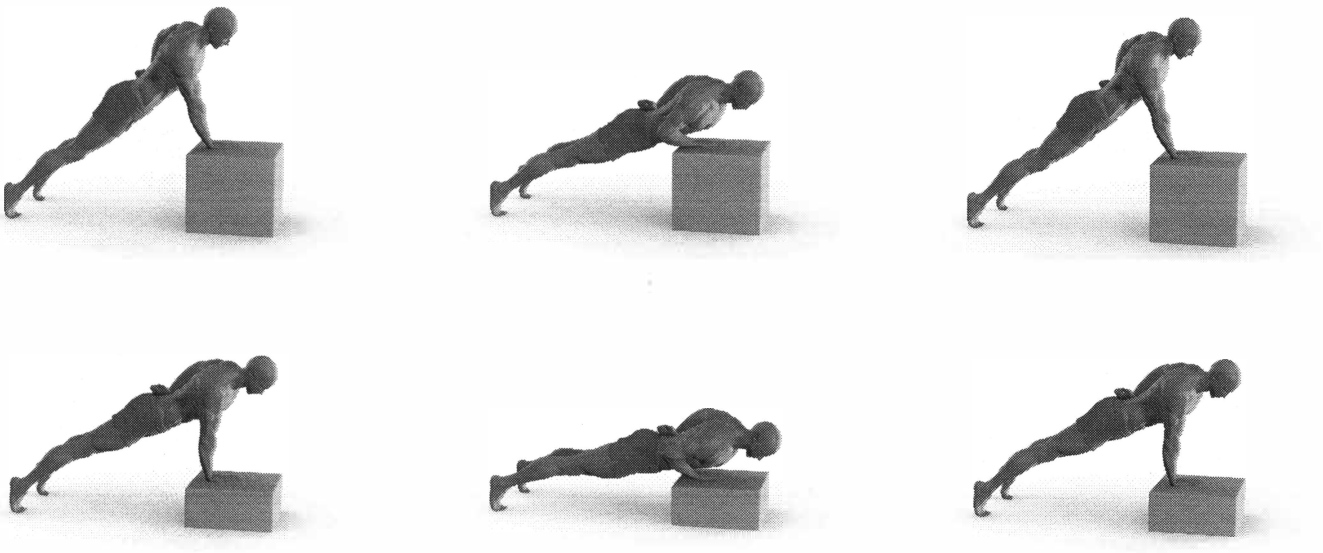
This progression is not as useful as the entire pushup progression, especially when performed on the rings. However, it can be used effectively to gain strength and hypertrophy. One of the cool standards that many individuals desire to work toward is the triple clapping variation:

Pushup to (1) clap in front of your body then (2) clap behind your back then (3) clap in front of your body a second time before returning to the pushup variation.

No one has as yet performed a triple clapping variation cleanly without piking their hips, so it may be more difficult than even Level 10-12 strength. If this is your goal you can work on sequencing the different variations in order to work up to the triple clap variation. Building your own progression will be a good indicator of how much you have learned.

One-Arm Pushups – Page 3, Column 6

HANDS-ELEVATED, ONE-ARM PUSHUP – LEVEL 5



Scapular Positioning: Your scapula will be fully protracted and depressed at the top of the movement. During the motion, your scapulas will naturally retract. They will be almost fully retracted at the bottom. As you move back to the starting position, finish with your scapulas fully protracted and depressed.

Technique: Bend one arm and descend into the movement until your chest barely touches the raised surface. Keep your bent arm at roughly a forty-five degree angle with your body as you do this. Press back up to the one-arm support position.

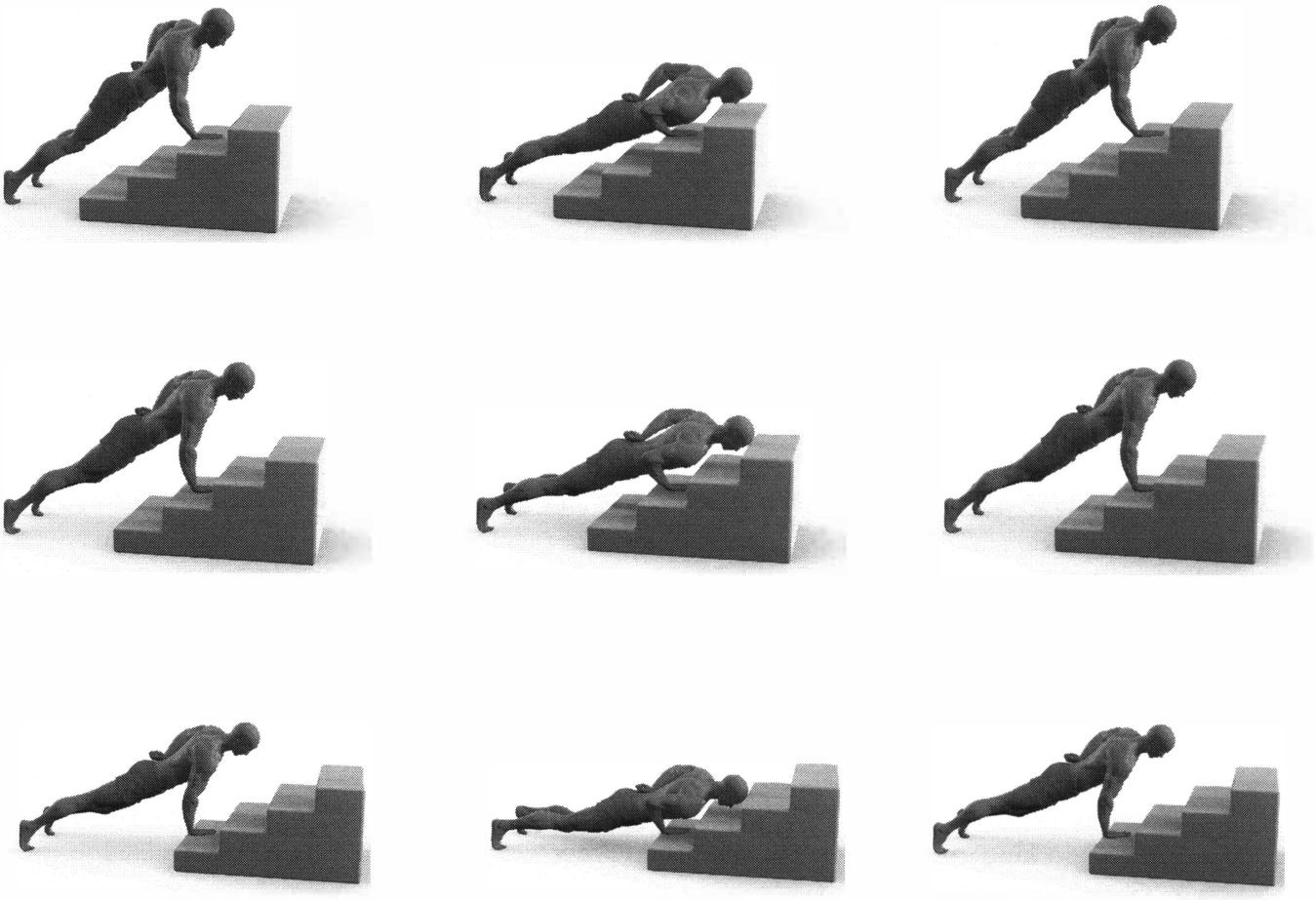
The *hands-elevated, one-arm pushup* (which can be abbreviated *Elevated OA PU*) can be made easier or more difficult by varying the height of the object that your hand is placed on. The key points of technique for this skill include locking your body straight and shifting your weight onto one arm. A straddled leg position may be employed to increase stability.

If your elbow is too far out, the skill will be more difficult to perform due to increased torque. However, increased rotational torque can be used to build core strength. Similarly, having your elbow too close to your body will increase the difficulty of the movement by placing a huge amount of stress on your triceps and shoulders.

Aside from arm angle, other difficulties encountered during this skill are related to the amount of torque on your wrist and possibly your elbows. If the torque at your wrist is an issue, rotate your wrist until you find a better position. If torque at your elbow is an issue, either your shoulder angle is off or you do not have enough elbow strength for this skill. In the event that the latter is true, you can increase the height of the surface to make the skill easier.

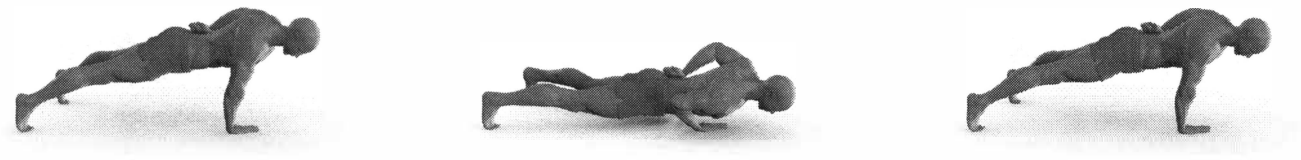
If you are new to this progression, start out with your body at a 45-degree angle with the ground. Progressively decrease the height of the block until you can reach the ground, at which point you will move on to the next progression. Decrease ten to fifteen degrees at a time as you improve.

Be sure to keep your core extremely tight. Take a deep breath and descend while squeezing your abdominals, lower back, hip flexors, glutes, and quads. Focus all of the strength through your shoulder during the movement, keeping the rest of your body still. Beyond that, performing the skill is a matter of strength.



Another alternative is using stairs to progressively decrease to work toward the one-arm pushup, as illustrated above.

STRADDLE ONE-ARM PUSHUP – LEVEL 6



Scapular Positioning: Your scapula will be fully protracted and depressed at the top of the movement. During the motion, your scapulas will naturally retract. They will be almost fully retracted at the bottom. As you move back to the starting position, you will finish with your scapulas fully protracted and depressed.

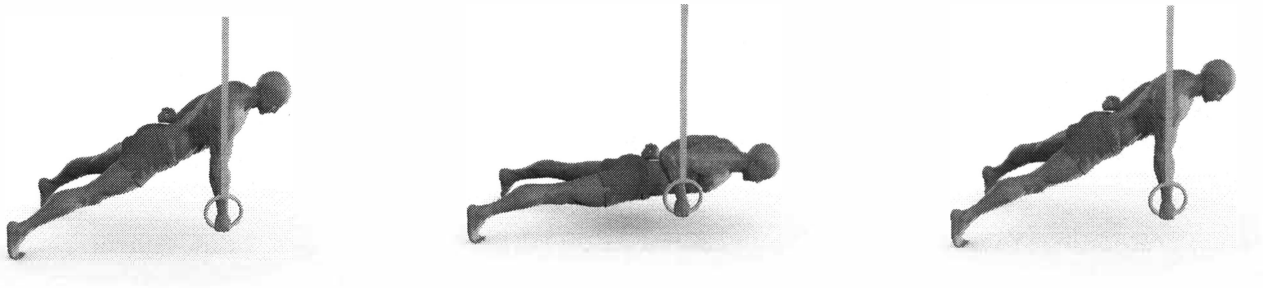
Technique: This one-arm pushup variation is performed on the ground. Descend into the movement until your chest barely touches the ground and then press back up to the starting position. You may straddle your legs as wide as possible at first to make the movement easier, but bring them together as you progress to perform the movement with standard form.

When performing a *straddle one-arm pushup* (which can be abbreviated *Straddle OA PU*), you want your elbow angle to be forty-five degrees (or a bit less) with your armpit in order to help protect your shoulder and avoid excessive torque at any particular joint. Like the previous progression, core tightness is the key to this skill. Do this and the rest of the skill only involves building your strength.

You may also feel some torque during the movement. This will twist your body slightly. Pressure will be placed on your working arm and, typically, your opposite leg. Resist this pressure as much as possible, as the force will encourage your pelvis to twist, making the movement look sloppy.

Your foot receiving the most pressure may be the one that is opposite of your arm that is performing the pushup. While this is natural, you should aim to equalize this pressure.

RINGS STRADDLE ONE-ARM PUSHUP – LEVEL 7



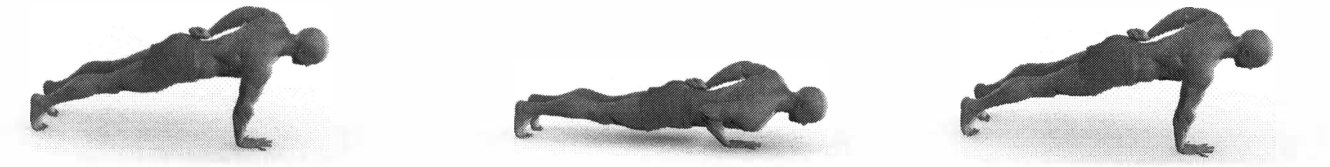
Scapular Positioning: Your scapulas will be fully protracted and depressed at the top of the movement. During the motion, your scapulas will naturally retract. They will be almost fully retracted at the bottom. As you move back to the starting position, you will finish with your scapulas fully protracted and depressed.

Technique: First, lower the rings to within two to four inches off the ground. Alternatively, you can elevate your feet off the ground at rings-height. (The former method is safer.) Begin in a straddle pushup position. Descend until your chest reaches the bottom of the rings and press back up to the starting position.

The rings element adds a fair amount of instability to the *straddle one-arm pushup* skill (which can be abbreviated *Rings Straddle OA PU*) but does not make it too terribly difficult. The only real difference between this technique and other straddled one-arm pushups is you want to keep the elbow angle less than forty-five degrees since any sideways displacement from the rings is going to make the movement much harder. Keep your arm as close to your side as possible.

This is a good lead-in to the straight-body one-arm pushup, which requires your arm to be very close to your side, as there is no laterally displaced foot to help you keep your balance. This exercise will improve your triceps and shoulder strength immensely.

STRAIGHT-BODY, ONE-ARM PUSHUP – LEVEL 8



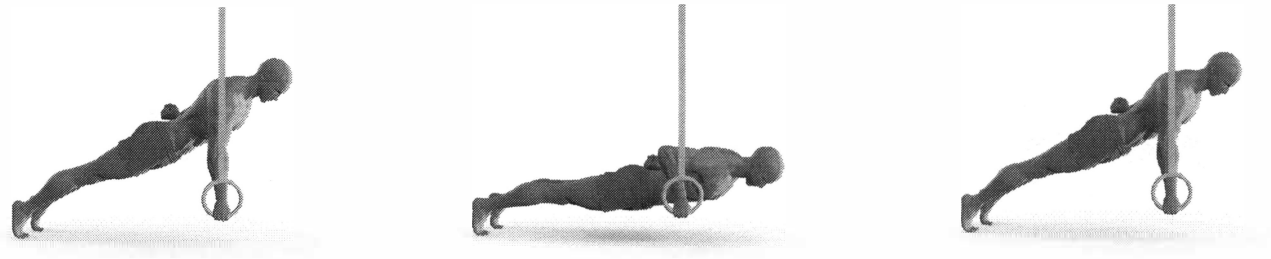
Scapular Positioning: Your scapula will be fully protracted and depressed at the top of the movement. During the motion, your scapulas will naturally retract. They will be almost fully retracted at the bottom. As you move back to the starting position, you will finish with your scapulas fully protracted and depressed.

Technique: The technique is the same as the previous skill, except your feet are held together, your elbow is in, close to your body and chest, and your core is kept tight. Begin in the one-arm straight-body pushup position. Descend until your chest lightly brushes the ground and press back up to the full one-arm pushup starting position.

The *straight-body, one-arm pushup* (which can be abbreviated *Straight-Body OA PU*) is a feat very few are able to master. This skill requires a very good sense of balance and an extraordinary level of strength in your shoulder girdle and elbows.

The balance component is the most difficult to master: The best advice is to lean toward the arm that is doing the pushup, and learn how to shift your weight from side to side in the descent. There are small corrections that need to be implemented during the descent and ascent, so it may take a bit of practice to get the feel of the balance before you can perform this skill efficiently.

RINGS STRAIGHT-BODY, ONE-ARM PUSHUP – LEVEL 9



Scapular Positioning: Your scapula will be fully protracted and depressed at the top of the movement. During the motion, your scapulas will naturally retract. They will be almost fully retracted at the bottom. As you move back to the starting position, you will finish with your scapulas fully protracted and depressed.

Technique: Lower the rings to within two to four inches off the ground. Alternatively, you can elevate your feet off the ground at rings-height. (The former method is safer.) Begin in a straight-body, one-arm pushup position. Descend until your chest lightly brushes the ground and press back up to the full one-arm pushup starting position.

Taking the *straight-body, one-arm pushup* to the rings (which can be abbreviated *Rings SB OA PU*) is an impressive feat, as it requires both immense upper-body and core strength. Like the two previous progressions, you want to first solidly lock down your core. Keep your elbow tucked while lowering through the movement and then push out forcefully while keeping your body sturdy. Leaning your body on the strap a bit may help initially but avoid this in the long run.

This technique blasts your core due to the instability of the rings and torsion of only using one arm, similar to the rings straddle one-arm pushup. If your body begins to twist, try to keep the rotation to a minimum because it makes the skill easier.

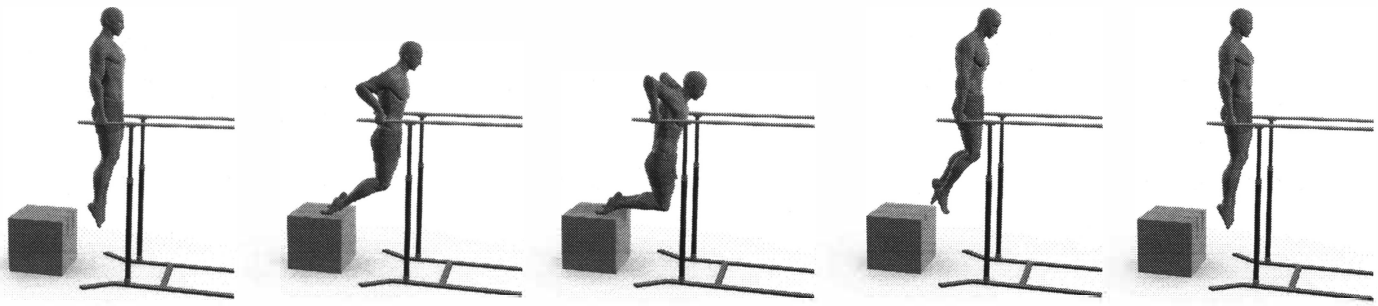
Congratulations on mastering the one-arm pushup progression! At this point, you can add weight to the movements to make them more challenging and continue to work them.

Dips – Page 3, Column 7

The basic dip progression on the parallel bars is short, and most of the skills are geared toward beginners. There are some difficult variations beyond leaned forward dips, but only one-arm dips are included here. (Rings are preferred to build dipping strength.)

The rings add extremely good strength benefits to regular dips. Additionally, they will help you master many of the upper-level progressions in other categories—including the planche. Move away from parallel bar dips and take them to the rings. One exception would be weighted dips, which can still be beneficial.

PARALLEL BAR JUMPING DIPS – LEVEL 1



Scapular Positioning: Begin with your scapulas depressed and neutral. As you lower into the movement, keep them depressed. At the bottom, you will have the choice to relax your scapulas or allow them to be elevated. Whichever you choose, they should be depressed again before you move back to the top of the movement.

Technique: You can either set a block lower so you can squat jump at the bottom of the movement, or your can use your legs to provide assistance. Whichever you choose, begin in the support position and slowly lower to the bottom of the dip before using your legs to jump back to the support position. Try to push through your hands and triceps, using your legs for as little assistance as possible.

Make sure that you go through the full range of motion. This means starting from the support position with your shoulders pushed down (i.e. not shrugged up toward your ears). Lower down into the bottom position of the movement with your hands as far into your armpits as flexibility allows. Then use your legs to help assist your body back to the top position of the movement.

It is common to feel tight in your chest and lats, to the point of feeling a stretch. Use your legs to mitigate the stretch if it is too uncomfortable, but try to sink deep into the stretch in order to help loosen up your shoulders. This flexibility will be put to use much later with muscle-ups, so it is imperative to begin developing it now. If you experience pain and continued aggravation, put this skill on the shelf and consult the Costochondritis section found in Common Bodyweight Injuries chapter. Focus on improving your shoulder mobility so you can perform this skill pain-free.

Alternatively, you can use a Gravitron machine at the gym to help build up to an unassisted concentric dip. This applies for both this progression and the next.

PARALLEL BAR DIP ECCENTRICS – LEVEL 2



Scapular Positioning: Begin with your scapulas depressed and neutral. As you lower into the movement, keep them depressed. At the bottom, you will have the choice to relax your scapulas or allow them to be elevated. Whichever you choose, they should be depressed again before you move back to the top of the movement.

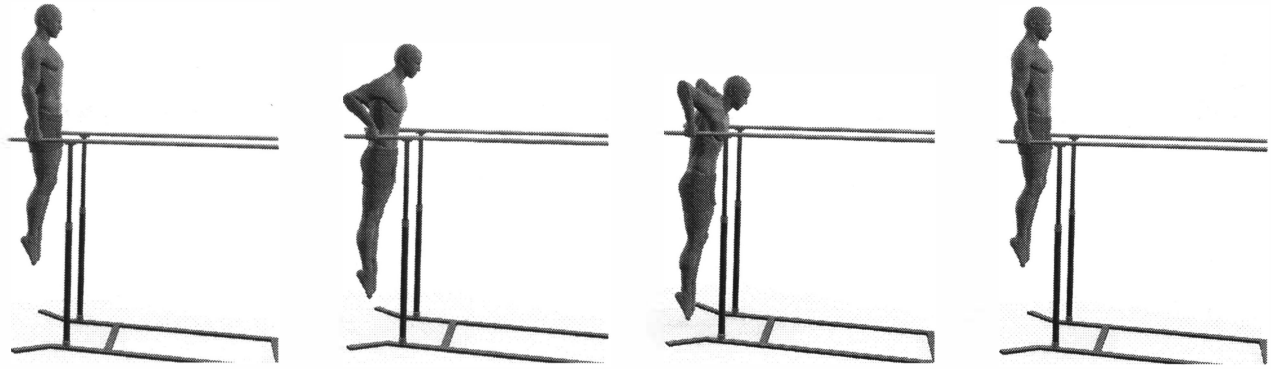
Technique: Begin in the support position and slowly lower to the bottom of the dip position.

A *parallel bar dip eccentric* involves performing only the negative portion of this movement; from the top support position down to the bottom (where your hands are next to the armpits). The goal is to take six to eight seconds to perform a single repetition—working up to seven to ten seconds—and perform two to three full sets containing two to three repetitions per set. This gives you enough time under eccentric control to build the strength and muscle mass required to obtain a full range of motion dip.

The key with this skill is to lower uniformly. If you lower too slowly in the first portion of the movement, it consumes too much energy, which causes you to pass through the ending portion of the movement far too quickly and with poor form. Correct this now by lowering uniformly and you will reap the benefits later on. If you experience pain, put this skill on the shelf and focus on improving your shoulder mobility so you can perform this exercise pain-free.

Alternatively, you can use a Gravitron machine at the gym to help build up to an unassisted concentric dip. This applies for both this progression and the previous one.

PARALLEL BAR DIPS – LEVEL 3



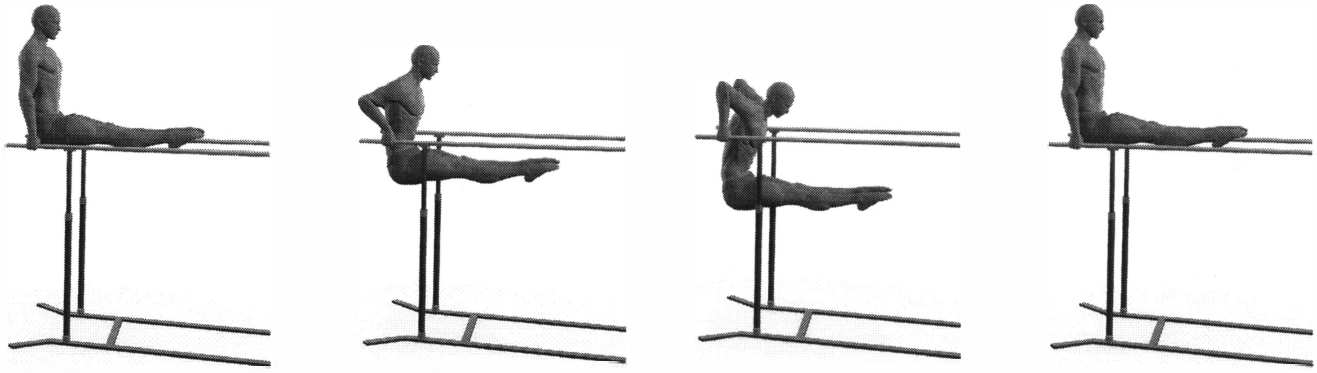
Scapular Positioning: Begin with your scapulas depressed and neutral. As you lower into the movement, keep them depressed. At the bottom, you will have the choice to relax your scapulas or allow them to be elevated. Whichever you choose, they should be depressed again before you move back to the top of the movement. Once you can perform five to ten full range of motion dips without relaxing your scapulas, you will have enough strength for a muscle-up but it may take some time to master the technique.

Technique: Begin in the support position and slowly lower to the bottom of the dip position. Push through your hands and triceps to ascend back to the starting position.

Parallel bar dips are one of the staples of gymnastics strength and conditioning. The technique is similar to the previous progression, except you receive no assistance from your lower body. While performing this skill, keep your body straight and your core tight—in a support position with your shoulder girdle depressed. Lower yourself to the bottom of the movement so that your hands reach your armpits (or your current flexibility limits) and then push back up to the top of the movement.

Head positioning is not critical, but try not to arch or crane your head up while pushing out of dips. This may lead to tightness and pain behind your neck, as well as tension headaches. If you experience pain, put this skill on the shelf and focus on improving your shoulder mobility so you can perform this exercise pain-free.

L-SIT DIPS – LEVEL 4



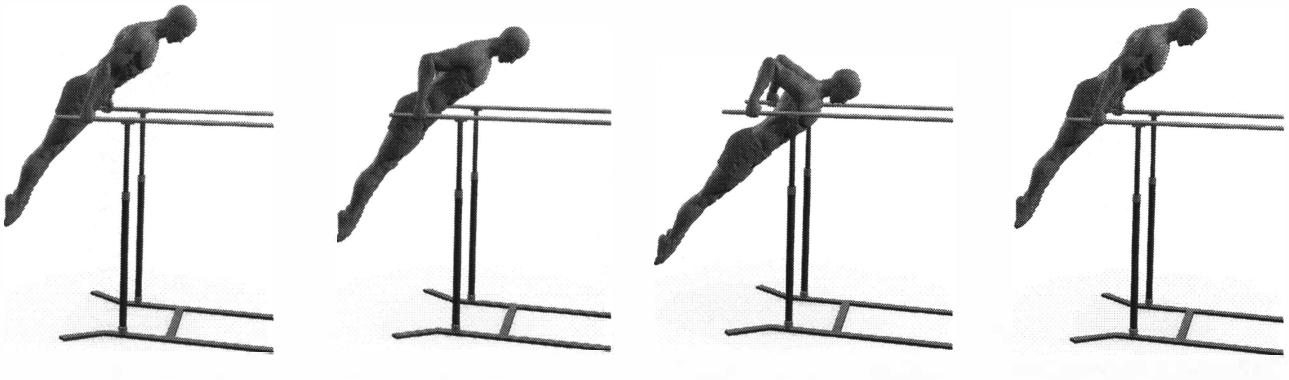
Scapular Positioning: Begin with your scapulas depressed and neutral. As you descend into the movement, keep them depressed. At the bottom, you will have the choice to relax your scapulas or allow them to be elevated. Whichever you choose, they should be depressed again before you move back to the top of the movement.

Technique: Begin in the L-sit support position. Slowly lower to the bottom of the L-sit dip position. Push through your hands and triceps to ascend back to the L-sit support position. Make sure you do not allow your legs to drop during any part of the movement. Your elbows may flare out slightly.

L-sit dips decrease the leverage of your triceps and shoulders by pushing your center of mass backward four to six inches, just like *L-sit pull-ups*. This will make the L-sit dip more difficult since there is a mechanical disadvantage when you increase tension on your triceps and shoulders. Expect a further challenge to stabilize through the depth of the movement due to the increased balance component.

It is important to maintain the L-sit position by keeping your legs parallel to the ground. It is equally important to descend as deeply into the dip as possible to get the full benefits of this strength move. This will also set you up for smooth muscle-ups when you reach that progression. Your range of motion for this skill may be limited when you begin training due to the balance component. This will be remedied as you grow stronger with consistent practice.

45-DEGREE FORWARD-LEAN DIPS – LEVEL 5



Scapular Positioning: Begin with your scapulas depressed and neutral. As you descend into the movement, keep them depressed. At the bottom, you will have the choice to relax your scapulas or allow them to be elevated. Whichever you choose, they should be depressed again before you move back to the top of the movement.

Technique: Begin in the support position and lean forward so that your body reaches a forty-five degree angle. Descend, maintaining this forty-five degree angle, until you reach the bottom of the dip and press back up through your hands and shoulders.

Leaning forward during dips, along with the planche variations, is one way to increase the challenge level of a basic skill. These variations require more body control, which puts the responsibility for advancement on the trainee. This is preferred to other methods of making dips more difficult.

It is your responsibility to ensure that you keep your body perfectly straight or in a slightly hollow position for the duration of the movement. Arching occurs naturally, but it must be resisted because it makes the skill easier. Dipping with a 45-degree forward lean can be accomplished two ways, the first of which is easier than the second:

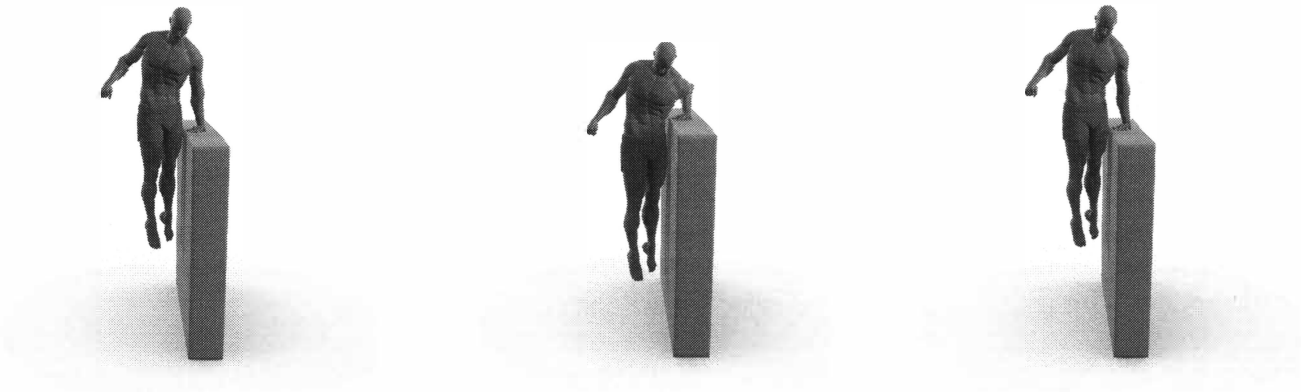
- Begin in a standard vertical support position. Lean forward as you enter the dip. Your lean will increase throughout the motion, meeting a 45-degree angle by the time you reach the bottom of the movement. From there, push back to support position.
- Begin in a 45-degree forward lean and maintain that position for the duration of the movement.

The hardest parts of this skill are pushing out of the bottom of the movement and locking out at the top if you use the second method. Avoid the inclination to arch at these points.

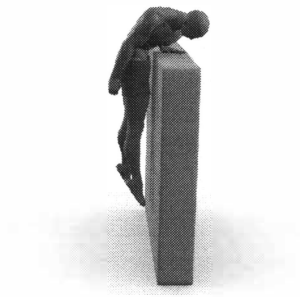
ONE-ARM DIP – LEVELS 8 & 9



Facing the Wall



Parallel to the Wall



A method that makes the skill exercise easier by bending your torso over a wall.

Scapular Positioning: Begin with your scapulas depressed and neutral. As you descend into the movement, keep them depressed. They will naturally retract during the movement, which is fine. After you hit the bottom, they will naturally return to a neutral position as you ascend.

Technique: There are two different variations of the one-arm dip, and a way to make each more difficult. These progressions should be performed on a wall, used to brace your legs for balance. It is possible to use a single rail, but it will make the skill significantly harder. Descending and ascending is the same as in the straight-body, one-arm pushup progressions. Keep your arm tucked in close to your body in order to minimize torque at your joints and rotational forces. Your core and legs must also be squeezed tight.

- The first variation of the *one-arm dip* is performed with your body facing a wall. You will typically place your hand toward the middle of your body with your fingers pointing forward.
- The second variation is performed by standing parallel to the wall, with one side of your body next to the wall. In this position, you place your hand in line with the direction you are facing. There will be some lean over your arm to maintain balance.

Like the one-arm chin-up or one-arm pushup, this progression can be useful for assessing your unilateral strength balance. It also requires good use of your core stabilizers. Plus, it is fun to see if you can perform this type of skill.

This skill can be made easier by simply bending your torso down and up. This decreases any movement of your legs, which takes weight off your pushing arm. Additionally, your legs can be used for minimal pushing because the wall generates a bit of friction. You will ultimately want to eliminate any forms of assistance by performing this skill with a straight body while only pressing through one arm.

If you bend and/or twist your torso as illustrated above, it can make the skill much easier—to the point where the skill level drops to Level 6 or 7. This can be used as a method to work up to the full skill, and it is also an alternative movement you can use to work on strength in the absence of a weighted vest, weight belt, parallettes, or other equipment.

Rings Dips – Page 3, Column 8

Rings dips are critical for building upper-body strength. Like the other progressions, these types of dips put the responsibility for correct execution on the trainee. Keep your body in the hollow position and commit yourself to resisting the inclination to arch.

SUPPORT HOLD – LEVEL 1



Scapular Positioning: Your scapulas should be depressed and neutral. It is very easy to protract them, thus caving in your chest. This should be avoided.

Technique: Lock your arms so they are straight and in the rings support position. In this position, with your arms locked straight, depress the shoulder girdle (shoulders away from the ears). If you are a true beginner, to make the movement simpler, focus on gluing the rings to your sides to stabilize the position. If you are having difficulty with this movement, work it on parallel bars or parallettes first and then transition over to rings.

Your goal is to be able to hold the rings a couple of inches away from the side of your body. To increase the difficulty of the skill, you can start to point your palms forward to attain the rings-turned-out position.

Make sure to remember to breathe. Attempt to build up each hold to thirty seconds before increasing the difficulty of the skill. Focus on maintaining proper body positions, as this will help you significantly in the future. This skill is a great warm-up, especially for beginners.

RINGS-TURNED-OUT SUPPORT HOLD – LEVEL 2



Scapular Positioning: Your scapulas should be depressed and neutral. It is very easy to protract them, which allows your chest to cave. This should be avoided.

Technique: Lock your arms so they are straight and in the rings support position. Slowly turn your palms to facing forward.

For the vast majority of rings support positions, you will begin with your hands turned in. Eventually, you want to be able to begin with your forearms and palms facing your body and the rings parallel to each other. Once you become proficient in this skill, turn the rings so your palms face forward. The zero to ninety degrees of the rings-turned-out (RTO) movement ranges:

- 0-degree position, rings stay parallel with each other, palms face you.
- 90-degree position, rings form a straight line through your body, palms face directly forward.

The RTO position is essential for developing many high-level strength skills, and it will eventually give you a lot more balance and stability even though it may not feel that way when you first begin.

The RTO position helps strengthen your elbows and shoulder connective tissues and it provides a straight-arm strength stimulus for your biceps. This will pay dividends in the future as you work up to more advanced rings movements.

The key concept for this position is palms forward. This rotates the inside of your elbows forward, and rotates your shoulder into external rotation. Physiologically, elbows-pointing-forward is the most stable position. By turning out your palms, the head of your humerus is centered in your glenohumeral joint, which puts your rotator cuff muscles in a good position to stabilize the joint.

RINGS DIP ECCENTRICS – LEVEL 3



Scapular Positioning: Your scapulas should be depressed and neutral. It is very easy to protract them, which allows your chest to cave. This should be avoided. As you descend into the movement, keep your scapulas depressed and neutral until you reach the bottom. Once there, you may relax your scapulas and allow them to elevate.

Technique: Lock your arms so they are straight and in the rings support position. Slowly lower from the support position to the bottom of the dip.

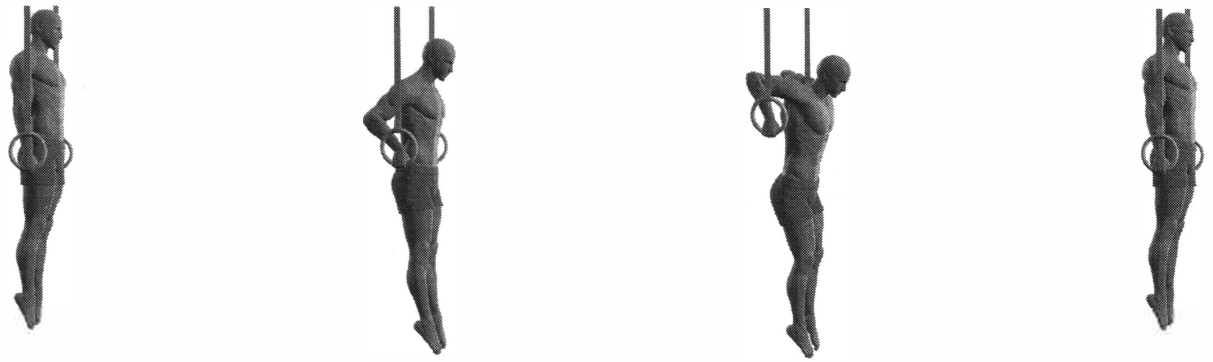
Rings dip eccentrics are the same as the bar eccentrics. The goal is to take six to ten seconds per single repetition and perform two to three full sets of two to three repetitions per set. Sets at this length will build the strength and muscle mass needed to obtain a full range of motion dip.

The key here is to lower uniformly. It is a common mistake, especially at first, to lower too slowly in the beginning portion of the movement. This uses up all your energy, causing you to pass through the end of the movement far too quickly and with poor execution.

The rings are easily stabilized by pressing them to your sides to prevent them from wobbling, especially during the lowering phase. During the ascent your arms will attempt to move away from your body. Keep them glued to your side.

If you are having difficulty, additional support hold work may be needed. Work your way up to a sixty-second support hold, then work it in the RTO position.

RINGS DIPS – LEVEL 4



Scapular Positioning: Your scapulas should be depressed and neutral. It is very easy to protract them, but that allows your chest to cave. This should be avoided. As you descend into the movement, keep your scapulas depressed and neutral until you reach the bottom. Once there, you may relax your scapulas and allow them to elevate.

Technique: Begin with the rings turned out (or at least parallel) in the support position. As you descend into the dip, you can allow your hands to rotate in if you desire. Your hands must remain close to your body, if not tight, for stability purposes. Pause in the bottom of the movement and push out to the top.

The instability of the rings provides greater strength increases than solely working the parallel bar dip progression. At this stage, you do not have to turn the rings out to perform *rings dips*. Work the support position with the rings turned out as soon as possible, but it is not necessary to hold the RTO position for the entire movement.

The key for this skill is to keep your hands glued to your sides and drive force through the base of your palms. It may help to focus on squeezing your chest and lats tight to your body as a cue.

RINGS L-SIT DIPS – LEVEL 5



Scapular Positioning: Your scapulas should be depressed and neutral. It is very easy to protract them, but that allows your chest to cave. This should be avoided. As you descend into the movement, keep your scapulas depressed and neutral until you reach the bottom. Once there, you may relax your scapulas and allow them to elevate.

Technique: Begin in an L-sit position (with the rings turned out or at parallel) and lower into the movement while keeping your legs parallel with the ground. Go as far down as possible before pushing back up, keeping your legs level. Remember to keep the rings glued to your sides for the duration of the movement. Pause at the bottom of the movement before pushing back to the top.

Rings L-sit dips, like the parallel bar variation, focus on developing triceps strength and stabilization when the rings are in front of your body. This strength is useful for future progressions where you maintain your hands in front of your body, such as L-cross and front lever progressions.

It is a common mistake to allow your legs to dip. You should keep them at 90-degrees or higher for the duration of the movement. This fault will usually manifest when you push out of the bottom of the dip. You may want to keep your hands slightly in front of you in order to counteract the forces that make your legs dip.

RINGS WIDE DIPS – LEVEL 6



Scapular Positioning: Your scapulas should be depressed and neutral. It is very easy to protract them, but that allows your chest to cave. This should be avoided. As you descend into the movement, keep your scapulas depressed and neutral until you reach the bottom. Once there, you may relax your scapulas and allow them to elevate.

Technique: There are two variations of *rings wide dips*:

- One variation is performed by beginning in the rings-turned-out (RTO) position. From there, allow your arms to go wide. Simultaneously allow your hands to rotate so your palms face backward. Finish the movement by performing the reverse motion, ending in a rings-turned-out support position. This variation internally rotates your shoulder, which places more stress on your lats and chest. It is useful for prepping your shoulders for more advanced moves like the iron cross.
- The other variation can be performed by simply pushing the rings out six to twelve inches from your body and holding this position while performing the dips. Like the other variation, this motion is hard on your shoulders and has an increased stability factor.

Work one or the other (or both), but know that this is just a progression to pass through.

RINGS-TURNED-OUT 45 DEGREES PAST PARALLEL DIPS – LEVEL 7

RINGS-TURNED-OUT 75 DEGREES PAST PARALLEL DIPS – LEVEL 8

RINGS-TURNED-OUT 90 DEGREES PAST PARALLEL DIPS – LEVEL 9



Scapular Positioning: Your scapulas should be depressed and neutral. It is very easy to protract them, but that allows your chest to cave. This should be avoided. As you descend into the movement, keep your scapulas depressed and neutral until you reach the bottom. Once there, you may relax your scapulas and allow them to elevate. Depress them again as you move out of the bottom back to the top position.

Technique: Begin in the support position, with the rings turned out. Lower in a controlled manner to the bottom of the dip while keeping your body straight. Do not allow your wrists to bend. Press out of the bottom of the dip to the rings-turned-out support position. Keep the rings turned out at the same angle for the duration of the movement.

These skills can be abbreviated *RTO 45 Deg Dips*, *RTO 75 Deg Dips*, and *RTO 90 Deg Dips*, respectively. The more you turn the rings out past the parallel position, the more difficult the skill. As noted previously, turning the rings out decreases the inherent stability of the rings themselves, forcing you to stabilize them via muscular coordination. Once the rings are turned out, they should never be turned back in for the duration of the movement. The last progression illustrated above shows the rings turned out to ninety degrees past parallel and held that way for the duration of the movement.

This skill is executed the same as the rest of the dipping movements. Do not forget to keep your hands glued to your sides! Concentrating on limiting instability more than the dipping motion itself should make the technique easier. When the rings are turned out this far, you will have to fight to keep them from turning back in at the top and bottom of the movement, especially during the concentric phase. You can do this by locking your forearms in a supinated position.

As you may have noticed, many of the RTO positions not only tax your stabilizers (in this case, your chest and lats) they also thoroughly work your arms, especially your biceps and its tendons. This is the primary reason for implementing the RTO dip skills at this point in your training. This increase in dip difficulty prepares your elbows for higher-level rings skills like crosses and one-arm chin-ups.

RINGS-TURNED-OUT 90 DEGREES + 30-DEGREE FORWARD-LEAN DIPS – LEVEL 10

RINGS-TURNED-OUT 90 DEGREES + 50-DEGREE FORWARD-LEAN DIPS – LEVEL 11

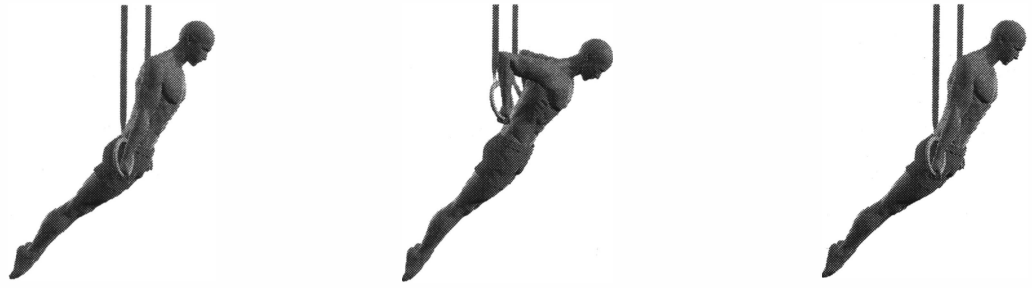
RINGS-TURNED-OUT 90 DEGREES + 65-DEGREE FORWARD-LEAN DIPS – LEVEL 12

RINGS-TURNED-OUT 90 DEGREES + 75-DEGREE FORWARD-LEAN DIPS – LEVEL 13

RINGS-TURNED-OUT 90 DEGREES + 82-DEGREE FORWARD-LEAN DIPS – LEVEL 14

RINGS-TURNED-OUT 90 DEGREES + 86-DEGREE FORWARD-LEAN DIPS – LEVEL 15

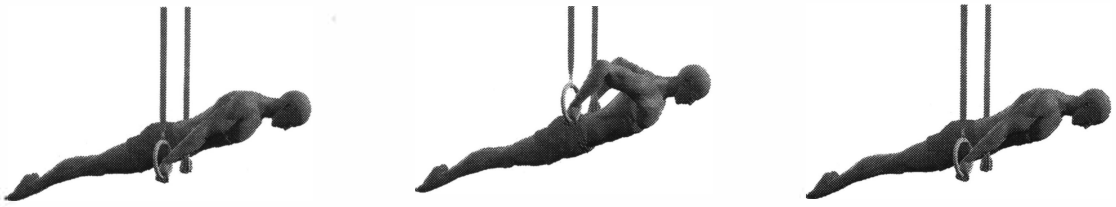
RINGS-TURNED-OUT 90 DEGREES + 88-DEGREE FORWARD-LEAN DIPS – LEVEL 16



30-Degree Forward Lean



50-Degree Forward Lean



75-Degree Forward Lean

Scapular Positioning: Your scapulas should be depressed and neutral. It is very easy to protract them, thus caving in your chest. This should be avoided. As you descend into the movement, keep your scapulas depressed and neutral until you reach the bottom. Once there, you may relax your scapulas and allow them to elevate. Depress them again as you move out of the bottom back to the top position.

Technique: Begin in the support position, with the rings turned out. Lean forward to the appropriate angle and lower in a controlled manner to the bottom of the dip. Keep your body straight and do not allow your wrists to bend. Press out of the bottom of the dip to the starting position, maintaining the lean in your body. Keep the rings turned out at the same angle for the duration of the movement.

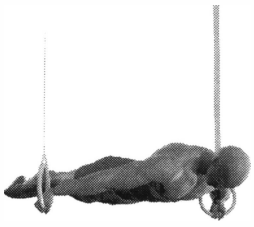
These skills can be abbreviated *RTO 90 + 30 Dips*, *RTO 90 + 50 Dips*, *RTO 90 + 65 Dips*, and *RTO 90 + 75 Dips*, respectively. Leaning forward will build on the control and connective tissue strength that you have already established from the previous RTO dip progressions. The forward lean puts more stress on all of your anterior muscle groups. Although the total range of motion will decrease, the torque will increase. RTO forward-lean dips act like a hybrid version of planche pushups and a leaning maltese progression. They make for excellent work in progressing toward those skills.

Keep a straight or slightly hollow body position. Your body will want to arch heavily, particularly at your abdominal region. This should be avoided because it makes the exercise significantly easier.

The forward lean portion of the skill (at the beginning and end—with straight arms) is very important. While some coaches may not like combining a forward lean with dips, as long as proper form is maintained the combination can build excellent control that can be utilized for moving in and out of other positions. Try pausing/holding for two seconds if you are working toward the maltese.

As you progress in strength, the angle you are able to obtain per level will diminish (similar to the cross). It is not uncommon for people with Level 8 strength to be able to lean forward forty-five degrees and hold this position for a few seconds. This may give you the illusion that you are more than halfway to the maltese. In reality, you are probably only one-fourth of the way there, due to increases in torque and decreases in muscle leverage.

MALTESE HOLD – LEVEL 17



Multiple gymnasts have utilized this forward-lean progression to obtain their maltese holds. It is obtainable with only the forward-lean progression absent of dips. Likewise, you can work solely planche leans to obtain the planche. Here, dips are combined with the forward lean because, like pseudo planche pushups, it builds bent-arm and straight-arm strength into one progression. Feel free to use the leaned forward progression alone or in conjunction with dips to work toward the maltese.

Weighted Dips – Page 3, Column 9

Weighted dips are often called "the squat of the upper body" due to the amount of musculature they use. They can be performed on either parallel bars or rings. Rings weighted dips are going to be more difficult than those performed on parallel bars at lower levels. However, once you begin to move toward full 2x bodyweight dips, they actually are easier on rings. While the rings tend to splay outward, physics dictates that the rings will stay put when you add significant amounts of weight to your body. When the rings move out, they also move up. Therefore, gravity, your bodyweight, and additional weight counteract the outward force that is applied to the rings from your hands. This helps to further stabilize the rings.

The weighted dip progression is very easy to measure, which is why it is particularly useful in training. Weighted dips transfer very well to planche skills, although they do not benefit handstand pushups as much. This should be expected, as weighted dips work the extended range of motion of the shoulder, conferring some benefit to the flexion of the planche. However, it is unlikely to confer benefits to fully flexed shoulder positions like handstands and handstand pushups.

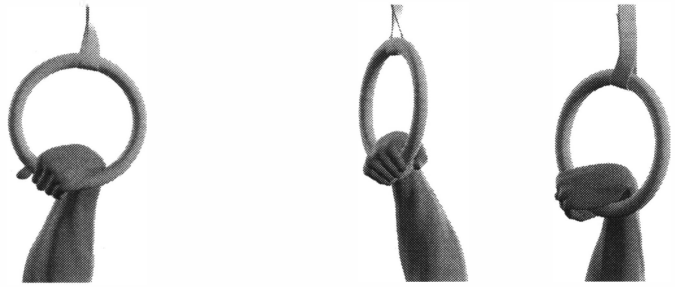
Weighted dips will typically outpace weighted pull-ups by a progression or two due to additional involved musculature. Additionally, your triceps are larger and stronger than your biceps. You should be able to perform a 2x bodyweight dip by the time you reach Level 9. This is consistent with the other skills you will develop around that level. As a point of reference, the straddle planche is a Level 8 skill, and the Half Layout / One-Leg-Out planche is a Level 9 skill.

- Chapter 27 -

MULTI-PLANE EXERCISES, CORE, AND LEGS

Muscle-ups and Inverted Muscle-ups – Page 4, Column 1

The muscle-up is a fundamental movement that is very important for beginners to learn. Not only does the muscle-up get you above the rings, it also develops strength in your full range of motion through the pull-up and dip positions. Once you reach a certain point, you will transition from the strict pull-up and dip muscle-up to more difficult pulling skills, pushing skills, and isometrics in succession with the muscle-up transition. This will help build strength as you move from one position to another, thus allowing you to build routines and sequences that can be utilized for strength and conditioning. By the time you reach the high end of the intermediate strength level, the muscle up has outlived its usefulness, and may be abandoned for more challenging movements.



False Grip Hand Positioning

The illustrations above show the false grip hand position on the rings. This muscle-up can also be performed on a single bar or parallel bars. Though it may be dropped later on, the false grip is essential to the learning process when you first begin to train muscle-ups. With your wrists on top, you are in a position that offers more leverage during the transitional phase. Use a false grip for all progressions unless otherwise stated.

A false grip is attained by shifting your hands up on the side of the ring (or bar), so that the crook of your wrist on the pinky side of your hand sits on the rings or bar. You then wrap your hand around the rings or bar, hold as tightly as possible, and begin the movement. Here are some general problems that you may encounter when you first begin using the false grip:

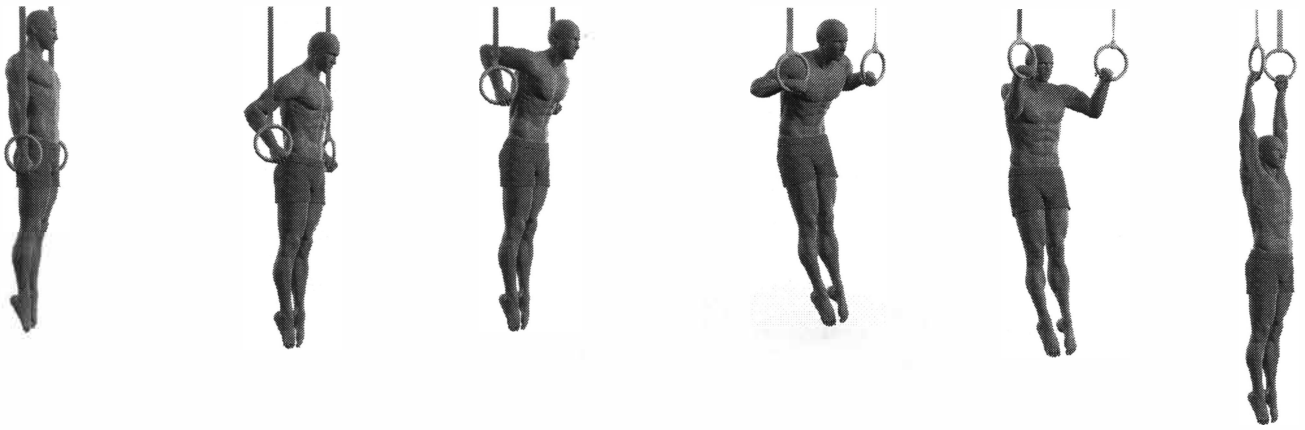
- Increased difficulty or tension due to poor wrist flexibility. To correct this, add additional wrist stretching and mobility work.
- Poor grip strength or inability to hang with a false grip. To correct this, add additional work to your warm-up and cool down such as hand/wrist strengthening exercises: wrist curls, wrist rollers, rice bucket.
- Slight errors in position. Your hand should be slightly up on the side of the ring so that your palm is directly at the bottom of the ring through the transition. Most people put their hand up too far on the side or they place their hand at the bottom.

It is possible to perform a muscle-up when you can achieve five dips and five chest-to-bar pull-ups wth full range of motion if you utilize a correct false grip. If you are much stronger than this and still have issues with a muscle up, your false grip positioning may not be correct. Alternatively, you may have other technique issues

If your wrists are being torn up during your training, you have a few options. The first is to decrease the frequency. This will allow your skin to heal and toughen up into calluses—much like how your hands will toughen up when you have trained long enough. Another option is to get wristbands or use athletic tape around the wrist to blunt the friction. (This generally makes it harder to hold a false grip, however.) Gloves can of course be used, but this takes away from grip strength and is not recommended.

By this point you should know that working through injuries could prolong them. There is no reason to destroy the skin on your wrists or even on your hands. Consider torn up wrists a sports injury that takes away from your training. The recommended method to address this is to train a different skill or similar progression while your wrists are healing and come back to the muscle-up when you are healed.

MUSCLE-UP NEGATIVES – LEVEL 3



Scapular Positioning: Begin in the rings support position, with your scapulas depressed. They will remain depressed to the bottom of the dip position. Once there, relax your scapulas and allow them to elevate. As you move through the transition, depress them again and lower to a hang position.

Technique: From the straight-arm support position, lower slowly to the bottom of a dip position. Be sure to keep the rings close to your sides. Once you reach the bottom of the dip, the following must occur during the transition phase—simultaneously:

- Lean back.
- Allow your hands to slide into the rings so that the bottom of the ring makes contact with the inner part of your wrist. Grip firmly (you will be in the false grip position).
- Keep your elbows close to your body. They may even brush against your body like your hands in the prior phase.
- From there, lower slowly to the hang position.

For *muscle-up negatives* (which can be abbreviated *MU Negatives*), you should focus on performing muscle-up technique exactly in reverse. This is the key to learning the movement before your strength allows you to complete it. Additionally, learning to control and manipulate negatives will allow you to chain consecutive muscle-ups together faster.

KIPPING MUSCLE-UPS – LEVEL 4



Scapular Positioning: Begin with your shoulders relaxed. As you move up from the swing, activate your shoulders by depressing your scapulas. As you enter the transition phase, retract them strongly. As you push out of the dip, they should be depressed.

Technique: Begin with an arch-hollow motion by pushing your hips and shoulders alternately forward and backward. On the final arch, initiate the pull-up. As your hands begin to near your chin, continue pulling until they reach your chest. From there:

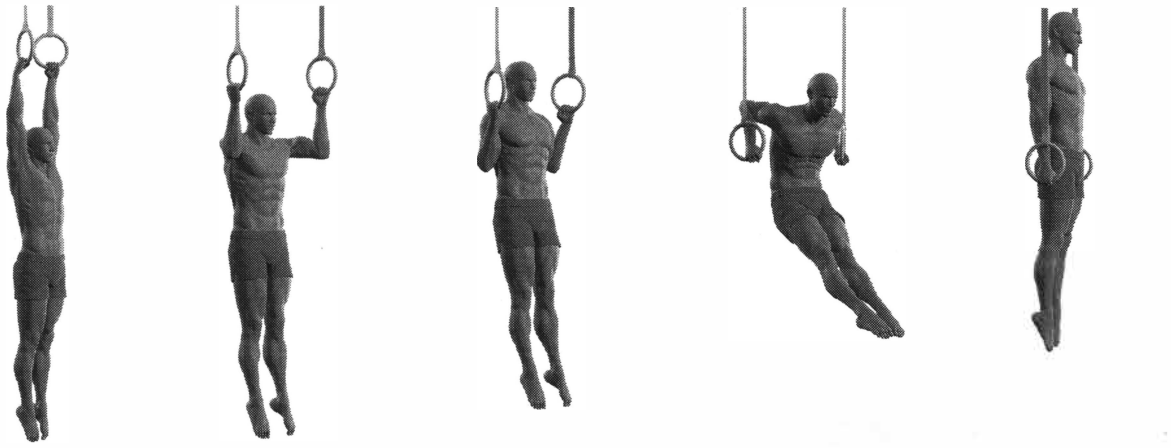
- Begin to lean forward.
- Keep your arms close to your body and shoot your hands to your armpits and your elbows straight back.
- From the bottom of the dip, push out while keeping your hands close to your sides.

The key with *kipping muscle-ups* (which can be abbreviated (*Kipping MU*) is to reinforce proper movement patterns and build strength through your complete range of motion while using the lower-intensity kipping method. Assisted-muscle ups (with a spotter or leg/band assistance) also fall into this category, and can be used as an alternative to kipping muscle-ups.

For most people, this is their first introduction to muscle-ups. If the kipping muscle-ups are not working, the difficulty most likely lies in the transition. You can lower the rings and practice the transition from a rowing position, or you can use a spotter to reduce the load while practicing the proper technique to move through the transition. If a pulley system is available to help decrease the load, this can also be used.

Most of the difficulties in this movement are grounded in two places. First, many people do not pull high enough to make it through the transition phase. This can be counteracted with increased strength, by including practice using the techniques outlined above. Second, many people will have problems stabilizing the position above the rings. This is also an issue of support hold practice, as well as practicing ring dips. You really have to focus on gluing the rings to your side to make sure that you do not wobble or fall out of the dip or support position while above the rings.

MUSCLE-UPS – LEVEL 5



Scapular Positioning: Begin in a hang position, with your shoulders elevated. Initiate the movement by depressing your scapulas. Keep them depressed and allow them to rotate during the pull-up. As you enter the transition phase, retract and strongly elevate your scapulas to the bottom of the dip. From there, depress them and push out of the dip.

Technique: Begin in a hang position with a false grip. Initiate a pull-up to the transition phase—this can be thought of as the upper portion of a row. Transition the hands from in front of your chest to underneath your armpits by leaning forward, rowing your elbows directly backward, and shooting your head up and forward between the straps. Next, push out of the dip to the support position.

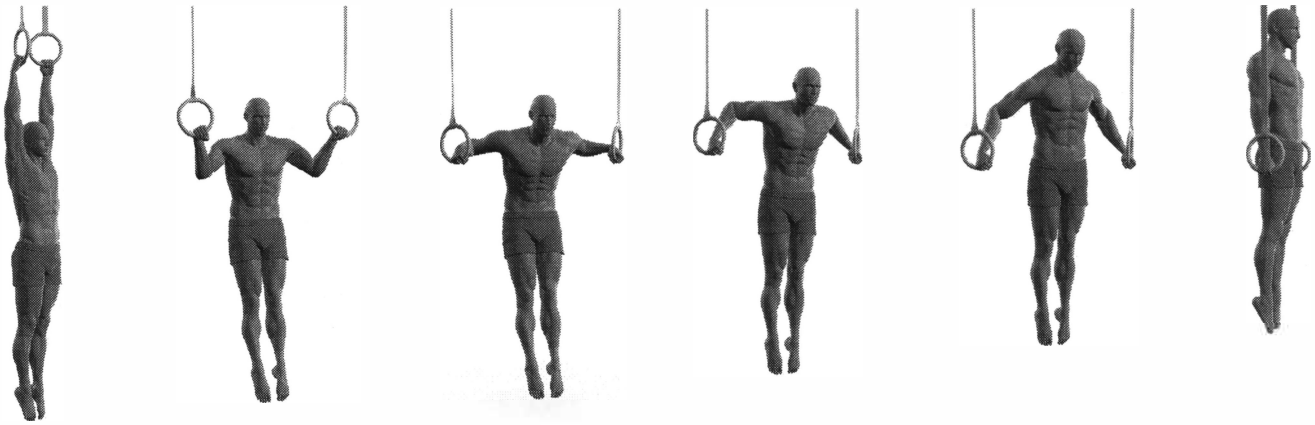
At this point, you should have a fairly good grasp of how the *muscle-up* technique works. Because the transitional phase is the limiting factor in the strict muscle-up, the main thing you need to focus on is raw strength development. If you can perform five pull-ups (with your chest to the rings) and five dips on rings (with your hands reaching your armpits), you should be able to perform a muscle-up if you have proper technique coaching. If you are at this point, it would be a good idea to work transition-specific exercises, like those mentioned in the previous section.

You can think of the transition phase as a rowing motion. As with anything involving rings, it is best to get on the rings for sake of specificity. You will be better off focusing on row muscle-ups, human-assisted muscle-ups, and pulley-assisted muscle-ups over dumbbell rows. But if you have access to dumbbells or similar types of weight, you can use one-arm bent-over rows with a light weight as an assistance exercise. In order to be effective, the hand performing the row should be able to complete the range of motion to your armpit.

There are a couple of other assistance exercises that may be used besides the aforementioned progressions. The first is to lower the rings so that your feet barely touch the ground at the bottom of the dip. Thus, you can slightly assist the movement with your feet to make it through the transition phase. Alternatively, you can use a Theraband looped between the rings and held with your hands. You can then kneel with one or two legs on the band to get some assistance through the transition phase.

This was once an A-level skill, but it is now officially unrated. It remains in the A-level section of the charts because the level of strength this skill requires rivals most of the other skills at this level.

WIDE / NO-FALSE-GRIP MUSCLE-UPS – LEVEL 6



Scapular Positioning: Begin in a hang position with your shoulders elevated. Initiate the movement by depressing your scapulas. Keep them depressed and allow them to rotate during the pull-up. As you enter the transition phase, retract and strongly elevate your scapulas to the bottom of the dip. From there, depress them and push out of the dip.

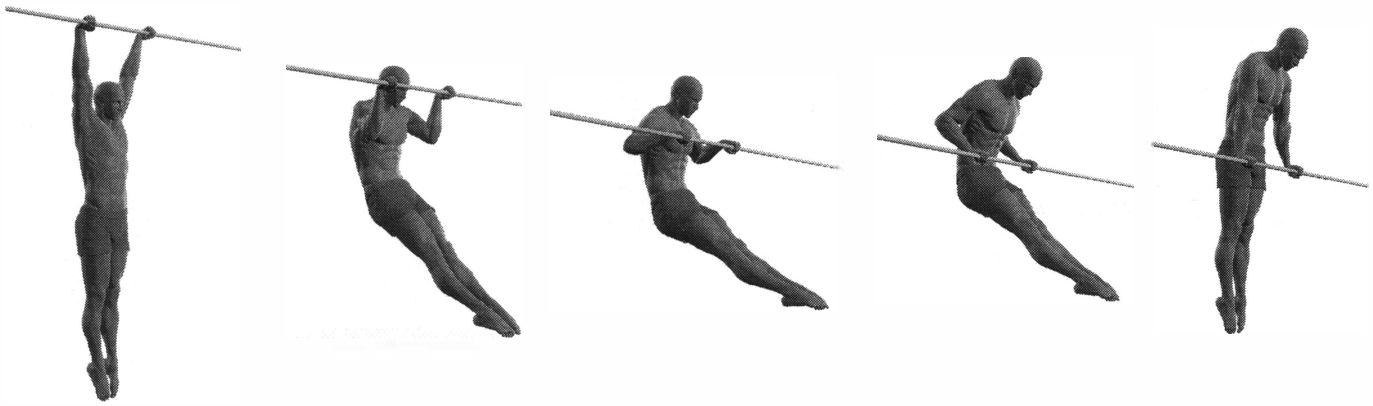
Technique: Begin in a hang position with a false grip. Perform a wide grip pull-up to the transition phase, which can be thought of as the upper portion of a row. Perform this phase and then push out of the dip to the support position. The rings should be kept wide through the transition until you reach the support position.

Wide muscle-ups still use a false grip, but your hands and elbows are allowed to drift away from your shoulders. As this happens, your shoulder leverage decreases, requiring an increased contribution from your shoulders to compensate. The technique essentially remains the same. Alternatively, you can perform the muscle-up without a false grip.

No-false-grip muscle-ups decrease leverage at the wrist, which requires more strength from your elbows and shoulders to compensate. Your hands must be manually moved through the transition so that they sit on top of the rings. Failure to do this may cause discomfort or pain.

These skills can be abbreviated *Wide MU* and *No FG MU*, respectively.

STRICT BAR MUSCLE-UPS – LEVEL 7



Scapular Positioning: Begin in a hang position with your shoulders elevated. Initiate the movement by depressing your scapulas. Keep them depressed and allow them to rotate during the pull-up. As you enter the transition phase, retract and strongly elevate your scapulas to the bottom of the dip. From there, depress them and push out of the dip.

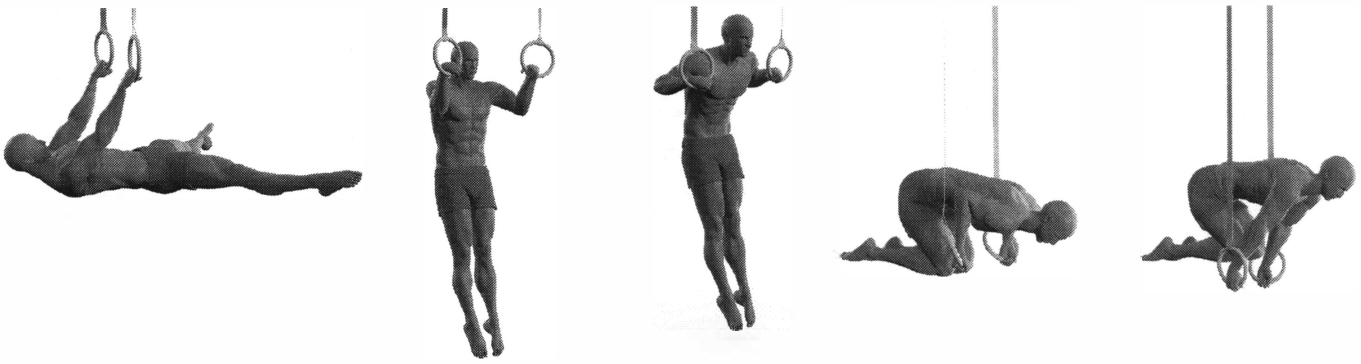
Technique: Begin in a hang position with a false grip. Pull-up to your chest. Row your elbows behind you and force your chest over the bar. Push out of the dip to the bar support position.

The *strict bar muscle-up* (which can be abbreviated *Strict Bar MU*) is performed without a kip, which makes it difficult. A false grip may be used for this movement. Since your body cannot go through the bar like it can with rings, it has to move behind the bar with your hands in front. This backward displacement of the body creates increased torque at your hands, which must be countered by an increase in elbow and shoulder strength.

It may be useful to use a semi-L-sit position for this movement, as it will push your torso back behind the bar. As your head is pulled up and past your chin, pressure must continually be exerted on your hands and wrists. As soon as your chest passes your hands, lean forward and drive your hands toward your stomach to compensate. You can drop the L-sit legs position at this point. The transition then occurs into a dip on the bar. From there, push the dip out to the support position above the bar.

The illustrations above do not depict the L-sit position, but they do show the type of muscle-up that you are working toward.

STRADDLE FRONT LEVER TO MUSCLE-UP TO ADVANCED TUCK PLANCHE – LEVEL 8



Scapular Positioning: Begin in a straddle front lever with your scapulas depressed and neutral. Keep them depressed and allow them to rotate during the pull-up. As you enter the transition phase, retract and strongly elevate your scapulas until you reach the bottom portion of the dip. Then, depress them and push out to the advanced tuck planche position, where they will be depressed and protracted.

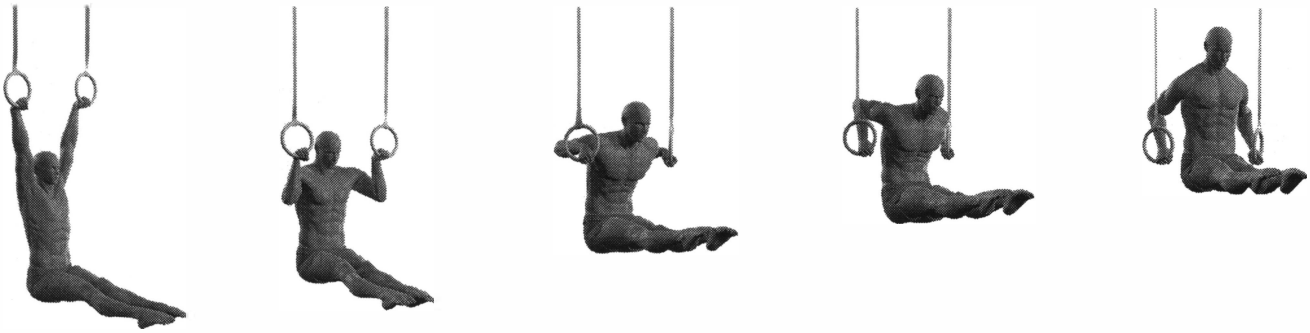
Technique: Start in the straddle front lever. Keep your body straight, muscle-up, and push out to the advanced tuck planche position.

This skill can be abbreviated *SFL MU ATPL*. The addition of skills to the muscle-up—in this case front levers and planches—increases the difficulty of the pull-up and dip portion of the muscle-up. While they do not directly affect the transition, moving into the transition from a decreased leverage position does tax your body and build strength.

In the lower portion of the movement, you will move from the front lever into the transition. Increased strength is required to reach the point where the transition begins, making the transition itself seem more difficult. The dip into planche makes that transition feel more difficult as well.

A false grip for this movement will make the transition easier, however, it should not be necessary at this level of strength. Begin in a solid straddle front lever position. As you move out of it and allow your torso and legs to drop, initiate the pull-up and transition. From there, push your hips up through the dip—all the way up to planche level—as your arms lock out. Hold each of the static positions for at least a second or two.

L-SIT MUSCLE-UP – LEVEL 8



Scapular Positioning: Begin in an L-sit hang with your shoulders elevated. Initiate the movement by depressing your scapulas. Keep them depressed and allow them to rotate during the L-sit pull-up. As you enter the transition phase, retract and strongly elevate your scapulas until you reach the bottom portion of the dip. Then depress them and push out of the dip.

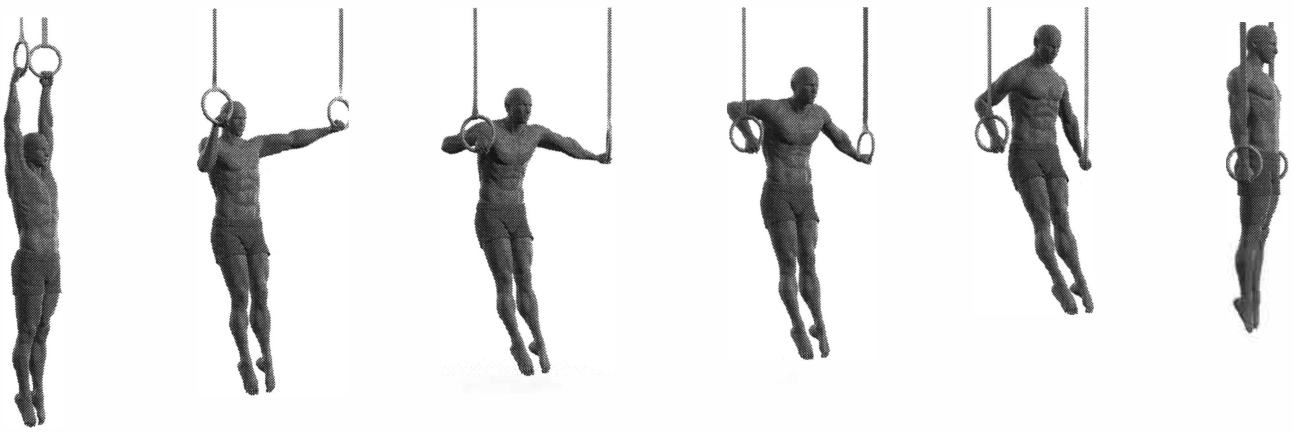
Technique: Begin in an L-sit hang and pull up through the muscle-up transition into the dip and end in an L-sit support position. Keep your legs above ninety degrees for the duration of the movement.

This skill is the impressive looking muscle-up variation shown in the popular YouTube video of gymnast Andreas Aguilar performing an exhibition routine.

You begin with an L-sit and a false grip under the rings. From there, perform a muscle-up while keeping your legs in the L-sit position for the duration of the movement. This skill requires immense strength because, like all of the other L-sit skill variations, your hands must be displaced four to six inches in front of your body for the duration of the movement. Failure to do this, especially through the transition, will lead to your legs dropping from the L-sit position.

Having your hands in front of your body for the entire movement increases torque at your shoulders. This makes the skill similar to what might be called an upright front lever position. Indeed, the difficulty actually rivals performing a full front lever.

ONE-ARM-STRAIGHT MUSCLE-UP – LEVEL 9



Scapular Positioning: Begin in a hang position with your shoulders elevated. Initiate the movement by depressing your scapulas. Keep them depressed and allow them to rotate for both your straight arm and your bent arm. As you enter the transition phase, retract and elevate your bent arm strongly to the bottom portion of the dip while keeping your straight arm depressed. Then, depress your bent arm scapula again and push out of the dip.

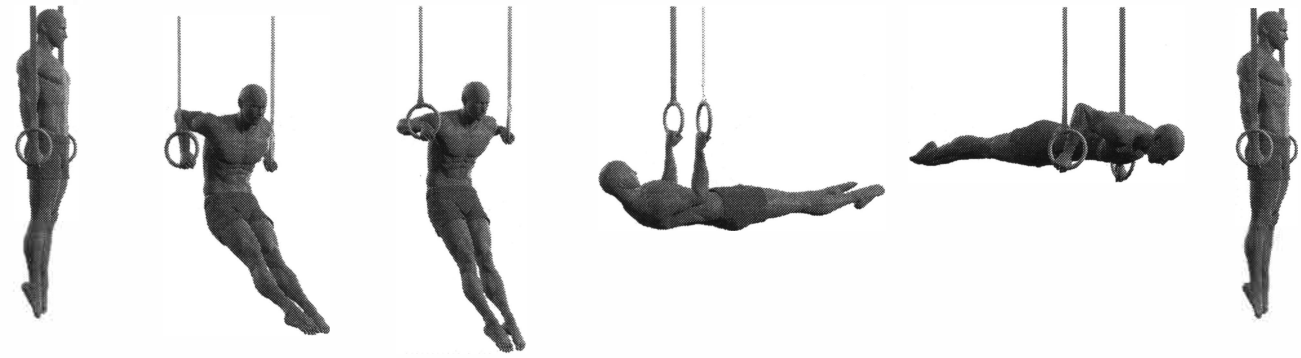
Technique: Begin with both hands in a false grip. One arm will pull straight, so the ring comes out to the cross position, while the other arm performs an assisted one-arm pull-up/chin-up. As the one-arm pull-up/chin-up arm passes your chin, initiate the transition phase by keeping your hand very close as you lean forward. At this point, you will probably want to put more weight on your straight arm to help shift your other arm as it is in the transition phase. This is expected and acceptable, as long as the assisting arm remains straight. From there, the movement is a combination of the one-arm dip with the assistance of the one-arm cross pullout. Alternate your arms. Though you are very likely to discover that one side is better than the other, try to keep both sides in strength balance.

The *one-arm-straight muscle-up* (which can be abbreviated *OA Straight MU*) completely eliminates the leverage of the wrist and elbow from one arm and instead relies on the shoulder strength from the straight arm and the pull from the other arm.

Variations of this skill, with the pull-up and dip separate, are sometimes used for strengthening the iron cross position. These variations can be used as a progression toward the iron cross if desired. It can also be used to train the one-arm chin-up / one-arm pull-up. This skill is a good hybrid of many highly desired skills, including the one-arm chin-up and iron cross. If you are interested in progressing toward either of these skills, the one-arm-straight muscle-up is strongly recommended.

It should be noted that using your straight arm puts a great deal of extra stress on your shoulder joint. During this exercise, your shoulders may fatigue to the point that strain is placed on your rotator cuff muscles. Be wary of attempting to push through any discomfort.

FELGE BACKWARD, STRAIGHT-BODY TO SUPPORT – LEVEL 10



Scapular Positioning: Your scapulas will be depressed in the support position and elevated at the bottom of the dip. As you begin to rotate, strongly retract and depress them through the rotation back to the support position. They will end depressed and neutral in the support position.

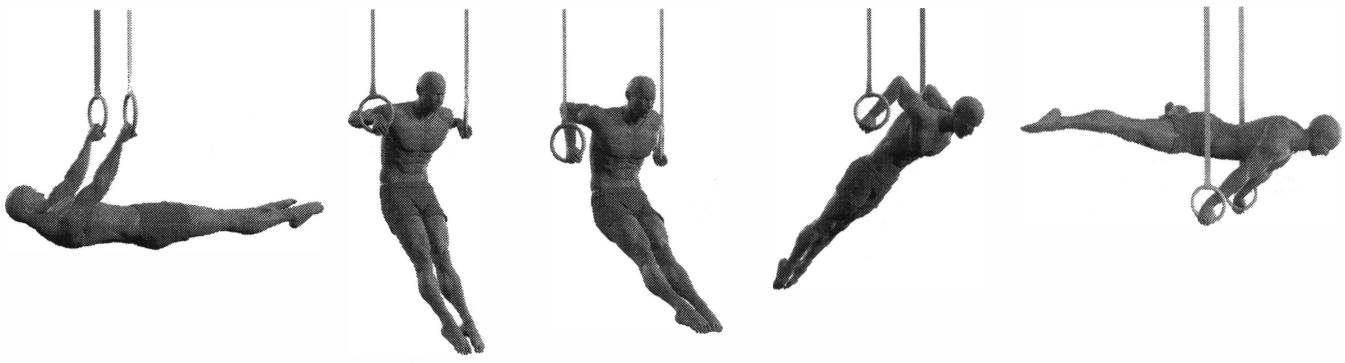
Technique: Begin in the support position and control your roll backward. Use only the amount of momentum you need and phase it out as you become proficient in this technique. Bend your arms as you rise through the second phase, allowing your legs to rotate your upper body back above the rings. Pin the rings to your hips and push your hands forward as hard as possible. This allows your body to rotate around your hands and back to the support. Finish in the support position after you roll over.

This is the first skill in the *inverted muscle-up* progression. It requires considerable strength, as the only momentum you can gain comes from the initial phase of falling down and/or manipulating the bend of your arms. Since your hips will be fully extended, there is no way to use your hips to assist with this skill. Ideally, you will perform this skill without the use of any momentum altogether, which is why this skill is ranked at Level 10. A quickly executed backward roll to support, even with good technique, is much easier than Level 10; using momentum, this skill can easily be learned at Level 6 or 7. However, performing this technique *without* momentum requires incredible control and strength.

The most difficult part of this skill is the inverted muscle-up portion, which is the second phase. Working negatives of the inverted muscle-up will help you progress. For example, you can get into the shoulder stand position and slowly lower to the inverted hang position.

This is a B-level skill in the Gymnastics Code of Points.

FRONT LEVER MUSCLE-UP TO STRADDLE PLANCHE – LEVEL 11



Scapular Positioning: Begin in a front lever position with your scapulas depressed and neutral. Keep them depressed and allow them to rotate during the pull-up. As you enter the transition phase, retract and elevate them strongly to the bottom portion of the dip. Depress them again and push out to the straddle planche position, where they will remain depressed and protracted.

Technique: Begin in a front lever position. Keep your body straight, muscle-up, and push out to a straddle planche position.

As noted earlier, the addition of much more difficult starting and ending positions will indirectly make the transitional phase more difficult when performing the *front lever muscle-up to straddle planche* (which can be abbreviated *FL MU Str PL*). This technique is exactly the same the *straddle front lever muscle-up to advanced tuck planche* except it involves more advanced positions.

If desired, a false grip for this movement may be used because it will make the transitional phase easier. However, you should have reached a level of strength by this point that this is not necessary. Begin in the front lever position. As you move out of this position by allowing your legs and torso to drop, initiate the pull-up and transitional phase. From there, push your hips up through the dip—all the way up to planche level—as your arms lock outward. Hold each of the static positions for at least a second or two.

FELGE BACKWARD, STRAIGHT-BODY TO HANDSTAND - LEVEL 12



Scapular Positioning: Your scapulas will be depressed in the support position and elevated at the bottom of the dip. As you begin to rotate, strongly retract and depress them through the rotation. Once you begin to invert, elevate them strongly overhead to a handstand.

Technique: From the support position, lean back and allow your hands to slide in order to obtain a false grip. As you enter the inverted hang position, strongly pull your hands forward from your shoulders and direct your body upward. Simultaneously pull your hands to your shoulders in a strong manner (much like an inverted biceps curl) to attain the shoulder stand position. From there, press out to a handstand.

This is the second skill in the inverted muscle-up progression. It takes the *felge backward, straight-body to support* a step further, taking it up to a shoulder stand and into a handstand.

The most difficult part is the second phase of the skill, the inverted muscle-up. Working negatives of the inverted muscle-up will help you progress. For example, you can get into the shoulder stand position and slowly lower down to the inverted hang position. You will need strong biceps in order to bring your hands to your shoulders and achieve the shoulder stand position.

This is a B-level skill in the Gymnastics Code of Points.

STRAIGHT-BODY ROTATION TO HANDSTAND – LEVEL 14



Scapular Positioning: Begin in a hang position with your scapulas elevated. Initiate the movement by depressing your scapulas and retracting them as you rotate through the front lever position. As you begin to rise to the shoulder stand position, elevate them strongly overhead to a handstand.

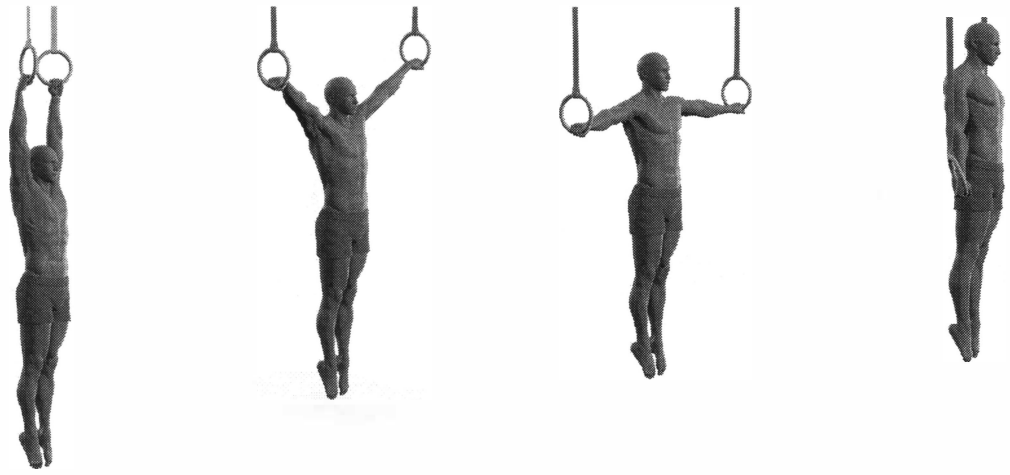
Technique: For the straight-body rotation to handstand, begin in a hang with a false grip. From there, pull to an inverted hang while keeping your body straight. This is the same as one of the front lever progressions like the hang pull to inverted hang. From there, perform a reverse muscle-up to a shoulder stand. Your feet will be directed vertically while your hands are pulled toward your shoulders in a curling motion. Once the shoulder stand is reached, press to a handstand.

Though the *straight-body rotation to handstand* was removed from the Gymnastics Code of Points, it is still worth learning since it is the natural progression from the *felge backward, straight-body to handstand* to the *elevator* skill, which will be discussed later in this chapter.

Obviously, the most difficult part is the middle phase of this skill, the inverted muscle-up. You can utilize some of the momentum from the pull to inverted hang to initiate this. Alternatively, you can work the felge progression mentioned earlier, or work the eccentric of this movement, which is the shoulder stand slow negative to inverted hang.

This *used* to be a C-level skill in the Gymnastics Code of Points.

BUTTERFLY MOUNT – LEVEL 15



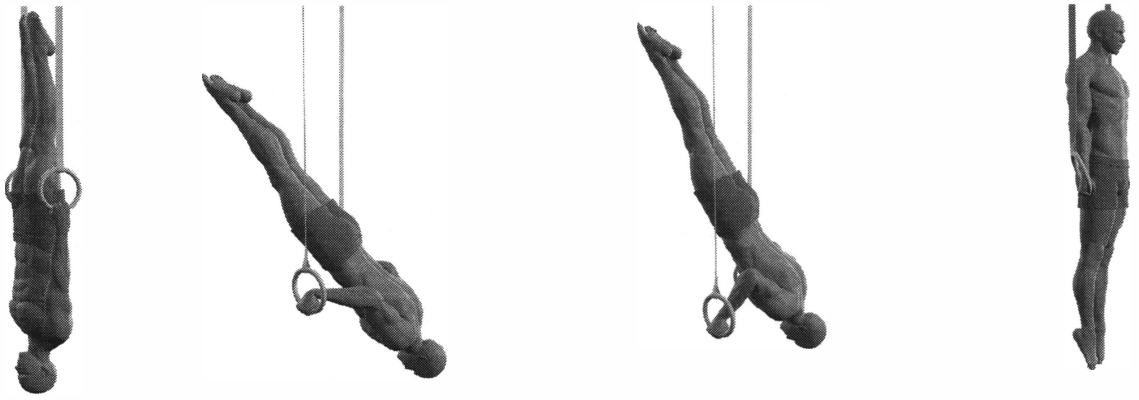
Scapular Positioning: Begin with your scapulas elevated and relaxed. Initiate the movement by activating your shoulders and depressing your scapulas. They will protract a bit through the pull to the cross. As you pass the cross position, keep your scapulas depressed and neutral or slighly protracted all the way to the support position.

Technique: Begin in a hang position, with straight arms and a false grip. From there, perform a straight-arm pull by forcing your hands downward. Keep your hands slightly in front of your body to obtain more leverage. As you approach the cross position, keep forcing the rings downward to maintain any potential momentum or speed you may have. If you begin to slow down or pause, it is very easy to get stuck and you are unlikely to have enough strength to complete the movement.

The *butterfly mount* is essentially a straight-arm muscle-up to support. Progressing this far represents having obtained an incredible level of pulling strength. Like the previous skill, the hard part is to begin from a dead hang. If you are struggling to pull out from the bottom of the skill, pull the rings in before forcing them out, giving your arms a bit of momentum before the pull. In the same way, you can also raise your legs into a semi-L-sit position to generate some upward force as you initiate the movement. Eventually, you will wait to eliminate any form of assistance when performing this skill.

This is a C-level skill in the Gymnastics Code of Points.

ELEVATOR / INVERTED MUSCLE-UP TO HANDSTAND – LEVEL 17



Scapular Positioning: Your scapulas will be depressed in the inverted hang. After the inverted pull to shoulder stand, strongly elevate them overhead to the handstand.

Technique: Begin in an inverted hang position with a false grip. From there, perform a bodyweight curl to the shoulder stand position. It is normal for the hands to start to drift out wide during this phase as opposed to staying soulder width. As you get closer to the shoulder stand position, they will start to come in toward the shoulders. Next, press from the shoulder stand to a handstand. For added difficulty, remove the false grip.

The final skill of the muscle-up progression is the "elevator." As the secondary description says, the elevator is essentially an *inverted muscle-up to handstand*. Obviously, the hardest part of this movement is the inverted muscle-up portion, which requires a great amount of biceps and shoulder strength to execute.

Working slow negatives is an effective way to train this skill. Also, the previous progressions that will help include the Felge backward to handstand and the straight-body rotation to handstand. All of these skills work the same motion, albeit with a bit of momentum, to assist the inverted muscle-up portion of the movement.

This was previously rated as a D-level skill in the Gymnastics Code of Points, but it was removed from the code in 2004.

Elbow Levers – Page 4, Column 2

The *elbow lever* progressions are mainly based on balancing ability. While some degree of strength is required to maintain the positions, practice is the main factor in attaining these skills. Therefore, level increases in these skills are inconsistent with the other skills and strength progressions on the charts.

TWO-ARM ELBOW LEVER – LEVEL 5



Scapular Positioning: Your scapulas will be depressed and slightly protracted. They should not be protracted to the point that your back rounds.

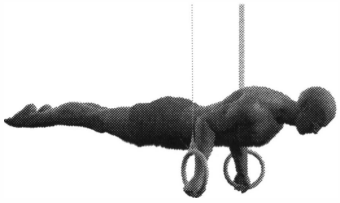
Technique: Your hands should be placed slightly less than shoulder-width apart. Your fingers may be placed forward or sideways. Hand position is based on personal preference. Most people prefer sideways, as it strains the wrists less. From there, place your elbows on your stomach—between your bellybutton and iliac crests (the hipbone on the side of your body). Next, straighten your body and lean forward for the hold.

The *two-arm elbow lever* (which can be abbreviated *Two-Arm EL*) is fairly easy to achieve, even with a lower level of strength. The key is learning to balance after the correct elbow and hand positions are placed. This lever can be performed on the floor or parallettes / parallel bars. Make sure the ending position is perfectly parallel with the ground.

One of the common errors is neglecting to open your elbows with the forward lean. If you lean forward without allowing the angle at your elbows to change, you will fall on your face. To obtain the correct balance point you need to open your elbow angle to roughly one hundred and twenty degrees as you lean forward. This angle may vary a bit depending on individual anthropometry.

Another common mistake is to allow your body to sag or to arch too much. Your focus on straight-body positioning in previous progressions will pay off. It is useful to have a mirror, camera, or spotter to provide feedback on your body positions. Aesthetically speaking, it is better to arch too much than to allow your body to sag.

RINGS TWO-ARM ELBOW LEVER – LEVEL 6



Scapular Positioning: Your scapulas will be depressed and slightly protracted. They should not be protracted to the point that your back rounds.

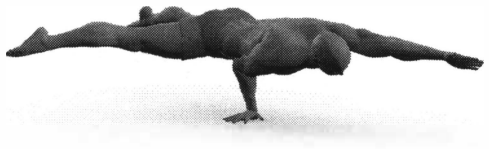
Technique: Your hands should be placed slightly less than shoulder-width apart. Your fingers may be placed forward or sideways, based on personal preference, though be aware that sideways will strain the wrists less. From there, place your elbows on your stomach—between your bellybutton and iliac crests (the hipbone on the side of your body). Next, straighten your body and lean forward for the hold.

The *rings two-arm elbow lever* (which can be abbreviated *Rings Two-Arm EL*) is a more difficult variation of the elbow lever, due to the instability of the rings. Other than the inherent instability of the apparatus, the skill is performed in exactly the same manner as an elbow lever is performed on the parallettes or floor. When performing this skill, ensure that your body is perfectly parallel with the ground when you reach the ending position. You can turn the rings out to improve control for the hold.

This lever is typically approached in two different ways. For the first method, begin in an L-sit. As you come out and lean forward, you can pull the rings in and place your elbows on your stomach. From there, lean forward into the skill while opening your elbows and straightening your body simultaneously. This takes practice to carry out correctly.

For the second method, begin in a rings shoulder stand position. Bring the rings in close to your body while maintaining the position and allow your elbows to make contact with your body. As you begin to lower from the shoulder stand you can adjust the elbow position. From there, all you need to do is lower your legs while keeping your body straight, and open your arms to achieve a rings elbow lever position.

ONE-ARM STRADDLE ELBOW LEVER – LEVEL 7



Scapular Positioning: Your scapulas will be depressed and slightly protracted. They should not be protracted to the point that your back rounds.

Technique: Like the two-arm elbow lever, your elbow will abut your stomach between your bellybutton and iliac crest. From there, lean forward and bring your body into a straddle straight-body position. Control your balance with your wrist. Alternate your support arm. Though you are very likely to discover that one side is better than the other, try to keep both sides in strength balance.

The *one-arm straddle elbow lever* (which can be abbreviated *OA Straddle EL*) requires a significant amount of strength to perform correctly because it is as much a balance skill as it is a strength skill for the balancing arm. The stronger you are in both pushing and pulling, the easier it is to control the skill. From there, it just takes a bit of practice. If you are having trouble performing this skill, take some time to focus on strength training.

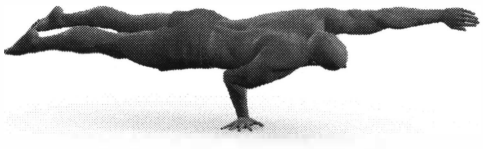
The hand placement for this skill is variable. It is possible to do it with your hands forward, sideways or backward. The hand position that works best, from a balancing perspective, is to align your body with your thumb. (This is essentially the hands sideways position.) Experiment to find your own preference.

Because there is only one point of balance, this skill is inherently unstable. You will have to compensate for this instability. Curving your body toward your balancing hand is one way for a beginner to help balance correctly; however, this practice must ultimately be eliminated. To do the movement properly you must use only your wrists for balance, like with a handstand. This will allow you to work any of the different positions beyond the straddle and straight body without introducing instability into the motion.

With the straddle variation only, you can open or close your legs arm to help with balance. The straight body version does not allow this, and it is not recommended to rely on this method long-term for balance. To focus on moving toward the straight-body version, slightly rotate your side away from your hand and toward the ceiling. While this is initially more challenging, it is ultimately more effective.

When beginning to move into this hold, remember the balance techniques mentioned above. Extend your elbows so that your elbow angle is roughly one hundred and twenty degrees, same as in two-arm elbow levers. Manipulate your forearm muscles and potentially also your elbows in order to balance your body. For overall stability, eliminate body movement as much as possible. Your forearms should be your primary means for balance.

ONE-ARM, STRAIGHT-BODY ELBOW LEVER – LEVEL 8



Scapular Positioning: Your scapulas will be depressed and slightly protracted. They should not be protracted to the point that your back rounds.

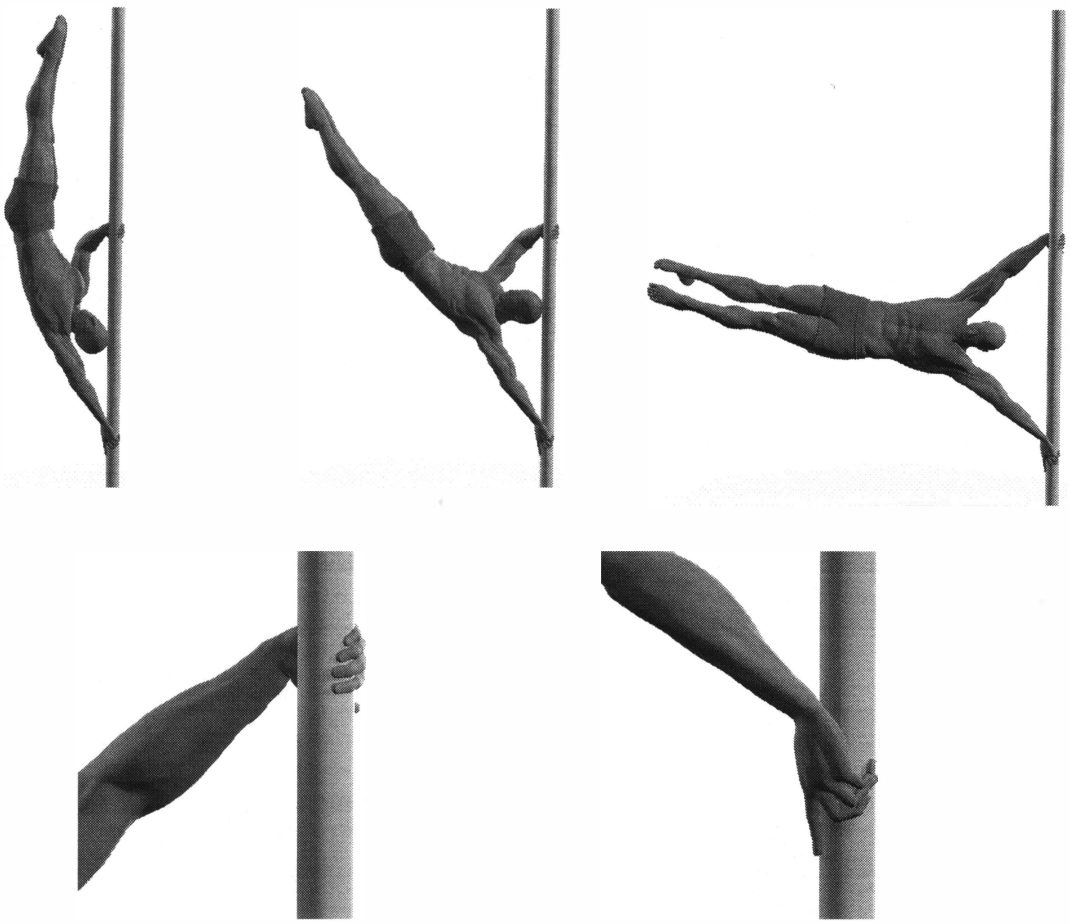
Technique: Like the two-arm elbow levers, your elbow will rest against your stomach between your bellybutton and iliac crest. From there, lean forward and bring your body into a straddle straight-body position. Control your balance with your wrist. Alternate your support arm. Though you are very likely to discover that one side is better than the other, try to keep both sides in strength balance.

The *one-arm, straight-body elbow lever* (which can be abbreviated *OA Straight-Body EL*) has the same elbow and hand positions as the straddled variation. If you already feel comfortable in certain positions then, by all means, keep training those positions so you solidify your hand and elbow placements. Alternate your support arm. Though you probably know by now which side is better than the other, try to keep both sides in strength balance.

This skill is all about improving your balance, since holding your legs together increases the difficulty of the movement. You need to start leaning / rolling your body up onto your planted arm fifteen to twenty degrees in order to center your mass over your elbow. This should be performed as you bring your feet together from the straddled variation.

It will take a fair amount of practice to attain this position, so be persistent. Try not to bring your feet in quickly because this will throw you off balance; instead, bring your feet together in a slow and controlled manner. Work on improving the entire phase of bringing your legs together from the straddle one-arm elbow lever to the straight-leg version. Being proficient in the entire set of positions will greatly enhance further proprioceptive work on one arm.

Flags – Page 4, Column 3



Positioning of Top and Bottom Hands

Flags, like planches, the L-sit/V-sit/manna family, and handstands, are a convenient skill that can be performed almost anywhere. The flag just needs some sort of vertical object to grasp, such as a pole or a tree.

Scapular Positioning: The bottom arm scapula should be neutral and elevated. Alternatively, some athletes use retracted and depressed position for the bottom arm scapula, which is a bit less strength intensive. Experiment what works best for you. The top arm scapula will usually be neutral and depressed.

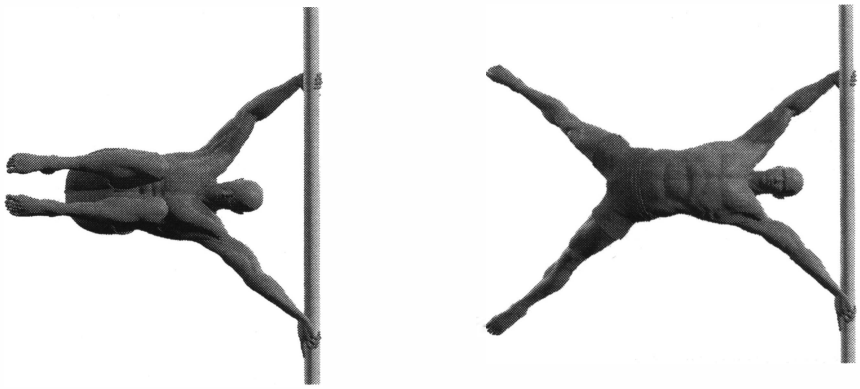
Technique: In flags, the bottom arm is the "plant" or brace arm and will actively push away from your body as hard as possible, much like the correct handstand position. The top arm is the "pull" arm and will be actively pulling your shoulder and, by extension, the rest of your body in order to keep it elevated. Keep your shoulder girdle approximately vertical so your clavicles line up vertically with each other, and are perpendicular to the ground.

Shoulder position remains constant among all these skills. The only thing that changes from one progression to another are leg positions. The flag is a semi-opposed skill because it requires good pushing ability in one shoulder and good pulling ability in the other shoulder. It is very important to train both sides; otherwise, you will develop imbalances.

Your hands should be greater than shoulder width apart—anywhere from a thirty to forty-five degree angle from horizontal for each arm. Try different angles to see what works best for you. Every person is different, so some people will want their arms to be slightly wider or narrower.

There are two different methods that work well to train this skill. Use whichever works best for you based on preference and availability of equipment.

- In the first method you jump almost to the inverted hang position with your arms grasping the pole in proper flag position. From here, you have multiple options. You can train full eccentrics to enable lowering through the whole movement, all the way to the ground, then jump back up to the top position and repeat. Alternatively, you can do partials, in which you eccentrically lower under control as far as you can and then pull back up to an inverted position. You can also use a spotter for assistance, or a pulley system to obtain some support in order to execute these movements with a more complete range of motion.
- The second method involves using the progressions—much like the back lever, front lever, and planche. Start by executing the movement in the tuck, and advance from there to the advanced tuck, straddle, half lay or one-leg-bent, and full flag positions. Isometrics can help extensively with learning the proper position you are trying to hit, and volume can be increased over time to execute and advance through these positions.



One of the problems with holding these positions is that the body tends to rotate or spin. It feels much like the one-arm chin-up that rotates due to a lack of pronation/supination control; however, in this case, the rotation or spin occurs because of a lack of shoulder control, and potentially also a lack of grip strength. Be sure to grip the pole slightly and squeeze as hard as possible. Push out your shoulder and do not allow this push to favor your stomach or backside. Instead, attempt to maintain the outward push of your bottom shoulder uniformly. Maintain a nice, firm grip with your top hand. This should eliminate any twisting.

Once you are able to hold yourself sideways in the tuck position, progress to each of the different leg positions. Note that it is often better to skip the tuck position until you build up enough strength for the straddle position, as the tuck position puts additional rotational torque on your body.

Generally speaking, the best method for learning the flag is with a spotter, as they can help you maintain correct shoulder and hip alignment and assist you through the various motions. If you have someone who can spot you, have them assist at your waist or feet from the inverted position down to the flag positions.

Ab Wheel – Page 4, Column 4

25S PLANK – LEVEL 2

60S PLANK – LEVEL 3

ONE-ARM, ONE-LEG PLANK – LEVEL 4

THE PLANK POSITION



Scapular Positioning: For planks it is generally a good idea to get used to moving the scapulas in all of the different positions. This will allow you to gain body awareness for correct scapular positioning for when you use the straight body positioning with other movements.

Technique: For planks you want to begin in a pushup position, with a straight or slightly rounded body (stomach kept tight while squeezing it in). If possible, you should create a very subtle dome shape with your back between your hands and your feet. Hold this position and do not deviate. The straight body is correct, but slightly rounded back will help you find the position better than arching and trying to get into the position.

Take care to execute this exercise correctly. Your hip flexors should never take over for your abdominals, as this will limit the benefits you are looking for. Regular planks may also be executed in the side position to work on your other core stabilizers. Many people do not have a very good awareness of their body positions in space, so learning planks could be critical. These movements are quite useful to teach core positions like the hollow. Compression work, the L-sit → manna progressions, and accessory core work can all be obtained using full-body exercises. The planks at Levels 2-4 specify the amount of requisite core strength needed.

Like pushups, planks can sometimes cause back pain. This is more likely to happen if your back arches or sags while holding the position. If you allow your back to arch, your psoas muscles (which help keep your hips in a neutral position) will be activated more than your abdominals. The psoas major muscle has its origin on your lumbar spine. Therefore, if you allow your body to arch and your psoas muscle pulls on your lower back, the result may be back pain.

For the one-arm, one-leg variation, choose one arm to lift and then raise the opposite leg. This introduces an element of instability as there are only two contact positions with the ground. Since the points of ground contact cross the body in a diagonal manner, there are some rotary forces placed upon the core. This makes performing the exercise quite challenging. Work your way up to sixty seconds, with a minimum of twenty-five seconds.

KNEES AB WHEEL – LEVEL 5

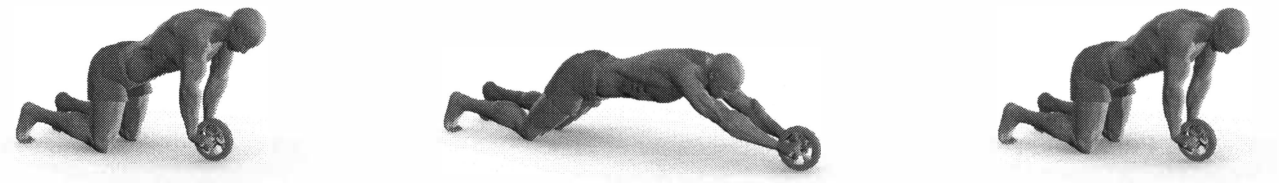
RAMP AB WHEEL – LEVEL 6

AB WHEEL ECCENTRICS – LEVEL 7

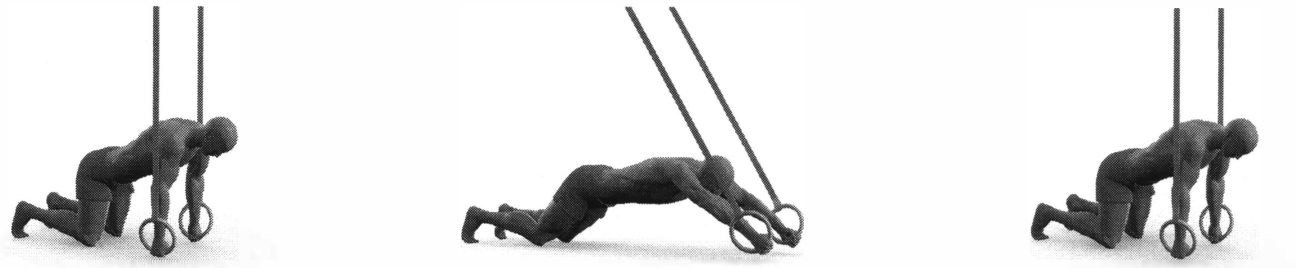
FULL AB WHEEL – LEVEL 8

AB WHEEL + 20 LBS. – LEVEL 9

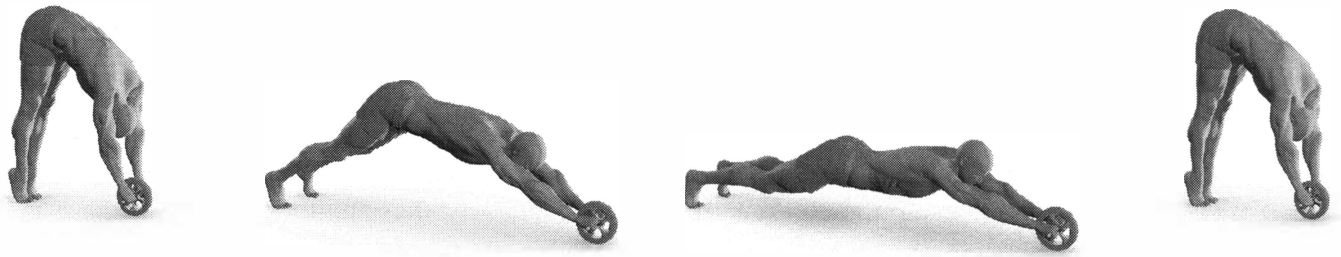
ONE-ARM AB WHEEL – LEVEL 10



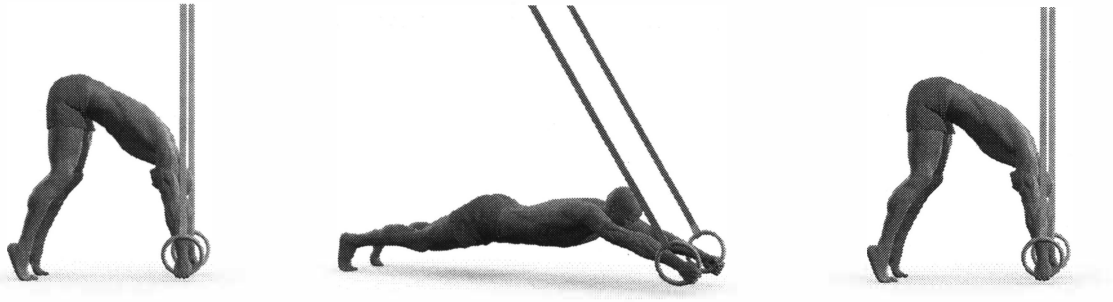
Knees Ab Wheel



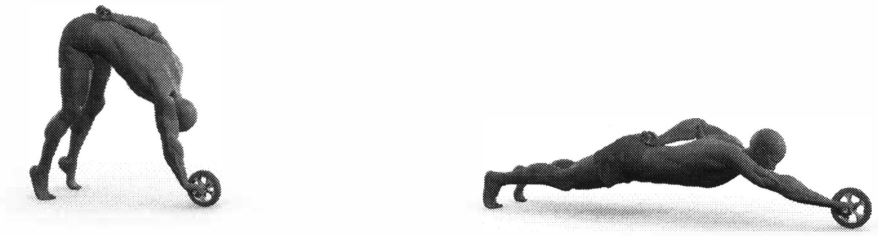
Knees Ab Wheel with Rings



Full Ab Wheel



Full Ab Wheel with Rings



One-Arm Ab Wheel

Scapular Positioning: Begin with your scapulas depressed and protracted. As you move through the movement, your scapulas will naturally start to elevate as your arms move overhead. Allow this to happen. At the end of the movement, reverse the scapular positions from elevated and protracted to depressed and protracted to complete the movement.

Technique: Aim for a uniform angle between your shoulder and your hips. Beginning from the pike position with your hands on the ab wheel and your arms straight, open your hips as much as your shoulders (uniformly) when descending into the movement. (e.g. if your shoulders are open at a forty-degree angle you will want the same angle at your hips.) This keeps your torso parallel with the ground and makes the movement aesthetically pleasing, not to mention technically correct and the right level of difficulty.

Note that these progressions may be completed using the rings instead of the ab wheel since the rings are in a frictionless plane like the ab wheel. Setting the rings further from the ground makes the movement easier; setting the rings closer to the ground makes the movement harder.

The core is thoroughly worked through compression work, in conjunction with the L-sit/V-sit/manna progression and advancement through the full-body exercises. It is common for those who have high proficiency in these skills to be able to complete full ab wheel rollouts without any prior practice. However, this is a bodyweight movement and is worth covering briefly as this is an extremely good core exercise if you want some direct work.

There are multiple progressions available. If you are at the stage where going from your knees is challenging, then work that up to at least three sets of ten repetitions before moving to the next phase.

When using the ab wheel, always initiate the skill from your shoulder. If you focus on opening up both your hip and shoulder at the same time it will be much easier to open up your hips and allow them to get

ahead of you. Initiate the movement with your shoulders so you can keep your hips under control and open them uniformly. *Your shoulders should initiate the movement.*

There are multiple methods for improving this skill. All of these approaches will work, so select the one you prefer:

- The first method is to work this skill from your feet and have your hands bump into an object. The object should be placed at a point where the amount rolled out can be rolled back in. For example, you can use a wall to limit the range of motion so that you go down to a range of motion just before you would collapse. This allows you to back your feet further and further away from the wall as you progress with the skill.
- The second method, which is the method noted on the charts for Level 6, involves working the ab wheel on a ramp that slopes upward. This will provide some resistance toward moving outwards as you go out further. The slope of the ramp will make a huge difference in how hard the movement is; if you are having a lot of trouble with the movement, a higher slope will be needed to work your way down.
- The third method involves using slow eccentric movements to build up toward the concentric movement. This is the Level 7 variation on the charts. You can begin the movement on flat ground and extend out (as slowly and controlled as possible). As you reach the point of collapse, go to your knees and finish going to the ground. As you pull back in from being fully extended, you should pop up from your knees onto your feet when you reach the position where you can support yourself. This ensures that you perform the entire movement.

There is one injury aspect that is important to note. The ab wheel is not a lower back exercise. *You should not be feeling it in your back.* If you do, it is an indicator that your hip flexors—particularly your psoas major—are firing too much. While your psoas major is part of the chain that connects your core, it has origins on your lumbar spine. Therefore, if you feel pain or discomfort in your lower back, your psoas major muscle is overactive. Back off from the progression until you can achieve a nice, solid rollout without feeling any pain or discomfort in your lower back. The last thing you want to do is strain your back and have to take time off from training!

There are multiple methods to make the ab wheel more challenging. Some of these variations are included on the charts (not illustrated). One of the variations is to wear a weighted vest. Since the vest is at your core, it will exert downward force in the middle of the movement, thus making the opposite side of your core work much harder. Adding a twenty-pound vest takes the skill to Level 9.

To further tax the rotary and stability of both your core and shoulder you can remove limbs from the equation. For example, the Level 10 ab wheel variation uses only one arm. You will need an ab wheel with two wheels on the outside of the handles to perform this variation. Since you are only using one arm, there will be a rotation torque along the body as you go further down, like with the one-arm pushup. Your weight will only be on one shoulder instead of both, which makes the movement more difficult. Build up to the one-arm rollout by utilizing the same techniques you would use to build up to the two-arm rollout: a wall, a ramp, and eccentrics.

You can increase the challenge factor of the one-arm rollout even more by wearing a weighted vest or lifting one of your legs while you are performing the skill.

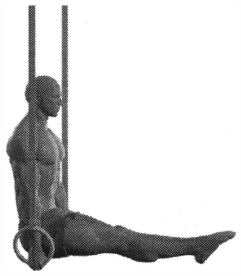
Specific Rings Elements – Page 4, Column 5

RINGS STATICS

Milestones may vary due to individual anthropometry.

Techniques for these skills are discussed earlier in this book, but here is a list of where they fall in relation to one another other in terms of difficulty.

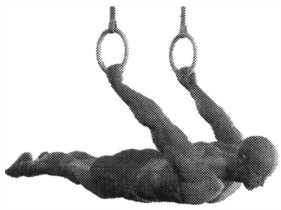
RINGS-TURNED-OUT L-SIT – LEVEL 5



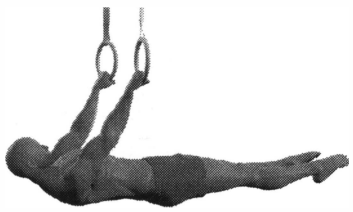
RINGS-TURNED-OUT STRADDLE L-SIT – LEVEL 6



BACK LEVER – LEVEL 7



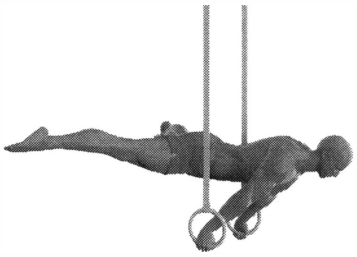
FRONT LEVER – LEVEL 8



RINGS 90-DEGREE V-SIT – LEVEL 9

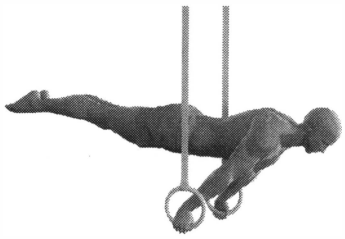


IRON CROSS / STRADDLE PLANCHE – LEVEL 10

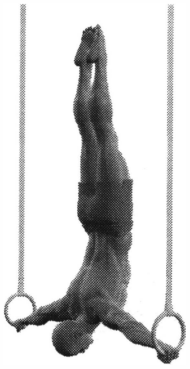




FULL PLANCHE – LEVEL 14



INVERTED CROSS – LEVEL 16



Rings Kipping Skills – Page 4, Column 6

The *rings kipping skills* are directly from the Gymnastics Code of Points. The kip progressions are typically a bit more skill-based than they are strength-based techniques. They are included in *Overcoming Gravity* for a few reasons:

- First, kipping skills require good body position and therefore body awareness. The amount of strength required to stabilize the final position helps develop strength. Some of these skills can transition directly into strength moves. This means while you are developing the strength in isometric positions, you are also developing the strength to move in and out of these positions. This is important for elite-level rings strength moves.
- Second, these skills can be easily integrated with routines or sequences, which is how a lot of higher-level strength is developed.
- Third, these skills are fun to learn! No further comments necessary.

When you begin learning these skills, lower the rings so they are at shoulder height or slightly lower when you are standing up straight. When you perform skills that take you above the rings from dynamic movements, the rings will naturally be unstable. This can cause you to fall from the support position. If the rings are too high, you can easily injure your shoulders if you do not land on your feet.

KIP TO SUPPORT – LEVEL 6



Scapular Positioning: Your scapulas will be depressed in the inverted hang and relaxed into the inverted pike positions. Through the kipping motion, depress and retract your scapulas through to the support position, where they will be depressed and neutral.

Technique: The kip to support is one of the basic ways to get above the rings. There are two different ways to start this skill. The classic way starts from inverted hang and quickly moves into inverted pike, then performs the skill. The alternative method is to kip straight from the inverted pike position. Only the inverted pike start position will be discussed here. If you are having a bit of trouble getting the hang of the skill, beginning from the inverted hang and moving through inverted pike helps to generate more explosive power, because the body acts like a spring. Explore this alternative.

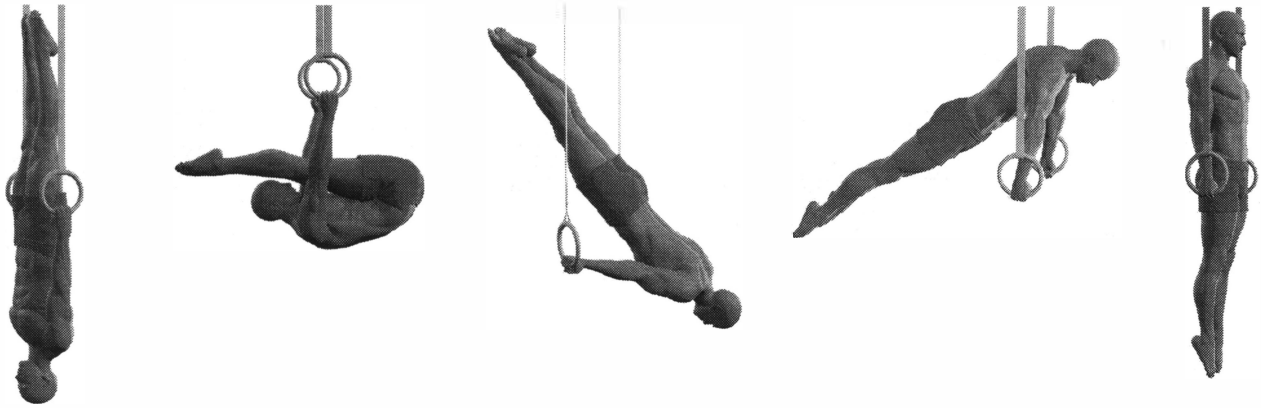
- A false grip may be used. It makes the movement much easier. It can also be performed without a false grip if you shift your hands up during the movement. Start with false grip and progress toward without false grip.
- From the inverted pike, extend your hips quickly until they are fully open, approximately forty-five degrees forward between the vertical and horizontal plane. This will generate upward momentum for your body so it can rise above the rings. This will also generate the rotational spin to rotate your body up to the support position.
- Immediately after your hips begin opening and your body is gathering some upward movement, exert downward and backward force on the rings. This will feel like you are going to push the rings quickly and forcefully to the pinky-side of your palm while keeping your arms straight. The extension of your shoulders puts force on the rings, which acts as the pivot point for your body. The momentum carries your body above the rings, pivoting around your hands. If there is not enough force placed on your hands, there is no way for your body to rise above the rings.
- As you rotate above the rings, stabilize them by exerting inward force and control it as you approach the top of the movement. When the movement is properly executed, you should end up in the support position, above the rings, with your arms locked straight.

Initially, most people will bend their arms and, if the rings are stabilized, they will end up in the middle or bottom of a rings dip. To correct this, focus on simultaneously exploding and pushing on the rings hard, and not bending your arms as you travel upward. Once you start to get the hang of the skill, you will typically end up in the transition phase of the muscle-up or in the deep part of the dip. This usually implies at leas tone of the following problems: First, you might not be exerting enough force through the rings. Second, it is possible that your explosiveness out of the inverted pike position is lacking. Third, it could be a combination of the coordination between the first and second elements involved in the movement.

Keep practicing. If you are still having serious issues, seek advice from people who know how to execute the skill or have coaching experience. You will get it with enough practice.

This is an A-level skill in the Gymnastics Code of Points.

BACK KIP TO SUPPORT – LEVEL 7

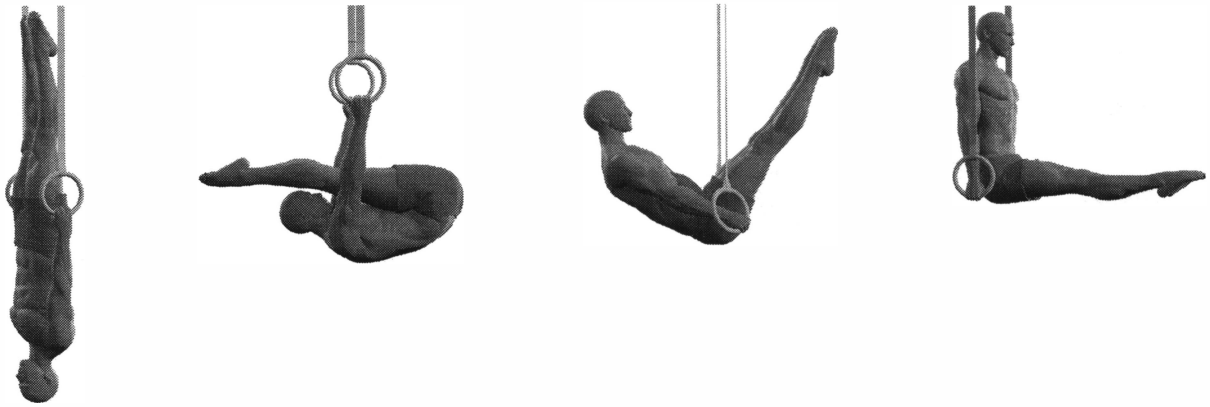


Scapular Positioning: Your scapulas will be depressed in the inverted hang and relaxed into the inverted pike positions. Through the kipping motion, depress and protract your scapulas to the support position, where they will be depressed and neutral.

Technique: The *back kip to support* on rings moves in the opposite direction of the kip to support. Instead of extending forward and shooting your legs at a forty-five degree angle to bring you forward and eventually upright, shoot your legs backward at a forty-five degree angle so your heels rotate over your head into the support position.

- It is recommended to begin with a false grip. It makes the movement much easier, though it can also be performed without a false grip if you shift your hands up during the movement.
- From the inverted pike, extend your hips quickly until they are fully open, approximately forty-five degrees forward between the vertical and horizontal plane. This will generate upward momentum for your body so it can rise above the rings, as well as backward rotational momentum. Right after your body gathers momentum and your hips begin to open, exert forward force on the rings.
- You will be nearly upside down at this point. Push the rings forward (in front of your body) in a quick and forceful manner, while simultaneously pulling them in toward your hips. Ideally, you should keep the rings near the pockets of your pants.
- To gain the upward and backward momentum, pull the rings inward and forward (toward your hips) after your hips have opened. Hold the rings there. (As you progress with this skill you can attempt to bring your hands forward and into your hips while keeping your arms straight.) End the skill in an L-sit position. This is an A-level skill in the Gymnastics Code of Points.

STRAIGHT-ARM KIP TO L-SIT – LEVEL 9



Scapular Positioning: Your scapulas will be depressed in the inverted hang and relaxed into the inverted pike positions. Through the kipping motion, depress and protract your scapulas to the support position, where they will be depressed and neutral.

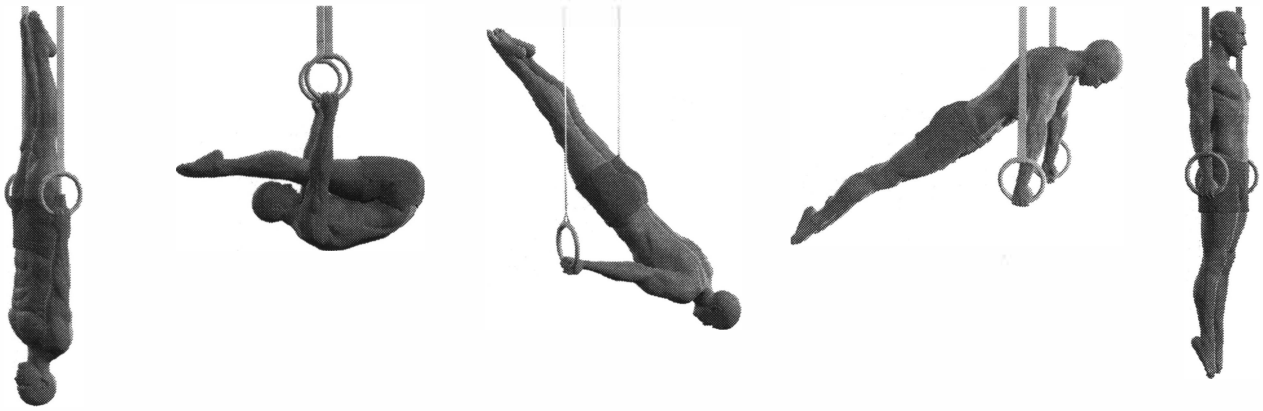
Technique: The technique is exactly the same as the previous skill. From the inverted pike position, explosively open your hips (but not fully) to maintain the L-sit position. The more quickly this occurs, the easier the skill becomes. Simultaneously, exert backward force on the rings to allow you to rotate up on your hands to the supported L-sit position.

The *straight-arm kip to L-sit* (which can be abbreviated *SA Kip to L-Sit*) takes the kip to the support position and raises the challenge level since the L-sit is achieved before the support position is reached. Since the skill ends in an L-sit position, you need to generate significantly more momentum from the initial inverted pike hang and—while keeping your arms straight—pull backward significantly harder to get your body above the rings.

The most difficult portion of this skill is executing the entire movement with straight arms. Additionally, you must end in an L-sit position without dipping your legs past parallel. This is why this skill is rated at Level 9 though the similar kip-to-support skill is rated only at Level 6.

This is one of the easier B-level skills in the Gymnastics Code of Points because you do not need extremely good strength or technique to execute it. If you do have a good combination of both you should be able to execute this skill correctly. This is the first B-level skill that most trainees achieve.

STRAIGHT-ARM BACK KIP TO SUPPORT – LEVEL 10



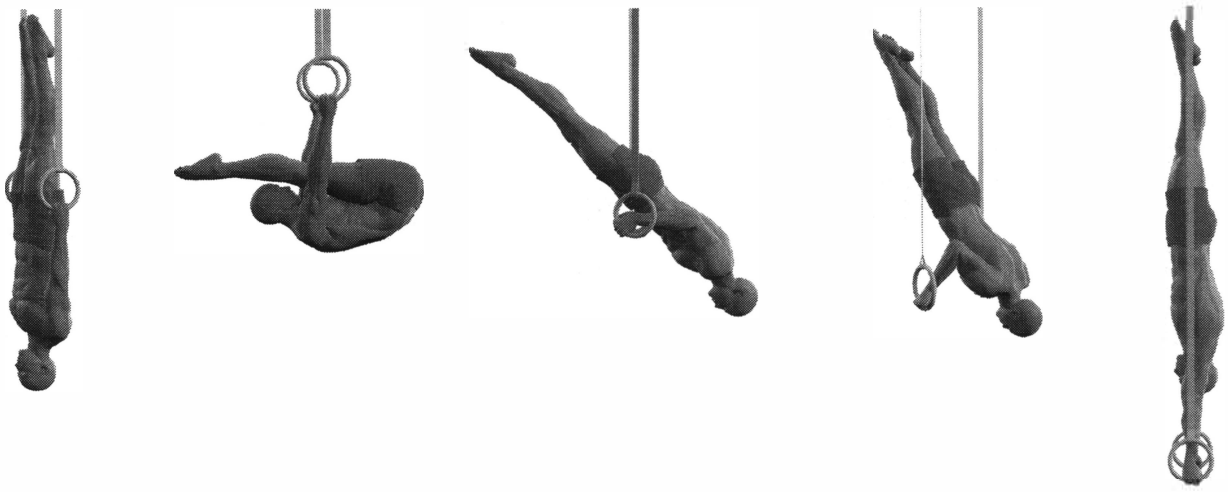
Scapular Positioning: Your scapulas will be depressed in the inverted hang and relaxed into the inverted pike positions. Through the kipping motion, depress and protract your scapulas to the support position, where they will be depressed and neutral.

Technique: From the inverted pike position, quickly extend your hips until they are fully open. Your toes should be aimed backward at a forty-five degree angle in order to generate upward momentum so your body can rise above the rings. Right after the hips begin opening and your body is beginning to gather some upward momentum, exert forward force on the rings. You will be nearly upside down at this point. Quickly and forcefully push the rings forward—in front of your body—while simultaneously pulling them in toward your hips. Ideally, the rings should stay near the pockets of your pants. (They may be closer to your knees if you have longer arms.)

The *straight-arm back kip to support* skill (which can be abbreviated *SA Back Kip to Support*) is executed in a manner similar to that of the back kip to support, except with straight arms. Using this method extends the lever arm upon which your body rotates, requiring more power to accomplish the skill. The difficult portion of this skill is executing the entire movement with straight arms. This is why this skill is rated at Level 10, though it is similar to the kip to support skill, which is rated at Level 6.

This is a B-level skill in the Gymnastics Code of Points.

BACK KIP TO HANDSTAND – LEVEL 11



Scapular Positioning: Your scapulas will be depressed in the inverted hang and relaxed into the inverted pike positions. Through the kipping motion, depress and protract your scapulas to the shoulder stand position. At that point, elevate them toward the handstand position.

Technique: The *back kip to handstand* is essentially a two-phase skill. The first phase begins in an inverted pike or inverted hang position, and involves kipping straight up to a shoulder stand. From there, the second phase involves pressing into a handstand.

One change to the kip in this skill relates to hips momentum. Your hips must direct the momentum straight upward, instead of at a forty-five degree angle forward or backward like in previous forward and backward kip skills.

Also, you will bring your arms to the shoulder stand position. Unlike in other skills, bring your hands up to your armpits immediately after initiating the kip. This stands in contrast to other progressions, where you brought your hands to your hips and pressed forward or backward, and will allow you to obtain the shoulder stand position, stabilize, and then press out.

This is a B-level skill in the Gymnastics Code of Points.

STRAIGHT-ARM KIP TO V-SIT / KIP TO CROSS OR L-SIT CROSS – LEVEL 13



Scapular Positioning: Your scapulas will be depressed in the inverted hang position and relaxed into the inverted pike position. During the kipping motion, depress and retract your scapulas as you move through to V-sit and L-cross, where they will end depressed and neutral.

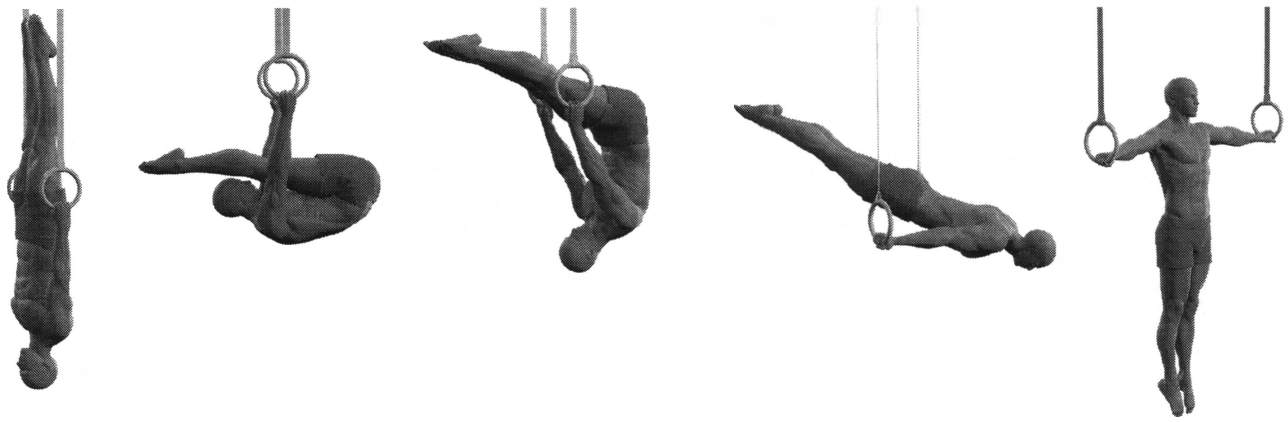
The *straight-arm kip to V-sit* is a step up from the *straight-arm kip to L-sit*. Your hips must generate more power in a shorter amount of time to effectively reach the V-sit position.

The *kip to cross or L-sit cross* transfers the dynamic portion of this skill into maintaining a strength hold. Initially, you can use your hip explosiveness to get high into the skill and then lower with straight arms into the cross position. However, you will eventually be strong enough to kip directly to the cross position.

The key for this skill is simply learning how to gauge the force needed to rotate your body to the cross position and then engaging your cross muscles (first assuming you have attained a cross) both correctly and accurately. Do not attempt this skill until you have attained a cross hold for a minimum of five seconds. If you don't do this first, the momentum from moving into this skill could strain your shoulders.

These are both C-level skill in the Gymnastics Code of Points.

BACK KIP TO CROSS OR L-SIT CROSS – LEVEL 14



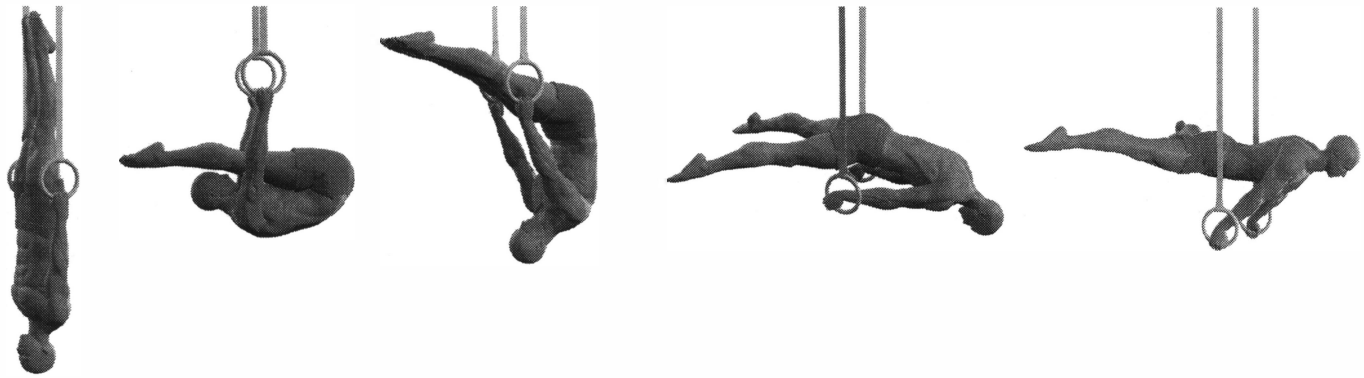
Scapular Positioning: Your scapulas will be depressed in the inverted hang position and relaxed into the inverted pike position. During the kipping motion, depress and protract your scapulas and quickly transfer them to depressed and neutral as you begin to move upright and into the cross position.

Technique: This skill is similar to the forward kip to cross position, except it is executed with a backward kip. The kip to cross or L-cross transfers the dynamic portion of this skill into maintaining a strength hold. Initially, you can use your hip explosiveness to get high into the skill and then lower with straight arms into the cross position. However, you will eventually be strong enough that you can kip directly to the cross position.

The key for these skills lies in learning how to gauge the force necessary to rotate your body to the cross position and then engaging your cross muscles both correctly and accurately. Do not attempt to learn these skills until you have attained a cross hold for a minimum of five seconds. Otherwise, the momentum from moving into this skill is likely to strain your shoulders or elbows.

These are both C-level skills in the Gymnastics Code of Points.

BACK KIP TO STRADDLE PLANCHE – LEVEL 15



Scapular Positioning: Your scapulas will be depressed in the inverted hang position and relaxed into the inverted pike position. During the kipping motion, depress and protract your scapulas until you reach the straddle planche position.

Technique: The *back kip to straddle planche* shoots your hips open in a more vertical manner than previous kipping skills. With this in mind, you can elevate your hips above the rings and keep them there to get your shoulders in position for the straddle planche. The straddle must occur after your feet have passed through the rings, otherwise you will hit them and fall down.

This skill is very similar to the *back kip to handstand* except you allow it to rotate a bit more. Think of it as hitting the shoulder stand position first. Then, as your legs rotate down, push your arms straight and use your strength to hold this skill.

This is a C-level skill in the Gymnastics Code of Points.

Rings Felge Skills – Page 4, Column 7

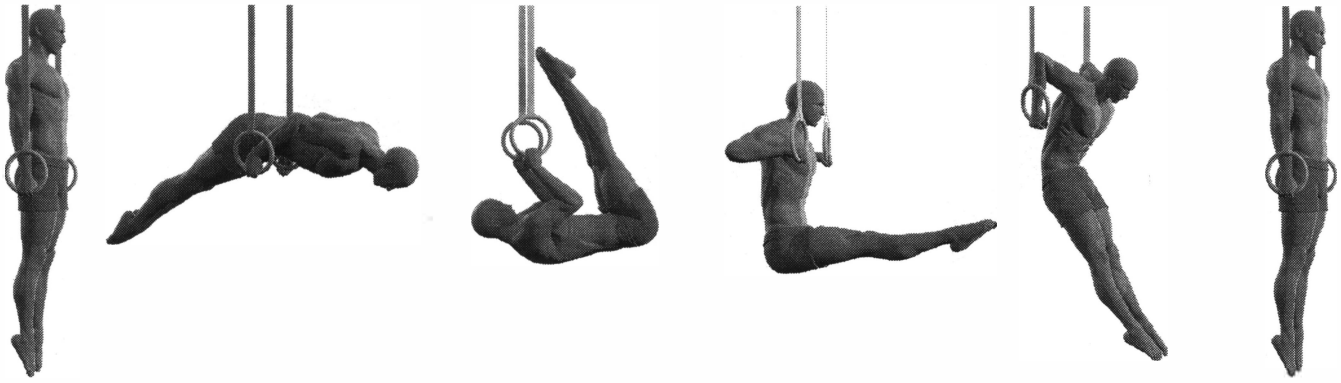
The *rings felge skills* are a series of forward and backward rolls performed on the rings, to either the support position or to various strength skills. When integrated into routines, they are a lot of fun to perform—and to just show off!

The variations of these skills using the tuck position have not been included, because they are either too easy or they are not aesthetically pleasing. However, these skills can always be learned in the tuck position before progressing to the pike position. Keep this in mind if the pike or straight-body variations are too challenging at first.

Before starting these skills, lower the rings so they are at shoulder height when you are standing up straight. Due to the nature of these movements, the natural instability of the rings can cause you to fall from the support position. If the rings are too high, you can easily injure your shoulders if you don't land on your feet.

The rings felge skills are typically more strength-based than they are kipping techniques. The tuck variations of the felge forward and felge backward to support, though not included in the charts, are approximately one level easier than their pike counterparts.

FELGE FORWARD TO SUPPORT (PIKED BODY) – LEVEL 6



Scapular Positioning: Your scapulas will be depressed in the support position. As you roll, they will stay depressed through the movement and transition from protracted to retracted, then back to neutral as you move back to support.

Technique: This skill begins from the support position. From there, raise your hips slightly and lean forward. Maintain a pike position as you begin to forward roll over yourself and allow your hands to slip into false grip on the rings and re-grasp. As your hips continue over your head, maintain the pike position and allow your hips to drop down. At the same time, keep your arms bent as much as possible and allow your upper body to shoot up between the rings. As soon as you reach the top of the pull-up position for your upper body, your hips will still be dropping down slightly. Use this momentum to power your body through the transition portion of the "muscle-up" phase. After your hips have spent their momentum, allow them to open and push through the rings, ending in the support position.

One common problem with this skill is failing to false grip as you roll forward. If this is the case, try to practice the forward roll slowly, or have someone spot you through the skill to remind you to use a false grip when rolling forward.

Another common problem is to lose the pike position as you rotate over. Keep your abdominals engaged to maintain the pike position. It is critical to help you drive through the transition phase, unless you want to muscle through the skill. If executed correctly, this skill should require far less strength than a muscle-up.

This is an A-level skill in the Gymnastics Code of Points.

FELGE BACKWARD TO SUPPORT (PIKED BODY) – LEVEL 7



Scapular Positioning: Your scapulas will be depressed in the support position. As you roll, they will stay depressed through the movement and transition from retracted to protracted, then back to neutral as you move back to support.

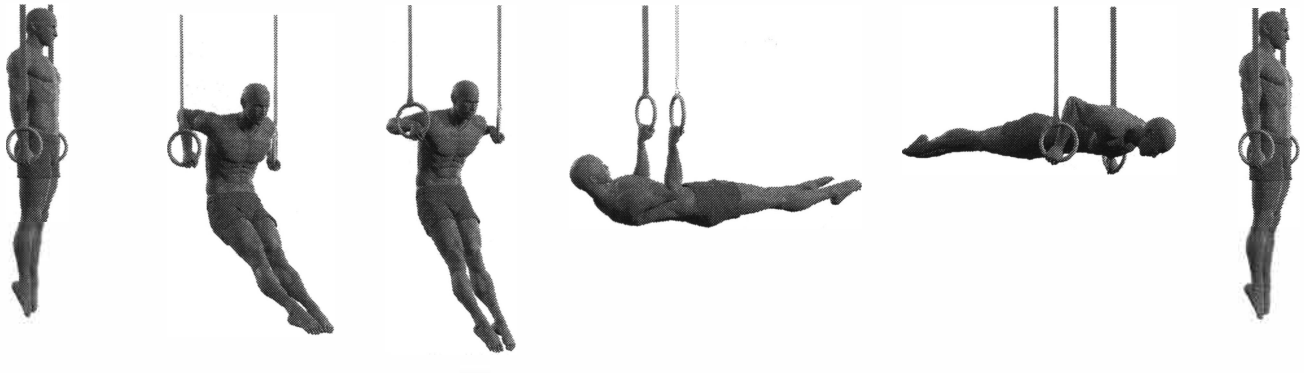
Technique: This skill begins from the support position. Like the previous skill, as you drop backward into the inverted hang position, you should allow your hands to slide into a false grip. As you begin to fall backward, assume the pike position. As you move through the piked inverted hang position, it is possible to use hip explosiveness to gain momentum to make it back up to the support position, similar to a back kip. While this is not preferred, it can be used when you first begin training this skill to give you a feel for it before you move on to correct technique. Curl your biceps strongly to keep your hips high and rotate over the top back to the support position.

Since this is a felge skill, it should be executed with the momentum given from the backward roll down from the support position. As you roll through to the inverted pike position, begin to open your hips while simultaneously pushing your hands forward and pulling them in, toward your hips. You may roll backward with a straight body as well, if you prefer. Do note that moving straight into the inverted pike allows a bit more rotational momentum.

Since rotational momentum is already being generated, you only need to add the upward force by pushing your hands forward at your hips. This allows the skill to be re-elevated above the rings as you rotate, ending right-side-up.

This is an A-level skill in the Gymnastics Code of Points.

FELGE BACKWARD TO SUPPORT (STRAIGHT BODY) – LEVEL 10



Scapular Positioning: Your scapulas will be depressed in the support position and elevated at the bottom of the dip. As you begin to rotate, strongly retract and depress them through the rotation and back to the support transition. They will end here, depressed and neutral.

Technique: Begin in the support position and roll backward in a controlled manner. Use only the amount of momentum you need, and phase it out as you become more proficient in this technique. Bend your arms as you rise through the second phase of the skill, allowing your legs to rotate your upper body back above the rings. Pin the rings to your hips and push your hands forward as hard as possible. This allows your body to rotate around your hands and back to support. Finish in the support position after you roll over.

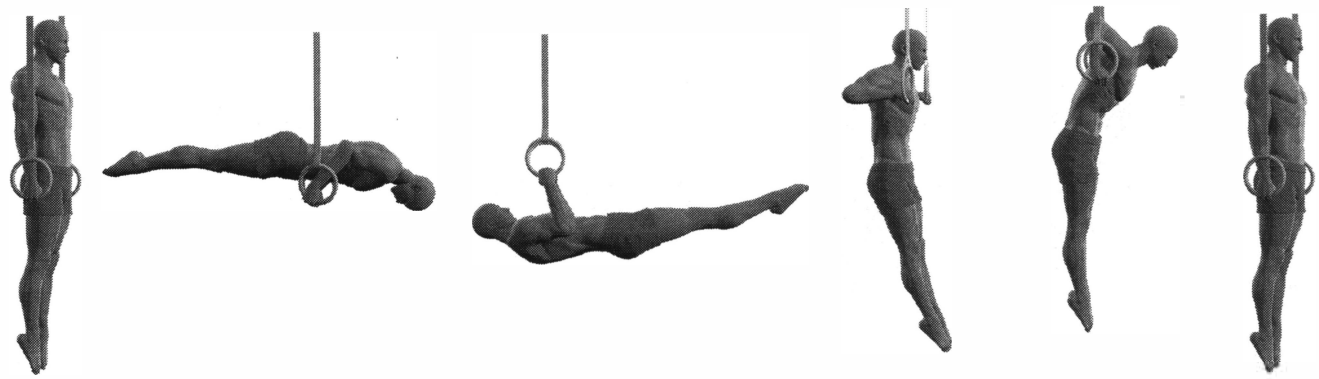
This is the first skill in the inverted muscle-up progression. It requires an enormous amount of strength since the only momentum you can gain is from the initial phase of falling down, and manipulating the bend of your arms. Since your hips will be fully extended, they will not be able to assist with this skill.

Ideally, you will eliminate the use momentum altogether, which is why this skill is rated at Level 10. A quickly executed backward roll to support with good technique is much easier than a skill at this level. The basic skill is learnable when you reach Level 6-7, if you harness enough momentum and execute the technique perfectly. However, performing this technique properly without momentum will require enormous control and strength.

The most difficult portion of this skill is the inverted muscle-up, which is the second phase. To help your progression, work negatives of the inverted muscle-up. For example, get into the shoulder stand position and slowly lower to the inverted hang position.

This is a B-level skill in the Gymnastics Code of Points.

FELGE FORWARD TO SUPPORT (STRAIGHT BODY) – LEVEL 9



Scapular Positioning: Your scapulas will be depressed in the support position. As you roll, they will stay depressed through the movement and transition from protracted to retracted, then back to neutral as you move back to support.

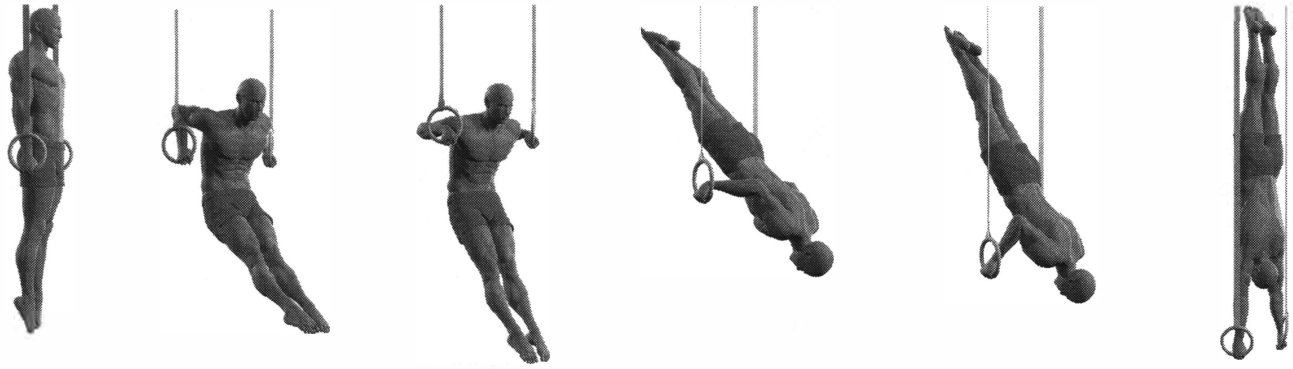
Technique: For this skill, you will roll forward with a straight body. Make sure that you begin to drop your shoulders before you hit the shoulder stand position. If you roll directly out of the shoulder stand position with a straight body, you will likely lose control and fall. Slip into a false grip as your body passes through the rings. As your feet begin to descend past rings-height you will have to use your upper-body strength to slow down the skill and control it. You will find that you nearly move through a semi-front lever position underneath the rings. As your legs drop further, you will shoot into a pull-up position, and then use your strength to execute the transition phase of the muscle-up. From there, simply press out of the dip to complete the skill.

You can significantly raise the challenge level of the *felge forward to support* skill by performing it with a straight body. This method does not allow you to use counter momentum from dropping your hips to help drive you through the transition. This makes the transition much more difficult, because you naturally want to pike through the skill to counterbalance your upper body through the transition.

Controlling this skill with a straight body will be much more difficult, mandating proficiency in the pike before you attempt it. Ideally, this skill should be completed in a slow and controlled manner with little to no momentum. (You may use momentum at first to get the hang of it, but you should eliminate the momentum as you get stronger.)

This is a B-level skill in the Gymnastics Code of Points.

FELGE BACKWARD TO HANDSTAND (STRAIGHT BODY) – LEVEL 12



Scapular Positioning: Your scapulas will be depressed in the support position and elevated at the bottom of the dip. As you begin to rotate, strongly retract and depress them through the rotation. Once you begin to invert, elevate your scapulas strongly over your head to a handstand position.

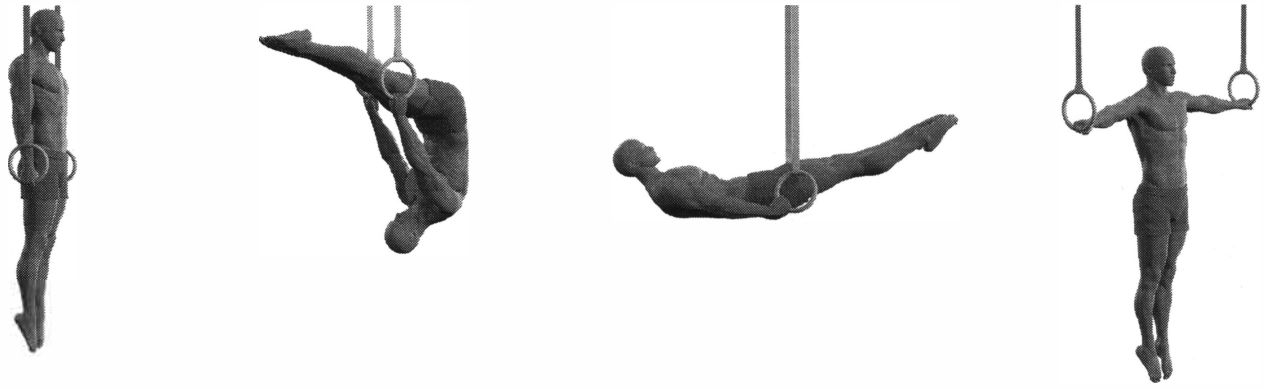
Technique: Begin in the support position. Lean back and allow your hands to slip in order to obtain a false grip. As you begin to enter the inverted hang, strongly pull your hands forward from your shoulders and direct your body upward. Immediately strongly pull your hands to your shoulders (much like an inverted biceps curl) to attain a shoulder stand position. From there, press out from the shoulder stand to a handstand.

This is the second skill in the inverted muscle-up progression. It can be abbreviated *Felge Backward SB to HS*. This skill takes the *straight-body Felge to support* another step further by taking it up to a shoulder stand and into the handstand.

The most difficult portion of this skill is the inverted muscle-up, which is the second phase. Working negatives of the inverted muscle-up will help you progress—for example, get into the shoulder stand position and slowly lower to the inverted hang position. You will need strong biceps to bring your hands to your shoulders and obtain the shoulder stand position. If this is a weak link, work on your biceps and keep practicing this skill.

This is a B-level skill in the Gymnastics Code of Points.

FELGE FORWARD TO CROSS (STRAIGHT-ARM, BENT BODY) – LEVEL 13



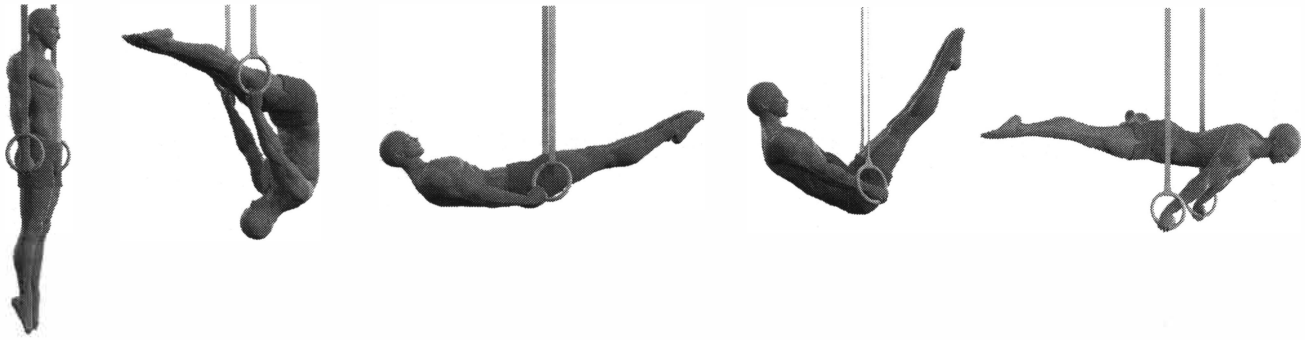
Scapular Positioning: Your scapulas will be depressed in the support position. As you roll, they will stay depressed through the movement and transition from protracted to retracted, the back to neutral as you move to the cross position.

Technique: This is a variation of the *felge forward piked body to cross*. Allow your hands to slide into a false grip (if you are performing a false grip cross), and fall forward while holding the pike position. Your hands may need to be out six inches or more from your hips as you are falling forward. As your hips begin to fall, you will move through an inverted pike position. After you have passed through this position, exert a downward, almost wide front lever pull on the rings. As you begin to move upright, this turns into a cross hold.

This skill can be abbreviated *Felge Forward SA to Cross*. Any of the transitions into a cross with straight arms require a large amount of practice, as they will feel unnatural until you become accustomed to the movement. It is often best to practice them with a dream machine (pulley with belt) or spotter to get a feel for how you should execute this skill.

This is a C-level skill in the Gymnastics Code of Points.

FELGE FORWARD TO STRADDLE PLANCHE (STRAIGHT-ARM) – LEVEL 14



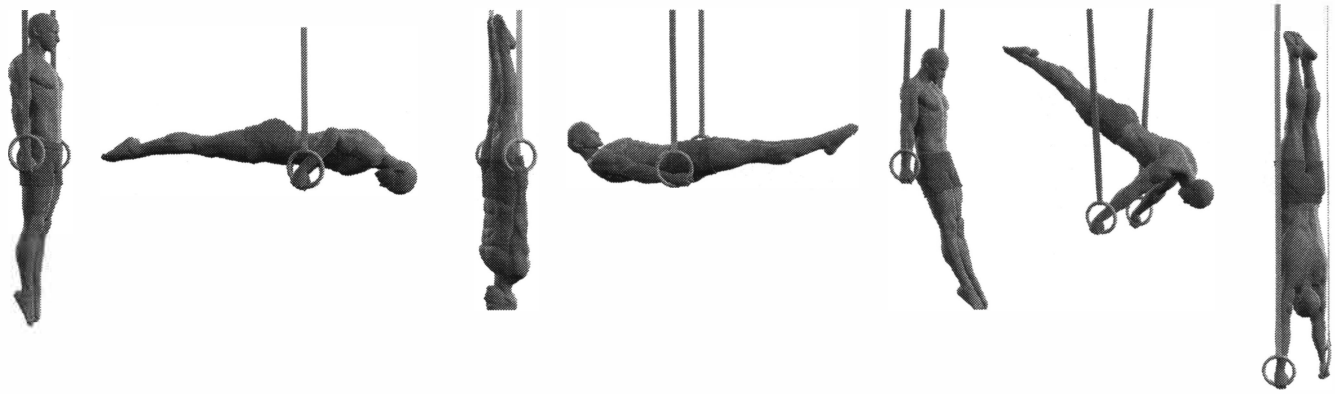
Scapular Positioning: Your scapulas will be depressed in the support position. As you roll, they will stay depressed through the movement and transition from protracted to retracted to the support position. As you move into the straddle planche, your scapulas will be depressed and protracted.

Technique: First, lean forward in support and slip into a false grip (if preferred). Next, use piked hips to drive your body above the rings during the transition and ascent phase. As you roll over, move into an inverted hang position. Force the rings out as wide as possible. As you begin to ascend, apply outward and downward pressure, moving through the wide arm front lever position. Push through the cross position into support and continue the rotation of your body to lift your hips. Continue lifting your hips and split your legs to hit the straddle planche position.

This skill can be abbreviated *Felge Forward SA to Str PL*. Since your arms will be straight, it is very likely that you will pass through a near-cross position. This will occur as you push out of the skill, and will likely be the most difficult portion of the skill. From there, continue to lean forward as you approach the support position and press into a straddle planche.

This is a C-level skill in the Gymnastics Code of Points.

FELGE FORWARD TO HANDSTAND (STRAIGHT-ARM, STRAIGHT-BODY) – LEVEL 15



Scapular Positioning: Your scapulas will be depressed in the support position. As you roll, they will stay depressed through the movement and transition from protracted to retracted to the support position. As you move through the planche to handstand, your scapulas will protract again and elevate until they reach the ending position of fully elevated and neutral in a handstand.

Technique: Your hands should be moved outward to approximately a thirty to forty-five degree angle at your shoulder. Roll forward in a controlled fashion through the maltese position. Keep your arms straight as your head dips below the level of the rings and apply outward pressure against the rings. This will move you through a wide-arm inverted hang position. Use a bit of the momentum from the felge to continue rotating your body all the way through to the semi-front lever position. As your feet continue to rotate downward, apply downward pressure with your hands. Your body will then move from the wide-arm front lever position into the cross position.

This skill can be abbreviated *Felge Forward SA SB to HS*. It requires more strength than the previous straight-arm progression to cross, since a straight body limits the amount of momentum that can be used to pull your upper body into position. Thus, more force must be exerted on your hands through both phases of this skill as your body rotates.

This is a C-level skill in the Gymnastics Code of Points.

Note: The D-level skills go beyond the scope of this book. When you reach that point, you should have enough knowledge of programming and technique to execute high-level skills with little instruction.

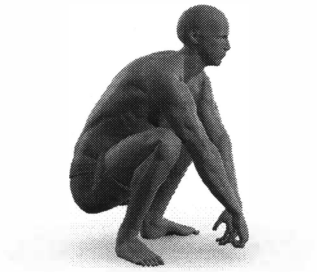
Squats – Page 4, Column 7

As I have stated previously, barbell exercises are superior to bodyweight exercises for both strength and hypertrophy for the legs. However, since the focus of *Overcoming Gravity* is bodyweight strength training, here are some basic progressions you can use to gain strength and hypertrophy without weights. (Do try to gain access to weights—whether from a cheap gym, buying them off Craigslist or another Internet site, yard sales, friends and family, or even making your own.)

The two primary leg exercises recommended for bodyweight exercises are the pistol progression as well as the lunge into deep step up progression. I will discuss the the squat progression into pistol, but I will only briefly discuss the lunge into deep step up progression. There are also other bodyweight leg exercises such as shrimp squats, king deadlifts, and the like, which may be useful to train if these progressions are inadequate not preferred.

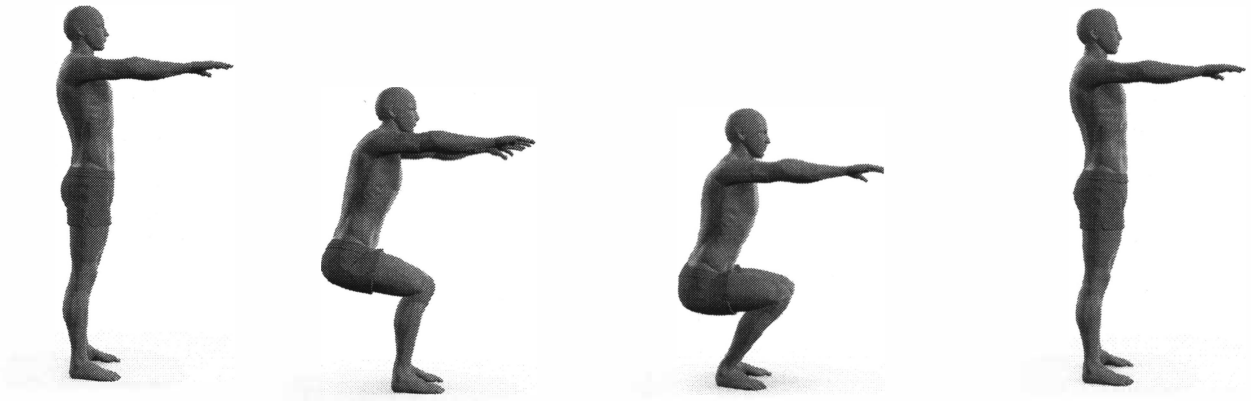
There are also other alternative bodyweight leg exercises that are more explosive. For example, vertical leaping, broad jumping, box jumps, plyometrics, sprinting, hill sprints, and many other forms of running or even cycling can be effective to train the lower body for both strength and hypertrophy. Likewise, many of the exercises within this section can be utilized with these alternatives. Pistol squats can be trained for height, for distance, or box jumping. Typically, the difficult part of some of these exercises like sprinting is that they are hard to gauge in terms of effective volume for strength and hypertrophy.

ASIAN SQUAT – LEVEL N/A

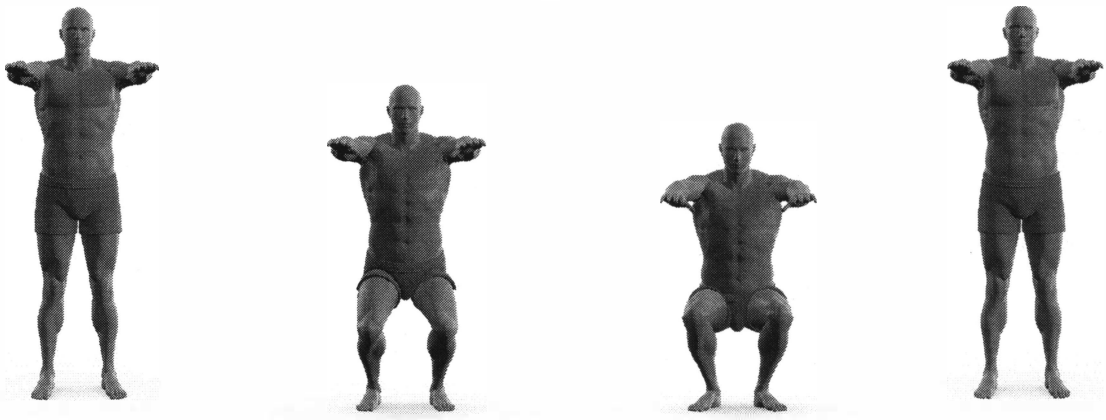


The *asian squat* trains your body to get used to the bottom position of a squat again. Many adults cannot even get into this position comfortably, whereas children can easily move in and out of this position. This position can be used to assess mobility and overall flexibility. Learning to move in and out of this position comfortably is not just good for maintaining flexibility and mobility but also for re-learning the foundations of human movement, which is helpful if you have been inactive for some time.

PARALLEL SQUAT – LEVEL 1



Side



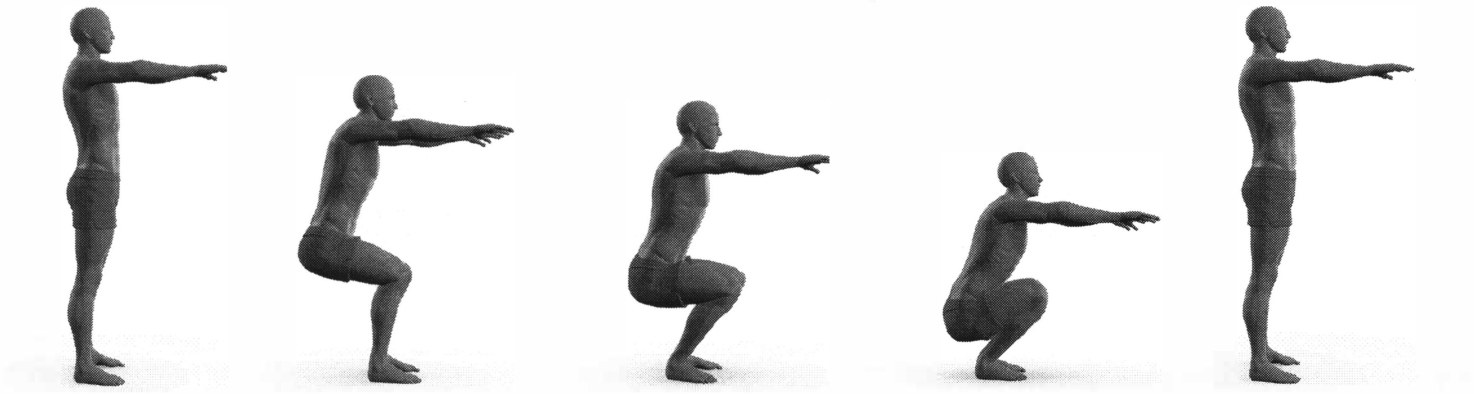
Front

Technique: The first row of illustrations for the *parallel squat* illustrates the side, whereas the second row illustrates the front. This is a foundational movement, and important for leg strength. Keep your feet shoulder-width apart or slightly wider. Turn your toes out anywhere from zero to thirty degrees (use the specific angle that is most comfortable for you). Initiate the movement as though you are sitting back in a chair while keeping your weight over the middle of your feet or slightly behind. Descend to the bottom of the movement while keeping your back straight. Do not allow your back to round at the bottom. If you have enough squat mobility, the back of your thighs should touch your calves. From there, ascend in the same manner that you descended while keeping your back straight and utilizing power from your hips and knees.

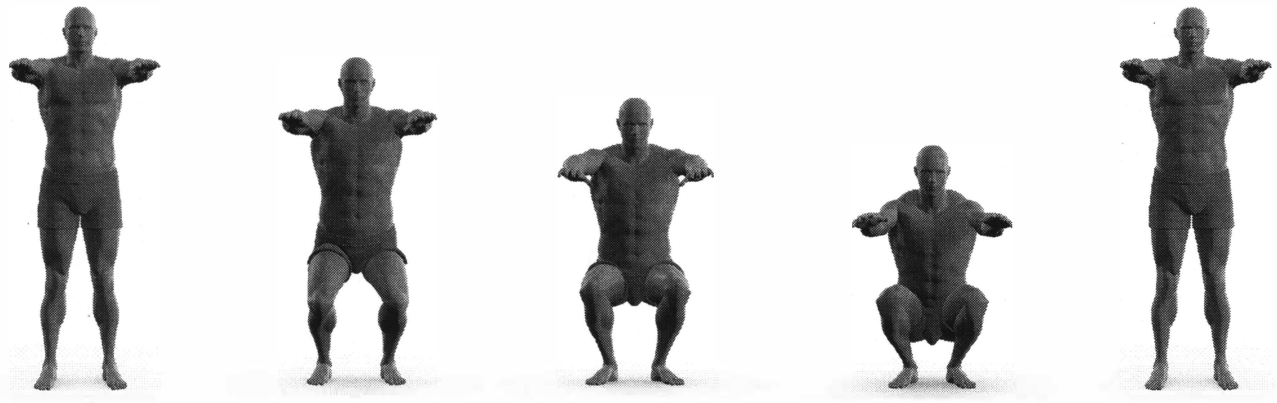
If you spend most of your time sitting (or have a desk job), you may have trouble with this movement. You will likely compensate by allowing your knees to move in front of your toes. Your knees should remain directly over your toes to maintain correct alignment, but you should sit back enough that you are using your hip muscles as well.

If you are struggling, hold a light weight (such as a kettlebell, backpack full of books, dumbbell, weighted plate, or any other ten to twenty-pound object) in front of your chest. This is called a *goblet squat* and in the vast majority of cases it will help you find the correct movement. If you are still having difficulty check out the *So you think you can squat* series on YouTube or have someone watch you and critique your form.

FULL SQUAT – LEVEL 2



Side

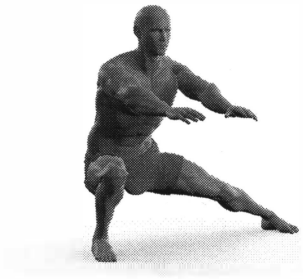


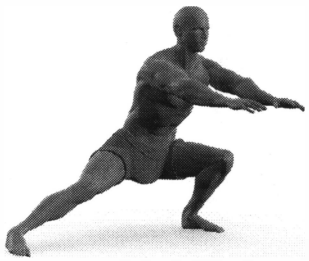
Front

Technique: Keep your feet at shoulder width or slightly outside of shoulder width. Turn your toes out anywhere from 0-30 degrees at whatever angle is comfortable for you. Initiate the movement like you are sitting back in a chair and keep your weight over or slightly behind the middle of your foot. Descend all the way until your thighs touch the back of your calves, keeping your back straight. Do not let your back round at the bottom. If you have good squat mobility, the back of your thighs should touch your calves. Form there go back up the same way you came while keeping your back straight and utilizing the power through your hips and knees. If you have a desk job or sit a lot, you may have trouble with this movement and compensate by allowing your knees to move excessively in front of your toes. Your knees should move over your toes to maintain correct alignment, but you should sit back enough that you are using your hip muscles as well.

The primary difference between the *parallel squat* and the *full squat* is mainly the range of motion. In the parallel squat, you descend until the thighs are parallel whereas in the full squat you descend until the thighs touch the back of the calves. This requires more flexibility and mobility, which can be difficult for those who have been sitting for their school or jobs. If you watch toddlers they can easily do a full squat, but we lose that ability once we stop using it and sit all the time. Our muscles become accustomed to shorter ranges which limit us from performing the full motion.

SIDE-TO-SIDE SQUAT – LEVEL 3



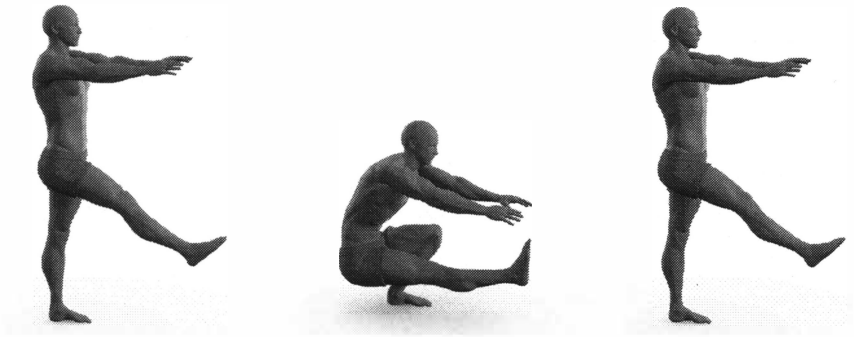


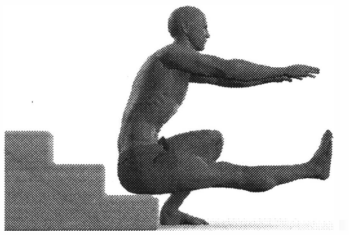
Technique: Begin in a standing straddle position. Slowly shift your weight to your left (or right) and slowly lower until your butt touches the calf on one side. Next, stand up through the movement to straight legs and slowly lower to the other side. Repeat as needed.

This exercise is also known as *Cossack squats*. It is useful for lunges, deep step-ups, and pistols as it biases your weight onto either leg as you move from side to side. The goal is to eventually go down to the thigh-to-calf or butt-to-calf range for this excise. It also allows you to stretch out your other leg as you move it to the straight position. This exercise is a great warm-up for pistols or deep step-ups.

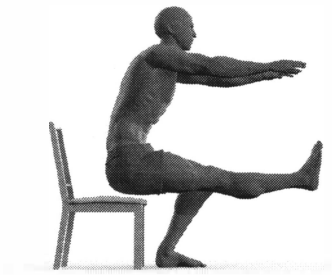
If this exercise is too difficult to perform from the full squat progression, elevate the feet with a mat or other implement in order to make it easier for the bending. Alternatively, you can hold onto a door or sturdy table in order to assist the bottom part of the movement. As you improve with this exercise, you can move the non-working leg in closer in order to mimic the pistol squat progression more.

PISTOLS (SINGLE-LEG SQUATS) – LEVEL 4





Stair Assist



Chair Assist

Technique: Stand on one leg. Slowly sit back into the movement and allow the knee to come forward over the toe. Continue to slowly descend into the bottom of the movement. Keep your muscles tight at the bottom when your butt hits your calves. Then push through your foot to stand up.

Pistols or *single-leg squats* are the single-leg movement that many bodyweight practitioners use to improve their strength and hypertrophy. The stair-assist and chair-assist methods (shown above in the second and third rows of illustrations, respectively) can be used to work up to the full-range depth as you progress. However, there are other ways this can be accomplished:

- If you have access to a pole or a door you can hold onto the pole or doorknob in order to work on the balance component, strength component, or both.
- If you are having difficulty with balancing you can work on single-leg balance in various bent-leg positions beginning from the top and bending your leg at different angles.

- If you are having difficult with flexibility and mobility, you can utilize the side-to-side lunge and/or asian squat.
- If you need to work on improving strength, you will typically need to increase the volume of your work and eliminate the balance component. Hold on to a wall, pole, door, or something else and simply work on good repetitions without worrying about balance.

Make sure that you have good knee control. The knee should always track over the toes and not inside of it. If it tracks inside that generally means you have poor hip control. This can potentially lead to knee pain. As long as you control the knee tracking over the toe well you will not have this issue. Therefore, execute the movement slowly unless you have good technique. If you need any extra advice do not be afraid to ask someone who has more experience. In general, pistols are not dangerous as long as you focus on knee control during the whole movement.

GMB's pistol tutorial may also be useful if you are having difficulty: https://gmb.io/pistol-squat/

WEIGHTED PISTOLS – LEVELS 5+

Once you have mastered *bodyweight pistols*, you can add weight to this progression to increase the difficulty level. There are other options with pistol squats, such as jumping for height or distance. I am not particularly a fan of the jumping method unless you want to build explosive static one leg strength. In most cases, it is much better to train standard barbell exercises because most jumping is not static off of one leg. It is either static off of two legs or it is a running plyometric movement off of one leg which needs to be trained differently than a static element.

The one negative regarding weighted pistols is that many people round their back at the bottom of the pistol which is fine without weight, but when you start weighting them there is the potential for injury. However, in training I have not seen much to indicate that it dangerous as long as you work up slowly and have no other pre-existing back injuries. Hence, after you can perform pistols sufficiently then barbell leg exercises are typically a superior option for both strength and hypetrophy.

These are the list of progressions on the chart:

- Level 5 – 1.2x bodyweight pistol
- Level 6 – 1.35x bodyweight pistol
- Level 7 – 1.5x bodyweight pistol
- Level 8 – 1.65x bodyweight pistol
- Level 9 – 1.8x bodyweight pistol
- Level 10 – 1.9x bodyweight pistol
- Level 11 – 2x bodyweight pistol

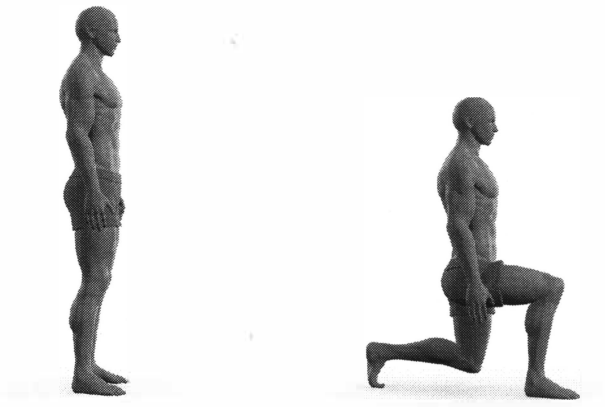
For example, what 1.5x bodyweight pistol means is that if you were 150 lbs you would add +75 lbs to perform a pistol. This is usually in the form a dumbell, plates, or kettlebells as they are the easiest way to add weight.

A general comparison to bodyweight exercises is that a 1.5x bodyweight pistol is approximately equal to a 2x bodyweight back squat. This means that at 150 lbs for a +75 lbs pistol is equivalent to approximately a 300 lbs back squat.

This is a general comparison and your individual results may vary due the nature of specific practice. Someone who performs only weighted barbell squats may not be able to transfer to pistols at +50% bodyweight right away due the the nature of learning the balance and technique of a pistol. Likewise, someone who only performs weighted pistols may not necessarily be able to go straight away to a barbell and squat 2x their bodyweight. However, if you were to train both at the same time, it is a similar comparison to the approximate strength you would obtain from the relative neurological adaptations and hypertrophy.

OTHER LEG EXERCISES

Lunge



The *lunge* is another of the basic exercises that can assist you in building leg strength. Most people will be able to perform this well starting out. If you cannot, work on decreasing the assistance you get from the back leg as you lunge up.

Chair Lunge



The *chair lunge* decreases the weight on your back leg and allows you to bias more weight onto your front leg, which increases the difficulty. It can also be used as a lunge down to back-leg-up stretch, which is good for your hip flexor and quadriceps flexibility.

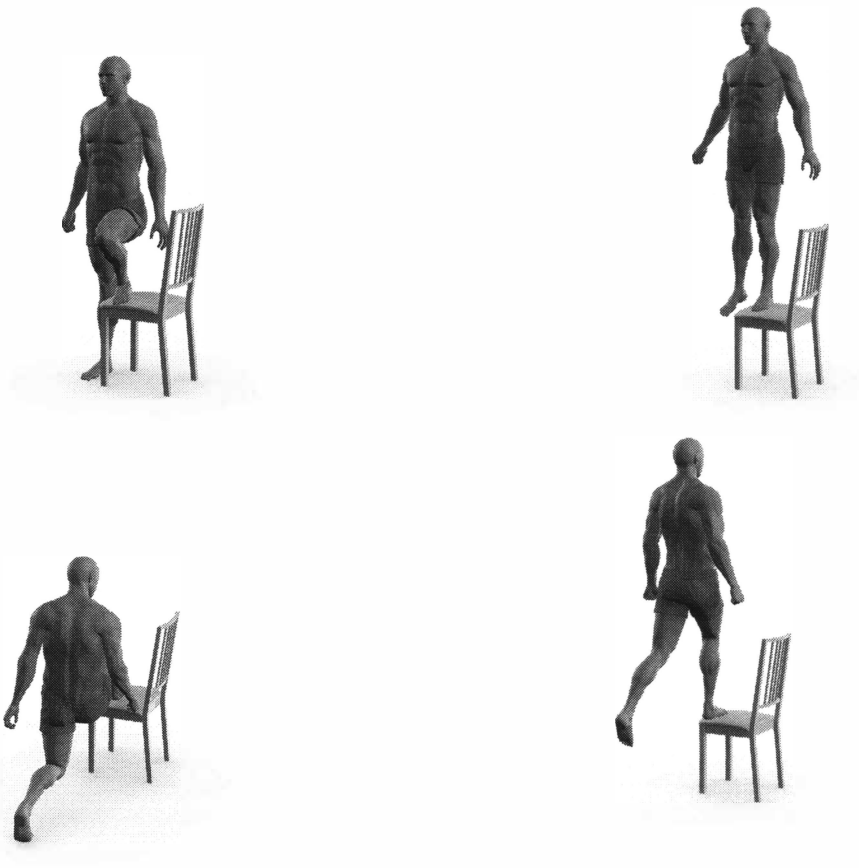
Stair Step-ups



I like *stair step-ups* as a prelude to deeper step-ups on a chair or ledge. You should aim to statically lunge and step up without using momentum. This is a good quad, hamstring, and glute workout. We often forget that stairs that are easy scaled by us as adults are much larger for children. When they become proficient in walking, they are stepping up huge stairs (relative to their leg length), which rapidly builds strength and muscle.

Chair Step-ups





The first row of illustrations shows a straight-on view, the second row shows a side view, and the third row shows a view form behind. *Chair step-ups* are one way to simulate a deep step-up if you do not readily have a counter, table, ledge, or other higher implement that can safely support your weight and allow you to bring your leg up high to step up. You can add weight to these as you get stronger. Try to minimize momentum as you improve to get the most out of the exercise.

Single-Leg Lunge



The *single-leg lunge* (sometimes called a *king deadlift*) is not necessarily more difficult than the chair step-up. If you grab your back leg while performing a single-leg lunge, the movement is commonly called a *shrimp squat*. These are an alternative to deep step-ups or chair step-ups. You can add weight to these as you get stronger.

MISCELLANEOUS EXERCISES

Not all types of bodyweight exercises are covered in this book. It focuses only on the exercises that are critical for strength development. Some useful exercises that had to be omitted due to space constraints include: regular rope climbs, hanging leg raises, and rings flys, or any variations thereof. In short, you should use whatever best helps you achieve your goals safely.

If you are interested in customizing and enhancing the charts by adding exercise progressions or various levels, fee free to do so. It is always good to make a useful resource better, so any suggestions for building upon and improving *Overcoming Gravity* are warmly welcome. If you believe you have some useful ideas, spread the word on the Internet or in your exercise community. You can reach Steven Low via his website or Reddit.

www.stevenlow.org

www.reddit.com/r/overcominggravity

RESOURCES

Recommended Books Related to Training:

- *Starting Strength* - Mark Rippetoe
- *Practical Programming* - Mark Rippetoe
- *Essentials of Strength and Conditioning* - NSCA
- *Stretching Scientifically* - Thomas Kurz
- *Supertraining* - Mel Siff
- *Science and Practice of Strength Training* - Vladimir Zatsiorsky, William Kraemer
- *Periodization: Theory and Methodology of Training* - Tudor Bompa, Gregory Haff

Much of the background theory and information on programming was acquired from Madcow's old Yahoo GeoCities website, which is now defunct. However, StrongLifts has a backup of the entire site. I've included a link below. I applied much of this training theory, from barbells to bodyweight. The daily undulated periodization (DUP) protocol and other more advanced periodization models applied to bodyweight were acquired from the three-part series on ABC Bodybuilding, which is also now defunct.

http://stronglifts.com/madcow/index.htm

Information on mobility, prehabilitation, and rehabilitation work was acquired from earning my Physical Therapy degree at the the University of Maryland School of Medicine, from previous gymnastics experience given by coaches at Fairland Athletics, Gymkana's coaches and volunteer staff, Roger Harrell's Drills and Skills and message board contributors Roger Harrell, Valentin Uzunov, and Blair Lowe. LYTPs from Dave Draper's site. Wrist pushups from martial artists. Additional thanks to Chad Cilli for reviewing the science behind this.

http://drillsandskills.com

Exercise pictorial descriptions, techniques, and tips were conceived from the FIG Code of Points and descriptions. The core of understanding these strength and skill movements comes from previous gymnastics coaches, Gymkana, and Roger Harrell's Drills and Skills along with contributors like Roger Harrell, Valentin Uzunov, and Blair Lowe. Other minor details for specific skill sets are Jim Bathurst/Jack Arnow (one-arm chin-ups), Ido Portal (some scapular positioning and structuring routines), and Coach Sommer (circle front levers, manna progression, maltese, and a few muscle-up progressions).

Thousands of repetitions for collagen and cartilage rehabilitation: Science, Theory and Clinical Application in Orthopaedic Manual Physical Therapy: Applied Science and Theory by Ola Grimsby and Jim Rivard; pages 50, 168, 326.

Protein Timing: The effect of protein timing on muscle strength and hypertrophy: a meta-analysis. Schoenfeld BJ, Aragon AA, Krieger JW. PUBMED ID:24299050

Historical bodyweight feats from John Gill's website; Olympic weightlifting feats from IWF:

http://www128.pair.com/r3d4k7/Chinups.html
http://iwf.net/results/olympic-records/

Prilepin Tables:

http://elitefts.com/education/training/sports-performance/prilepins-chart/

Review of Central Nervous System (CNS) Fatigue:

http://mass-lift.com/2013/05/a-review-of-central-nervous-system-fatigue/

Hypertrophy:

http://strengthandconditioningresearch.com/hypertrophy/
http://lookgreatnaked.com/blog/how-long-should-you-rest-between-sets-for-hypertrophy/
http://strengtheory.com/the-new-approach-to-training-volume/

Tempo and Hypertrophy:

http://strengthandconditioningresearch.com/2014/01/21/volume-hypertrophy/
http://strengthandconditioningresearch.com/2014/01/23/frequency-hypertrophy/
http://strengthandconditioningresearch.com/2014/01/30/repetition-speed-hypertrophy/
http://danogborn.com/training/slow-eccentrics-for-growth/

Non-functional Hypertrophy – Sarcoplasmic vs. Myofibrillar Hypertrophy:

http://higher-faster-sports.com/nonfunctionalmyth.html
http://baye.com/myth-of-sarcoplasmic-versus-myofibrillar-hypertrophy/

Efficacy of Different Types of Periodization and Strength:

http://strengtheory.com/complete-strength-training-guide/
http://ergo-log.com/differentweights.html
http://ncbi.nlm.nih.gov/pubmed/19528843
http://ncbi.nlm.nih.gov/pubmed/22516910
Superiority of > 65% 1 RM for strength and hypertrophy in untrained populations, although good strength and hypertrophy in < 60% group: http://ncbi.nlm.nih.gov/pubmed/25530577

Analysis of Passive Rest, Active Rest, and Active Recovery:

http://suppversity.blogspot.mx/2013/11/resting-done-right-passive-rest-or.html

Methods of Injury Prevention: Strength training, stretching, proprioception, and combinations – The effectiveness of exercise interventions to prevent sports injuries: A systematic review and meta-analysis of randomized controlled trials:

http://bjsm.bmj.com/content/48/11/871.full

Periodization Overview:

http://elitefts.com/education/training/powerlifting/overview-of-periodization-methods-for-resistance-training

Athlete Profiling: Choosing a Periodization System to Maximize Individual Performance

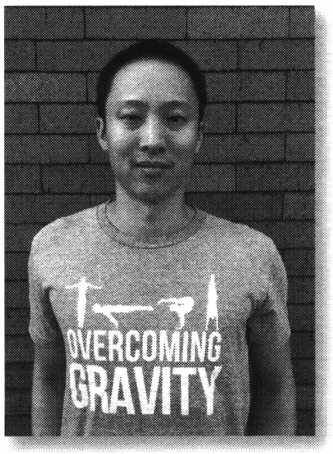
http://nsca.com/Videos/Conference_Lectures/Athlete_Profiling__Choosing_a_Periodization_System_to_Maximize_Individual_Performance/

Knee Injuries Account for the Sports-Related Increased Risk of Knee Osteoarthritis:

http://ncbi.nlm.nih.gov/pubmed/16978252

The rest of my ideas or implementation of ideas have come from the time I spent coaching the Gymkana gymnastics troupe, as well as my personal training. The Athletic Profiling video linked above is one of the best introductions to application of periodization.

ABOUT THE AUTHOR



Steven Low is a former gymnast and coach who has spent thousands of hours independently researching the scientific foundations of health, fitness and nutrition. His unique knowledge base enables him to offer numerous insights into practical care for injuries. Steven holds a Bachelor of Science in Biochemistry from the University of Maryland, College Park, as well as a Doctorate of Physical Therapy from the University of Maryland, Baltimore. During his time at UMCP, Steven performed with Gymkana, an exhibitional gymnastics troupe. Since then, he has coached Gymkana athletes and currently serves as a senior trainer for Dragon Door's Progressive Calisthenics Certification (PCC).

Steven's training is varied and intense, with a focus on gymnastics, parkour, rock climbing, and sprinting. Feats of strength include: full back lever, full front lever, four one-arm chin-ups on both arms, ten-second iron cross, straddle planche on rings, five reps of +190-lbs. dips, +130-lbs. pull-ups, +70-lbs. strict muscle-up on rings, eight freestanding handstand pushups on paralettes, five hollow back presses, and twenty degrees off full manna. He is currently working on achieving the full planche and elevator.

For more information, please visit www.stevenlow.org

Questions about *Overcoming Gravity* may be addressed to Steven directly via Reddit.

www.reddit.com/r/overcominggravity



Made in the USA
Middletown, DE
27 September 2018

SECOND EDITION

Commonly referred to by readers as an "exercise Bible," *Overcoming Gravity* is a comprehensive guide that provides a gold mine of information for gymnastics and bodyweight strength training within its nearly 600 pages.

Steven Low, who holds a BS in Biochemistry and a Doctor of Physical Therapy from the University of Maryland, takes the reader on a journey through logically constructing a strength-oriented bodyweight workout routine. With a highly systematic approach, he delves into the physiology behind strength training and equips the reader to adequately prepare their body for the rigors of bodyweight training. This book covers much ground that other books do not, offering information on health and injury management, factors that contribute to a successful routine, and actual program implementation. If you prefer your health and fitness books to include scientific data, comprehensive sample programming, and effective recommendations, *Overcoming Gravity* is the ideal choice for your library.

This Second Edition has been revised, expanded, and re-organized to read easier, provide more content, and offer easily accessible next-steps for beginner, intermediate, and advanced populations. Notable improvements include the following:

- Increased clarity on scientific principles and routine construction.
- Updated scientific information to ensure the book aligns with current research.
- Extensive information on body part splits and population modifications, allowing one to construct a routine that fits their lifestyle and skill level.
- More in-depth explanation of each element of a routine.
- An entirely new chapter entitled *Methods of Progression* to ensure plateaus are never an issue.
- Expanded sample programming that includes common faults made at different skill levels.
- More real-life examples of how a routine may look.
- Addition of proper scapular positioning and technique for each exercise.
- Upgraded images that illustrate exercises from 2D to 3D.
- Modified charts with more accurate level placement and new leg exercise inclusions.

OVERCOMING GRAVITY



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