A PROFESSIONAL'S GUIDE TO FELINE BEHAVIOUR

UNDERSTANDING, IMPROVING AND RESOLVING PROBLEMS



CRC Press
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Caroline Clark

A Professional's Guide to Feline Behaviour

A Professional's Guide to Feline Behaviour is an invaluable resource for the feline professional, yet written in such an accessible way that it would be of interest to anyone who shares their life with a cat and wants to gain a deeper understanding of their behaviour.

The book is presented in easy-to-navigate sections, each packed with practical advice and the colour illustrations, tables and graphics throughout make it approachable for every type of reader.

What this book offers:

- A greater understanding of cats and how to meet their needs.
- How to recognise and mitigate negative emotions and deal with challenges that cats face both at home and particularly in the workplace.
- How to analyse feline behaviour accurately, with a view to designing a tailored behaviour modification plan.
- Comprehensive information on common, and not so common, problematic feline behaviours.
- The fundamentals of learning theory, with step-by-step training guides.
- Real-life case studies, accompanied by behaviour plans that integrate clinically proven methods to help manage or resolve a range of behaviour issues.

Written by Caroline Clark, a Registered Clinical Animal Behaviourist and RCVS-listed veterinary nurse, this well-researched book draws from her knowledge and professional experiences, offering a unique insight into feline behaviour.

I thoroughly recommend this delightfully written but informative book and its both a welcome addition to the more clinical veterinary and behavioural setting as well as for the general cat owner. No easy feat to straddle both worlds but Caroline has achieved this admirably with her easy-writing style and own extensive clinical knowledge and her general love of cats. This comprehensive guide has chapters ranging from how to observe the pain status of the cat, to enriching its home-life with easy fixes, pharmacology intervention and behavioural modification treatment plans.

The inclusion of the coloured diagrams and the 'keynote take home points' and 'scientific snippets' make it easily accessible as a point of reference for those short of time or wanting to refresh their knowledge. In addition, little has been written about learning theory for cats and so the use of positive reinforcement is particularly welcome. I fully support this book as 'recommended reading' for those not only embarking on their careers but for those more experienced whether in cat rescue, clinical settings or facilitative care' as there is more than one golden nugget to be found.

Claire Klima, *APBC Accredited Clinical Animal Behaviourist, ABTC Accredited Clinical Animal Behaviourist*

As a veterinary surgeon dealing with the complexities of feline behaviour which challenge me on a daily basis this new and exciting publication is an essential for any veterinary professional who wishes to improve the experience and welfare of their feline patients. Despite the modern advancements in feline veterinary medicine, feline behaviour is still so often over-looked and the importance of recognizing the unique behavioural needs of cats is more relevant than ever as they become one of our nation's most popular pets and the expectation of cat owners understandably increases. In *A Professional's Guide to Feline Behaviour* Caroline uses her insight and expertise to bring together an informed and enriched text which clearly assists and aids us to "demystify" the needs of our most behaviourally challenging patient.

Dr Paul Knott *BVM&S, MRCVS, GPCert. in Feline Practice*

A Professionals Guide to Feline Behaviour is an invaluable tool for anyone working in the field of cat behaviour as well as super passionate cat lovers alike. It is a comprehensive resource offering practical insights for identifying cats needs, resolving behaviour problems and developing a solid understanding of this unique and often misunderstood species, underpinned by the latest scientific research. Caroline expertly navigates the complexities of feline behaviour counselling, providing clear guidance on how to transform the lives of the cats we work with for the better. This is absolutely one for the bookshelf for me and will no doubt be one I return to time and time again. I highly recommend it.

Lucy Hoile, *MSc, CCAB, Feline Behaviourist*

There are very few veterinary publications dedicated solely to feline evolution and behaviour. It is important that anyone involved with feline care, especially those in a professional capacity, keep up to date with understanding feline behaviour to safeguard their welfare. I would therefore thoroughly recommend *A Professional's Guide to Feline Behaviour*, as it brings together the rapid advances in feline behaviour in a clear, interesting, and easily accessible manner.

Dr Rayana Kamal, *BVSc., MRCVS, PG Diploma in Veterinary Physiotherapy, PGCert in Small Animal Behaviour*

A Professional's Guide to Feline Behaviour is a must read for all cat advocates. Caroline's wonderful way with words and obvious passion for the species makes this a powerful addition to any bookshelf. The species-specific needs of the feline variety is discussed in depth but with a kind and considerate message on how cats are definitely not small dogs. A fantastic follow-on from Caroline's canine fear and anxiety book, this book is an up to date, evidence based, kitty behaviour bible!

Nikki McLeod, *BSc(Hons), PG Diploma in Clinical Animal Behaviour, NCert. (Behav), ISFM Cert. in Feline Nursing, Advanced Cert. in Feline Behaviour, RVN*

Caroline leads the reader on a journey through the mind of our domestic cats. *A Professional's Guide to Feline Behaviour* gives the reader a solid grounding of the cat and its inner mind, but digs further into how they can then influence and improve their pet's welfare.

Samantha Lympany-Tier, *MSc, BSc(Hons), PTLLS, (Feline Fine Behaviour Consultancy)*

A Professional's Guide to Feline Behaviour is an absolute must-have for anyone delving into feline behaviour or beginning a career as a feline behaviourist. As a newly qualified cat behaviourist I had been looking for a comprehensive book which covered all aspects of cat behaviour and one that also encompassed practical tips for helping with behaviour consultations. This book applies the theory of feline behaviour to the practical aspects of working as an animal behaviourist which is exactly what a newbie behaviourist who is just starting out in the world of feline behaviour needs! It would also be an extremely useful tool for vets and vet nurses who see feline behaviour cases within the veterinary clinic.

Francesca Lees, *BSc(Hons), NCert. (AnBeh), ISFM Cert. Feline Nursing, RVN, (Wildcats Feline Behaviour)*



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A PROFESSIONAL'S GUIDE TO FELINE BEHAVIOUR

Understanding, Improving and Resolving Problems

Caroline Clark


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This book is dedicated to all the cats that have featured in my life and taught me so much about feline behaviour. But it's especially for Lily who went too soon; for my little blind cat, Jane (featured on the front cover), who, despite her painful start in life, is the happiest of cats and never ceases to amaze me with her incredible sensory skills; and last, but not least, for Lladro, my 18-year-old golden oldie who features heavily in the book. Sadly, just after I had finished it, we had to say our last goodbye, but I can find comfort in knowing that he had a life well lived.





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Author

Caroline Clark has been working with cats and other companion animals for over 40 years and during that time has amassed a wealth of knowledge. She began her career as a veterinary nurse and, after many years in first opinion veterinary practice, spent some time lecturing. Having a passion for animal behaviour, she gained a postgraduate diploma in companion animal behaviour at Southampton University, UK, being fortunate to study under some of the world's leading behaviourists. Since then, Caroline has been working with cats and their caregivers to help them overcome a range of problematic behaviours so they can lead happier lives.

Caroline divides her time between seeing clinical behaviour cases, mentoring budding behaviourists and providing online and in-person continuing education to the veterinary community and other pet professionals.

In her spare time, Caroline loves being with her animals in the Yorkshire Wolds where she lives.

Caroline can be contacted at www.carolineclarkauthor.co.uk

Preface

I was asked to write this book after being recommended to the editor by a friend and colleague, Claire Klima. Thanks to her generosity in passing on my name I was thrilled to be given the opportunity to write a book on the subject of which I am so passionate.

When I first began working as an animal behaviourist it wouldn't have been financially viable to specialise solely in cats. Back then the bulk of referrals and enquiries were for dogs and so my caseload was weighted in their favour. Yet I always relished the cat cases and wished I had more. Fortunately, over the years, the field of cat behaviour has grown and more people are reaching out for specialist help. This has been aided and abetted by a greater understanding of feline behaviour, particularly among the veterinary community, who are equipped to help with cases themselves or know when to refer a case to someone who does. Here in the UK, organisations such as International Cat Care (iCatCare) and Cats Protection have also had a significant part to play in educating caregivers and, through social media, can reach a mass audience. However, we mustn't become too complacent. Myths do still perpetuate and the cat can get a raw deal when it comes to having all their needs fulfilled. So, as well as indulging myself in writing about this unique, elegant and curious animal, I hope to contribute to your understanding of them.

As far as possible, I have based all the information on current scientific evidence. Nonetheless, there are still some gaps in our knowledge, so some information is based on the collective experience of experts. Now and again, I will also add my own observations, based on what I have learned from working with cats for over the past 40-plus years.

Any errors or omissions are entirely mine.

Acknowledgements

There are so many people whom I'd like to thank for helping me write this book. I'll begin with my husband, Phil, who was always willing to proofread, act as a sounding board and generally hold things together whilst I spent an inordinate amount of time in the study. Phil, you are my rock. Other family members and close friends come next. Sending a supportive message, offering to proofread, cheering me along and for being understanding when I couldn't make an engagement because of a looming deadline, really meant a lot and kept me going – so thank you all.

I have always loved cats although it was whilst I was studying at Southampton University that I developed a deeper understanding of their behaviour. Therefore, I'd like to extend my gratitude to the programme leader, Dr Anne McBride. Anne put together a truly amazing course with a host of inspirational lecturers. I vividly recall sessions with Sarah Heath, one of the world's leading veterinary behaviourists, and being awe-struck by her extensive knowledge and infectious enthusiasm … I caught the bug!

The creation of a book is heavily dependent on its physical appearance, and I have been fortunate to amass a large number of fabulous photographs which, I think, bring the book to life. This was made possible by the generosity of people from all over the world who willingly shared pictures of their cats. A huge thank you to you all. Unfortunately, the requirements for reproducing images in a book are exacting, so apologies to those people whose photos didn't get used. I truly loved seeing them all.

The person to whom I owe the biggest debt of gratitude is Tommy Taylor. He's the one responsible for all the eye-catching illustrations that are featured throughout the book. Nothing is ever too much trouble for Tommy and, after listening to my ideas, he would use his creative flair to come up with something that was the perfect fit. He also took some incredible photos of my animals, helping to illustrate a particular behaviour I was looking for, whilst still managing to capture their spirit. He's been an invaluable help with everything IT related and given his time generously, staying up till the wee small hours to help me put everything together so I could get the book submitted. I honestly don't think I could have done it without his support. So, Tommy, from the bottom of my heart, thank you.

Whilst writing this book I had some minor health issues and various other difficulties which meant that the deadline had to be put back on more than one occasion. This was made much less stressful by having such an approachable and supportive team at Taylor & Francis. Thank you, Alice, Amelia, and Shikha.

Finally, a big shout out to all the veterinary surgeons who have referred cases to me over the years and, of course, to the caregivers who have entrusted me with the behavioural care of their cherished cats. Without you, I wouldn't have gained the experience necessary to write the book.

Introduction

The domestic cat (*Felis catus),* formerly (*Felis silvestris catus)*, has a rich historic and cultural association with human societies. Originally kept for their hunting prowess, they made an evolutionary leap to become one of the world's most popular pets, currently providing companionship to millions of people throughout the globe.

This book tells this story with the focus firmly on the cat's behaviour.

It is presented in four main parts and the first part begins where it's always a good place to start … at the very beginning.

In order to understand an animal species, we can glean a great deal of information by exploring their ethology. This is the study of animal behaviour under natural conditions and, in the case of the domestic cat, we base our observations on the African wildcat (*Felis silvestris lybica*), still around today and with whom they share their ancestry. Coupled with this, studies of colonies of free-living cats adds weight to our knowledge. Studying their way of life, how they interact with each other and the environment in which they choose to live, provides us with a deeper understanding of our modern-day cat's needs and helps us prevent and resolve problematic behaviours when they occur.

In the first part of this book, I give an account of the early history of instincts that are genetically hardwired into a cat's biology and how this guides their behaviour.

Despite their popularity, cats are perhaps one of the most misunderstood companion animals. Making comparisons with dogs is a common mistake and that's perhaps why humans find it difficult to comprehend certain aspects of their behaviour. Yet there are a number of distinct differences and some of these are mentioned.

In addition to genetic influences, there are other factors that greatly influence behaviour. This includes the physical environment and experiences a cat is exposed to, particularly during critically sensitive learning periods, when the brain and its memory centres are more receptive to learning. These topics are discussed before moving on to our responsibility for providing an environment that supports their species-specific needs. To convey this, I use the International Society of Feline Medicine's (ISFM) Five Pillars of a Healthy Feline Environment as a guide.

Being able to accurately decode a cat's signalling is fundamental to living and working with cats effectively, so a chapter is given over to how cats communicate with each other and, by extension, with us.

Part 2 begins with a discussion of stress and the negative impact this has on the cat's physical and mental state of health. It explains what is actually going on at a biological level, helping the reader appreciate why a cat might find it difficult to cope in challenging circumstances. The next chapter explores the effects of pain and highlights some painful medical conditions that can befall the cat with explanations of how they contribute to negative emotional states and provoke problematic behaviours. A whole chapter devoted to anyone who works with cats contains tips and tactics to help the cat and caregiver through, what can be, a stressful time.

Part 3 focuses on feline behaviour problems. It begins by providing an insight into the role of the feline behaviour counsellor, sharing some of the skills used to analyse a behaviour problem and how a behaviour modification plan is formulated. A range of commonly encountered problems are presented next, along with a range of treatment and management strategies.

Finally, in Part 4, I draw on what has been covered in earlier chapters by presenting some real-life case studies with examples of what can be included in a behaviour modification plan. But first I provide some information about how cats learn and the benefits of training. This will help embed some of the training guides that have been included in the appendices, many of which can help as part of a behaviour modification plan, enhance mental enrichment and enrich the cat-caregiver relationship.

To get the most from the book it's a good idea to read each section in order, as the earlier chapters act as a platform for introducing new topics and for obtaining a better understanding of some of the case studies and behaviour plans covered later on in the book. However, I know how busy life sometimes gets so I have designed the book to include photos, infographics, tables and feature boxes which makes it easy to dip in and out of when time is limited and helpful for anyone who is using this in the workplace and needs to access a snippet of information quickly.



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Part 1

Understanding Cat Behaviour and Meeting Their Needs

To fully appreciate any animal, and make sense of their unique behaviours, it's always a good idea to delve into their past. Learning about the cat's origins, their social organisation and how they evolved, in other words, their ethology, can provide us with a wealth of information and better our understanding.

From a biological perspective, furthering our knowledge of genetics, appreciating the impact of early life experiences and familiarising ourselves with their physical and mental development provides another dimension to our understanding. But nothing strengthens the human–animal relationship better than effective communication and to do this effectively, we must first learn how cats communicate with one another.

So here, in Part 1, I aim to bring all those strands together so that we have a clear picture of what makes a cat 'tick', how to fulfil their needs and begin our journey of demystifying feline behaviour.



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1 Domestication and the Influence of Genetics

ORIGINS AND DOMESTICATION

At the time of writing this book, here in the UK, there are around 11 million domestic pet cats and around 24% of the adult population own at least one (PAW Report, 2023). On a global scale, they have gained mass popularity and in many developed countries they are currently the most popular companion animal. We are not absolutely certain how they transformed from their wild origins but through genetic analysis and archaeological evidence we have been able to map out some fairly accurate details of their early history and evolution which provides us with a backdrop to the current behaviour we see in domestic cats today.

All domestic cats (*Felis catus*) can trace their origins back to the African wildcat (*Felis silvestris lybica*) a highly territorial, solitary hunter that can still be found in parts of the North African savannah and Middle East. Although domestication has modified the behaviour of the modern-day cat, their genetic make-up is almost identical to their ancestor and many of their characteristics and physical features are still in evidence today, albeit with adaptations that have made them so successful at living alongside us.

It is difficult to say exactly when the earliest domestication of the cat began but it is thought to have started in a region of the Near East (now referred to as the Middle East) called the Fertile Crescent, around 10,000 years ago. This coincided with the development of agriculture in that area when nomadic hunters began settling and farming in one place. Storage of grain will have been necessary and this practice will have attracted an abundance of rodents, including the house mouse (*Mus musculus*) that appeared and began to multiply around this time. In turn, this will have attracted natural predators – including the African wildcat, who will have controlled the number of vermin and therefore have been a welcomed visitor rather than a companion animal (Driscoll 2009).

Over a number of years, the most confident of these wildcats will have lived closer to human settlements and been encouraged to stay as pest controllers, whilst the less bold will have dispersed back into the wild. This divergence is believed to have been the beginning of the domestic cat. It's likely that kittens born in the settlements will have been raised closer to humans and become more tolerant of them, moving the process of domestication further and strengthening human–cat relations.

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Cats in Ancient Egypt

The transition from full-time pest controller to companion pet animal was a gradual process however, the course and timing of cat domestication is still uncertain. Until recently Egypt was thought to be where it all began some four thousand years ago. But, in 2004, French archaeologists discovered a 9,500-year-old grave in Cyprus that contained the carefully interred remains of a Neolithic cat alongside a human corpse. This makes it the oldest known evidence of a tamed (but not fully domesticated) cat and, from the manner of its burial, the earliest suggestion of a strong association with humans (Muir 2004).

Yet, current data suggests that the most expansive domestication of cats began in ancient Egypt. It is believed to be here that cats began living more closely with humans and, in addition to the practical role they played in vermin control, they were held in high regard for killing animals that were dangerous to humans (e.g. snakes and scorpions).

During this period, cats quickly became established as an important part of Egyptian culture. They represented good fortune and many feline companions were mummified and given the honour of an elaborate burial alongside their owners. They were also seen as a link to the divine and rather than being worshipped as an animal, they were revered and venerated as manifestations of Gods and Goddesses. Archaeological excavations show that cats were bred in great numbers, specifically to be sacrificed and sold to pilgrims who offered them up as part of religious practices and to commemorate their visits to temples (Bradshaw 2014).

> **Scientific Snippet:** DNA taken from ancient cat bones and mummies has revealed that most ancient cats had stripes and that spotted cats were uncommon until the Middle Ages (Leuven 2017).

The cats' wider dispersal is believed to have taken place when sea trading routes were established and became more widespread. It's likely that they will have been taken on board ships to control mice, which would have infested foodstuffs and other cargo destined for varying locations. Inevitably some will have escaped at ports, although it's also possible that traders and travellers who migrated and colonised other countries (i.e. South West Asia, Africa, and Europe) took their cats with them. From here, these cats will have inter-bred with others, increasing their population and widening their gene pool further. With this expansion, they eventually evolved into being a much more tolerant and socially adapted version of their descendants.

Trials and Tribulations

To travel through their timeline the cat has suffered a turbulent existence. Although attitudes to cats were generally positive, or at least they were largely well tolerated, things began to change in the Middle Ages, specifically throughout Western Europe.

This was driven by the Christian church who, in the thirteenth century, condemned cats for their association with Paganism, Satanism, and witchcraft. Consequently, vast numbers were tortured and massacred in order to ward off evil spirits or as a sign of devotion to Christ. Some were even killed for fear that they could be a witch in disguise. This kind of persecution lasted for over 400 years, spreading to other locations throughout the world (Mark 2023).

It wasn't until the church lost its power hold over people's lives that things began to gradually change for the better. The period of enlightenment brought with it even greater freedom of thought and eventually, by the nineteenth century, the status of the pet cat was elevated. This was aided, in part, by Queen Victoria whose love of cats was well reported and popular authors of the time, such as Mark Twain, waxed lyrical about their virtues, quoting: "When a man loves cats, I am his friend and comrade, without further introduction" (Mark Twain, 1835–1910).

Feline Fact: In 1233, Pope Gregory IX issued a public decree denouncing cats, especially black cats, as being evil and in league with Satan. Perhaps this concept is still ingrained in public consciousness and partly explains why black cats are, to this day, the least likely colour to be adopted and find homes.

Is the Cat Truly Domesticated?

Their transition from a highly territorial, solitary species to being one of the most popular companion animals in the world has been impressive. This has been largely due to the way the cat has rapidly adapted to cohabiting with humans and other cats, notwithstanding the pressures that this must have (and in some cases still does) put them under.

There is, however, a long-standing debate between scientists about whether the cat is truly domesticated or not. Central to the process of domestication is controlling breeding in order to choose desirable behaviours and physiologies that suit the human purpose. The process of selective breeding was widespread in dogs who were domesticated at least 15,000 years ago but probably even earlier (Zhang et al. 2020) – certainly much earlier than cats. Breeding was led by the qualities that enabled them to assist in hunting, herding, and guarding, which led to a collaborative and cooperative affiliation between dogs and humans – a relationship that still exists.

Domestication of cats was a much more spontaneous affair and they were left to their own devices without interference. Hence the genetic material they share with their wildcat predecessor remains largely unchanged and, despite their divergence, certain inherent characteristics have been retained: namely a strong desire to hunt and the need to maintain an independent lifestyle. Even today, cats remain one of the few domesticated animals that largely control their own breeding and choice of mate.



FIGURE 1.1 Pedigree cat breeds represent only around 10–15% of the worldwide pet cat population and some of them still retain the features of their ancestor. Photo courtesy of Andrew Jeeves and Nick Moon.

It was not until the late nineteenth century that cats were selectively bred for physical and temperamental traits, although, in comparison to their canine counterparts, there have been very few changes to their general appearance. Nevertheless, there has been a steady upward trend, but still, pedigree cat breeds represent only around 10–15% of the worldwide pet cat population (Figure 1.1).

Based on these facts, ethologists generally agree that, rather than being a fully domesticated species, they are better described as being semi-domesticated (Nilson et al. 2022). Whilst this narrative shouldn't detract from our responsibilities to them, it might help us understand them better when we come to consider their species-specific needs, motivations and traits.

The Misunderstood Cat

The relationship between evolution and domestication proves helpful for us to gain an improved understanding of feline behaviour. Yet, despite their worldwide

popularity, cats still remain a mystery to some people, even cat caregivers themselves. Aloof, snooty, cruel (hunters), surly, standoffish, regal and independent. Those are just a few of the adjectives used to describe cats and the familiar saying: 'Dogs have caregivers, cats have staff' usually raises a knowing smile between cat lovers. But comparing cats to dogs is probably where the problem lies!

Cats Are NOT Small Dogs

Being a social species ourselves means that humans tend to relate to aspects of the dog's psyche more easily than to the cats. Coupled with this is the long history of canine–human cooperation. Shared experiences are bound to have an impact at a deeper, even subconscious, level. But the tide is turning. Welfare organisations throughout the world, including the International Cat Care (iCatCare), Cats Protection, International Society of Feline Medicine (ISFM) and the American Association of Feline Practitioners (AAFP) have done much to educate caregivers and professionals alike.

Distinct differences between domestic dogs and cats include:

- Dogs were domesticated at least 15,000 years ago, much earlier than cats.
- Dogs were selectively bred by humans (chosen for desirable traits) to assist in hunting, herding, and guarding. This led to collaboration and cooperation, fostering strong human–canine relations.
- Domestication of cats was a more spontaneous affair and they were left to their own devices, with very little interference in terms of selective breeding. Hence the genetic material they share with their wildcat predecessor remains largely unchanged.
- The dog (like humans) is a social animal that requires a social network to survive. Accordingly, it has developed numerous ways of communicating and, through time, has adapted to coexist with humans.
- The cat is a non-obligate social animal (it doesn't need others to survive) and although it can form social bonds, it communicates primarily through scent. Consequently, it is not equipped with as wide a repertoire of obvious vocal or body signals, making it less easy for humans to 'read' than the dog.
- Being unable to rely on a social system to protect them, cats are self-reliant and acutely aware of danger so can appear skittish or remote. The dog, on the other hand, depends on others for security and is therefore more likely to seek out their caregiver as part of their coping mechanism.
- Dogs generally display pain more readily whereas by comparison cats don't. Showing any vulnerability isn't going to serve a purpose for the cat and being a prey (as well as a predator) animal, may reduce their chances of survival.

The Move to Sociality

The domestic cat is often described as a solitary animal. However, as revealed, they have the capability to be socially flexible, choosing to live alone or in organised

groups of familiar members. Observations of free-living domestic cats, i.e. those that are not owned, have given us greater insight.

Cats can form a colony (a social group) around females and their offspring. Here they will live and feed in close proximity, most usually in an area where there is shelter and a sufficient food supply available through scavenging or hunting (Crowell-Davis et al. 2004). This is a framework that reflects the way their wildcat ancestors evolved.

Established matrilineal groups will join in communal nests and share the caring and nursing of kittens (Bradshaw 2018). This behaviour will undoubtedly aid safety but also ensure that the kittens receive sufficient nourishment should the mother be unable to fulfil this requirement. Related females spend more time together, forming strong bonds but they can also show friendliness to unrelated females within the social group and seem to have preferred associates who they spend more time with than others. Although males are not part of the close-knit social group, several reproductive males can reside alone on the periphery and their territories can overlap a number of smaller female colonies where mating will take place.

Aggression is uncommon other than that shown towards young male kittens who are driven out once they begin to reach sexual maturity, an adaptive behaviour most likely to avoid interbreeding. However high levels of territorial aggression would be shown if an outsider tried to venture into an established colony. Nevertheless, with persistence, an outsider can sometimes become part of the colony (Crowell-Davis et al. 2004). Initially, there may be shows of aggression and they would be repelled but gradually, with time, some individuals can be successful and accepted into the group.

Valuable lessons can be learned from these observations. Sharing a home with unfamiliar cats, animals, and people can be a cause of great stress. Of course, there is variability between individuals and some cats are more socially flexible than others depending on genetics, early life experience and temperament (factors we shall be exploring soon) but typically cats prefer to choose which other cat(s) they interact with and newcomers are not always well tolerated, most especially when resources are limited (Bradshaw 2016).

Feral Cats, Street Cats, and 'In-betweeners'

Feral cats are exactly the same species as pet cats but act like wild cats because they haven't been socialised to living a domestic life with humans. True feral cats derive from generations of other feral cats and are adapted to free-living with no desire to live with people. Rehoming them would be extremely difficult and cause them considerable mental distress. Many charities recognise this and operate 'trap, neuter, and return' (TNR) schemes so their numbers can be controlled. After surgery, the tip of one of the ears is nicked so they can be identified as having been neutered. Afterwards, they are returned to their familiar environment, which, in the case of the true feral is the best thing to do for their well-being.

Other free-living cats include those sometimes described as 'street' or 'community' cats. These tend to congregate around areas where locals feed them so they receive a degree of care and human contact but vary in their level of socialisation



FIGURE 1.2 'In-betweeners' often thrive better in farms or factory settings. Photo courtesy of Anne Downes.

depending on their background. A proportion of community cats are pet cats abandoned by humans and these individuals can be successfully rehomed.

Others in this category have been described, by Vicky Halls a UK-based, internationally recognised feline behaviourist, as 'in-betweeners'. These are the ones who require support because they don't fit into life on the street, although often find domestic life challenging too. With a more flexible approach they can be successfully rehomed, yet they require a greater sense of independence and a need for being in control (Halls 2020). Consequently, the caregiver has to respect their requirements for this kind of lifestyle. Farms, factories, and other similar settings might be more suitable for them to thrive (see Figure 1.2).

THE INFLUENCE OF GENETICS ON CAT BEHAVIOUR

Genes are the basic units of heredity, made up of molecules called deoxyribonucleic acid (DNA). These molecules are the blueprint of an individual, carrying all the coding responsible for how they function and their physical appearance.

Genes are passed from each parent to their offspring throughout the generations and therefore how a cat functions, behaves and deals with situations is strongly affected by the characteristics they inherit from their descendants. This diversity is recognised when we compare a feral cat to a pet cat.

Breeding pedigree cats, to select for physical appearance and temperamental traits, began in the late nineteenth century. However, we are beginning to learn that breeding animals to produce a particular temperament isn't a guaranteed venture. What has been shown time and again is there is as much behavioural variation between individuals as there is between breeds.

Of course, there are other critical factors that shape an individual including environmental influences and life experiences, particularly in early life. We shall explore these subjects in more depth as we move through the book, but for now, let's look at how genetics can affect innate motivations and behavioural characteristics to help us better understand what it is to be a cat.

Instinctive Behaviours

Instinctive (or innate) behaviours are inborn, impulsive actions that are performed without being taught. Some instinctive behaviours include simple behavioural patterns displayed in response to a specific stimulus or within a specific context, like a kitten finding the mother's teat and suckling, whilst some others are more complex.

The cat has a number of complex behaviours that are driven by these inbuilt desires and an awareness of some of these can help further our understanding.

Hunting and Predation

One strong instinctive drive for all cats is hunting and predation (Cecchetti 2020). Being more knowledgeable about the cat's origins helps to understand where that came from.

Akin to the wild cat, hunting behaviour in domestic cats is very much a solitary endeavour. In the wild, hunting is within the cat's own control and a large proportion of time and energy is spent searching for small prey items that they can easily kill alone. Being a crepuscular (active in twilight hours) animal, most hunting activity takes place at dawn and dusk when their prey is most active and fewer predators are around. Hunting is not always successful, so the cat is driven to hunt even if they are not hungry. It is estimated that a catch provides only around 8% of their calorific requirements, so throughout a typical day, they need to consume numerous small regular kills in order to meet their nutritional demands. Because of this, a cat's digestive system is still suited to small regular feeds rather than larger less frequent offerings, which should guide the way we offer their meals.

Predatory behaviours can be directed to anything that moves, including human members of the family. This kind of misdirected predatory behaviour can be evident in cats that have a high prey drive and no suitable outlet. However, providing an outlet isn't just about allowing them outside access to hunt. In fact, many caregivers are uncomfortable with their cats' predatory nature and conservationists are concerned that cat predation has a significant impact on wild small mammal and bird populations

(Trouwborst et al. 2020). It's more about providing enriched feeding opportunities and appropriate interactive play, subjects I will be returning to in Chapter 3.

Scratching

Cats have an innate drive to scratch objects (indoors and outdoors). Scratching serves a number of different functions, including maintenance of the claws and stretching and exercising the forelimbs and spine, all important for honing predation and agility. It also plays a significant role in communication and self-expression (Bowen and Heath 2005). As such, this behaviour should not be thought of as being naughty and the cat should not be punished. This would only lead to problematic behaviours and stress. Instead, they should be given access to suitable sites and resources to fulfil this need, a topic we shall be covering in Chapter 3.

Self-maintenance

Grooming is a natural self-maintenance behaviour that typically takes up an hour of the cat's daily time budget. Being a fastidious creature, the cat performs this behaviour to keep itself clean and free from external parasites. The backward-facing barbs on their tongue act like a comb, and the incisor teeth nibble and gently tease out knots and debris. Cats can become extremely stressed if they are unable to perform this behaviour, so assistance might be necessary if the cat is elderly, or has a medical condition such as tongue ulcers, a fractured jaw, or is wearing a collar after a surgical procedure that impedes their normal grooming.

FELINE FACT: WALKING A FAMILIAR PATH

Many wild animals, like deer and badgers, often walk along the same path when moving around. This behaviour is sometimes evident by flattened grass trails, seen when walking in the countryside. It's most likely that this behaviour helps an animal stay safe so they can easily locate familiar and safe territories, guiding them to food and a water source. However, it's a behaviour that is still seen in the domestic cat. Look out for trails they lay in the garden or watch their routes in the house (see Figure 1.3).

PHYSICAL ATTRIBUTES OF A CAT

The domestic cat's physical appearance hasn't changed much from its wild ancestor either and they still retain some of the same sophisticated anatomical features and qualities.

Cats perform their role as a supremely efficient hunter, helped by their keen sense of sight, particularly in the dusk and dark, acute sense of smell and sharp hearing. The arrangement of their skeleton and musculature means they can swiftly jump and spring onto prey, or run away from danger. Their retractable claws are used for climbing and, along with the sharp canine teeth, help to kill and rip prey items apart.



FIGURE 1.3 Walking along a familiar path and making a trail is a behaviour still seen in the domestic cat. Photo: Author's own.

Eyes

- Large in relation to the size of the head.
- Binocular vision: good for depth perception.
- Good peripheral vision to aid predation and detect threats.
- A layer of iridescent cells behind the retina (tapetum lucidum) – reflects the light to improve night vision (Fraser and Girling 2011).
- Close-up vision is less acute than long vision but they are masterful in detecting movement.
- The nictitating membrane (third eyelid) protects the eyeball during fights or when moving/hiding in the undergrowth.
- Pupils are elliptical in shape making them capable of narrowing to slits in bright light, protecting the eye from damage. Also helps them dilate (open widely) in dark light to let in a large amount of light, aiding vision in low-light conditions.

Ears

- Covers an impressive range of hearing from very low frequencies to extremely high frequencies.
- Can hear and locate the ultrasonic sounds that mammals make which aids their hunting ability (Atkinson 2018).
- Large pinnae (earflap) to funnel sound.
- Each ear can move independently helping pinpoint prey and danger.
- Folds inside the ears increase the ability to locate the height of sound, useful for capturing birds (Figure 1.4).

Smell

- Highly developed sense of smell estimated to be at least 1,000 times more sensitive than ours (Menke 2024).
- Well-developed olfactory bulbs (situated on the bottom side of the brain above each nasal cavity) receive information about smells by way of the olfactory tracts.



FIGURE 1.4 The shape of cats' ears are designed to funnel in sounds. Photo courtesy of Brenda Delgado.

- Cats communicate with others and the world around them through scent.
- Their familiar scent profile is important to the cat's sense of place and security.
- Cats possess something called the Flehmen Gape Response – a biological adaptation that enhances scent/pheromone detection and interpretation (Bradshaw 2014) (see Chapter 4).

Skeleton

- On examination, skeletons from the cats' wildcat ancestors share the same appearance.
- Long coccygeal vertebrae (tail) to aid balance and express emotions (see Chapter 4).
- The clavicle bone (collar-bone) is free floating and not connected to other bones. This arrangement allows them to squeeze into very small spaces and plant one paw in front of the other, improving balance and agility.
- Long muscular limbs for mobility – important for jumping and pouncing on prey.
- Highly flexible spine allows U-shaped arching of the back to stretch and helps as a shock absorber during a fall (Figure 1.5).

Teeth

- As an obligate carnivore (requiring meat to survive) they have long, sharp canine teeth.
- Carnassial teeth (specialised cheek teeth) to grind and shear flesh from the bones of their prey.

Hair and Skin

Claws

- Sheathed and retractable.
- Used for climbing and ripping prey apart.
- Used to scratch (to function as a visual and olfactory signal).

Whiskers/Sensory Hairs (known as vibrissae)

- Abundant around the side of the face.
- Sensory hairs above the eyes and behind the forelimbs provide additional sensory input.
- Whiskers are used in the final phase of the kill to feel and detect prey and thus compensate for poor close vision.
- Whiskers detect vibrations when they touch against an object, helpful when judging distances and space – thus assisting with navigation.
- The position of the whiskers can help express emotion (which will be discussed later in the book).



FIGURE 1.5 Cats are extremely supple and can fit into the smallest of spaces. Photo courtesy of Beverley West.

Many of these physical features are still apparent in pedigree cat breeds. Yet, where selective breeding has caused extreme physical variations, certain qualities have been compromised and can hamper the cat's ability to fully express themselves. In later chapters, we shall discuss some of the effects these physical changes can have.

Feline Fact: The righting reflex is an automatic response that allows the cat to land on their feet from a fall. Within one-tenth of a second the head and body orientates itself in a position where all four feet can land safely, whilst the back arches and limbs extend to act as shock absorbers. However, a distance of at least 10 feet is required to give time for all that to kick in. There have been some accounts of cats falling from incredible heights with only minor injuries. But this doesn't mean that cats are resistant to doing themselves some damage – they can still sustain some nasty injuries depending on the surface on which they fall – so it's still wise to protect them from high places!

TEMPERAMENT

Temperament (or personality) refers to the biogenetically determined behavioural tendencies that an individual is born with and are relatively consistent throughout life (Travnik et al. 2020). However, in addition to genetics, a cat's temperament is also influenced by their interactions with the environment (which begins during in-utero development) and the experiences they accumulate throughout their life.

It is difficult to apply a single dimension to represent a cat's personality although they might be broadly categorised as being one (or a combination) of the following:

- Sociable/friendly (friendly is often defined as boldness).
- Confident/easy-going/adaptable.
- Timid/nervous/fearful.
- Active (playful)/energetic.

The cat's temperamental traits can impact its ability to cope with stress and the coping styles they adopt. This is something we shall look at more closely when discussing stress and how it affects the cat's behaviour in Chapter 5.

Friendly Genes

Of particular interest is the fact that friendliness is inherited from the father (McCune 1995). Studies where the father has had no contact with the kittens after mating have helped us establish that the response of kittens to people (willingness to approach and have contact with them) is due to the father's temperament. We also know that these friendly traits interact with socialisation. In other words, the friendliest, most confident kittens, are from friendly fathers and have been well socialised (McCune 1993).

Another interesting fact is that kittens in a single litter may have been fathered by more than one tom cat (i.e. a sexually mature male cat). This is called superfecundation. In other words, it is possible that each individual in a single litter has a different father altogether – so siblings may only be half-brothers/sisters. Knowing that the boldness trait is inherited from the father might explain why members of the same litter can be more or less outgoing and friendly depending on their paternity.

KEY TAKE HOME POINTS

- In evolutionary terms, domestication of the cat is fairly recent.
- The domestic cat and their wild cat ancestor are almost genetically identical and still share many physical and behavioural characteristics.
- As a species, cats have a flexible social system. They can either live alone or in groups – provided there are sufficient resources to support them all.
- Cats have retained a territorial streak and do not take kindly to incoming cats from outside their social circle.
- The father's genes (in combination with a good socialisation experience) determine a kitten's friendliness.

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2 Life Stages and Behavioural Development

Like all other species, domestic cats have distinct life stages and during each of these phases, you can expect a number of developmental and behavioural changes to take place. Having knowledge of these landmarks means that the caregiver can assess whether the cat is developing and functioning as it should and provide them with the necessary resources and healthcare to meet their needs.

Five distinct age-related stages have been identified:

1. Kitten: (birth to one year) encompassing:
   - Neonatal period (birth to two weeks of age).
   - Socialisation period (two to around the end of seven weeks of age).
   - The later stage sensitive period for socialisation (8 to around 16 weeks of age).
   - Puberty (typically commences between 6 to 12 months of age).
   - Adolescence (from puberty up to around two years of age).
2. Young Adult: (one to six years of age).
3. Mature Adult (7 to 10 years of age).
4. Senior (10 to 14 years of age).
5. Super-senior cats (15 years of age and upwards).

Source: Based on The American Association of Feline Practitioners (AAFP) 2021 Feline Life Stage Guidelines (Quimby et al. 2021)

This chapter will centre on the kitten stage, mainly because this is when most of the critical behavioural developments occur. However, I shall also feature the onset of puberty and reproduction along with some information on senior cats because these life stages represent significant behavioural changes.

But first, something should be said about the very earliest stage of a kitten's behavioural development, which is the period before they are even born, specifically when they are still developing in utero (in the womb). This is called the prenatal period.

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THE PRENATAL PERIOD

As with other mammals, a kitten's early life experience actually begins before they are born. The womb itself is an environment in its own right and the developing foetus can be affected by what is going on around them there, just in the same way that environmental influences affect them once they are born.

Scientific research has revealed that maternal stress during pregnancy can lead to stress hormones (e.g. cortisol) crossing the placenta. This influx can give rise to neural and hormonal changes to occur in the developing foetus. Through a branch of genetic research, called epigenetics, we now know that early life experiences can alter the way genes are expressed. Although studies in cats are currently lacking, work done in humans and other mammals shows that these changes can affect the way an individual's stress management systems develop and leave them vulnerable to fear-related problems and difficulties in coping with stressful events throughout life (Gudsnuk and Champagne 2012). Consequently, breeding from an emotionally stable mother and making sure she is kept in a low-stress environment during her pregnancy will help to safeguard her kittens.

KITTEN: BIRTH TO ONE YEAR

During this period of life, an abundance of behavioural development takes place. It accommodates the all-important processes of habituation and socialisation, important early learning phases. Puberty and adolescence also take place during this time – when the brain and body undergo neurological and hormonal changes which impact the young cat's behaviour. We shall be returning to these key landmarks in more detail soon but for now, we shall focus on the life stage that begins immediately after birth, the neonatal period.

Neonatal Period (from Birth to Two Weeks of Age)

During this phase, the newborn kittens are totally dependent on the mother and their only form of communication with her and their littermates is primarily through touch and smell (olfaction) (Vitale Shreve and Udell 2017).

Kittens are born blind until their eyes open, typically occurring anywhere between 7 to 14 days of age. Their hearing is limited because of the folds that partially block the ear canals but this gradually improves from 5 to 14 days as the ear remodels itself**.**

Although kittens are unable to regulate their own body temperature, they can sense changes in temperature. This allows them to wriggle (their only form of movement) from cold to warmth, helping them to navigate to the nest and their mother.

The rooting reflex is present and they can lift their heads. This aids suckling, and together with touch and olfaction, the kitten locates the mother's mammary glands (nipples) (see Figure 2.1). Of interest, kittens appear to have a preferred nipple (Overall 2013), most probably related to recognition of their own scent and perhaps the Cat Appeasing Pheromone (CAP), a chemical signal that aids feelings of



FIGURE 2.1 The kittens are able to locate the mother's nipple using the rooting reflex, touch and scent recognition. Photo courtesy of Amotherby Cat and Kitten Rescue.

contentment and security, emitted from the mother's mammary glands (see Chapter 4 for further information on pheromones).

Assessing the kitten's ability to suckle as soon as they are born is recommended, not least because they need to feed to thrive but also they must ingest the mother's colostrum-rich milk as soon after birth as possible (ideally within the first 12 hours) (Veronesi and Fusi 2022). Colostrum contains maternal antibodies, a form of passive immunity that protects the kitten against disease for the first few weeks of their life.

Vocalisation is limited at birth although the usual kitten-like squeaks are present. Purring begins at around two days old, usually whilst the kitten is suckling, which is most probably a signal to the mother that they are receiving milk and to encourage her to continue letting them feed. High-pitched vocalisation to call the mother is present and peaks at one week old. This distress signal intensifies the further the kitten is from the nest and is unable to detect the scent of the nest site (Lowell et al. 2020). For this reason, to avoid stress, overzealous cleaning of bedding should be avoided.

The mother cat's influence on the behaviour of her offspring is also related to the nature of maternal care in the postnatal period. The amount of nuzzling, licking, and attentiveness in the first few weeks of life is important for an animal's behavioural and cognitive development, and studies in a range of mammals have shown

that good quality mothering increases social engagement and helps proof against stress (Bales 2017).

One of the factors in the premature death of neonatal kittens is under-nourishment leading to hypoglycaemia (low blood glucose levels) and dehydration (Veronesi and Fusi 2022), so providing the lactating mother with a good quality diet before, during, and after pregnancy ensures the kittens' nutritional needs are met (supplemented by a kitten milk formula if necessary).

Neonates are unable to eliminate their bowels and bladder unless stimulated by the mother because their 'voiding reflex' is still not present. A mother helps with this voiding by grooming and licking around their perianal region (under the tail and around the genital area). It is therefore imperative that when caring for orphaned kittens they should be stimulated in a similar way (Little 2013). Using warm, damp cotton wool in a stroking action around the perianus, before and after feeding, is a suitable method and should be maintained until the kitten is able to carry out voiding independently, usually at around three to four weeks of age.

Kittens are able to stand by 10 days and begin to walk by 14 days although their motor skills are still not fully developed and movements are uncoordinated. Any movement based on visual ability, such as following the mother, begins towards the end of the neonatal period.

During the first two weeks of life, healthy kittens spend almost all of their time sleeping and suckling, but if they vocalise excessively, fail to suckle, and do not settle then something is wrong. Prompt veterinary attention (taking the mother with them wherever possible) is required, as infant death in these circumstances is rapid.

During the neonatal period, whilst all these developmental changes are taking place, work can begin on building a kitten's emotional resilience. This can be done through the process of habituation, the earliest and most simple form of learning.

HABITUATION

Habituation is the process whereby an animal learns that certain non-threatening things that they hear, touch, see, and smell are irrelevant and merely part of their day-to-day environment so should not cause them concern. This is done through repetition and sensitive exposure to a range of commonplace stimuli. Without the appropriate exposure, everyday occurrences would cause a fearful response and the kitten's behavioural development would be impaired, leading to serious negative consequences.

To be at its most effective, habituation should begin within the neonatal period and extend throughout the whole socialisation period, i.e. from birth to the end of seven weeks of age. Table 2.1 provides some examples of the social and non-social experiences that should be included.

Habituating the Neonate

Being raised in isolation with only the mother and her litter would cause a kitten(s) to be startled by even the simplest stimulus. Therefore, in the home, the normal

TABLE 2.1 Examples of Social and Non-Social Experiences that Kittens Should be Habituated and Socialised Towards from the Neonatal Period and Throughout the Socialisation Period

Social stimuli **Meeting and interacting with:**	**Non-social stimuli** **Hearing, seeing, touching, smelling, and interacting with:**
• Familiar/unfamiliar people of all genders and descriptions • Children and babies • Delivery people • Dogs and other animals • Visits to the vet (meeting staff) • Visits to the cattery (meeting staff) • Being touched, handled and restrained • Playing with toys (with caregivers) • Being groomed	• Domestic appliances (TV, music, radio, washers, vacuum cleaners) • Thunderstorms/fireworks (sounds and visual stimuli) • Traffic/bicycles and other modes of transport • Aircraft sounds • Wheelchairs, prams • Scents, e.g. disinfectants, smoke, etc. • Tactile triggers, e.g. tiles and slippery floor surfaces, uneven surfaces, grass • Seeing and interacting with toys • Cat carriers • Being transported • Recorded sound effects can be useful.

range of experiences needs to be introduced. Hearing begins to improve from day five so being exposed to everyday sounds such as the TV, radio, domestic appliances, and people talking is necessary (Ellis 2020).

Since the sense of touch is present at birth, gentle and unobtrusive handling and stroking (known as gentling), by a person familiar with the mother, can be introduced. However, because some mothers will reject kittens if they are interfered with before they have had some time to settle with their offspring, it's best to be cautious and wait for a week or so before proceeding. However, it is important that kittens are habituated to being touched and handled appropriately, gradually increasing the duration and number of people involved, from the end of their neonatal period and all throughout the rest of their socialisation period (see Figure 2.2).

Top Tip: Don't overwhelm the neonate: Bombarding them with stimuli could have the opposite effect to habituation, a phenomenon called sensitisation. This causes escalating fear responses and heightened emotional arousal. So, being mindful of the intensity of the experience, (e.g. volume and duration) is important and progress should be gradual and sensitive.



FIGURE 2.2 Kittens can be gently handled in the neonatal period to help habituate them to human touch, although the mother's response should be observed. Photo courtesy of Helen Kubiak.

On average, a kitten's eyes open when they are around 10 days old although visual orienting and being able to follow doesn't occur until 15 to 25 days. Vision continues to improve and by five weeks they have functional eyesight with further improvements in visual acuity continuing as they mature.

Introducing them to smells that they are likely to encounter, such as the scent of people or other household animals, should take place too. This usually occurs naturally via the environment and through handling but more work must be done as they enter the next extremely important developmental phase**,** the socialisation period. This is when their senses become more developed and learning life skills are optimal.

Details of where to access a comprehensive socialisation chart and links to a playlist of sound effects can be found in Appendix 3 at the back of the book.

THE SOCIALISATION PERIOD (BETWEEN TWO TO AROUND THE END OF SEVEN WEEKS OF AGE)

At week two, the kitten enters the next critically important phase of their development: the socialisation period. In this phase kittens begin to spend more time outside the nest, exploring their environment. They also undergo rapid physical and behavioural development and learn how to interact with other cats, animals, people, and situations within a social context (see Figure 2.3).

During this phase, the kitten's brain is rapidly developing and all their senses are beginning to be more functional, so they are able to take in and learn about everything going on around them, both good and bad. It's now when a kitten is most influenced by social experiences, so as well as introducing them to non-social stimuli it is important to give them positive and sensitive exposure to the kind of social encounters that they are likely to experience throughout life.

Interacting with Kittens

Handling during the kitten's socialisation period plays a vital part in preparing a kitten for adulthood and there has been a range of scientific studies and reports of the benefits. Here are just a few worth highlighting:



FIGURE 2.3 Kittens should be habituated and socialised to people and everyday sounds and sights. Photo courtesy of Matthew Stringer.

- Kittens that were regularly handled and socialised between 2 and 12 weeks of age went through a series of experiments when they were 1 year old. These kittens were quicker to approach, touch and rub a test person, were more vocal, and spent a greater amount of time around the person when compared to cats that were not handled (unsocialised) (McCune 1995).
- Kittens handled by five different people were better socialised and less fearful to people than kittens restricted to being handled by just one person (Collard 1967). Based on this it would be advisable to include different genders, and supervised children so that the kitten will feel comfortable and relaxed around a range of different people.
- It has been reported that handling should be undertaken for around 40 to 120 minutes a day, split into positive, short, gentle, and frequent bouts (iCatCare 2022). Talking to the kittens during the handling can also be beneficial.

Handling experiences can be stepped up to include gentle restraint, sensitive introductions to being lightly groomed, and delicate examination of all parts of the body. For example, looking in ears, pulling the eyelids up and down gently to examine the eyes, and opening the mouth prepare a kitten for medical interventions and vet visits.

The key to the success of socialisation is the way it is carried out. The most important thing is to make sure the kitten isn't overwhelmed or traumatised. Throwing them in the deep end is a recipe for disaster and can cause more harm than good, leading to something called flooding.

A few of the key developments that take place between the neonatal and socialisation period, along with some ideas about the kind of things that the kitten will require at the various landmarks, can be found in Table 2.2.

Flooding is a term used to describe prolonged exposure to a frightening stimulus without any means of escape. This kind of learning is detrimental and can heighten fears and lead to the development of fear-related behaviours. Knowing the signs of anxiety (covered in Chapter 5), particularly the subtle ones, can help because this means handlers and caregivers can spot when the kitten is feeling uncomfortable and can stop and re-evaluate how they are proceeding.

Consequences of an Impoverished Socialisation

Once a kitten is beyond eight weeks of age, it becomes virtually impossible to catch up on a limited socialisation experience and, having lost the critical time frame, they will be fearful in almost all new situations and likely to develop behaviour problems as a consequence (e.g. inappropriate play behaviour, anxiety, and fear aggression). Of course, a suitably qualified behaviour counsellor can support and

TABLE 2.2 Some of the Key Developments and Considerations for the Caregiver during a Kitten's Neonatal and Socialisation Periods

Life stage/periods	Key developmental and behavioural landmarks	Information and advice to caregivers
Neonatal period (birth to two weeks)	Nutritionally dependent on mother.	Provide a good quality diet to the mother (so she can support herself and her offspring nutritionally).
	Blind at birth.	Provide a warm, safe, secure nesting environment for the mother and her offspring.
	Unable to regulate their own temperature.	
	Unable to eliminate bowels and bladder voluntarily unless stimulated through being groomed in the perianal region by the mother.	In orphaned kittens, the voiding reflex needs to be stimulated by the caregiver using warm, damp cotton wool in a stroking action before and after each feed.
	Tactile (touch) sense present.	Unobtrusive handling (gentling) of the kittens can begin towards the end of this period but this must be initially conducted by the person most familiar with the mother.
	Olfaction present.	Scents can be introduced including those smells likely to be encountered in life. Avoid over-powering noxious scents, e.g. strong disinfectants, air fresheners and perfumes.
	Hearing is limited at birth and gradually improves from day 5 to day 14.	Habituate to the commonplace sounds that they will encounter throughout their life.
Socialisation period (Two to around the end of seven weeks)	The critical period for social learning.	Follow a programme of habituation and socialisation that incorporates a wide range of experiences.
	At 3–4 weeks can discriminate different feline vocalisation and will approach familiar and friendly calls and avoid unfriendly and unfamiliar ones.	If possible, expose to other friendly kittens under safe and supervised conditions. Kittens should only be exposed to friendly cats that have a full vaccination history.
	Weaning begins at 3–4 weeks of age.	Provide a good quality diet appropriate for this life stage. Where possible, early weaning should be avoided.
	At 5–6 weeks kittens begin to use a litter box.	Ensure the availability of suitable litter box provision (see Chapter 3).
	At around 5 weeks, kittens begin to use scratching material/locate sites.	Provide a range of suitable vertical and horizontal scratch sites (see Chapter 3).
	From 4 weeks onwards, kittens spend more time exploring and interacting with the environment.	Provide opportunities to explore and interact with a wide range of suitable resources.

Source: Based on the AAFP Feline Behavior Guidelines 2004 and Overall 2013.

guide the caregiver by designing a carefully planned behaviour programme. Whilst this may help to a degree, it's most likely that they will require lifelong behaviour management.

Positive experiences encountered in the socialisation period can diminish if not repeated, so appropriate positive interactions and exposure to stimuli should continue throughout the whole kitten period and into adulthood.

THE LATER STAGE SENSITIVE PERIOD FOR SOCIAL LEARNING (FROM 8 TO AROUND 16 WEEKS)

Although the crucial time for kitten socialisation finishes at around the end of seven weeks of age, their social behaviour continues to develop and they are still capable of learning, so frequent positive social interactions with plenty of appropriate handling and life experiences should continue right through to adulthood.

Exploration of the environment will increase and locomotor function and eye–paw coordination will improve. Providing an environment with suitable resources and opportunities to develop these skills further, therefore, makes sense. Information on how this can be accomplished can be found in Chapter 3.

Kittens will be fully weaned and eating a solid diet by now so should receive a nutritious diet that supports their growth during this life stage. Cats tend to reject new foods, probably as an inbuilt strategy to avoid consuming something poisonous. Adding novelty to the diet, including different textures (wet and dry), can therefore help to avoid 'faddy' eating behaviours later. Another reason for accustoming young cats to new food types is so they don't become neophobic (fear/reluctance of new things) if they require a dietary change for a medical issue later in life.

Kittens will be growing and amongst other adaptations, such as the size of their beds and scratch post height, the litter box should be replaced to accommodate growth. Ideally, a litter box should be 1.5 times a cat's body length (from the tip of the nose to the base of their tail) and they should be able to move around easily so they can get into a comfortable toileting position.

OTHER IMPORTANT CONSIDERATIONS FOR THE KITTEN

Proofing against Frustration

Frustration is a negative emotion which occurs when an individual's will or goal is denied or unfulfilled. Feelings of frustration can lead to problematic behaviours such as anxiety, anger, and aggression. However, frustration tolerance can be learned at a young age.

Whilst with the mother, kittens will often be left in the middle of being fed. Signals of non-reward such as standing up, rolling over, and walking away teach them that they can't access her for milk at will and, in this way, they learn that an expectation isn't always fulfilled. It's these early life experiences that help prepare kittens for dealing with frustration in adulthood.

Interestingly, it has been reported that hand-reared kittens may have a greater likelihood of developing frustration-related problems (Hargrave 2018). The provision of regularly timed feeds and allowing the kittens to stop suckling when they are satisfied fails to condition them to be frustration tolerant and may create false expectations about human contact. This could potentially lead to frustration-aggression towards people as they mature.

To ward against this it's been recommended that, whilst hand-rearing, the caregiver should be more in control of when the bottle is removed. That is to say, before a kitten stops suckling. This better mimics normal feeding, i.e. withholding the 'reward'. It's obviously still important to ensure that the correct amount of milk substitute is provided throughout each day and monitoring body weight daily is recommended to ensure they are continuing to grow (see Figure 2.4).

Once fully weaned introduce them to food puzzles but make it relatively easy and increase the level of difficulty gradually. The idea is that food isn't immediately



FIGURE 2.4 Hand-rearing kittens should mimic certain aspects of how the mother would behave, and this would help to proof them against frustration. Photo courtesy of Helen Kubiak.

forthcoming so that the young cat can be conditioned to deal with delays and not expect access to an immediate reward – not for it to be so difficult that it induces and heightens frustration.

Diet

Under-nourishment of the mother and nutritional deprivation in kittenhood can contribute to physical abnormalities and disorders including impaired growth of the brain – potentially leading to poor learning abilities. In turn, long-lasting problematic behaviours are more likely throughout life. This may include diminished development in coordination: movement, play, and climbing (with increased accidents), delayed exploratory behaviours, hyper-reactivity, anxiety, and abnormal fear and aggression behaviours.

It is not within the remit of this book to go into full details of a cat's nutritional requirements but suffice it to say, appropriate feeding of a pregnant and lactating mother cat and a suitable diet for weaning kittens and throughout their early life stage is of paramount importance for normal physical and behavioural development.

Social Learning

By observing their mother and interacting with litter mates, kittens learn important social behaviours (Crowell-Davis et al. 2004). This includes how to interact with other cats and the nuances of body language. Paying close attention to how their mother reacts to social and non-social situations helps them learn how to behave (with cats, animals, and people), what things are safe and what might be considered dangerous. This is why the caregiver's relationship with the mother should be friendly and relaxed because seeing her sociable response to people and handlers will promote their friendliness.

If a kitten sees its mother displaying aggression, fear-related behaviours, and generalised anxiety toward people and other non-threatening stimuli, then they are likely to learn to respond in a similar fashion. In these circumstances, brief periods of separation from the mother during socialisation sessions are most advisable.

Weaning

Weaning is the process of gradually withdrawing the supply of the mother's milk and ultimately replacing it with a solid diet. In the wild, this typically begins around three weeks of age when the mother brings dead or dying prey items for her offspring to consume. However, in nature, kittens stay with their mother and continue to suckle for longer periods than most domestic cats.

Weaning in domestic scenarios generally begins at around four weeks of age and it is usually completed by eight weeks of age – the typical age when kittens are rehomed. However, there is a good argument for them staying with the mother longer to aid optimal behavioural development. Some welfare organisations prefer to keep kittens with the mother until they are 9 weeks old and it's not unusual

for breeders of pedigree kittens to wait until they are 12 weeks old before letting them go.

In scientific literature, early weaning of animals has been shown to impair memory and cognition and appears to blunt social learning. It has been suggested that in kittens it can lead to rough play and in 2017 some research, undertaken by scientists from the University of Helsinki, Finland, showed that it increased the probability of aggressive behaviours when compared to kittens who stayed with the mother until 12 to 13 weeks of age (Ahola et al. 2017). This same piece of research concluded that the welfare of home living cats may be improved by pushing the recommended weaning age to 14 weeks.

Extended weaning however means that the kitten(s) will be with the breeder for a significant length of time. This may be advantageous provided the breeder's level of knowledge is sound, the behaviour of the mother is solid and the environment they are kept in is appropriate. Carrying out a risk assessment is the best policy: if the kittens are likely to have an impoverished socialisation experience and are being raised by a mother who is fearful, anxious, and has a number of problematic behaviours, then it's best not to leave them with her beyond the usual weaning time frame.

Top Tip: Studies have shown that the scent of the nest site reduces stress (Behnke et al. 2021) and acts as a secure base. This effect can be applied when a kitten enters a new home. Asking the breeder for a remnant of the bedding and placing it in their new bed or chosen resting place may help establish their new surroundings as being secure and comforting, aiding the transition to their new home.

Play

Play is significant in the kitten's development and in the wild this would be a prelude to learning hunting skills to fend for themselves. Kittens will begin to play with other litter mates at around three weeks of age (Overall 2013), but by about five weeks of age they become more coordinated and start playing with objects (object play). This involves tossing things in the air and pawing and pouncing on them as if they were prey.

Playing with the mother and their siblings also teaches a kitten about bite inhibition. Knowing how much pressure to use with teeth helps to ensure social interactions don't get out of hand and are kept within acceptable boundaries. Other functions of play include building independence, enhancing physical fitness, promoting mental health, and developing and fine-tuning coordination skills.

Providing kittens with a variety of toys that have different textures and sounds and encourage a range of movement can help develop sensory development and eye–paw coordination (see Figure 2.5). To prevent inappropriate play and teach the kitten bad habits, playing games that involve hands and feet is to be avoided.

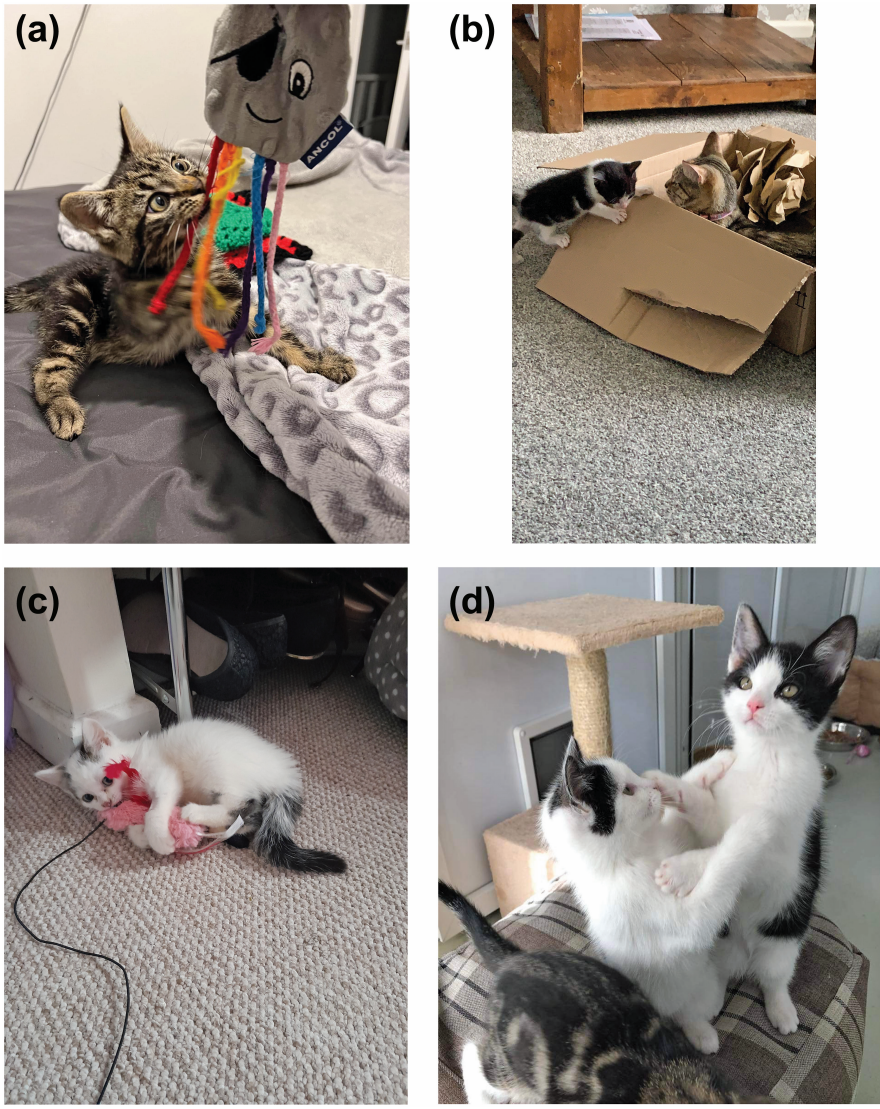

FIGURE 2.5 Play is important for kitten development. Photos courtesy of Amotherby Cat and Kitten Rescue (a), Helen Kubiak (b), Chloe Riddick (c), Holly Barker at Hull Animal Welfare Trust (d).

Singleton kittens tend to direct play to their mother, but as she is less likely to participate than a litter mate would, these lone kittens may lack social play which can stunt their development, but may also predispose them to inappropriate play behaviours with humans throughout life. Caregivers should therefore make a concerted effort to engage them in acceptable play. We shall be spending more time on how this can be done later in the book.

PUBERTY

Puberty is the time when the cat is capable of sexual reproduction, during which time there are a number of behavioural changes. Various factors determine when this commences, especially in relation to the female – which will be covered in more detail under the heading 'Reproductive Behaviour'.

ADOLESCENCE

The beginning of adolescence occurs around the onset of puberty and can last until 18 months to 2 years of age. It is a period when the youngster transitions from kitten to young adult, so there is heightened hormonal activity and significant neural changes going on within the brain as it remodels and adapts.

Behaviourally, adolescence is associated with greater independence and the young cat usually begins to express itself with more force. As well as the development of sexual behaviours, other changes emerge. The youngster sometimes begins to appear less tolerant as they explore and extend their physical boundaries. Scratching may also become more prevalent as they designate territory and develop their olfactory communication skills. These are fairly typical and quite normal changes but it's a good idea to channel the cat's behaviour, by providing them with suitable resources and outlets to focus on, so they don't develop bad habits.

Another potential effect of adolescence is emotional volatility. It's not uncommon for some caregivers to report that their young cat is suddenly more reactive to new things or is beginning to show fears towards things that they had previously been well socialised to. The best advice is to return to the principles of habituation and socialisation, taking a few steps back and revisiting some of earlier training which can help familiarise them and reset things again.

Because this sensitive phase can coincide with neutering and the consequent trip to the vet, it's important to prepare them by working on cat carrier training. Ensuring that the veterinary clinic of choice adheres to feline-friendly protocols is also highly recommended.

Details of cat carrier training can be found in Appendix 1.2 at the back of the book.

Preventing Unwanted Pregnancies

Because it is possible for kittens to become sexually active as early as four months of age, veterinarians and cat charities recommend that neutering should be carried out before a cat reaches five months of age. This helps to prevent unintended pregnancies and subsequently reduces potential overcrowding in already stretched rehoming centres.

Although there have been some valid concerns about presenting a very young cat for surgery, most charities still recommend early intervention. Research that looked at spay/neuter outcomes found that the veterinarians who took part in early neutering schemes (and had collectively performed approximately 200,000 early neutering

procedures) unanimously agreed that early surgery was safer, faster, and easier than the same surgeries in those that were six months of age or older (Land 2000).

REPRODUCTIVE BEHAVIOUR

The Domestic Tom Cat

Male cats reach puberty typically between 7 and 12 months of age although spermatogenesis (the production of sperm) can commence as early as four to five months of age (Adams et al. 2011).

The tom cat is unlikely to make a desirable house pet largely because their behaviour is driven to attract sexually receptive females. This involves urine spraying which has a characteristic pungent odour due to high levels of an amino acid (protein) called felinine. As we shall soon learn, spraying urine is a method of chemical and visual communication, although in mating scenarios its main function is to inform sexually receptive females and rival tom cats about an individual's sexual status and physical fitness.

The Domestic Queen

The female cat reaches puberty (sexual maturity) at around six to nine months of age, after which she is referred to as a 'queen'. However, because oestrus (aka 'season') is driven by the seasons and in relation to longer day-length and periods of light, this can dictate the onset.

In the UK, kittens born in late spring may not experience their first season until they are 12 months old, whereas those born in early winter might enter their reproductive cycle at a much younger age as the days get longer (Adams et al. 2011). There is also some variation between breed types and it has been noted that longhair cats tend to reach puberty later than shorthair cats (Tsutsui and Stabenfeldt 1993). Behavioural changes during oestrus can be quite alarming and some inexperienced owners can, understandably, mistake them for signs of pain.

Oestrus

A day or so prior to oestrus (a period called pro-oestrus) the queen may begin showing some signs of oestrus but she will not be receptive to toms even though they will begin to show an interest in her. She is in oestrus for around five to seven days although this can be shorter or longer depending on whether she has been mated or not.

The signs of oestrus include:

- Loud, intense, and persistent vocalisations (described as a 'mowl' sound) to 'call' for a mate.
- Increased facial rubbing on objects to deposit scent and pheromones.
- Frantic rolling around on the floor.
- Purring.



FIGURE 2.6 A queen in oestrus will perform lordosis to signal her receptivity to the tom. Courtesy of Emma Bush.

- Holding the tail to the side to expose genitalia.
- Lordosis – lowering her chest, elevating her backend and sometimes treading with the back feet (see Figure 2.6).

The queen is an induced ovulator meaning that the ova (eggs) for fertilisation are produced (or induced) in response to being mated. If she isn't mated or doesn't become pregnant, oestrus declines but after a period of around a week or so she returns to oestrus and the cycle continues. She can have multiple 'seasons' when daylight length is suitable and can mate many times – sometimes with different toms. As the day length decreases and nights draw in, she usually enters a period of hormonal inactivity called anoestrus. These facts help explain why litters of kittens are typically more likely to be born between April and September in the UK.

Courtship and Mating

Courtship behaviour is a noisy affair and similar to the queen, when the tom senses a nearby queen is coming into oestrus, he also makes a distinctive and intense mowl 'call'. Facial rubbing behaviour, believed to form part of courtship, acts as a visual display but also deposits a pheromone from glands in the face. We'll be exploring pheromones and their role in communication a little later in the book but essentially,

pheromones are chemical signals that trigger a social response in members of the same species.

Tom cats also engage in frequent fights with other toms to 'win' the right to mate the queen. This is accompanied by loud, intense growling, yowling, and shrieking. These encounters can put them at a greater risk of sustaining injuries and contracting serious diseases that are transmitted through cat bites. The most concerning are Feline Immunodeficiency Virus (FIV) (sometimes referred to as 'feline aids') and Feline Leukaemia Virus (FeLv), both of which can weaken their immune system, rendering them vulnerable to other diseases and making them a source of infection to other cats.

Mating itself is quite a rapid and dramatic affair. The male grasps the queen by the scruff of her neck with his teeth and mounts her. She assists by lowering her chest, elevating her backend and moving her tail to one side to expose her genitalia, a behaviour known as 'lordosis' (Johnson 2022b).

Whilst the tip of the tom's penis is smooth, two-thirds of its length is covered in a series of tiny barb-like structures called penile spines (Johnson 2022a). During erection, engorgement of the penis causes the spines to tighten and protrude outward. It is believed that these structures assist with the 'hold' and also provide additional stimulation to encourage the female to ovulate (release ova for fertilisation). In less than 30 seconds of thrusting, he withdraws quickly, which causes the queen to emit a low growl, followed by a loud yowl – most likely in response to the sharp penile spines. As an after reaction she typically rolls, rubs along objects and licks her vulva. If the tom doesn't get out of the way quickly enough, she can sometimes show some aggression towards him – swiping out with her unsheathed claws and vocalising. This post-mating behaviour is usually confirmation that intercourse was successful. After a short period of recovery, mating is repeated – usually many times per day.

Pregnancy

The normal gestation period (length of pregnancy) varies but is generally between 63 and 68 days (around nine weeks) with the average litter size being between four to six kittens.

During pregnancy, there may be a number of behavioural signs. Some caregivers report higher levels of attention-seeking and clinginess, increased friendliness and affection. Others report a rise in aggression and irritability. Some cats don't seem to undergo any behavioural changes. To err on the side of caution, any signs that denote negative emotions should be reported to the veterinarian to rule out any clinical conditions.

Parturition (Giving Birth)

When giving birth (sometimes called 'queening') there are a variety of behavioural changes, representing the three stages of labour:

Stage One

Occurs when birth is imminent – may last 6 to 24 hours.

- Loss of appetite.
- Increased respiration rate (panting).
- Restlessness.
- Increased vocalisation.
- Purring.
- Hiding.
- Nesting behaviour (scratching around a bed or kittening box).
- Increased grooming – paying attention to her vulva and mammary glands (which may act as an olfactory cue to help the newborn kittens locate the teat).

Stage Two

Occurs when the kittens are being delivered.

- Strong contractions and noticeable straining.
- Appearance of the first kitten within 30 to 60 minutes.
- Other kittens can follow on within 10 minutes but the queen may need a rest in between. This might last for a couple of hours (but veterinary advice should be sought if there is active and unsuccessful straining for more than 30 minutes or if she appears distressed).
- During and after giving birth to her litter, the queen licks away the birth membranes surrounding the kitten – paying attention to those around the nose and face and she chews the umbilical cord to detach it.
- The placenta (afterbirth) can be expelled with the passage of each kitten.
- Vigorous licking of the kitten helps stimulate it to breathe.

Stage Three

Occurs after all the kittens have been born.

- Expulsion of the placenta (which may already have occurred in stage two as mentioned).
- Counting the number of placentas can help confirm that they have all been passed. A retained placenta, although rare can lead to serious infections.
- Left to their own devices, queens usually consume all the foetal membranes and placentas. In the wild, this would have prevented predators from being attracted to the nest site as well as providing a nutritious meal (Atkinson 2018).

During the birthing process, to avoid triggering any problematic behaviours such as abandonment and aggression towards the kittens, it is advisable to keep a low profile. Observations are of course important to ensure everything is going smoothly but should be done with minimal noise and interference.

Whilst a queen is feeding her offspring she doesn't usually come back into oestrus until around 10 days after weaning. Queens with small litters, or those whose litters have died, can enter oestrus approximately 10 days after delivery.

Maternal Aggression

It is not unusual for a queen to show some aggression towards people or other animals that come close to her kittens after she has given birth – especially unfamiliar ones. Respecting her uncertainty for the first few days, and letting her settle with her offspring, should bring about a reduction in her behaviour. Once she is less protective, gradual and sensitive interactions can be made. However, if the behaviour perpetuates beyond the neonatal period, it can be damaging for the kittens in terms of their social learning. As mentioned earlier in the book, handling is critical for optimal socialisation and may need to be done without her being around so they don't take her lead. Neutering after the kittens have been fully weaned is best as breeding from a queen with these traits is not recommended.

THE SENIOR CAT (10 YEARS UPWARDS)

With the arrival of improved diets and modern veterinary medicines, the life expectancy of companion animals has increased and cats are no exception.

Equating a cat's age to that of a human isn't easy, simply because we are a totally different species. We know that the old method of calculating seven years for every one of our human years isn't very accurate but to give us a better idea, International Cat Care (iCatCare) has suggested using the following formula:

The first 2 years of a cat's life compare to 24 human years and every year thereafter is equivalent to 4 human years. So, a 10-year-old cat is similar in age to a 56-year-old person.

The Process of Ageing

Ageing is a natural process and not a disease, yet many physical and mental changes accompany old age and health risks increase with each advancing year. The immune system is less efficient and general wear and tear can take its toll.

Some conditions can be painful or bring about changes that impair mobility and cognition, affecting the cat's behaviour and quality of life. This can be compounded when there is multi-morbidity (i.e. more than one disease process going on at a time).

Pre-empting and recognising the changes that take place can help detect and, with the right veterinary care, can delay the progression of disease and ultimately prolong life.

Physical Changes

Some of the more noticeable physical changes include:

- Thickened, overgrown, and brittle claws, which sometimes need trimming to prevent them from getting caught or ingrowing into the skin.
- Thinner skin with loss of elasticity.
- Changes in weight, including obesity or weight loss. However, weight loss can be related to muscle wastage (see Figure 2.7). Keeping an eye on body scores is a good idea (see Chapter 7).



FIGURE 2.7 Muscle wastage on the thighs is a noticeable change in elderly cats. Photo courtesy of Tommy Taylor.

- Sensory decline, including hearing loss and visual impairment; most cats cope well with a gradual decline, but sudden onset can be disorientating, heightening fear and anxiety. Sudden blindness can arise as a complication of hypertension (high blood pressure), all the more reason for having an elderly cat's blood pressure (BP) monitored regularly. Deaf cats sleep very deeply, so they should always be woken gently to avoid startling them. Blowing softly on their fur, rather than risk frightening them by touch, is a tactic that can work well. Strategically placed night lights may help visually impaired cats find key resources, such as litter boxes and water bowls in the dark.

Behavioural Changes

- Reduced activity.
- Sleeping for longer periods.
- Changes in appetite (reduced ability to smell and taste food can affect appetite).
- Reduced play and hunting behaviour.
- Increased vocalisation.
- Less tolerance for stress.
- Sometimes more needy, clingy, and dependent.

Behavioural and physical changes can be directly related to a medical condition so rather than assuming that the change is an inevitable part of getting old, it's always

best to get the cat examined by the vet. In many cases, treatment is available and can make a significant difference.

The AAFP Senior Care Guidelines (Ray et al. 2021) recommend that regular examinations that include diagnostics (e.g. blood tests and blood pressure monitoring) take place at least annually for cats from seven years of age. These can act as a reference point when tracking future changes. For older cats, especially those from 10 to 15 years of age, twice-yearly examinations are recommended (Caney 2023) and for healthy senior cats over the age of 15, every four months. Cats with pre-existing conditions will need to be seen more regularly under the direction of the veterinarian supervising the case.

Medical Conditions Prevalent in the Elderly Cat

Diseases that affect organs and conditions that cause pain and impair mobility can contribute to changes in the cat's behaviour, whatever their age. That will be our focus in Chapters 5 and 6, but for now, it's important to highlight some of the medical conditions that are more prevalent in seniors, these include:

- Osteoarthritis – a degenerative joint disease.
- Oral health issues (see Chapter 6).
- Impairment of the senses, e.g. declining hearing and sight.
- Chronic kidney disease (CKD).
- Hypertension – high BP.
- Diabetes mellitus (DM) – an endocrine disease caused by insufficient production, or response to, the hormone insulin which is essential to the regulation of blood sugar.
- Hyperthyroidism – an increase in thyroid hormone production.
- Feline dementia – more formally known as feline cognitive dysfunction syndrome (CDS).
- Tumours and growths.
- Dehydration (secondary to other diseases such as DM and CKD).

Source: Based on Caney (2023) and Ray et al. (2021)

It doesn't fall within the remit of the book to cover all medical conditions but I shall offer some information on a few that are more representative in elderly cats.

Osteoarthritis

Osteoarthritis (OA) is a painful degenerative joint disease (DJD) causing inflammation around the joints. This comes about when the cartilage, found on the ends of the bones that make up the joint, becomes rough and uneven. As the condition progresses the bones rub together which causes decreased joint movement and a high degree of discomfort. Although there is no cure and the condition worsens over time, it can be managed so that the progress of the disease is slowed down.

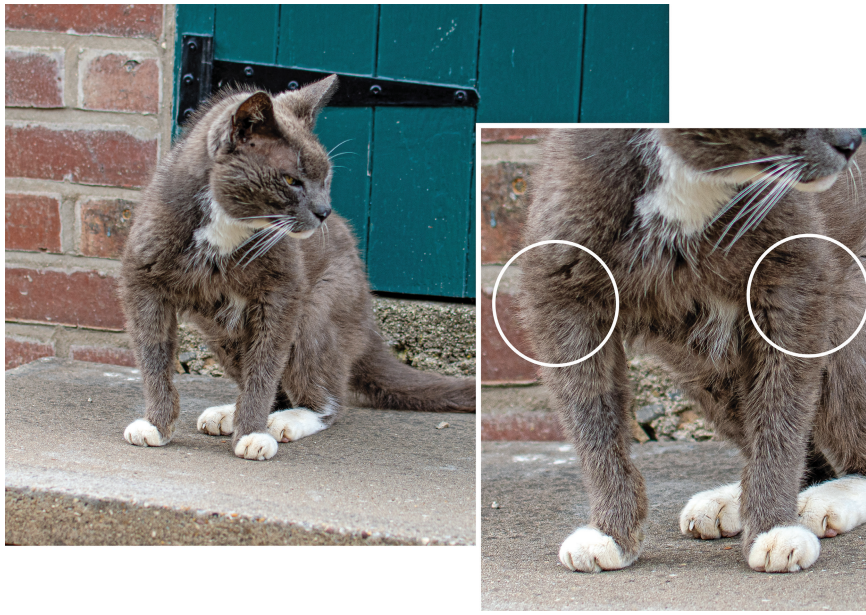

FIGURE 2.8 Osteoarthritis is common in elderly cats and can affect the elbow joints causing thickening. Photo courtesy of Tommy Taylor.

OA can affect any age of cat but it is more prevalent in the elderly. Studies suggest that it is significantly underdiagnosed. One retrospective study of 100 cats demonstrated that 82% of cats older than 14 years had radiographic signs of osteoarthritis, 61% of cats older than 6 years had radiographic evidence of osteoarthritis in at least one joint and 48% had changes in multiple joints. However, only 13 of the 100 cat carers reported noting any lameness (Slingerland et al. 2011) A second study reported that 90% of cats older than 12 years of age had radiographic evidence of osteoarthritis (Hardie et al. 2002). The joints most commonly affected include those in the limbs, especially elbows (see Figure 2.8) and stifles (knees).

Recognition of OA

There are a range of signs that caregivers should look out for, although changes in mobility can be extremely subtle and difficult to discern. Remarkably, cats rarely limp unless in extreme pain, preferring to restrict certain activities to protect themselves from discomfort and to guard against appearing weak and vulnerable. In the wild, this would have acted as a survival strategy to ensure they did not succumb to predation. Once limping or lameness is apparent, it suggests that the cat is in a high degree of pain.

Reflecting on the cat's routine and observing their movements is particularly important. Determining whether a cat is using their resources freely or not can also help identify problems. For example, cat trees and scratch posts may be used less

often or places they sleep and rest might have changed to downstairs or to lower levels.

Bending down to drink and eat can be more difficult if the vertebrae of the neck and back are affected. This may, therefore, manifest in a reduced appetite leading to nutritional deficits and potentially a degree of dehydration, which can have an impact on urinary and kidney health – a risk much more serious in the elderly cat. Raising bowls is a simple solution along with increasing the opportunities for them to drink (see Chapter 3).

From a behavioural aspect, being unable to jump up and down from a height can affect their ability to access one of their main important coping mechanisms, leading to generalised stress and anxiety. Similarly, being unable to return to the home because of difficulty getting over high fences or climbing in and out of cat flaps can affect the cat's sense of freedom and control, which can lead to frustration and stress.

Cats with OA can find it painful to groom themselves. Matted fur and general neglect especially in places hard to reach, such as the lower back and rump, can be an indication of problems. As a fastidious creature, this can be a source of stress. Assisting with grooming can be beneficial. Conversely, some cats will spend more time grooming. However, close observations may reveal that this is generalised to areas around a joint(s) – a response that many animals exhibit as a reaction to localised pain.

House soiling may be another sign of problems. High-sided or a covered litter box can be more difficult to step in and out of which can discourage a cat from using them. Ramps leading into the litter box or choosing ones with lower sides can ease access. With regard to litter substrate, offer another alternative if their current one is uneven and chunky as this might be uncomfortable to stand on or painful to dig when joints are sore. Finer litters may be favoured.

It's always worth remembering that older animals can have a lower threshold for anxiety, especially when there is underlying pain. Also, sudden changes to their routine and environment can trigger stress – so alterations should always be made gradually and with sensitivity.

Spotting the Signs of OA

- General signs of pain (see Chapter 6).
- Reduced mobility/activity.
- Reluctance, hesitance, or refusal to jump up or down.
- Reluctance in going up or down stairs.
- Limping and stiffness – especially after longer periods of rest.
- House soiling (as a result of difficulties accessing a litter box or getting into a comfortable toileting position).
- Difficulty/reluctance to go through a cat flap.
- Increased time spent resting or sleeping.
- Reduced or cessation of hunting or exploring the outdoor environment.
- Sleeping in sites that are more readily accessible.

- Reduced interaction with people or other animals (e.g. withdrawal, reduced play).
- Altered grooming behaviour (unkempt coat or increased grooming/licking at the joints in response to pain).
- Reduced use of scratch posts/sites.
- Overgrown/ingrowing or reduced maintenance of claws.
- Temperament changes, e.g. irritable, grumpy, withdrawn, and anxious.

Management and Treatment

Veterinary input is essential so that pain can be controlled. There is a strong likelihood that they will recommend a therapeutic diet and/or a specific supplement to assist with joint health (e.g. omega-3 fatty acids). Integrated therapies such as physical rehabilitation, acupuncture, and low laser therapy, that reduce inflammation and pain, may form part of the plan (Jaffe 2023).

Because pain is an individual experience, the results of diagnostic imaging (e.g. X-rays) do not always match up with the degree of pain an individual is experiencing. In other words, minor changes or lack of significant abnormalities in joints does not imply that the cat isn't feeling pain. In fact, some veterinarians prefer to diagnose arthritis on the presenting symptoms, the cat's history and their response to treatment. Some clinicians may only use X-rays as a guide or may even choose not to X-ray cats that have all the symptoms of arthritis on a physical examination.

> **Top Tip:** Avoid over-extending or holding the limbs with force. For instance, care should be exercised by veterinary teams when manipulating the forelimbs to give intravenous injections, and groomers and other caregivers should take care when holding limbs for brushing or when clipping claws.

Caregivers can make a significant contribution to the management of osteoarthritis by keeping an eye on the cat's body weight, as obesity can exacerbate the condition. Carrying out an assessment of the house can also make life much easier for them. Thinking about the general layout of the home and garden, and ways it could be altered, can really improve their quality of life.

Examples of the modifications that can be applied include:

- Rearranging furniture so they can step up and down, and to and from, favoured locations without having to jump or place pressure loads on limbs.
- Creating floor level cat flaps or using ramps to ease access to it.
- Cutting holes in fences so they don't need to jump over gates and high barriers to get back home.
- Consider cat-proof fencing for safe outdoor space if there are concerns for the cat's safety (e.g. difficulty getting across roads or remembering how to get home).



FIGURE 2.9 Raising food bowls can help elderly cats with arthritic changes in the spine and neck. Photo courtesy of Ruth Egan-Linnecar and Sarah Scahill.

- Review the litter box arrangement.
- Raising feeding and water stations to the right height, to avoid strain on the neck (see Figure 2.9).
- Providing extra padding in beds to aid comfort and provide support for joints.
- Adjusting the style of play to account for changes.

iCatCare and ISFM (the veterinary division of the charity) have produced guidance for caregivers on how to detect and manage pain. See Appendix 3.3 at the back of the book.

Feline Cognitive Dysfunction Syndrome (CDS)

Feline CDS is also known as feline dementia. The age of onset can vary but it primarily affects senior cats, sometimes beginning at the relatively young age of 10.

Symptoms, which include disorientation and loss of memory, can affect the cat's ability to locate familiar resources and locations, all of which can be a source of anxiety. Because other age-related diseases and organ failure may also be involved it is especially important that a full clinical examination is performed by the veterinary surgeon.

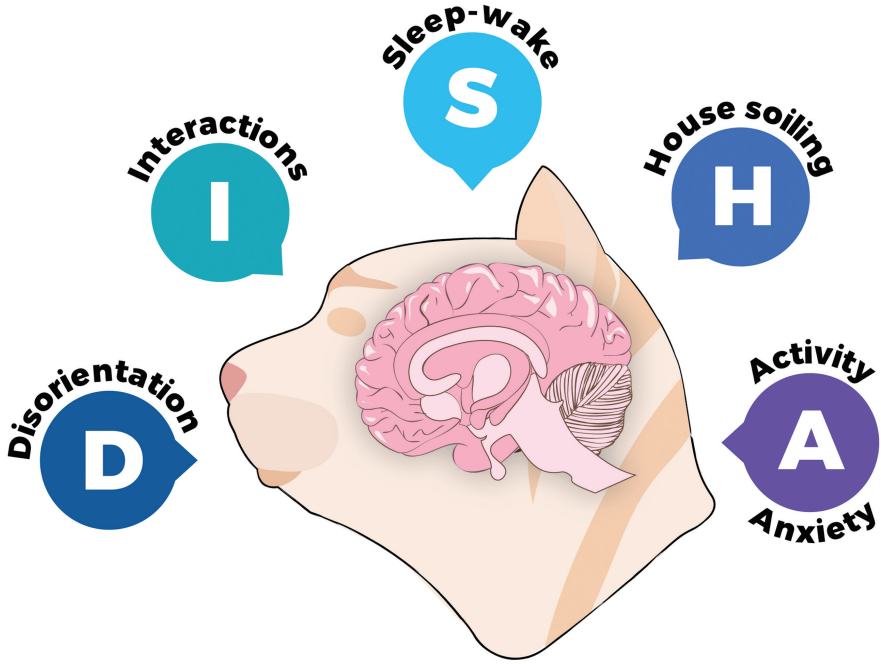

FIGURE 2.10 The acronym DISHA has been used to represent the categories of clinical symptoms typical of cats with cognitive dysfunction, although there are other signs particularly increased vocalisation.

Recognition of CDS

Diagnosis is based on the exclusion of other medical disorders. The acronym **DISHA** has been used to represent the categories of clinical symptoms typical in cats with cognitive dysfunction. Targeted questions based on these categories can help educate caregivers and flag up some of the hallmark symptoms, guiding veterinary and behavioural management (see Figure 2.10).

- **Disorientation**, confusion, and forgetfulness, e.g. asking for food repeatedly.
- Alterations in their **interactions** and social relationships, e.g. seeking attention from caregivers or interacting less.
- Alterations in **sleep–-wake** patterns, sometimes leading to excessive vocalisation in the early hours of the morning, due to their circadian rhythm (natural body clock) being disturbed.
- **House** soiling, possibly due to the inability to locate the cat flap or litter box.
- **Anxiety** and any of the stress signals (see Chapter 5).
- **Activity**, e.g. aimless pacing, repetitive movement (often in combination with vocalisation).

Source: Based on Landsberg et al. (2010).

Management and Treatment

At present there is no effective cure for feline CDS. Nevertheless, there are a variety of supportive treatments and suggested management strategies that may help to ameliorate the symptoms and reduce the advancement of the condition.

Caregivers have the power to enhance their elderly cat's cognitive environment by providing enriched feeding opportunities and interacting with them through play to activate the brain, keep the joints moving and boost the production of natural feel-good endorphins.

Supplementing the diet with nutraceuticals may also offer opportunities to manage the condition. Antioxidants and essential fatty acids that help to reduce oxidative damage, and other ingredients that are known for improving brain energy and cognition, are commercially available. Although clinical trials are still scant, they have been purported to help keep the signalling systems in the brain firing. Speaking to a veterinarian about what is available is a good idea (see Chapter 10).

Hyperthyroidism

Hyperthyroidism is an endocrine (hormonal) condition that occurs due to excessive production and secretion of the thyroid hormones: thyroxine (T4) and triiodothyronine (T3). This overproduction of thyroid hormones increases the cat's metabolic rate, speeding up many of the physiological parameters (Gear and Mathie 2011).

Recognising the Signs

Behaviourally, a cat with hyperthyroidism often eats excessively but still loses weight. Other notable signs include irritability, low tolerance, and difficulty relaxing. Clinically, if the thyroid gland is enlarged it can be palpated by the vet (this is called goitre). The heart rate is often increased and the blood pressure (BP) is raised (Mardell 2022).

Diagnosis is based on blood samples. Interestingly, cats with hyperthyroidism have been shown to have raised cortisol (a stress hormone that we will be learning more about soon) in their urine (Ramspott et al. 2012), which suggests a possible link with chronic stress, although it's still uncertain whether this is because the condition itself causes stress or if stress predisposes the cat to the condition. Further research may help in our understanding.

Management and Treatment

Veterinary treatment is available to restore normal thyroid levels and this usually also brings about a positive change in behaviour. Depending on the case, treatment options include oral medication, surgical removal of the thyroid gland(s) (with drug therapy to replace the hormone thereafter), or radioactive iodine therapy which destroys abnormal thyroid tissue (Mardell 2022).

Hypertension (High Blood Pressure)

The risk of hypertension in cats increases with advancing years. It has been estimated that one in eight cats over the age of nine are likely to be sufferers. Quite often hypertension is secondary to an underlying disease, commonly chronic kidney disease (CKD) and hyperthyroidism (Taylor et al. 2017). However, hypertension is a well-known physiological consequence of stress so this can also be a factor.

Hypertension makes the blood in the vessels circulate at high pressure which can cause bleeding and damage to vital organs such as the kidneys, heart, brain, and eyes. Sudden blindness, congestive heart failure and irreparable kidney failure can be some of the more serious consequences.

Recognising the Signs

It can be difficult for the caregiver to spot the signs of raised BP which is why regular monitoring is so important.

Behaviourally, the cat may appear depressed, disinterested, and withdrawn. In people, it's common to suffer from headaches and there is no reason to believe that cats don't also experience similar symptoms. Unfortunately, they can't tell us!

Similar to humans, BP can rise due to stress in the clinical environment (known as the 'white coat effect'). Therefore, a series of measurements are taken once the cat is settled in the clinical environment. For cats that get especially stressed, prescribed medication is available, which can be given prior to the appointment. This helps to calm them down but fortunately doesn't affect the BP readings.

Management and Treatment

Treatment designed to reduce BP is available from the veterinarian, although a full blood screening to rule out and treat any underlying diseases is an important step, as is following a stress reduction plan.

Teaching a cat to relax on a comfort mat whilst the BP and blood samples are being taken can be particularly helpful. For details refer to Appendix 1.1 at the back of the book.

KEY TAKE HOME POINTS

- Kittens have distinct developmental life phases when specific physical and behavioural landmarks occur.
- Positive early life experiences are crucial for a kitten's development and enhance their lifelong welfare.
- A kitten's socialisation period begins and ends over a relatively short time frame, so can easily be overlooked.
- Inadequate opportunities to play, early weaning and poor nutrition can be risk factors for the development of behavioural problems in adulthood.
- Ageing is a process, not an illness.

- Senior cats undergo physical and mental changes that can, with vigilance and prompt veterinary care, be well managed and controlled, thus improving their quality of life.

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3 Identifying and Fulfilling the Cat's Needs

One reason that people choose cats as companion animals is because they are considered to be low-maintenance. Unlike the dog, they don't need to be taken out for walks and their independent nature means they are more self-sufficient. To a degree this is true, although cats do have a significant number of key requirements that ensure their welfare needs are met. Most of these focus around the provision of a safe environment that allows them to express their natural behaviours.

For optimal emotional well-being, a cat requires a suitable environment in which to live. These requirements have been scrutinised by feline behaviour experts and organised into a set of guidelines that provide caregivers and practitioners with an easy-to-follow framework for a healthy feline environment.

Two of the most acclaimed include the Multimodal Environmental Modification (MEMO) framework – developed by Dr Tony Buffington, a professor of veterinary behaviour and the 'Five Pillars of a Healthy Feline Environment', created by a team of experts (Ellis et al. 2013) on behalf of the International Society of Feline Medicine (ISFM) and the American Association of Feline Practitioners (AAFP). Both offer practical measures that can be applied whatever the setting or lifestyle of the cat.

MULTIMODAL ENVIRONMENTAL MODIFICATION (MEMO)

MEMO creates a safe, stimulating environment that cats can thrive in, singly or in multi-cat households. It also offers a programme of treatment for cats that have a variety of stress-related behaviours. Table 3.1 provides details of the environmental resources required (Buffington 2023).

Aligned with MEMO philosophy, all cats require multiple resources. This gives them more choice and control over their environment. Being able to access a particular resource when another is less convenient, or inaccessible, means the cat feels safer. Competing for limited resources is a source of conflict, so in multi-cat homes there must be enough to go around, laid out with sufficient space in between them.

Observing which types of resources are favoured, and taking into account their location or the context in which they are used, helps shape the way we manage and set up each individual's environment in accordance with their preferences.

FIVE PILLARS OF A HEALTHY FELINE ENVIRONMENT

The five pillars that encompass the needs of a cat represent key requirements as depicted in Figure 3.1.

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TABLE 3.1 MEMO Provides a Framework for Creating a Healthy Feline Environment and Has Been Shown to Significantly Improve Some Aspects of Feline Behaviour

Environmental resource	Examples of modifications
Litter box (also known as litter tray)	• Multiple litter boxes – ideally one per cat, plus one extra spaced apart. • Use unscented litter of optimum depth and provide a suitable-sized box, (ideally 1.5 times the length of the cat, from nose to base of tail). • Cats generally prefer sandy litter over coarser heavier varieties. Consider setting up a preference test. • Cats prefer to toilet away from their feeding and drinking stations. Position litter boxes in appropriate quiet, private, locations.
Drinking water	• Provide plenty of opportunities to drink. • Offer water at multiple water stations, in a variety of receptacles. • There appears to be a preference for large ceramic bowls with wide openings. Avoid plastic as this can taint the water. • Separate drinking stations away from food (cats tend to drink more when water is away from their food).
Food	• Provide separate feeding stations for each cat with a sufficient distance apart (i.e. in a different location) to avoid being watched or forced to share, as this can increase anxiety. • Avoid preparing food in the presence of the cats as this can create tension and may lead to conflict. • Encourage hunting and foraging behaviours through interactive feeders (ensure they are not too difficult to begin with as this can induce frustration). • Offer several small meals daily. • Feed well away from litter boxes and water stations. • Wet diets can help to increase water consumption.
Toys	• Provide sufficient and favoured toys for each cat. • Rotate regularly to prevent boredom. • Set aside regular, consistent, interactive play times with each cat individually but encourage independent play too.
Scratching opportunities	• Provide opportunities to scratch (sufficient resources to support each cat) as scratching is a form of marking and may help to increase feelings of security. • Provide a choice of vertical and horizontal scratch sites. • Encourage cats to use new sites by scratching/raking with a wire brush. This mimics scratch marks, creating a visual stimulus.
Resting and sleeping	• Provide numerous, comfortable, warm, and cosy sites. Include elevated and quiet locations.
Hiding and raised locations	• Provide sufficient accessible hiding places. • Utilise furniture (e.g. shelving/bookcases). • Upturned cardboard boxes provide cost-effective hides.

Source: Based on MEMO Created by Tony Buffington.

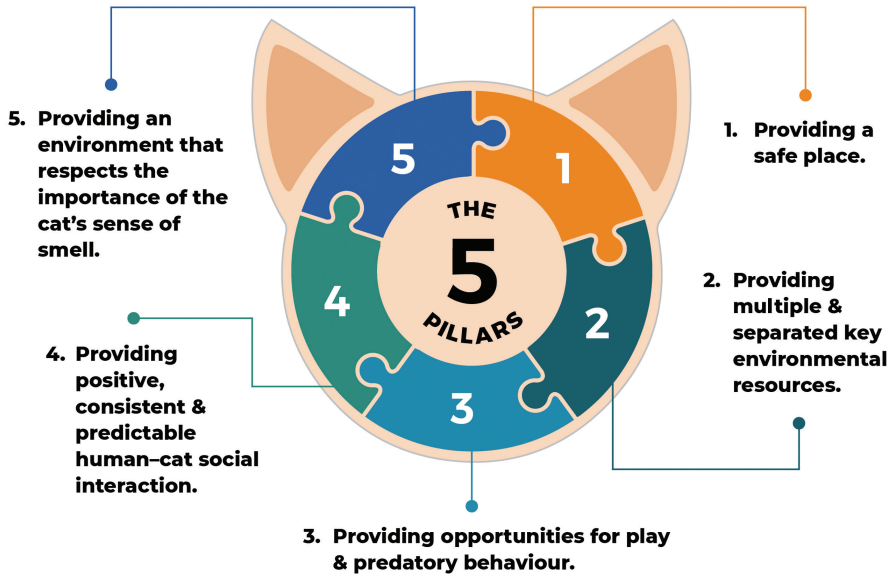

FIGURE 3.1 The Five Pillars of a Healthy Feline Environment created by the ISFM and the AAFP.

Pillar 1: Providing a Safe Place

The range of a domestic pet cat's physical environment is dictated by a number of factors:

- Whether they have access to outdoors/outdoor spaces.
- The number of other cats outside the home (which can limit their home range).
- The dimensions of the core territory (the space at their disposal).

Problems can sometimes occur when the density of cats exceeds their physical environment (see Figure 3.2). This will be discussed in more detail later in the book.

Within the house (core territory), and to a lesser degree in the garden (territory), the cat has a number of requirements:

The Need for Safe Retreats

Whilst most people think of the cat as being a predator, they are also a prey animal, and so need somewhere safe to hide and retreat to in order to feel secure. In the wild, if threatened, this would most likely have been at the top of a tree, where the cat could easily hide and assess the landscape and escape from danger (see Figure 3.3).

Creating hideouts, in elevated locations in and around the home, helps a cat feel secure and can act as a mechanism for coping with situations when they feel vulnerable (Halls 2016).

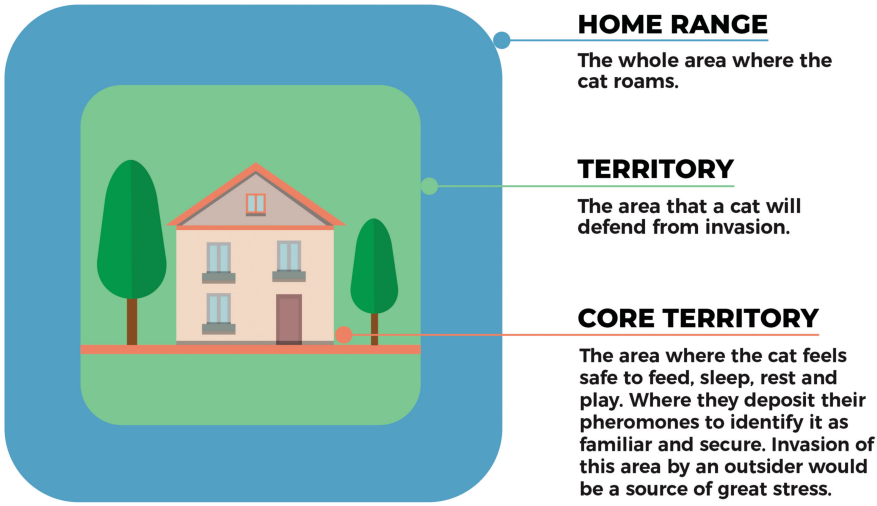

FIGURE 3.2 The Three Zones of a Cat's Physical Environment. Based on an image featured in the ISFM Guide to Feline Stress and Health.



FIGURE 3.3 A cat feels safe in elevated locations. Trees in gardens can help fulfil this need. Photo courtesy of Rebecca Whitehead.

Ways to enhance their surroundings can be achieved by creating suitable sites:

- Cardboard boxes are a magnet for most cats and these can be used extensively throughout their environment. Upturned, with an entrance and exit hole cut out at either end, can assist them in getting in and out easily. In multi-cat households, this arrangement prevents another resident cat from blocking their withdrawal.
- Radiator cradles, windowsills, and enclosed nooks and perches on a cat tree provide other suitable spaces to climb and hide inside.
- There are a number of companies that provide cat-friendly, wall-mounted, and freestanding furniture that helps create spaces for cats to climb, rest, and observe their surroundings – both inside and outside the home (see Figure 3.4a).
- Furniture, such as bookshelves and wardrobes, to hide under or on top of, lined with comfy bedding, can be made accessible (see Figure 3.4b, c).

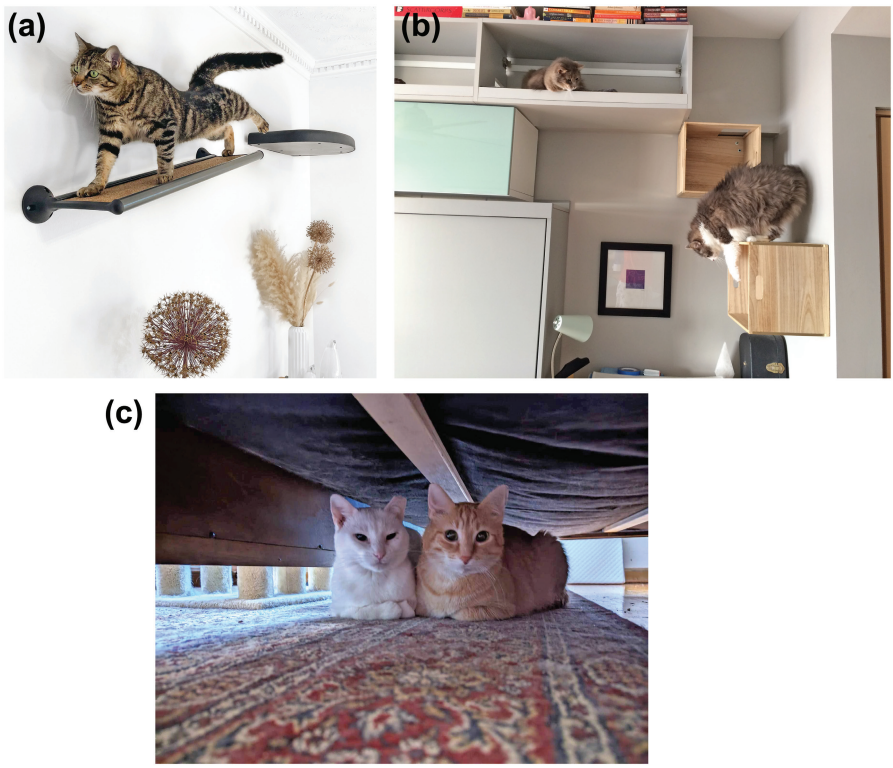

FIGURE 3.4 Wall-mounted furnishings, specifically designed for cats, can provide elevated vertical spaces (a) or existing furnishings can be adapted such as bookshelves and space under beds (b and c). Photos courtesy of Joseph Sutton at Catipilla (a), Elken Miller (b), and Anne Jamil (c).

BRUCE THE DESPOT

The cat's territory is important to them, but their core territory should be sacrosanct. When an incomer invades this space, it is a major source of stress, as you will see in this story.

The History

Sophie was an indoor two-year-old female domestic shorthair cat (DSH). Her caregiver got her when she was eight weeks old from a friend whose cat had a litter of kittens. Sophie was described as being timid and shy and would hide when visitors came to the house. However, she was relaxed around her female caregiver and would spend time sitting on her knee and following her around the home. Problems were triggered when a new cat (Bruce) had moved into the neighbourhood. Apparently, Bruce had climbed in through an open window on a couple of occasions and had once helped himself to Sophie's food. After these incidents, Sophie had become withdrawn, on high alert, and began to spend more time hiding on top of the wardrobe in a spare bedroom.

Bruce can be described as a despot – a cat that seeks out another cat's territory and tries to claim it as its own. They can often cause a great deal of stress if they enter another cat's core territory, as this is the place they need to feel the most secure and safe. Despots tend to target cats that are elderly, infirm or those with a nervous disposition.

Treatment and Outcome

Preventing Bruce from entering the house was the first step. This involved simply removing an outdoor dustbin that was under the window, acting as a platform for him to gain entry and look in. Addressing Sophie's generalised anxiety was helped further by providing upturned boxes and increasing access to elevated spaces and hideouts to satisfy some basic needs and enhance her sense of security. These small environmental changes alone brought about a major improvement in Sophie's behaviour.

Safeguarding the Outside Territory

Outside the house, in the areas around the door and cat flap, a cat will feel more secure and less vulnerable if they are able to slip behind a potted shrub or climb onto a high-up place such as a tree, sturdy shrub, or conveniently placed platform, in order to view their surroundings safely (see Figure 3.5). This can be particularly helpful for cats that live in a location that is densely populated by other neighbouring cats, because leaving the safety of the home through a door or cat flap can be a daunting prospect for a timid cat, especially if there is a strong likelihood of them coming face-to-face with an unfamiliar passerby.



FIGURE 3.5 Providing hideouts in the garden enhances security. Photos courtesy of Amotherby Cat and Kitten Rescue (a) and Mrs Tracy Roberton (b).

Outdoor versus Indoor

Deciding whether to keep a cat exclusively indoors or allow it outdoor access can be difficult. Here in the UK pet cats are free to roam and, unlike certain other countries in the world, there are currently no restrictions or curfews. Consequently, most have the freedom and choice to come and go as they please, particularly if the householder has a cat flap installed. This means they have the opportunity to engage in natural behaviours and gain some respite from the challenges they meet when living in a busy household. However, regardless of location, some caregivers prefer their cats to have an indoor lifestyle. Reasons vary but primarily centre around their safety, potential theft, and to protect wildlife populations.

Whilst all these reasons are perfectly valid, their independent nature means that cats kept wholly indoors are at greater risk of becoming bored and frustrated, potentially leading to behaviour problems (AAFP 2016). Obesity is another risk factor due to the lack of physical exercise. Nonetheless, with an enriched environment that meets their mental and physical needs, it is quite possible to keep a cat indoors without any deleterious effect on their welfare. That is to say, the principles of the Five Pillars of a Healthy Feline Environment can still be accomplished.

Providing a Restricted and Contained Environment

Many caregivers compromise by allowing their cat(s) outdoor access within a restricted and contained environment. This can provide a healthy balance and aligns

with the AAFP Indoor/Outdoor Lifestyle Position Statement (2024), which emphasises that indoor/outdoor living, in an environment that is safe, is the best option for most pet cats.

Installing cat-proof fencing (see Figure 3.6) or erecting a purpose built, outdoor enclosure (also known as a catio) (see Figure 3.7), are practical ways to turn the outside into a safe and secure haven, from where a cat can enjoy greater enrichment and a sense of freedom. It's even possible to install professionally erected modules around a balcony, so cats in high-rise flats and apartments can benefit from some safe outdoor space too.

Once a safe outdoor space has been created, it helps to think about the kind of things the cat will need access to. Obvious things such as toileting facilities, food and water, and comfortable resting places should be provided. If they cannot gain access to these back inside the house, all the same principles should apply in terms of where to locate them including consideration of privacy and optimising the resources (as discussed throughout this chapter).



FIGURE 3.6 Specialist firms provide fencing that makes it physically impossible for the cat to climb over and escape. Photo courtesy of ProtectaPet, with kind permission of Kate Halls.



FIGURE 3.7 A catio provides a safe and secure space. Fixtures, fittings, and items can enrich the environment. Photo courtesy of Michael Darcy.

Being in the confines of a catio or a barren garden can present some additional challenges. For example, cats can feel vulnerable if they are overlooked by unfamiliar cats, people, or other animals. This can be mitigated by providing places to hide, screening the perimeter of the enclosure with plants or camouflage netting and strategically placed planters to aid privacy.

Cat-deterrent, spiky strips that are uncomfortable to walk on, but do not cause injury, can be applied along the top of adjacent fences and walls to prevent neighbouring cats from perching and intimidating the resident catio-bound cat.

When confined outside, shelter from wind and rain is required. Also, somewhere to find shade is important as prolonged exposure to sunlight can cause hyperthermia and sunburn, especially in white or hairless breeds (e.g. sphynx). As well as plenty of shade, cat-safe sunblock can be applied to exposed areas such as the tips of their ears and the nose.

Each cat is, of course, an individual, but while most can adapt well to an indoor or restricted outdoor lifestyle, cats that have previously been allowed free access, those with a high predatory drive or characters that don't deal with confinement are likely to be less tolerant and can become extremely frustrated if they feel trapped. In these circumstances, a cost–benefit analysis has to be carried out, although the cat's mental health has to be a priority.

Other Ways of Giving an Indoor Cat Access to Outdoors

With the correct training, a cat can learn to accept wearing a harness and be taken out on a lead. Some cats can also be trained, and are wholly at ease, in a cat pram/stroller (see Figure 3.8). It's safe to say that these measures won't suit every individual and taking a cat into busy public places, whilst restrained, is highly likely to cause stress, especially where it's difficult to control the environment. Always follow a training programme beforehand, choose safe and secure locations and monitor them for signs of stress. Details of how to train a cat to wear a harness can be found in Appendix 3.

Scientific Snippet: Studies have shown an increased risk of road traffic accidents (RTAs) in young male cats aged six months to six years (Conroy et al. 2018). Knowing this may better inform caregivers with cats that fall into this category, and who live on a busy road, to choose an indoor lifestyle for them or restrict their movements when traffic is heavy. Alternatively, these prospective new cat caregivers might decide to acquire an older male cat or a female to minimise the risk.



FIGURE 3.8 With the appropriate training and the right temperament, some indoor cats can be given more freedom. For example, taken out on a lead and harness (a) or in a pram/stroller (b). Photos courtesy of Dawn (Rowan) Dubrulle (a) and Natalie Wallace (b).

Reducing Predation

Being confined in a catio or restricted to a garden prevents or reduces predation. However, there has been some encouraging research from Exeter University suggesting that it is possible to reduce hunting using non-restrictive measures (Cecchetti et al. 2021). Their study demonstrated that caregivers who provided their cat with a high meat protein, grain-free food and caregivers who provided 5 to 10 minutes of daily playing with their cats (enacting stalking, chasing, and pouncing) had reductions of 36% and 25% respectively, in the numbers of prey captured and brought home by cats (relative to controls and before the experiment started).

The study also showed fitting a Birdsbesafe® collar cover (see Figure 3.9) reduced the number of birds captured and brought home by 42%, although it had no discernible effect on mammals. Of course, it's worth noting that wearing a collar isn't without risk and this has to be assessed.

Sharing a Home with Other Cats

Like its ancestors, the need to have autonomy and a lone territory is still inherent in the domestic cat**.** Contact with other cats outside their social group is usually minimal and although we know that the modern-day cat has developed more flexibility in terms of sociality, this is very much dependent on the individual. Largely cats still need to select who they want to mix with – they cannot be forced together and don't take kindly to sharing their resources.



FIGURE 3.9 Birdsbesafe® collar covers can reduce predation. Copyright to Power of Gratitude LLC.

These traits help to explain why problems can arise in multi-cat households and densely populated spaces, where cats are forced to share their core territory or when their outside territories overlap.

Conflict can also arise when cats are introduced or mixed together inappropriately or without considering the best match. In fact, most cats are perfectly happy being kept in single-household environments. Obviously, some do establish close relationships and splitting bonded cats is absolutely not recommended but, on the whole, cats do not generally need another cat for company.

A cat that previously enjoyed a close bond with another cat that has died is unlikely to take kindly to having a strange cat suddenly thrust upon them either. Instead of feeling better they invariably end up with social and bereavement stress. Far better to treat them with sensitivity and schedule some mentally enriching activities to help flood their system with natural mood-enhancing endorphins. Other ways to support their mental health can be found in Chapter 10.

Choosing for Compatibility

Although it isn't easy to predict whether a cat will accept another, there are some general tips that might help when deciding to get another cat or when choosing for compatibility:

- Relatedness, e.g. siblings or kittens that are raised together from birth and during the socialisation period (i.e. between two and seven weeks of age) are more likely to have a longterm affiliative social relationship with one another when compared to other categories (Finka 2022) (see Figure 3.10).
- Mixing cats with a history of positive social exposure to other cats during their socialisation period can increase the likelihood of success.
- The risk of conflict between cats is greater in unfamiliar, unrelated adults.
- If the resident cat is stressed by neighbouring cats or viciously repels them, forget introducing another cat to the household!
- Incompatibility and long-term intolerance rise significantly if cats are not introduced sensitively and even then there is no guarantee of success.
- Assess temperaments. There is no perfect matching but a very bold and confident cat may target a shy/timid cat. However, two bold cats might clash and two very timid cats might be stressed in the presence of each other. Extreme personality types might be best housed singly.
- An elderly cat may resent a kitten that pesters them to play.

A protocol for introducing new cats to a home with a resident cat can be found in Appendix 2.4.

Pillar 2. Providing Multiple and Separated Key Environmental Resources

An important part of meeting a cat's physical and emotional needs is having an adequate resource provision and these must be plentiful and support each cat in multi-cat households. In addition to the safe retreats mentioned earlier, these should include:



FIGURE 3.10 Siblings or similar-aged, well-socialised kittens are usually more compatible for cohabiting. Photo courtesy of Katie Jones.

Beds and Resting Places

Cats sleep on and off for an average of 12 to 18 hours a day. This is thought to be a leftover adaptation that helped conserve energy when the cat spent many hours hunting. As such, they like to have many different sleeping sites to choose from and usually alternate between locations. It is believed that this behaviour stems from the cat's need to stay clean and, in the wild, this regular movement would have kept them free from or reduced the accumulation of parasites. Consequently, a plentiful supply of comfortable, cosy resting sites should be made available in different places and, to enhance their sense of security, at varying heights (Figure 3.11).

Toys and Environmental Enrichment

Cat toys that replicate prey, and feeding methods that mimic hunting behaviour, allow the cat to express their natural drive for predation and can provide an enriching experience. This subject has been touched on in the previous chapter and, because of its worth, we shall be returning to it again in the next pillar of a healthy feline environment.



FIGURE 3.11 On average a cat sleeps for 12–18 hours a day and likes to choose from a plentiful supply of suitable beds in various locations and different heights. Photos courtesy of Jessica Wardale (a), Adrianne Goff (b), Cassie Kemp (c), and Frankie Lees (d).

Food and Drinking Stations

Cats need to feel relaxed and secure at meal times and can easily become stressed if the conditions aren't right for them. Unfortunately, the signs can be subtle and go unnoticed but over time prolonged anxiety can lead to physical and mental illness.

Harking back to their solitary hunting style means they like to eat alone. Eating socially still isn't part of a cat's normal behaviour repertoire and it can be stressful when being forced to eat at close quarters with one another. Even the preparation of food can, with other cats present, instil tension. It is far better to fix meals out of sight, in a separate food preparation area and give the meals to the cats at their own separate feeding station, where they cannot hear, see, or feel the presence of one another.

With regard to drinking, it appears that cats have a preference for eating separately from where they drink. Various theories have been surmised, but one of the most popular is that, in the wild, prey consumed near a water source would potentially contaminate and sully it. Whatever the reason, it's true to say that cats tend to hunt and seek water at separate times. Therefore, spacing water and food stations apart is recommended – so ditch the double diners!

More about feeding behaviour can be found in the next pillar of a healthy feline environment.

Encouraging Water Intake

Feline lower urinary tract disease (i.e. Feline Idiopathic Cystitis) can be triggered by stress (and vice versa) and kidney problems can trouble the cat, especially as they age. One way of helping combat these disorders is encouraging them to increase their water intake so they are kept well hydrated. There are a number of ways this can be achieved (see Box 3.1).

BOX 3.1. Think Drink

- Some cats like a moving water source so might prefer a drinking fountain.
- Avoid using plastic bowls as they may taint the taste of the water.
- Cats show a preference for large wide-open bowls that prevent the whiskers from touching the sides.
- Metal bowls can be reflective and this may put some cats off using them.
- Give choice by offering a number of different types of receptacles.
- Cats appear to like water topped up regularly – probably so they don't have to lean down for it.
- One drinking station per cat, plus one extra – spaced out throughout the house is a good rule of thumb.
- For cats that have outdoor access, provide drinking water outside as well as inside.
- Make sure the water stations are easily accessible, especially for elderly cats. Raising bowls from ground level so they don't have to strain their necks can help if they are arthritic and stiff.

- Position water stations away from food.
- Flavoured water, e.g. tuna spring water (drained from a can) can encourage cats to drink more.
- If the cat is fed on dried food, try replacing some meals with the wet variety.
- Cats can reject water that has a chemical aroma – filtering or boiling (and leaving to cool) can help.
- Cats seem to prefer water served at room temperature rather than chilled (see Figure 3.12).

Top Tip: Ensuring there are a variety of drinking bowls and numerous water stations throughout the house and in the garden will encourage and remind the cat to drink and also help caregivers assess their cat's preferences.

Litter Box

Litter boxes are an obvious requirement for indoor cats, although cats that have outside access may also choose to use a litter box in the house from time to time or require one during periods of confinement, perhaps after a surgical procedure, or in winter, when the ground is frozen.

Because the cat is a fastidious character, they usually tend to be quite discerning and particular about their toileting arrangements. Things such as its location, size, depth, and the type of substrate (litter) provided can play a role in how a cat feels about their litter box.

In many cases, cats have to put up with a less-than-ideal setup because we humans tend not to give it as much thought as we should. Yet, house soiling problems are very commonly associated with poor litter box management so getting things right from the onset will help to keep a cat happy.

Litter boxes come in many varieties, but generally, they are available in either an open or covered style. There are pros and cons with each type. Some cats like

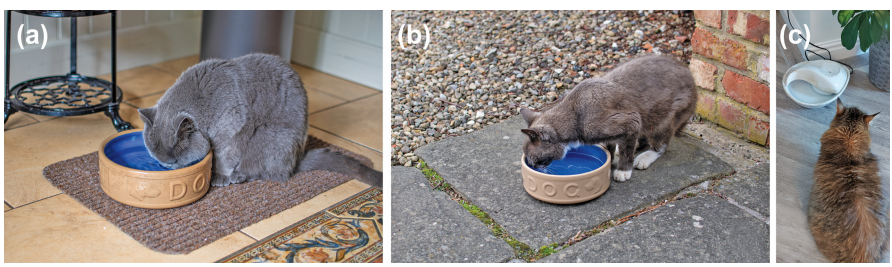

FIGURE 3.12 Providing opportunities to drink inside (a) and outside (b) can remind a cat to drink and stay hydrated. Some cats prefer moving water, so you could provide a circulating filtration system (water fountain) (c). Photos courtesy of Tommy Taylor (a and b) and Jessica Wardale (c).

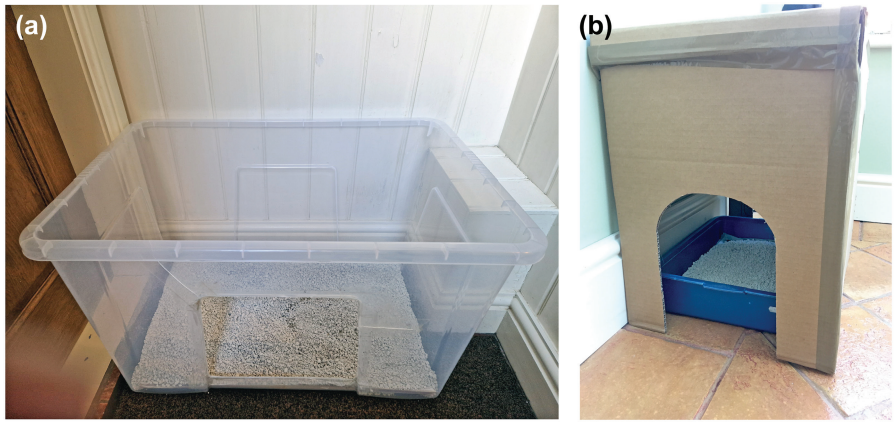

FIGURE 3.13 Adapting large storage boxes and modifying them by cutting out an entrance at the front is likely to be comfier for larger cats to manoeuvre and easier to access for elderly cats with mobility issues (a). Placing a cardboard box (with a cut-out entrance) over one of their open trays is a good way to test whether a cat would prefer a covered tray design (b).

the security and privacy of a closed box whilst others may feel hemmed in and can object to the build-up of odours. It's been known for some cats to urinate in one style and defecate in another. Whatever the circumstances, giving a cat the choice to decide which they prefer, as opposed to what we prefer, is the best policy. Before investing in a particular type, it is possible to create a DIY version so that one can assess the cat's preference (see Figure 3.13).

Fortunately, there has been a fair amount of research and interest in litter box provision so we do have some useful information to guide us (Carney et al. 2014, Grigg et al. 2012, Neilson 2004) (see Box 3.2).

BOX 3.2. Guidance on Litter Box Provision

Optimising litter box provision is important for the cat's well-being. Using a setup that doesn't quite fulfil the cat's requirements can be a source of daily stress and may lead to house soiling and stress-related problematic behaviours.

Location:

- Choose a private location that is safe, quiet, and away from busy areas.
- Avoid placing close to a window, door, or cat flap where a cat might be disturbed and feel insecure.
- Boxes must be well away from food and water. Would you want to eat your lunch looking at the toilet?!

Cleanliness:

- The cat is a fastidious animal so daily removal of faeces and spot cleaning is important.
- A build-up of urine and faeces – especially from other cats is a common cause of litter box aversion and house soiling.
- A full and thorough clean out and complete change of litter should be done at least once a week, remembering to avoid strong-smelling disinfectants and those that are poisonous to cats (e.g. phenols).

Substrate:

- Litter should be free from scents. Pleasant-smelling litter appeals to us but not the cat!
- Experts advise that cats tend to prefer clumping and fine substrates over heavier, coarse varieties (Carney et al. 2014).
- A depth of three to four centimetres is ideal for burying deposits.
- Avoid box liners as these tear and snag when the cat is covering their waste. Plus, they can hold urine which makes it unpleasant for the cat to stand on.

Size and Number:

- Studies suggest that larger litter boxes are favoured over the typical standard-length (Guy et al. 2014). Cats like to be able to move around to get into a comfortable position before toileting so choose one that is at least 1.5 times their length (from the tip of their nose to the base of their tail).
- Cats do not like sharing and this generally applies to their litter box. The general rule of thumb is a minimum of one box per cat and if there is room enough for one extra – all the better.
- Space litter boxes well apart. Lining them up side-by-side is just like one big litter box and does not afford privacy.

Scientific Snippet: It has been reported that cohabiting cats showed increased frequencies of friendly behaviour when the number of litter boxes (and food stations) was increased (Finka 2022).

Scratch Posts and Pads

A range of commercial cat scratching products are available – including vertical panels to fix on walls, mats to lay on floors, freestanding cat trees with inbuilt scratch posts, and scratch pads made of corrugated cardboard. However, it needn't

be expensive. For example, forage branches and bark from non-poisonous trees (ensuring they are washed and scrubbed to remove any existing scents). Hessian or sisal mats and loose-weaved carpet squares on the floor, or attached securely to a wall, can provide additional scratching sites and may be useful to cover and protect carpets and other areas that the cat targets.

To encourage a cat to use sites of our choosing, it is important to think about where to position them and how to make them attractive so that they will be used in a manner that suits the homeowner as well as fulfilling the cat's needs.

- Place scratch sites in a clearly visible location and in places where the cat has previously scratched.
- Some cats like to use a scratch site as a visual marker to depict their territory so place some close to the entry and exit points in the home.
- Place a tall post close to where the cat rests. This is because quite often, when cats wake up, they want to stretch and scratching fulfils this behaviour.
- Scratch posts should be stable and sturdy. If they feel flimsy, or they fall over, the cat will avoid them.
- They should be tall enough for the full-grown cat to stretch up to their full height.
- Cats like vertical and horizontal sites so give them the choice to use both varieties.
- When offering a new scratch site, rake them with a wire brush to create some fake scratch marks. Use a marker pen to draw lines in some of the scratch marks to help act as a visual trigger.
- Harvesting and transferring their scent (from other freshly scratched sites) via a scent cloth can also help (see Appendix 2.2). Work the scent-laden cloth well into the fake scratch marks.
- Sprinkling a little dried catnip or scattering food on or around the scratch site may encourage a cat to investigate and use them.
- Engaging the cat in play, by wafting a rod toy or piece of ribbon up or across the scratch site, can trigger scratching as they make contact with their claws.
- Create opportunities for cats that have outdoor access by planting trees and shrubs and fitting sturdy posts and suitable wall-mounted panels in the garden.
- Scratch marks contain pheromones that are distributed by glands found in the pads of a cat's paws. These familiar pheromones are believed to facilitate a sense of belonging and security – so try to avoid getting rid of their established scratch sites (Figure 3.14).

Source: Based on DePorter and Elzerman (2019) and Cat scratching behaviour – A nuisance or necessity? (iCatCare 2020)

Caregivers can reinforce their cat's scratching behaviour by giving attention (praise or play) when they are scratching the sites chosen. But do be aware that some cats use scratching and clawing as a means of gaining attention or when they want to play. Therefore, attention should be more random once the site has been established and the cat is consistently using it. If not, we may be inadvertently reinforcing our



FIGURE 3.14 Cats have an innate drive to scratch so provide plenty of opportunities for this behaviour. Photo courtesy of Grace Coomber.

cats to perform this behaviour when they want us to play or engage with them on demand. Cats are clever and quickly learn how to train us!

> **Feline Fact:** The longer an object has been scratched, the more significant it is for the cat. So, if it looks tatty, don't throw it out. At least not until a new object has been introduced and well used!

Declawing

Declawing (onychectomy) is a veterinary procedure to amputate the last bone of each toe with the intention of stopping a cat from scratching. Although it can be performed legally in a number of countries, it has never been allowed in the UK (other than for genuine medical reasons) and fortunately has also been banned in many other places. The AAFP strongly opposes declawing as an elective procedure,

primarily because it can cause pain and increased sensitivity in the feet of some cats, leading to long-term suffering. Moreover, it deprives them of an important form of communication and strips them of a key natural instinct, thus decreasing their quality of life.

Pillar 3. Providing Opportunities for Play and Predatory Behaviour

The importance of play in the development of the kitten has been discussed in Chapter 2, although it's not only kittens that benefit. Cats at all life stages should be given the opportunity to play. This can be encouraged by providing access to a range of toys, remembering to rotate them regularly, and providing new toys now and again to prevent boredom and increase their enrichment value.

Play for the mature and elderly cat may need to be modified to suit any sore joints but gentle movement can be therapeutic. However, some senior cats gradually cease to play altogether and whilst this could be a natural process it may also be an indication of pain and general malaise, in which case veterinary advice should be sought.

Encouraging Interactive Play

Engaging cats in play is good for their mental and physical well-being and enhances the human–cat bond.

Toys left lying around are unlikely to motivate a cat to play which is why it is recommended to choose interactive toys that represent the range of prey that a cat is likely to catch. Toys on rods, with feathers attached, long ribbons waved around at head height, or dragged along the floor in a zig-zag fashion, can mimic birds flapping in the air and being brought down. Also, rolling toys on the floor has the effect of a small mammal scuttling along. Essentially, actions that encourage stalking, chasing, pouncing, catching, throwing, and manipulating prey represent the sequence of the hunt and therefore help to satisfy innate predatory drives (Figure 3.15).

Laser toys are not generally the best kind of toy to give a cat. The fact that they never come into contact with anything tangible can heighten arousal and may increase their frustration. If they are going to be included in the toy box, avoid pointing the laser straight towards the cat's eyes and ensure that they are only used as part of the chase and pounce sequence. Follow on by mixing it up with a toy that they can manipulate. Ping-pong balls can be fun!

To prevent frustration, a cat often needs a sense of making the kill so, at the end of the play session, it is advisable to give the cat the toy so they can 'finish it off' so to speak. Sometimes offering a wrinkled towel, fleece, or cuddly toy allows them to bunny kick it. That's the informal term for raking, which describes the action of a cat when they roll over on their back or side and wrap their front legs around their prey (or, if you're not careful – your hand!!). At the same time, they vigorously kick out with both hind legs, inflicting injuries (often fatal to their prey) with their claws. At the end of the play session, it's best to provide a food item. This enacts the consumption of their prey – thus completing the hunting sequence and fulfilling the goal (Figure 3.16).



FIGURE 3.15 Toys on rods with feathers can mimic birds flapping. Photo courtesy of Tommy Taylor.

It's always worthwhile observing the cat's response to get a sense of what play style the cat prefers or whether it is in fact having a positive effect. Indeed, some cats are more independent and prefer to be left alone, whilst others have a certain level of tolerance and may become irritated after a certain period. An awareness of their general reaction, body language, and level of engagement is important.

As well as all the other benefits, it turns out that play can also help reduce inappropriate behaviour problems. One study, published in the *Journal of Veterinary Behavior* by Strickler and Shull (2014) surveyed cat caregivers to determine the frequency and duration of their daily interactions with their indoor cat in relation to the prevalence of six selected behaviour problems. These included aggression to the caregiver, aggression to visitors, urinating outside the litter box, inappropriate defaecation, inter-household cat aggression, and inter-cat aggression to outdoor cats. Of significance, the caregivers who had play bouts with their cat for five minutes or more reported fewer behaviour problems than those caregivers who only engaged in play bouts of one minute.



FIGURE 3.16 Toys are often raked with the hind claws mimicking hunting behaviour. Photo courtesy of Tommy Taylor.

Encouraging Normal Feeding Behaviour

Most captive animals appear to prefer working for food rather than receiving freely available meals, something known as contrafreeloading (Delgado and Dantas 2020). We have already established the cat's strong desire to hunt so providing an enriched feeding experience, that integrates some of the principles discussed in the previous pillar of health and mimics more natural feline feeding behaviours, offers an outlet for an inherently rewarding experience. Later in the book, we shall look a little more closely at how enriched feeding can promote feline well-being and how it can be integrated into a behaviour modification plan (Figure 3.17).

In comparison to many other mammals, the cat requires a higher level of protein in their diet. They are classed as 'obligate carnivores', which means they require food specifically from an animal protein source. These foods contain essential amino acids (simple protein molecules) that cats cannot synthesise themselves, namely: taurine, arginine, methionine, and cysteine. Deficiencies can lead to a variety of serious health issues involving the heart, the immune system, and the retina in the eyes, which can lead to blindness (Gajanayake et al. 2011). There have however been recent reports of cats doing well on vegan diets (Knight et al. 2023), but the evidence is not robust and still very limited. For now, the consensus of veterinary opinion is that cats should still be fed largely an animal protein diet.

Satisfying the cat's crepuscular hunting nature can be challenging and it's not uncommon for cats to wake their caregiver(s) during the night or in the early hours

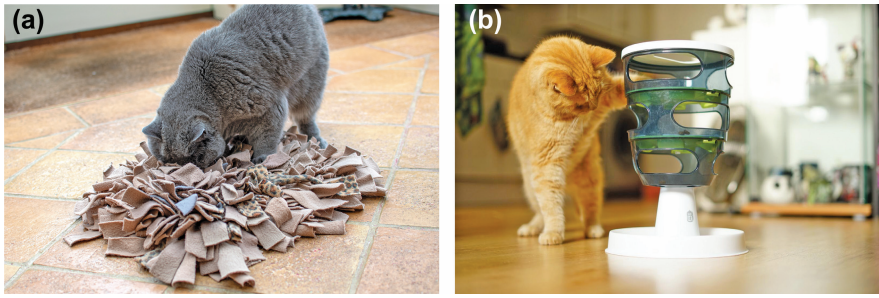

FIGURE 3.17 Foraging for food (a) and interacting with a puzzle feeder (b) are ways to encourage a cat to work for food. Photos courtesy of Tommy Taylor (a) and Samantha Lympany-Tier (b).

of the morning. This behaviour is usually motivated by the cat's internal body clock and being a species that primarily hunts at dawn and dusk means that they are active and raring to go when we are still tired. Boredom, hunger, and learned behaviour also play a part as portrayed in Tom's story.

TOM THE TEARAWAY

The History

Tom was a 12-month-old male indoor (neutered) cat that was driving his caregivers mad with his bouts of dawn time activity. They were often woken by hearing him dashing about but this quickly developed into him scratching at the carpet outside their bedroom door and crying to gain their attention. In an attempt to keep him quiet, they would get up and give him some food or play with him, after which he settled for a few more hours until they got up – usually much earlier than they would like!

Treatment and Outcome

Getting up to feed or play with a cat that is scratching and caterwauling is a great way to teach them how to get your attention. Cats can be creatures of habit so it was important to prevent Tom from getting into bad ones!

Creating a more appropriate routine helps. A suitable regime for Tom and his caregivers was to schedule a play session before bedtime. Afterwards, he was left with a puzzle feeder to provide mental stimulation. A food trail was also laid so he could be kept busy, seeking and following the scent. Additionally, an automatic feeder was timed to operate around the time he usually became active (see Figure 3.18). Using food in this way can lead to obesity so it was important to ensure that no more than his usual ration was given but instead split up into smaller rations throughout a 24-hour period. Fitting a cat flap, so a cat can get to an outdoor space, may also offer another



FIGURE 3.18 A timed feeder can provide small meals regularly. Photo: Author's own.

option for them to burn off energy if the caregiver wishes them to have outdoor access.

Employing these simple steps helped refocus Tom's attention and provided an outlet for his predatory nature, resetting his routine. Soon his caregivers were getting a much better night's sleep and Tom appeared much more settled.

Pillar 4. Providing Positive, Consistent, and Predictable Human–Cat Social Interaction

As mentioned, cats have evolved to be much more sociable than their forebears and, provided they have been handled and exposed to people appropriately in the socialisation period, can enjoy a mutually beneficial relationship with their humans.

Fundamentally, when it comes to social interactions, choice, predictability, and consistency are key. This is very much about appealing to the cat's sense of

independence and so they should initiate and be in control of interactions at all times. Chasing after a cat and pursuing them is going to cause distress and should be avoided.

In general, cats prefer low-intensity, high-frequency contact. This means that frequent, short-duration interactions are preferred over prolonged and forced interactions. Of course, each cat has very different requirements and being aware of likes and dislikes, as well as knowing how to gauge things by their body language and response, is key. Here are some of the indicators of when a cat may want to interact with us:

- An active approach towards the person with a tail-up posture (usually curled over at the end) (see Figure 3.19).
- Eyes and ears forward.
- Head bunts to our offered hand.
- Rubbing their body (usually the flank) along our legs.
- Actively engaging in interactive play.



FIGURE 3.19 Observing a cat's body language can help assess whether it wants to interact or not. Photo courtesy of Aimee Grindrod.

Here are some indicators of when a cat does not want to interact with us:

- If they retreat, are engaged in something else (playing, grooming, hunting) or ignore us altogether.
- If they show clear signs of fear, anxiety, irritation, and aggression (described and explained later in the book).

Pillar 5. Providing an Environment that Respects the Importance of the Cat's Sense of Smell

Cats are sensory animals and their sense of smell plays an important role in their communication and social behaviour. However, in the context of the home environment, cats use their own scent to create a familiar odour or, in multi-cat households, a group odour which enhances their recognition of one another and promotes social cohesion.

To create a 'scent profile' in the home, cats use certain pheromones (chemical molecules) that are produced in specialised scent glands distributed throughout the body. The cat's unique 'signature odour' and pheromones are deposited via head and body rubs and from interdigital glands in the pads on their paws, released during scratching. These pheromones are primarily distributed throughout their territory but especially within and at the boundaries of their core territory, where they expect to feel the safest (see Figure 3.20).



FIGURE 3.20 Cats use their pheromones to distribute a familiar scent in their environment. Photo courtesy of Tommy Taylor.

The exchange of scents between social group members is achieved by rubbing along the same location (allomarking) and, for closely affiliated cats, can include mutual rubbing of the head, cheeks, and flanks of the body. This behaviour is known as allorubbing.

These familiar odours also have a self-appeasing function which means the cat gains security from their presence within their familiar environments (Vitale 2018). Changing or disturbing a cat's scent profile is therefore likely to be a cause of distress and in multi-cat homes can even lead to the breakdown of social bonds.

Ways to respect the cat's scent profile:

- Avoid using heavily scented air fresheners, scented candles, and the like, particularly in their core territory and places the cat frequents in the home.
- Do not be overzealous with cleaning or redecorating areas where the cat has facially marked (these are sometimes evident by a waxy-looking mark left behind on walls or corners of doors and furniture).
- Avoid scented cat litter. These are marketed to appeal to people but don't usually appeal to the cat!
- Thoroughly rinse away any traces of detergents after cleaning food and drinking receptacles, litter boxes, and any other of their resources.
- When washing bedding avoid using heavily scented washing powders. Also, use a system whereby a small piece of their bedding is left behind in order to retain some scent continuity.
- Avoid replacing scratch posts and beds on an excessively regular basis.
- New pieces of furniture and other items entering the home should be rubbed with the cat's scent to combat sudden changes in their scent profile (see Appendix 2.2).
- New scents can be brought in from outside by us and visitors. Store bags, shoes, and outdoor clothes in a location away from areas where the cat frequents.

The important role that pheromones play in feline communication will be further explored in Chapter 4.

KEY TAKE HOME POINTS

- Cats have a number of key requirements that mostly focus on the provision of a safe environment that also allows them to express their normal behaviours.
- MEMO and the 'Five Pillars of a Healthy Feline Environment' are frameworks that provide useful guidance for cat caregivers and professionals and can be applied to all pet cats, regardless of their lifestyle.
- Creating a safe, stimulating environment that cats can thrive in, either singly or in multi-cat households, has been shown to significantly improve some aspects of feline behaviour.

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4 Feline Communication

Being able to interpret feline signalling helps prevent misunderstandings and improves our relationship with them. Recognising the methods by which cats communicate with each other (intraspecific communication), and the kind of messages that are being conveyed, is an excellent starting point because cats will often extend similar gestures towards us and other species (interspecific communication) with whom they live. Understanding the underlying motivation for a particular signal(s) can also give us valuable feedback about the cat's emotional state.

Cats are a much more sensory species than us and approach the world quite differently. Encounters with other cats are generally limited to their own social circle so, in contrast to dogs and other social living animals that have a pack structure or distinct hierarchy, they haven't developed the same extensive range of body postures and facial expressions to express themselves to unfamiliar cats. Instead, they prefer to exchange information with others using remote visual and chemical markers and this enables them to avoid face-to-face meetings with unfamiliar cats which could lead to conflict and potential injury. Nevertheless, the process of domestication has increased cats' sociality and they are very capable of communicating through touch, body language, and via their vocal repertoire. Knowing what to look for and appreciating the messages they wish to deliver is key for developing a better understanding of their behaviour and improving human–cat relations.

METHODS OF COMMUNICATION

Communication occurs when one animal responds to signals emitted by another.

In the social context, the behaviour of an individual (the signaller) affects the behaviour of another (the receiver).

Cats communicate by using:

- Olfactory communication (scent and smell).
- Visual communication (body language and visual markers).
- Auditory communication (vocalisation and hearing).
- Tactile interactions (mutual rubbing and grooming).

Olfactory Communication

Scents are produced and deposited in a number of ways and some have a visual component attached to them too. Using scent and the sense of smell is a convenient way of communicating without actually having to meet other cats. This suits the cat's nature, allowing them to convey and gather useful social information without

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FIGURE 4.1 Cats can discern a great deal of information using their sense of smell. Photo courtesy of Siobhan Buttress-Grove.

risking hostile encounters with other unfamiliar cats. However, scent and pheromones can be emitted during close social contact, e.g. courtship, suckling, and affiliation.

Leaving scent has been likened to leaving a calling card or a series of post-it notes containing informative messages throughout a location. They provide signals to the receiver about things such as sexual status, when and where they visited, as well as indicating the position of the boundaries of their territory which can help prevent clashes and over-hunting of a particular site (Figure 4.1).

Pheromones

Pheromones have already been mentioned quite a few times in the book, so you can guess that they play a highly important role in the cat's world.

Pheromones are chemicals made up of organic molecules that, when received by a member of the same species (conspecific), activate a specific behavioural response (Vitale Shreve and Udell 2017). They are detected by other individuals via the main olfactory and vomeronasal system (see Box 4.1). As mentioned earlier they can also

provide a means of conveying self-directed information – mostly relating to the cat's sense of familiarity and environmental security.

The Production of Pheromones

The cat produces pheromones from a number of glands situated throughout the body (see Figure 4.2). These glands include:

- Submandibular gland (under the chin).
- Perioral glands (around the lips, chin, and cheek aka as Cheek Glands).
- Temporal glands (forehead – between the eyes and ears).
- Supracaudal gland (around the base of the tail).
- Caudal glands (along the tail).
- Interdigital glands (from the pads on the feet).
- Mammary glands (from around the nipple – producing the Cat Appeasing Pheromone which conveys a sense of harmony and promotes bonding with the mother when suckling).
- Anal and urogenital glands (pheromones delivered in urine and faeces).

Cats are attracted to pheromones primarily because of their smell, although those produced in the skin contain a waxy-like substance that can leave behind a visual mark. Ardent cleaning of these marks should be avoided when spotted in the home, particularly for cats that are suffering from anxiety problems related to insecurities within their environment.

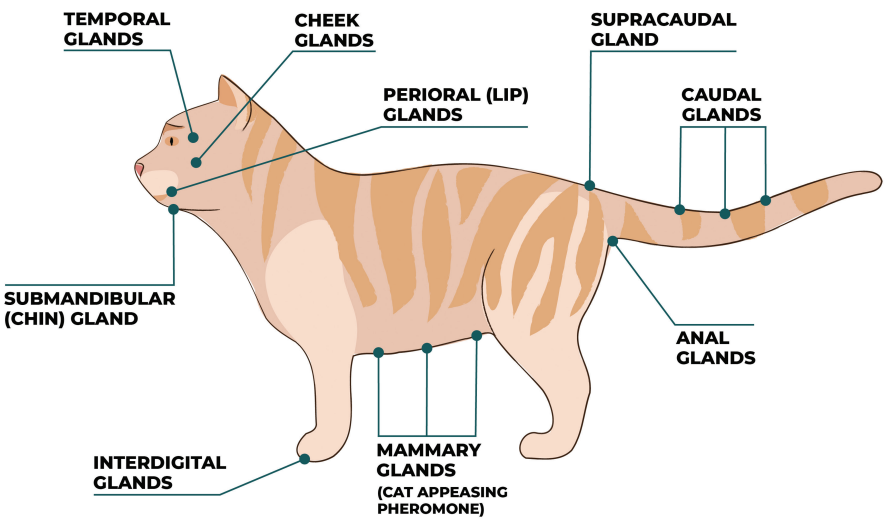

FIGURE 4.2 Pheromones are produced by a variety of glands distributed on the surface of the cat's body.

Although there is still a lot we don't know about the different pheromones, a number of functional pheromones have been isolated and identified. These include five of the pheromones deposited by facial rubbing. Of these, scientists have been able to determine that F2 feline facial pheromone (FFP) is associated with sexual marking, F3 is associated with territory, and deposited on objects and places where a cat feels safe and at ease. F4 is the one deposited on inanimate objects and exchanged with cats belonging to the same social group through direct facial rubs or shared through rubbing along the same location (Vitale 2018) (Figure 4.3).

Synthetic versions of some of these pheromones have been produced in order to convey the same positive emotions and are commercially available in the form of sprays and diffusers. These can be used therapeutically to help relax and calm stressed cats and may be useful as part of a behaviour treatment plan (see Chapter 10).

Urine

The use of urine to communicate is a normal feline behaviour and can be used both as an olfactory and visual form of communication (Horowitz 2019). Pheromones and other chemical compounds (chemo-signals) released in the urine are used to communicate messages about territory, indicate sexual viability, and, in certain circumstances, are believed to express stress or fear.



FIGURE 4.3 Head bunts and facial rubbing are tactile forms of communication, usually reserved for socially bonded individuals. Knowing this makes it a special gesture when conveyed to us. Photo courtesy of Tommy Taylor.

Voiding urine via a squatting position is most usually (but not always) buried, and, when covered, does not attract much attention whereas spraying urine is a much more conspicuous marking behaviour that draws interest from other cats.

Urine Spraying

Urine spraying is accomplished by backing up to a vertical surface whilst a jet of urine is emitted in a backward direction (see Figure 4.4). At the same time, the cat treads the hind feet alternately and the erect tail quivers. This behaviour can be performed by both males and females irrespective of whether they have been neutered or not although, as previously mentioned, urine spraying is more frequently observed in tom cats when they detect a female in oestrus. In these cases neutering dramatically decreases their urine spraying behaviour (Cafazzo et al. 2019), although will not prevent it in all cats.

Sniffing spray marks triggers a behaviour called the 'Flehmen response', something that helps achieve maximum scent input. This response is used exclusively in social situations and has been described as a sense somewhere between smell and taste. However, the truth is we humans cannot really fully comprehend its function as we have no experience of anything like it (see Box 4.1). What we do know is that it has an important role in communication.



FIGURE 4.4 The function of urine spraying is to communicate via the visual marks and scent. Photo: Author's own.

BOX 4.1. The Vomeronasal Organ (VMO)

In addition to the usual way of smelling, the cat is capable of detecting and analysing chemical signals by using their vomeronasal organ (VMO – aka Jacobson's organ), a specialised structure situated in the rostral end of the hard palate within the nasal cavity (Bradshaw 2014).

Two very small openings (nasopalatine ducts) are situated in the roof of the mouth behind the incisor teeth. These help to channel the molecules to receptors in the VMO which have neurological connections to the brain where the information is processed affecting an emotional response or specific social behaviour.

When encountering scents and pheromones a cat will sniff the area and perform a kind of gaping action with the mouth, sometimes moving the tongue to help direct the information into the VMO (see Figure 4.5).



FIGURE 4.5 The Flehmen response enables a cat to process information carried in scents and pheromones. Photo courtesy of Emma Bush.

The use of urine as a visual marker can help to inform and warn other cats to keep out of a territory or at least let them know when and where they have been in a location to avoid meeting (see Figure 4.6). Most cats will generally avoid an area where there is evidence of a fresh deposit and can determine when the urine was left by scent degradation and wetness.

Urine spraying has also been observed as a response to conflict, frustration, and when tensions are high between cats. This suggests that it also functions as an expression of emotion and may serve as a passive form of aggression (Overall 2013).

Urine Spraying in the House

When urine spraying occurs in the home it may be because the cat is feeling anxious or fearful. Deposits tend to be in areas where a cat feels threatened and insecure so sometimes occur close to entry points to the house (e.g. around doors, cat flaps, and windows). It's also common for some cats to spray new items that are brought into the house because the new scents they bring with them can be discomforting and disturb the cat's scent profile. However, inappropriate urination can be linked to medical disorders so a veterinary examination is essential. We shall be returning to problematic urine spraying and ways to help in Chapter 9.



FIGURE 4.6 A clear urine mark, deposited to convey a visual signal. Photo: Author's own.

Scratching

In communication, scratching has both an olfactory and visual presence. Information relating to territory is conveyed through deliberate marks and pheromone deposits released from the interdigital glands in the paws (DePorter and Elzerman 2019).

A common site for scratching is outside. Chosen locations tend to be on strategically placed trees, fence posts, and suchlike, to mark a territory (see Figure 4.7). However, cats may wish to perform this behaviour inside the comfort of their home too, so require resources to allow this behaviour to take place. Providing appropriate sites should help prevent damage to furnishings.

Scratching is also used to express emotions such as excitement (play) but can be displayed during negative emotional states too. For example, sudden onset or excessive scratching at multiple locations spread throughout the home can indicate stress and insecurity.

In a multi-cat household, increased scratching may be heightened if there are insufficient resources or, depending on the social dynamics, it may represent territorial confidence or general unrest.



FIGURE 4.7 Scratch marking on a tree trunk in the garden will convey information relating to territory. Photo: Author's own.

Faeces

Cats don't usually spend much time sniffing the faeces of unfamiliar cats, although, like dogs, cats have a pair of anal sacs. These contain the secretions of the anal glands which open to each side of the anus and empty, usually when a stool is passed (although they can also be emptied during a fearful event). Anal gland secretions contain volatile compounds that have a pungent odour and in the dog, and some other carnivores, they are believed to contain information about sex, reproductive state, and recognition of individuals. The results of one study by Miyazaki et al. (2017), demonstrated that cats can distinguish differences in anal sac secretions by their scent so it appears that, to a certain extent, they can use faeces for recognition of others.

Middening

Unlike normal defaecation, which is usually deposited in private locations, middening is the act of leaving faeces in a conspicuous and prominent site (Carney et al. 2014). Its function is thought to act as a visual signal rather than an olfactory signal and is most likely designed to warn other cats that they are entering an area that is already occupied.

Middening within the home is a less common problem than urine spraying but once medical conditions and litter box aversions have been ruled out, it may indicate insecurity and negative emotions, as Charlene and Chico's story recounts (see Box 4.2).

Finding cat faeces displayed outside may be an indication that there is a dispute over territory. If deposited by the resident cat, in their own territory, ideally it should be left alone to act as a signal and ward off the intruder. If deposited by a neighbouring cat it should be promptly removed as this could be a source of stress.

BOX 4.2. Charlene and Chico (four-year-old, neutered, cream Persian cats)

The History

After being vet checked to eliminate any medical issues, I was called in to see this well-bonded brother and sister pair after they had started toileting outside their litter box. The trigger had been the erection of a newly built conservatory extension. A few weeks after the cats had begun using the completed room, their caregivers had noticed some urine pooling on the windowsills, with evidence of it dripping down the window frames. This had progressed to deposits of faeces being left in the middle of the new cream settee that was situated there. As you can imagine this wasn't going down well with the householders!

Finding out where the urination first began can be revealing as this can indicate where the perceived threat was (or continues to be) located. Being all along the windows made it likely that it was something outside that was the cause of distress.

Cameras had been set up and revealed that both cats were spraying urine almost exclusively in the conservatory but it was only Chico that was defaecating. Fortuitously, to help with the diagnosis, the camera also picked up a neighbouring cat sitting on an adjacent party wall and jumping up onto the roof of the conservatory, looking directly in at them. Both cats were clearly distressed by its presence and it appeared to prompt the spraying behaviour.

The deliberate and conspicuous location of Chico's faeces (middening) was a sign that he was probably using it to act as a territorial marker and seeing the visiting cat peering down at them was causing them both to be stressed, triggering them to use urine and faeces to try to repel their visitor.

Treatment and Outcome

To begin with, a stress review of the whole house was undertaken and some general recommendations were made to enhance their environment, including ways to increase opportunities for them to access their coping strategies (see Chapter 8).

Making sure they had plenty of drinking stations, to help with bladder health, was an important step in order to prevent and manage Feline Idiopathic Cystitis, aka 'Feline Stress Cystitis' (see Chapter 5).

Deterring the 'visitor' was our next task. Cat-deterring strips that are commercially available were attached to the top of the party fencing. The plastic spikes make it uncomfortable for a cat to walk along but do not cause injury. Blinds had already been fitted so these were pulled on during the day to reduce the chances of them being overlooked through the windows. Everywhere was cleaned to eliminate any scent or visual marks of their previous deposits. Choosing the right cleaning agents is important because many mask but don't completely remove their scent which often encourages them to 'top up' the degrading aroma (Bowen and Heath 2005). Because they had always enjoyed sleeping on the sofa, a large blanket was draped over the back of it, creating a tent-like arrangement so that they could rest there with a sense of being hidden from view.

Almost immediately, the cats began to appear visibly more relaxed and within a couple of weeks the problematic behaviour was resolved.

Auditory Communication (Vocalisation)

Sound can be detected over a long distance so the signaller has no need to have a face-to-face encounter with the recipient. Around 21 different vocalisations have been described in domestic cats (Tavernier et al. 2020) but decoding them all can be difficult and the context in which they are emitted can alter their meaning. It is also proposed that some sounds are not within the auditory range of humans so may go undetected.

Research in this area is presently sparse and it may be some time before we identify all vocalisations and achieve a clear understanding of their meaning. In this section, I will discuss some of the more familiar feline vocalisations but have provided an overview of a selection of those that belong in the cat's repertoire, along with a brief description (see Table 4.1).

The Meow

Most people recognise the meow sound but rather than it being a distinct vocal sound it is a combination of different sounds that have variations between individuals and breeds. For example, the Siamese has rather a distinct meow, albeit each individual may have a slightly different timbre.

Interestingly the meow is seldom used between feral or wild cats but is very commonly used by pet cats in human-directed communication (Prato-Previde et al. 2020). It is therefore apparent that this particular vocal sound is a direct product of domestication.

When the meow is elicited towards people it is mostly associated with greetings, to gain food or attract attention although the sound may be individualised and conditioned. In other words, if a caregiver responds by providing a favourable resource this will positively reinforce (reward) and strengthen that particular vocal signal. Moreover, it has been reported that most caregivers can recognise their own cat's meow and distinguish between cats in multi-cat households (Figure 4.8).

The Purr

This low-pitched rumbling sound is mostly associated with contentment. The acoustic quality of the purr can differ depending on the circumstance. For example, a 'solicitation purr', which has been identified as the one used when a cat is asking for something (e.g. food), has been described as sounding more urgent (McComb 2009). It appears to originate from kittenhood, when it is elicited during suckling but it has been exploited to gain food from human caregivers. Like the meow, it is likely that obliging the cat with food reinforces them to continue using it.

The purr can also be heard during times of anxiety so may have a self-appeasing function. Perhaps, because we humans are less perceptive, it may not appear discernibly different to the contented purr but it is likely that another cat will be aware of the different message being conveyed.

Scientific Snippet: Scientists have always struggled to understand how domestic cats produce such a low-pitched, purring noise. Typically, it's larger animals, with long vocal folds, that are able to produce lower frequency sounds so it was surmised that cats used a radically different system based on active laryngeal muscle contractions. However, recent research has now shown that they have specially adapted structures (pads made up of connective tissue) embedded in their short vocal folds that allow them to create this low-frequency, self-sustained vocalisation (Herbst et al. 2023).

TABLE 4.1 Examples of Some of the Common Feline Vocalisations Emitted

Sound emitted	Definition and context
Hiss (rapid expulsion of air) Spit Yowl	• Strained and intense sounds. • Used in defensive and offensive interactions but most usually motivated by fear and distress.
Shriek	• The shriek is designed to startle an attacker most probably to give the signaller a brief opportunity to mount an escape.
Growl	• Designed to signal danger or warn off an opponent.
Trill	• A greeting/friendly gesture, usually directed to a familiar family member. • Excitement.
Chirrup	• Greeting. • Produced when the mother cat approaches the nest.
Purr	• Associated with general contentment. • Elicited in kittenhood whilst suckling from the mother. • The 'solicitation purr' is sometimes directed to caregivers when asking for something. Most usually food (McComb et al. 2009). • Can be elicited when the cat is anxious/distressed and is widely reported in ill cats within a veterinary setting. • It may have a self-appeasing, and some believe, a self-healing function too. Perhaps a bit like a feline equivalent of our yoga 'ohm'?
Meow	• A 'silent meow' is a variation of the audible meow whereby a cat opens and closes its mouth in the same way but doesn't emit a noise (that we can detect – it may be outside our frequency). • Audible and 'silent' meows incite social interactions (most usually with humans).
Mew	• The cry of a kitten to the mother – often elicited when hungry or distressed. • Typically starts from around a day old, ceasing at two to three months of age.
Courtship 'call'	• Described as a 'mowl' sound: designed to travel some distance in order to attract a 'mate'.
Chatter or chitter	• The sound is the result of a kind of quick stuttering that makes an ek-ek-ek noise. • The meaning is unclear but it is most commonly emitted when stalking prey or when seeing prey that is unobtainable (e.g. through a window). • Depending on the context – it may be a displacement activity, indicate excitement, frustration, or an underlying anxiety.
Caterwaul or mowl	• Loud and drawn out, like the yowl. • Intense. • Has different meanings depending on the context. • Courtship. • Antagonistic.

Source: Based on Bowen and Heath (2005) and Tavernier et al. (2020).

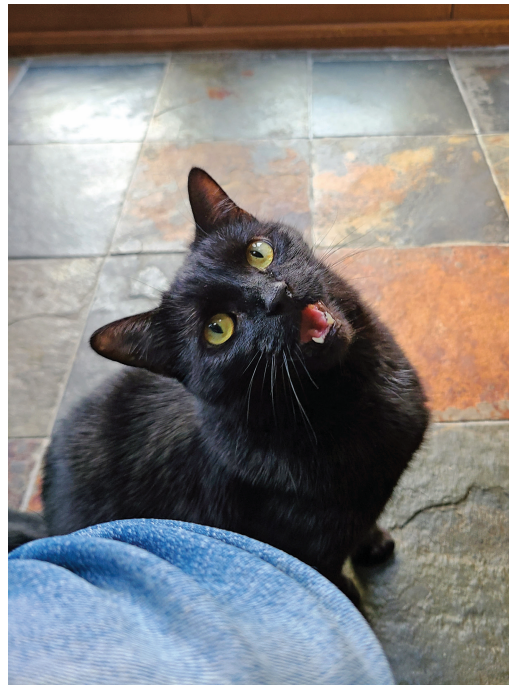

FIGURE 4.8 Meows are almost always elicited towards humans, so are believed to be a product of domestication. Photo courtesy of Emma Chapman.

It's worth noting that vocalisations can increase as a cat ages. When it is accompanied by other symptoms, it has been associated with feline cognitive dysfunction syndrome (Landsberg et al. 2010) – more commonly known as feline dementia (see Chapter 2).

Visual Communication (Body Language)

Cats can form close relationships with those in the same social circle and, through domestication, have adapted to living a more social existence. As such, they do have the ability to communicate through body language, albeit in a much less sophisticated way than the dog.

In the main, a cat's visual signalling is to increase or decrease the distance between other cats depending on their relationship with them.

Face

Facial signals can be subtle and tend to be limited, primarily because the muscles of the face restrict movement and expression. However, through close observations, and with practice, it is possible to interpret the signs.

During meetings and interactions, cats appear to pay significant attention to the head–face configuration and different features can be used to assess emotions and predict outcomes.

Eyes

- Rapid blinking and avoidance of eye contact are observed in some cats during conflict or threat (usually a defensive gesture rather than offensive).
- Staring is a threatening gesture (the 'victim' usually looks away).
- Dilated (widening) pupils are involuntary (not under the cat's control) and can be governed by reduced light. They also indicate high arousal (e.g. excitement, fear, aggression) so the context/situation has to be evaluated in order to identify the cat's mood state (see Figure 5.2 in Chapter 5).
- Slow eye blinks when directed to another cat (or caregiver) usually indicate affiliation and signals that they feel relaxed and content in their presence (see Figure 4.9).

Ears

- The relative position of the ears can convey mood states and pain.
- When cats interact, the outcome is more likely to be positive when their ears are erect (see Figure 4.10a, b), as opposed to when the ears are non-erect (see Figures 4.10c, d) when negative outcomes are more probable (Deputte et al. 2021).
- Flattened ears denote defensiveness.
- The flatter the ears are to the head, the greater the cat's fear (see Figure 4.10d).
- Ears rotated backwards (but not flattened) can denote frustration or anger (see Figure 4.10c).

Mouth

- Rapid tongue or nose flicks can be a sign of anxiety/emotional conflict.
- Open mouth (emitting a hiss, spit, or one of the other strained and intense sounds) is observed in defensive and offensive interactions (see Figure 4.10d).
- Excessive salivation and exaggerated swallowing indicate fear and anxiety (but drooling can also be detected in relaxed cats – usually when being stroked).

Whiskers

- Mystacial vibrissae (large facial whiskers) are operated by muscles in the face.
- When a cat is feeling relaxed the whiskers are held in a loose, relaxed, and curved position (see Figure 4.10b).
- During play or hunting, they are more splayed and point slightly forward.
- During negative mood states (fear, conflict, and pain) the facial muscles around the muzzle are tight and the whiskers are often pulled straight or can be drawn towards the face, with less of a curve (see Figure 4.10d).



FIGURE 4.9 A slow blink conveyed to other cats and caregivers is an affiliative gesture. Photo courtesy of Tommy Taylor.

> **Top Tip:** Making an accurate assessment: When trying to interpret feline communication signals it is important to take a holistic approach. Avoid focusing on just one feature and instead observe them as a whole. Also, remember that a cat's emotional state and intent can change second by second – so be cautious.

Tails

A cat's tail can be a useful indicator of their emotions. The position of the tail is usually accompanied by other signals such as the ear position. For example, tail-up friendly greetings are likely to be combined with an erect ear position.

Tail-up

The 'tail-up' signal is the name given to a tail that is held vertically. This is a distance-decreasing signal denoting friendliness and usually paves the way for allo-rubbing, sniffing, and other friendly interactions between closely bonded cats (and other species – including us).

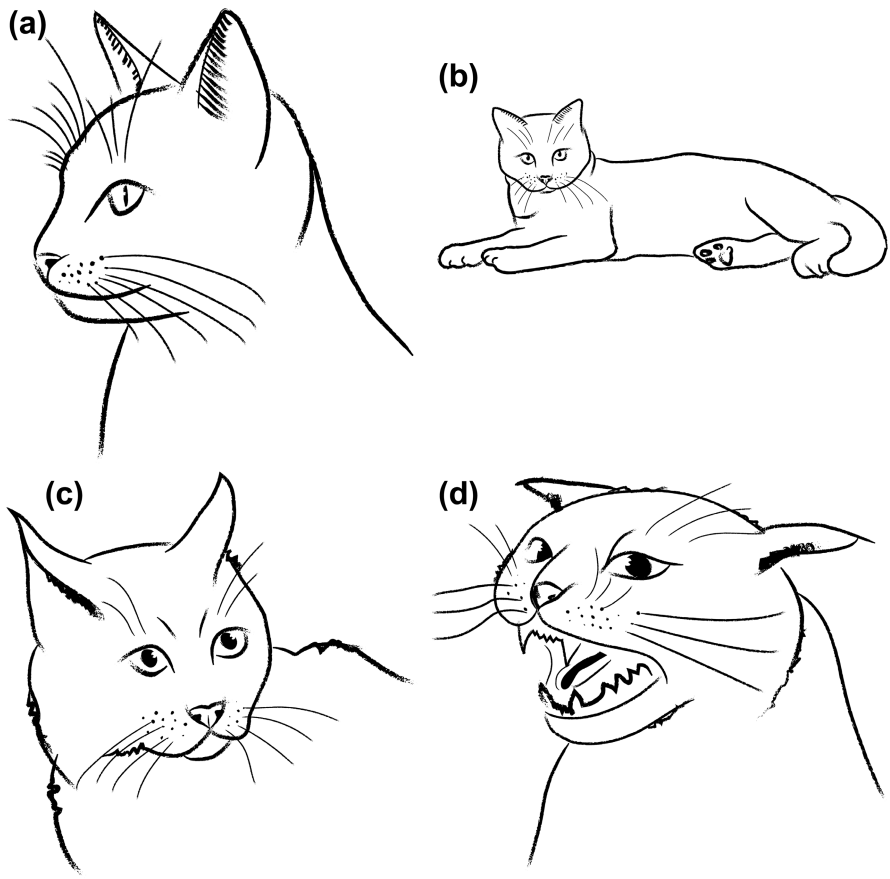

FIGURE 4.10 Being able to discern feline body language can help the caregiver decode emotions: a relaxed and non-threatening pose (a and b). Ears rotated backwards with a degree of facial tension can denote frustration and/or anger (c). Flattened ears, laid close to the head and hissing/spitting and maybe growling demonstrate defensive aggression (d). Based on images used in An Ethogram for Behavioural Studies of the Domestic Cat by the UK Cat Behaviour Working Group (1995).

Tail-down

Tail-down close to the anus is often recognised when a cat is fearful and defensive (see Figure 4.11).

Tail Wrapping

The intertwining of tails or wrapping the tail around another part of an affiliate's body is observed between closely bonded cats. As well as the tactile nature of the interaction it is believed that the glands distributed along the tail produce a pheromone that maintains a group odour which promotes social cohesion. As with other friendly gestures, it tends to follow a tail-up approach.

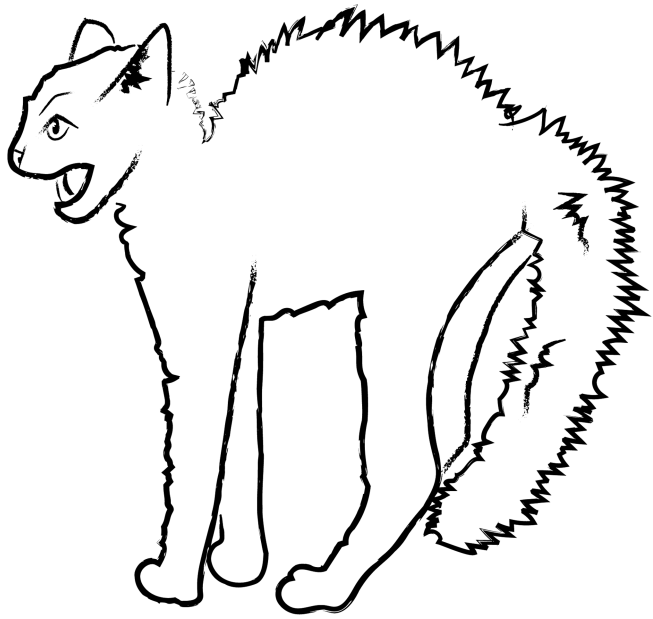

FIGURE 4.11 A startled and fearful cat may use piloerection along the spine and tail to make itself look larger.

Scientific Snippet: A study by Dr Cameron-Beaumont (1997) demonstrated that cats approached a cat-shaped silhouette depicting a 'tail-up' posture readily whereas they were much less likely to approach those silhouettes showing a lowered or half-lowered tail. Evidently, the tail position provides a clear signal to the receiver.

Mid-tail Wag

A side-to-side, slow-swishing tail that is level with the body can be indicative of indecision or emotional conflict. It is sometimes accompanied by pacing. This behaviour is often seen when a cat is frustrated; can't quite make a decision or something they desire can't be accessed physically or emotionally.

One of my cats displays this behaviour when he would like to go outside but if it's raining, like many cats, he doesn't like getting wet. Being torn between going out and staying in – he stands at the door showing his frustration by a mid-tail wag whilst I stand there with the door open waiting for him to make a decision (and getting cold in the process!).

Tail Quiver

As mentioned earlier the tail quiver often accompanies the ritualised action of urine spraying, when the cat reverses up to a vertical surface, lifts its tail vertically and

sprays a jet of urine. However, it can sometimes be displayed during excitement, particularly during greetings with other cats and caregivers.

Swishing/Slapping

Rapid or distinct movement of the tail, usually when lying or sitting, indicates annoyance, anger, frustration, and threat. Caution should be exercised as this can lead to aggression.

Bottle Brush Tail

The name perfectly describes the appearance of the tail. It occurs when the cat is feeling threatened and the hairs stand on end to make the cat appear larger. This is known as piloerection and, as well as the tail, it affects the hair all along the spine too (see Figure 4.11).

Whole Body Postures

Arching the back, with a broadside stance, is a distance-increasing signal designed to repel a perceived threat. This posture, usually combined with piloerection, is intended to create the illusion of being bigger so is, in a sense, a 'bluff'. At the same time, it's quite common for the cat to hiss or spit at the 'aggressor' (see Figure 4.10).

If this tactic fails the cat may make a slow withdrawal, moving sideways to keep a watchful eye on their opponent. A hasty retreat often triggers a chase so they prefer to slink away rather than turn and run.

Defensive Body Postures

Defensive postures are distance-increasing signals adopted by a cat when it is feeling threatened. Typical signs include:

- Leaning away with weight shifted slightly backwards – this poses less of a threat and means a cat can retreat more easily.
- Crouching – to make the cat appear smaller and less threatening.
- Tense facial muscles.
- Closed and crouched posture – probably to protect vulnerable body parts in the abdomen.
- Feet planted on the floor – ready to escape quickly.
- Dilated pupils – a physiological stress response that increases visual input.
- Head and neck pulled close to body – protecting delicate structures in the neck.
- Ears flattened and down against head – to protect and prevent ears from being damaged in an attack.
- Tail held down and tight to body.
- Rapid eye blinks whilst keeping an eye on the 'threat' (but avoiding a hard prolonged stare, as this can incite aggression).
- See the cat on the right in Figure 4.12.

Offensive Body Postures

Offensive postures are also distance-increasing signals but are more confrontational than defensive postures. They involve a seemingly confident approach towards the other individual with the intention of inflicting harm if necessary.

Some of the typical postures include:

- An upright stance with weight shifted forwards and towards the 'victim'.
- Tail held down and close to the body.
- Ears upright but turned sideways/backward rotation.
- Intentional and direct eye contact.
- Tension in the facial muscles (around the muzzle).
- See the cat on the left in figure 4.12.

Defensive aggression is the type of aggression mostly associated with fear involving self-preservation, withdrawal, and avoidance. However, a cat often exhibits aggressive behaviours such as hissing and growling to repel the subject of their fear.

Because the best form of defence, in some situations, can be to attack – a cat may escalate their level of aggression when they fail to repel the 'aggressor' or when they continue to feel threatened.

Offensive aggression is a more assertive form of aggression involving the aggressor controlling the interaction with threat and escalation of attack. Whether a cat chooses this form of aggression depends on numerous factors: their temperament, circumstances, and from experience and learned behaviour.

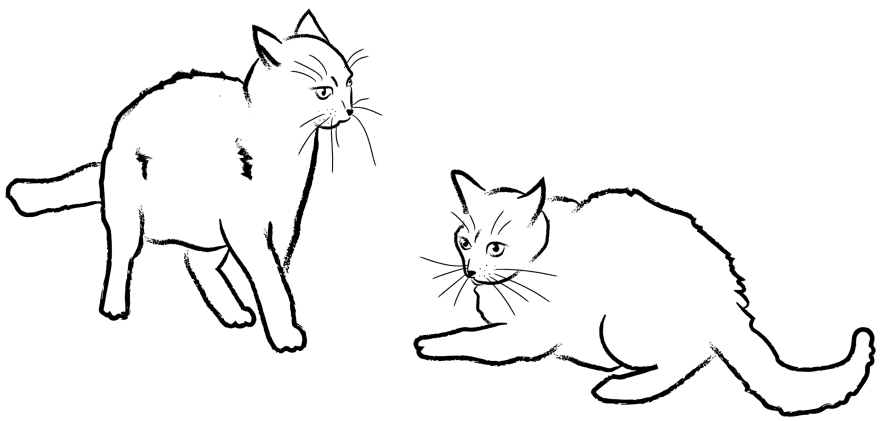

FIGURE 4.12 When rival cats meet, defensive and offensive body postures can be apparent and this can help reveal the dynamics of the encounter. These can, however, change during the interaction.

Gestures

Social Roll

This is a distance-decreasing signal, conveyed to those with whom the cat feels relaxed and comfortable and is mostly seen in greetings or as an invitation to interact and play (see Figure 4.13). Nevertheless, because the underside of a cat is a vulnerable part of the body, they may well, on impulse, respond by grabbing hold of the person's hands to scratch or bite. Therefore, do not assume that they want touching there. In most cases, this is an area to avoid!

Jumping or Rearing up on the Hind Legs

Cats sometimes exhibit this behaviour during a friendly encounter with their caregiver, whilst head bunting and raising their tail in a greeting. Because most humans will reciprocate by stroking and petting them back, this might become conditioned and subsequently elicited whenever they greet or want attention.

Tactile Communication (Touch)

Tactile signalling inevitably involves the exchange of scent and is of course a visual signal too. As such it has a multimodal (more than one) effect.

Examples include:

- Allorubbing (foreheads, cheeks, flanks, and tails).
- Allogrooming (mutual grooming).
- Sniffing and nose touching.
- Tail wrapping.
- Kneading.
- Sleeping and resting together.
- Play behaviour.

Tactile communication is usually reserved for close affiliates and helps to cement relationships.

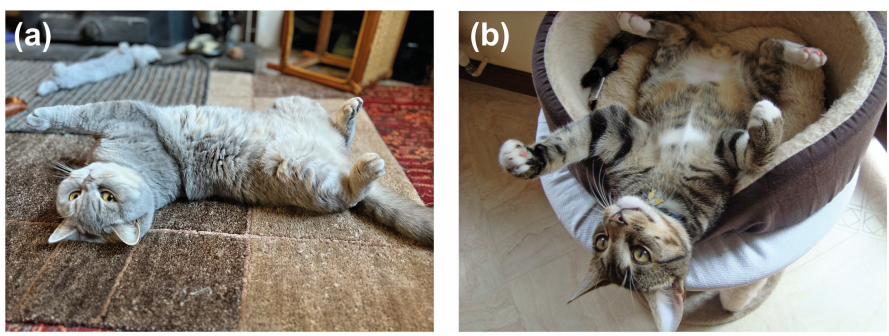

FIGURE 4.13 A social roll is usually a solicitous gesture reserved for those with whom the cat feels secure. Photos courtesy of Nicola Hatfield (a) and Rebecca Whitehead (b).

In social interactions between preferred individuals, a mutual tail-up greeting often precedes nose touches and sniffing and may be noticeable after a period of separation. Similar behaviours can be observed between less well-bonded cats but further sniffing of the anal region and other parts of the body are likely and the tail carriage of both cats is lower. Some cats will rebuff this kind of interaction.

Being aware of the intercourse between cats can be helpful when evaluating relationships and factions within groups of cats that live together, particularly when a home needs to be modified to accommodate different cliques and preferred associates.

Behaviours that indicate affiliation and social cohesion between cats include:

- Sleeping/relaxing together in close proximity.
- Allogrooming (grooming and licking each other).
- Rubbing each other to mix and create a group odour (foreheads, cheeks, flanks).
- Rubbing each other whilst purring.
- Running together side by side whilst purring/with raised/linking tails.
- Friendly greetings – approaching each other with a raised tail/vocalising (trilling, chirruping).
- Nose touching.

Source: Based on Crowell-Davis et al. (2004)

These same behaviours can be elicited to other animals and humans too which demonstrates close bonds and affection (Figure 4.14).

Kneading

Kneading (sometimes called 'padding') is a sign of general contentment, usually accompanied by purring. This behaviour is demonstrated during suckling and the rhythmic treading with the front paws whilst unsheathing and retracting the claws helps stimulate milk flow from the mother's mammary gland. Once weaned the action is still associated with the feelings of being content. It may be triggered when touching anything soft and fleecy but is also directed to closely bonded cats and humans.

Cat–Human Communication

Research has taught us that cats actually prefer their human caregivers to approach things in a similar way to how they would interact with another well-bonded cat. This involves body rubs, where scent glands are in abundance (primarily around the head) (Ellis et al. 2015).

There are a number of 'no go' areas and these should be respected although some might be reserved for familiar humans. For example, my cats allow petting at the base of the tail and seem to like it, often raising their tail in a friendly gesture and giving permission for me to continue by leaning in or pushing their rear end into my touch. However, like the underside of the abdomen and their feet, it's definitely not a



FIGURE 4.14 Cats sleeping together (a) and cats in close proximity (b). Signs of affiliation can be conveyed to other non-cat species (c). Photos courtesy of Brenda Delgado (a), Helen Campbell (b) and the author (c).

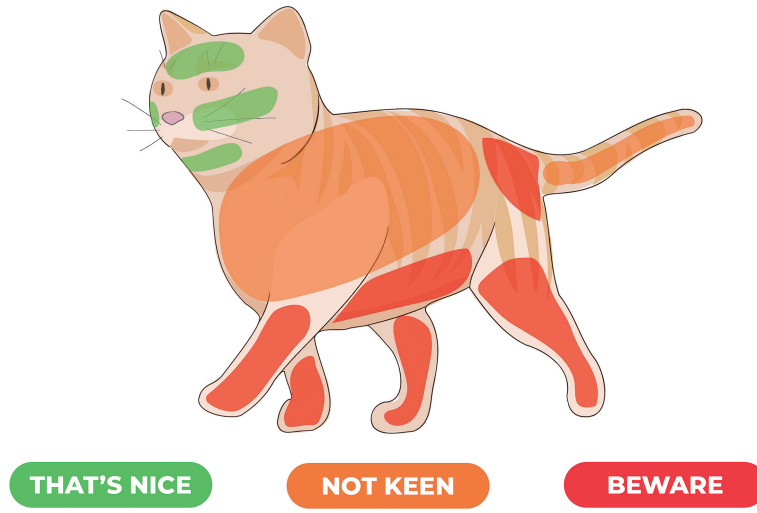

FIGURE 4.15 An illustration providing a useful guide for interacting with less familiar or unknown cats. It shows the areas where they like and dislike being touched in cat–human interactions. Based on the works of Dr Lauren Finka and Dr Sarah Ellis and colleagues. Adapted from iCatCare: 'Cat Friendly Interaction' online guide.

location I would advise venturing towards in a cat you don't know and I would still recommend proceeding cautiously with a cat that you do know (see Figure 4.15).

Gaining Consent

Consent is now an important concept in animal handling. This means that rather than leading the interaction, we should 'ask' for permission to engage with them and regularly check in to determine whether they are still willing to participate. Doing this with cats is easy once we understand feline body language and adhere to some basic principles.

First and foremost, we should allow a cat to initiate the interaction and approach us. Once we have established that they want to enter our social space and engage with us in a friendly way we should let them make the first contact. Throughout the engagement we should observe the cat for their feedback, pausing briefly to give them the choice to remain or end the contact (see tips in Box 4.3).

BOX 4.3. Recommendations for Approaching and Interacting with Unfamiliar Cats

- Let a cat make the first approach.
- Crouch down with a side-on posture and speak calmly and quietly.
- Move slowly avoiding sudden movements.
- Slow blink and avoid staring or making direct eye contact.

- Assess the cat's behaviour and body language to check whether they want to interact.
- Offer the back of the hand, with a softly closed fist, but avoid thrusting it out towards them.
- If they take the initiative and give their 'consent' restrict your touch to the preferred areas (green areas in Figure 4.15) and observe their response.
- Employ the 'three second rule':
  1. Engage with them for three seconds – pause and move the hand a short distance away to give them the choice to end the interaction. If they move towards the hand again continue with the contact as before.
  2. Stop as soon as they show signs that they wish to end the interaction, e.g. disengage, move away, or show some mild intolerance.
  3. Do not pursue them or try to coax them to continue with the interaction.
  4. Engaging with the cat in this way gives them choice which gives them a sense of control – exactly how the cat likes to operate.

  Based on Care: Cat Friendly Interaction (iCatCare 2022)
- The 'CAT' acronym, developed by Haywood et al. (2021), acts as a reminder to help guide and enhance positive human–cat interactions:

  C is for **Choice** and **Control.**

  A is for paying **Attention** to the cat's behaviour and body language during the engagement.

  T is limiting our **Touch** to their head and neck region where most cats prefer to be stroked (Figure 4.16).

Research Matters

There is a large body of research that provides us with a deeper understanding of feline sociality towards humans, e.g. Ellis et al. (2015), Haywood et al. (2021), McComb et al. (2009), and this has been beautifully reviewed and presented by leading cat behaviourist and scientist Lauren Finka (2022).

Here are a few key findings:

- Cats interact with their caregivers for longer durations when the interactions are initiated by the cat rather than the other way around.
- Cats exhibit a preference for social interactions with adults (particularly females) over children. Women have been shown to vocalise to cats, crouch down to their level, and generally display less threatening behaviours when they engage with them. Children, on the other hand, are more likely to make a direct approach when the cat is resting, follow them around and try and pick them up, which is likely to be perceived as threatening.
- The area of the cat's body that a human touches appears to affect the nature of their behavioural responses. Certain areas, e.g. the underside of the body, may induce signs of discomfort (e.g. flicking and swishing of the tail) and



FIGURE 4.16 Voluntarily approaching a person and head rubbing demonstrates the cat is giving consent to being touched. Photo: Author's own.

aggression such as hissing and biting. In contrast, stroking areas around the head is more likely to lead to greater rates of affiliative behaviours (e.g., half-closing the eyes, purring, and rubbing against the handler).

- Companion cats seem to be able to read certain facial and postural cues displayed by humans. For example, companion cats were found to approach unfamiliar humans significantly more often when they performed a 'slow-blink sequence' towards the cat, compared to when they adopted a neutral expression.
- Cats spend a longer time in contact with people when they display a 'happy' rather than an 'angry' posture and facial expression.
- Positive human experiences in the socialisation period correlate with higher levels of sociability to humans.
- Heritable temperamental traits may also interact with kittens' early social experiences to influence the nature of their sociability towards humans.

Aggression Associated with Human Interactions

Low Tolerance Petting Aggression

This relates to a cat's level of tolerance for being petted. It appears that the cat is conflicted by their desire to be stroked and the limit to which they can tolerate the interaction. This can result in what a caregiver describes as a sudden flare-up of aggression, e.g. lashing out, hissing, or biting. Yet, there are very often some signs that precede the outburst that include:

- Swishing of the tail.
- Stiffening of the body.
- Changes in the ear position.
- Rippling of the skin more usually over the back (lumbar spine)*.
- Hissing or emitting a low growl.

*A further complication of low tolerance petting aggression may be linked to an under-diagnosed condition called feline hyperaesthesia syndrome (Bowen and Heath 2005). The signs include a typical rippling skin effect, especially when touched around the lumbar spine region. There is still much to learn about this condition but it is believed to be a neurological syndrome causing neuropathic discomfort, hence the resentment to being touched. I shall be discussing this condition again in Chapter 9 as it can be implicated with compulsive behaviour disorders.

Each cat has their own level of tolerance so applying that knowledge and stopping petting well before any signs of impending aggression are shown is key. It's also important to understand how to interpret feline communication so that the effect of your interaction can be judged more accurately.

On the whole, cats like to be in control and tend to prefer low-intensity, less intrusive interactions, in short regular bursts. But, a bit like us, some cats are more tactile than others and some are simply less responsive to being touched. Being respectful of that and determining what kind of human interaction they feel most comfortable with is something else to consider.

Other management tips for low tolerance petting aggression:

- Provide attention in other ways. For example, use slow eye blinks and learn to be content with cats who just want to sit close by and prefer not to physically interact (See Figure 4.17).
- Limit interactions to seconds and stop petting before the cat becomes irritable.
- Learn to respect an individual's preferences. Most cats prefer head and neck petting.

KEY TAKE HOME POINTS

- Cats have a rich and unique range of communication methods.
- A greater understanding of how a cat processes and uses chemical signals in self-directed and social contexts can be used to improve their well-being.
- Having an awareness of feline body language helps us to assess their emotional state more accurately and promotes positive human–cat interactions.
- Initiatives such as the 'three second rule' and the 'CAT' acronym may facilitate safer and more beneficial human–cat interactions.



FIGURE 4.17 'Hanging-out' with their human family is an affiliative gesture. Some cats prefer this to tactile shows of affection, and may be deterred if their human keeps pursuing them for a cuddle! Photo courtesy of Katie Jones.

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Part 2

Negative Emotional States

Their Effects and How We Can Help

Because the domestic cat occupies such a special and unique part of our natural and social world, we have a responsibility to ensure their emotional needs are met.

How a cat sees and interacts with the world in a domestic setting can expose them to a number of challenges and pressures which can be at odds with how they naturally function. Part 2 highlights the impact that negative emotional states have on a cat's mental and physical health. Moreover, it provides some practical solutions that caregivers and feline professionals can follow, in order to help cats under their care cope with challenging situations.



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5 Fear, Anxiety, and Stress

Fear, anxiety, and stress (FAS) are emotions that affect a cat's well-being and are often at the root of certain problematic behaviours. It is important to consider what these emotions mean for the cat and to understand the involuntary physiological forces and processes that take place during negative emotional states which are detrimental to the cat's physical and mental health.

NEGATIVE EMOTIONAL STATES

Terms such as fear, anxiety, and stress are often used interchangeably. However, although they share similar features and give rise to similar outward signs, they do have different meanings. Therefore, to avoid confusion, it is useful to have a clear definition of what they all actually mean and to know something about each of them.

What Is Fear?

When fear is in proportion to the danger, it is a normal, adaptive response, essential for survival. Without it, and the reactions that it triggers, animals would be extremely vulnerable. It makes perfect sense to act fearfully to something that is known or perceived to be dangerous. Nevertheless, it becomes damaging when it is disproportionate to the situation or when the fear response is continually triggered by non-threatening situations.

A key feature of fear is that it is directed to the location or object of the fearful stimulus and the fear response is terminated when the object of fear is removed. For example, a cat that is frightened of fireworks will react whilst being exposed to the flashing lights and loud sounds that are going on around them but the fearful response will stop when they are removed from that situation or when the fireworks cease. The other kind of things that may induce fearfulness include being restrained or pursued by a human, being enclosed in a cat carrier or being threatened by a dog or other animal.

Feline Fact: According to the 2023 Cats and Their Stats (CATS) annual report, almost two-thirds (64%) of UK caregivers, who have seen their cat experience fireworks, say that their cat is adversely affected. The signs of fear reported included hiding, trying to escape/run away, and showing fearful body language. However, because many cats seek refuge outside and some caregivers are unable to recognise fearful behaviours, it is likely that this figure is even greater.

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What Is Anxiety?

Anxiety is the anticipation of a fearful event, sometimes described as apprehensive expectation. In other words, the cat is anticipating that something frightening and unpleasant may occur rather than reacting to a fear-inducing stimulus (Casey 2002). Anxious cats can spend large amounts of time worrying and are often in a state of hypervigilance (i.e. scanning their environment and startling easily). Chronic (long lasting) anxiety is physically and mentally tiring and serves no real function. For that reason it is considered abnormal and recognised as a welfare concern.

Despite the differences, fear and anxiety can occur together and sometimes the signs overlap. Indeed, it is often very hard to pick the two apart because we can't ask the cat if they are worrying about something specific and in the present or whether they're worrying in anticipation of something that might happen in the future. Of course, making observations of what is going on in their environment can help although, because of this crossover and not always knowing what the cat actually does feel, these two emotional states are often considered to be on the same spectrum (Mills 2016).

Recognising the Signs of Fear and Anxiety

When a cat is frightened and anxious, their main strategy is to escape and hide (usually in an elevated location) until the danger has passed. But there are other signals, some of which have already been described in Chapter 4. Knowledge of the full range, including more subtle behaviours, increases our perception and allows us to take the necessary action.

During a frightening event a cat may show one or a combination of any of the following responses:

- Alterations in the ear position, e.g. lowered and flattened to the head.
- Alternations in tail posture (see Chapter 4).
- Crouching body stance with feet planted to help make a hasty retreat.
- Escape – fleeing is the cat's number one response to a fearful event.
- Emptying the anal glands (usually when in a highly fearful state).
- Hiding and/or seeking an elevated location.
- Licking lips, performing tongue flicks, and noticeable swallowing.
- Panting and open-mouthed breathing (more likely when experiencing extreme fear).
- Raised hair along the back and tail (piloerection).
- Rapid eye blinks.
- Slow retreat.
- Stiffening of the body.
- Swiping and batting out with the paws (claws may or may not be sheathed) and other forms of aggression.

- Tension in the muscles of the body.
- Trembling and shaking.
- Turning the body sideways on (but keeping the target of their fear in view).
- Urinating and defaecating (usually when in extreme fear).
- Vocalising, e.g. hissing, spitting, growling, and shrieking when they feel extremely threatened (Figure 5.1).

Source: Based on Carney and Gourkow (2016)

Physiological (biological) indicators of fear can be noticeable whilst some are more subtle. An increased respiration rate is evident by the cat's rapid breathing. However, a raised pulse rate and high blood pressure are not so easy to measure without some medical knowledge and relevant apparatus. Others indicators to look out for include sweaty paw prints (sometimes visible on a veterinary or grooming table) and excessive shedding of fur. The latter is largely due to the tiny muscles attached to hair follicles being activated by trembling. This causes the hair to stand on end and, in the process, pushes out hairs that are primed to be shed.

Physiological Indicators

- Dilated pupils (increased diameter) (see Figure 5.2).
- Increased respiration (breathing).
- Increased heart and pulse rate.
- Raised blood pressure (a veterinary procedure requiring specialised apparatus).
- Perspiration from sweat glands in the feet.
- Excessive shedding of fur.

Source: Based on Buffington (2018)

Details of how to access a mini guide to feline health, including how to measure pulse and respiration, can be found in Appendix 3 at the back of the book.

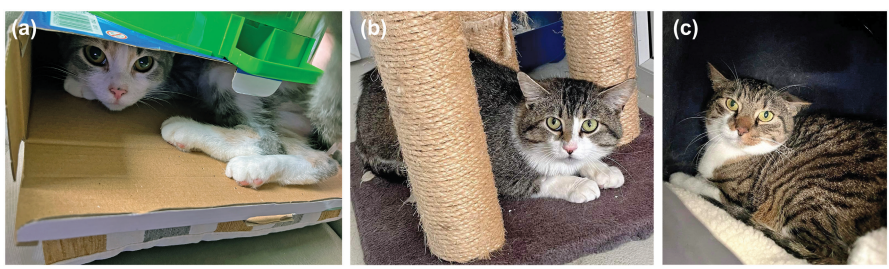

FIGURE 5.1 Withdrawal and hiding (a). Feet planted on the floor, ready for a speedy retreat (b). Crouched and flattened ears (c). All these are signs that indicate fear and anxiety. Photos courtesy of Beverley West (a) and Holly Barker at Hull Animal Welfare Trust (b and c).



FIGURE 5.2 Dilated pupils are a sign of high arousal, often accompanying other signs of fear. Photo courtesy of Zaklin Wachowiak.

Basic and Immediate Help for a Fearful Cat

We shall be exploring a selection of specific fear-related problems and their treatment later in the book but the immediate, first aid behavioural help for a fearful cat focuses on their welfare and on the health and safety of all concerned:

- Seek prompt veterinary attention to rule out any pain or medical conditions, which can lower the threshold for fear and anxiety (see Chapter 6).
- Identify things that trigger the behaviour and avoid exposure to them.
- Never forcibly restrain, corner, or pick up a fearful cat as this can lead to fear aggression and handler injuries.
- Stop any form of punishment as this heightens fear, e.g. shouting, spraying with water, etc.
- Create a safe, quiet, and calm environment with plenty of high-up places and hidey holes for them to retreat to.
- Seek the help of a suitably qualified feline behaviour counsellor.

Source: Based on Bowen and Heath (2005)

Top Tip: When a cat is fearful and anxious, they prefer to be left alone. Although it's tempting to want to pursue or uproot them from their hiding place in order to reassure and fuss over them, this is the last thing they are likely to want. For their benefit, and to prevent injuries, it's far better to leave them alone until they feel that it's safe to come out by themselves.

What Is Stress?

Stress is the broad term used to describe the changes that cause behavioural, emotional, and psychological strain in response to difficult or fear-provoking situations. Strictly speaking, in the biological sense, stress that is perceived as being bad or negative is called distress and stress that is perceived as being positive and useful is known as eustress. Eustress might be the type of emotion a cat feels whilst hunting and killing prey and during predatory play. Eustress enhances performance and is therefore a normal healthy state. However, in this book, I shall largely use the terms stress and distress interchangeably to describe the deleterious effects.

Stress can be described as acute or chronic:

- **Acute stress** is short-lived and the body quickly recovers with no long-term damage. This is an adaptive process, designed as a survival strategy to deal with an impending situation.
- **Chronic stress** is persistent, prolonged and constantly recurs. This is the most physically and emotionally damaging kind of stress but can be difficult to detect in cats.

Difficulties Recognising Chronic Stress in Cats

In a bid to avoid appearing vulnerable, and therefore weak, and choosing avoidance as a coping tactic, means that recognising chronic stress behaviours in cats can be challenging, especially for the inexperienced caregiver. Data from a large scale survey of cat caregivers showed that almost three-quarters of cats (72%) exhibited at least one behaviour that was an indicator of stress (CATS Report 2022).

Unfortunately, it's usually only when problems become blatantly obvious and undesirable (e.g. house soiling, fighting between other cats in the household, or stress-induced illness) when help is sought, which represents a greater, but not impossible, challenge for being able to resolve.

'Behavioural problems' is one of the most commonly reported reasons for relinquishment in both dogs and cats (Jensen et al. 2020). Focussing on education, so that caregivers can recognise and understand the common triggers and be familiar with the signs of problems, is therefore a vital component for promoting animal welfare and for easing the pressures placed on animal shelters.

Some of the indicators of chronic stress may include:

- Withdrawal (hiding, reduced play).
- Changes in appetite (decreased and increased).
- Hiding.
- Clinginess to the caregiver.
- Changes in demeanour, e.g. less relaxed, 'depressed'.
- Easily startled and hypervigilant (on high alert).
- Increased scratching and facial rubs in their environment (most likely to add their scent to act as a self-appeasement signal).
- Disturbed sleeping patterns.
- A lower tolerance for aggression (redirecting aggression towards caregivers and previously well-bonded familiar cats).
- Compulsive disorders such as over-grooming*.
- Inappropriate urination and defaecation*.
- Increased urine spraying*.
- A range of medical conditions that are known for having strong links to stress*.

Source: Based on Amat et al. (2015)

*These highlighted behaviours and conditions develop when the earlier signs of stress are ignored and are indicative of a severely distressed cat. These will be discussed in more detail in Chapter 9.

When problems do strike, it may be necessary to get some help from a suitably qualified, feline behaviourist. This involves them carrying out a full assessment so that they can pinpoint problems and design a tailored behaviour modification plan. If the veterinary surgeon is not able to provide this service within their practice, they will refer their patient to a recognised professional. Details of how to find a suitably qualified and registered feline behaviour counsellor can be found in Appendix 3 at the back of the book.

Stressors

The events, experiences, and sensations that underlie and induce stress are called stressors**.** A stressor can include something seemingly minor (to us) through to something more obviously frightening and threatening (see Figure 5.3).

As with the human experience, a cat's life is filled with a range of unavoidable stressors. These might include everyday occurrences such as unfamiliar visitors coming to the home, unexpected noises in the environment, and experiencing changes in the home and to their routine.

Emotionally resilient cats, i.e. those that have had positive socialisation and early life experiences, usually take stressors in their stride and recover rapidly whereas some others don't. These are the ones whose stress response is regularly triggered, impairing their health. Potential causes of their inability to cope include:

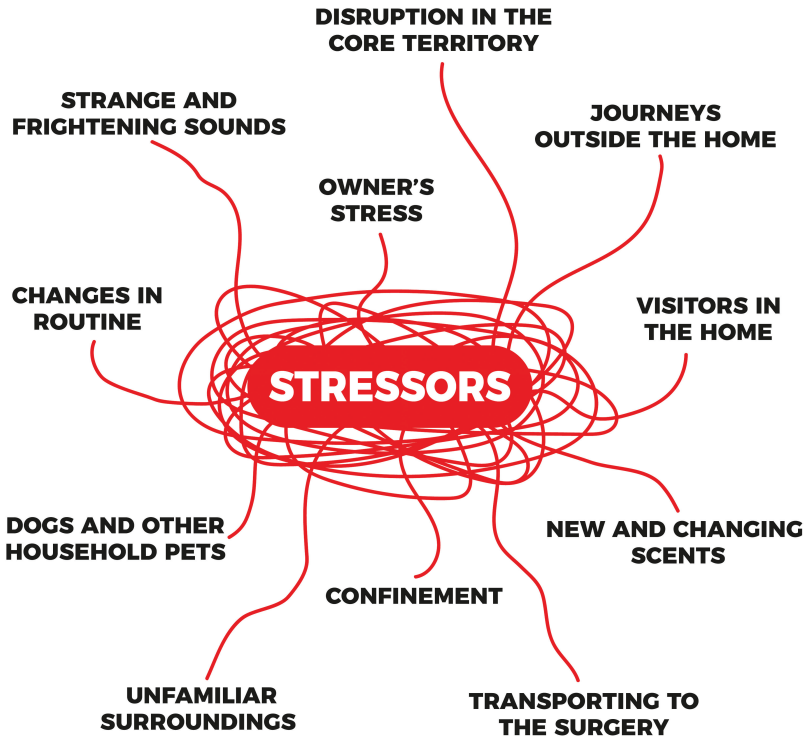

FIGURE 5.3 A number of stressors can impact the cat, many of which can be unavoidable when living as a domestic pet.

- A poor habituation and socialisation experience.
- Negative prenatal experiences and poor mothering.
- Genetics – inheriting a timid temperament.
- Experiencing a traumatic experience.

Despite the fact that these individuals are at a disadvantage, doesn't mean that they can't be helped. Ways to assist and support them will be covered in more detail later in the book.

Physiological Processes: What's Actually Going On?

When we consider negative emotional states, knowing what is going on at a biological level often helps to answer questions about why an animal responds and behaves as they do. Combining this with knowledge of the cat's evolution helps to complete the picture.

The Stress Response

The stress response evolved as a survival mechanism and has a critical role in preparing an animal for real threat. However, for the fearful and anxious cat, this

response can often remain activated and in charge for a large part of their daily time budget.

During a frightening situation, the cat receives information from the outside world via their main senses. From there, specialised neurones (nerves) send information to a part of the brain called the amygdala, where it is processed and interpreted. Once the alarm is raised another brain structure, called the hypothalamus, coordinates a multi-action process, preparing the cat to deal with the danger at hand.

The Sympathetic–Adrenal–Medullary Axis (SAM Axis)

Immediately, a specialised part of the nervous system called the autonomic nervous system (ANS) is activated. The ANS controls involuntary actions (things outside the cat's control) such as blood flow, heartbeat and breathing. A branch of this, responsible for speeding up these actions (known as the sympathetic nervous system), is then prompted to act, causing the heartbeat and pulse to quicken, breathing becomes more rapid and the adrenal glands (two structures located above the kidneys) release stress hormones (Etim et al. 2014).

The three major stress hormones include:

1. Epinephrine (also known as adrenaline).
2. Norepinephrine (also known as Noradrenaline).
3. Cortisol (a glucocorticoid hormone).

Within seconds epinephrine and norepinephrine (belonging to a group of hormones called *catecholamines*) flood through the system bringing a number of physiological changes. These are all designed to hone the cat's senses, to help them fight off an opponent if necessary or to run away and take flight in order to survive (Table 5.1). Hence the term 'fight-or-flight' reaction.

The term 'fight-or-flight' reaction describes the immediate response to threat. We know that the cat's main response is avoidance and escape (flight) although if this option isn't available, the fight response may be needed for defence.

Another response to fear and anxiety is to freeze. This is evidenced in the cat when they become motionless and hunker down and hide, most usually in a high-up location, until they feel that the danger has passed. However, this shouldn't be confused with a phenomenon called learned helplessness.

Learned helplessness occurs when an animal has come to expect emotional discomfort, i.e. fear, pain, or suffering, without any means of escape (Hammerle et al. 2015). As a result of not knowing what they need to do to resolve the problem – they just shut down completely and stop trying. This can sometimes be interpreted as the cat being calm and responding or becoming used to a situation they are forced to face when, in fact, it is quite the opposite. Learned helplessness can sometimes be witnessed when the cat is being pursued or restrained for a medical procedure.

The Hypothalamic–Pituitary–Adrenal Axis (HPA Axis)

After the initial surge of epinephrine and norepinephrine, glucocorticoid hormones including cortisol are released. This is mainly controlled by the other element of

TABLE 5.1 Some of the Effects of Epinephrine and Norepinephrine during the Stress Response

Organs and body systems affected	Physiological effects of Epinephrine and Norepinephrine	The function
Heart	• Increases the rate and force of heart muscle contraction, increasing the output of blood and raising blood pressure.	• To prepare the body for strenuous activity.
Circulation	• Diverts blood flow to the brain, large muscles, and lungs. • Decreases the flow of blood to the digestive system, the skin, and the peripheral parts of the body.	• Blood delivers oxygen and energy supplies to the brain in order to enhance alertness. • Blood diverted to large muscles and the lungs prepare for flight and fight. • Digestion and blood flow to the skin and extremities is slowed down so that the body can divert all its internal energy to dealing with the perceived danger at hand.
Lungs	• Increased respiration and dilation of bronchioles (tiny air passageways in the lung).	• To help increase and maintain oxygen supplies.
The eye	• Dilates pupils (widens the diameter).	• To allow more light to enter the eyes, improving vision and the ability to scan the surroundings.

Source: Based on Fraser and Girling (2011)

the stress response known as the HPA system, which basically comprises of three inter-communicating structures; the hypothalamus in the brain, which stimulates the adjacent pituitary gland to release hormones that cause the adrenal glands to release cortisol.

So, what does cortisol do? As well as fuelling the stress response, cortisol plays an important role in managing how the body uses carbohydrates, fats, and proteins. It also regulates blood pressure and increases glucose in the bloodstream, providing an energy boost which is required for ongoing real, or perceived, danger.

This sharp rise in blood glucose during an acute stress response is called stress hyperglycaemia (Rand et al. 2008) and although it's not exclusive to cats it is a more severe and common occurrence when compared to many other species. It's worth noting that high blood glucose concentrations may affect the diagnosis and management of certain conditions (e.g. diabetes mellitus). Veterinary teams must therefore endeavour to create a calm environment and practice cat-friendly handling techniques when taking blood specimens to ensure accurate diagnostic results are obtained, otherwise blood glucose results can be skewed (see Figure 5.4).



FIGURE 5.4 Using gentle handling techniques during blood sampling can prevent stress and reduce the physiological effects of a sudden rise in glucose, which can affect the results of a blood test. Photo courtesy of Frankie Lees.

Like epinephrine and norepinephrine, cortisol can curb bodily functions that are non-essential. Systems such as digestion, reproduction, immune responses and even growth processes can be switched off until the threat is over, so that energy can be redirected to the more important body systems required for survival. However, when stress hormones are operational for prolonged periods the effects on these systems can be damaging.

All these physiological effects are part of a finely tuned process and, in normal circumstances, after the danger has passed, these bodily processes calm down and the cat returns to homeostasis (their normal baseline state). Yet, if a cat remains under constant stress and the system stays activated, the physiological disruption can eventually lead to chronic stress, resulting in physical and psychological health issues.

Scientific Snippet: One study showed that when cats were given the opportunity to hide when encountering a scary situation, the levels of the stress hormone, cortisol, in their blood stream and urine decreased (McCobb et al. 2005).

The Brain and Behaviour

The limbic system is the part of the brain that is responsible for processing information and for behavioural and emotional responses. The two structures of particular significance are the amygdala (already mentioned) and the hippocampus (Figure 5.2).

The amygdala is responsible for controlling the way cats (and other mammals) recognise, process, and express emotions such as fear and anxiety and, as previously noted, has a role to play in the stress response. The amygdala determines how deeply the memory of an emotional experience is stored. Unsurprisingly, memories linked to fear and trauma tend to become more deeply rooted.

The hippocampus is adjacent to the amygdala and is also responsible for memory formation. Whilst the amygdala stores the memories of traumatic experiences, the hippocampus plays a part in linking sensations to the memory.

It makes complete sense for any animal to remember something that was frightening (and potentially life threatening) and recall it quickly so it can take rapid action to avoid it next time. For this reason, fearful memories can be formed after only a few repetitions and sometimes, if distressing enough, just one event is all that is required for them to learn something that becomes deep-rooted. This is called single-event or one-event learning – a form of associative learning which can have a long-term impact on the cat, as Kiki's story demonstrates (see Box 5.1).

BOX 5.1. Kiki's Single-Event Learning Experience

Kiki was a five month old female kitten and was due to be spayed. The morning of her planned operation came and she was placed inside her carrier which she had been habituated to. She'd also had a great socialisation and was taking everything in her stride.

On the journey to the veterinary clinic the car she was travelling in was hit by another vehicle. Although she was in her carrier and secured with a seat-belt on the front seat – the air bag was activated but, with the impact, she was jolted forward. The caregiver was not badly injured but was obviously distressed, as was Kiki.

The operation was postponed for a few days and Kiki seemed to have recovered from the ordeal but when the cat carrier came out she was clearly anxious. She was even unhappier when she was fastened in it. However, the worst reaction was when she was put in the car. Kiki was desperate to get out of the carrier, scratching and vocalising loudly. Clearly she had learned by that one, single, frightening experience that going in the carrier, and especially the car, represented great danger.

In contrast to instinctive behaviours, learned behaviours are ones that an animal develops as a result of experience. Kiki's case provides a perfect example of associative learning which occurs when events are linked or occur together.

Kiki was also subject to another learning phenomenon called fear conditioning. This is a simple form of associative learning that occurs when a neutral stimulus, (something not frightening in itself – such as the car), is paired with something aversive, such as pain or fear.

Further complications were the links she made with the physical surroundings. This is called contextual fear conditioning which can trigger a fearful response. Let's not also forget that Kiki was hitting puberty and adolescence – times in her behavioural development which may have made her more sensitive to the whole ordeal.

With regard to health and safety, the Center for Pet Safety (centerforpetsafety.org) recommends that most carriers should be placed and secured on the floor of the vehicle behind the front seat.

Triggers

In the context of negative emotions, a trigger is something that sets off the memory or is associated with a stress-inducing stimulus or event. In Kiki's case the carrier and the car acted as triggers. Triggers are activated through one or more of the senses: sight, sound, smell, and even touch. The latter may include physical touch, perhaps from a handler, but can include the sensory input when a cat touches something they come into contact with. For example, the sensation of the anti-slip rubber matting on a grooming or veterinary examination table might be a sensory trigger because of the memories it conjures up of being frightened or in pain whilst standing on it. Different scents detected in veterinary environments or catteries could work in a similar way.

Neurotransmitters

Another way that the brain mobilises activity in response to stress is through neurotransmitters. In common with stress hormones, neurotransmitters are chemical messengers but they work by sending their messages between neurons (nerve cells) targeting cells all over the body (Bear et al. 2001). Because epinephrine and norepinephrine also have a role in helping neurones communicate, they can be categorised as neurotransmitters as well as hormones.

In addition to other roles within the body, certain neurotransmitters play an important part in the brain systems that regulate mood and emotional behaviour. It has been suggested that disruption to their production is linked with fear-related problems. Three neurotransmitters of particular significance include:

- Serotonin (sometimes called the happy hormone).
- Gamma Aminobutyric Acid (GABA).
- Dopamine.

In accord with one another, the production of these neurotransmitters can be increased through naturally pleasing activities. This includes cat-centric feeding methods, play, and other mentally enriching activities (see Chapter 10).

Serotonin is scientifically known as 5-hydroxytryptamine, often abbreviated to 5-HT. As well as its effect on feelings of well-being, it has roles in regulating sleep and appetite. Studies in the field of animal behaviour have suggested that low levels are linked with aggression and impulsivity (Seo et al. 2008).

GABA is instrumental in reducing stress, lowering anxiety, and creating a calm mood. GABA is often found as a listed ingredient in a number of natural, over-the-counter, feline calming supplements.

Dopamine is involved in working memory, focus, attention, and motivation. Sleep deprivation and stress can reduce dopamine levels and this may lead to a downward spiral of events, contributing to the maintenance of certain behavioural problems.

Dopamine spikes when an animal receives or anticipates receiving a pleasurable reward. Consequently, an extremely effective way of inducing its release naturally is through the seeking systems of the brain. The feeding activities mentioned in Chapter 3, and the use of reward-based training in Chapter 11, may help to induce its release, thereby having a therapeutic effect and mitigating stress-related behaviours (Dantas et al. 2016).

How Cats Cope with Conflict

Coping can be defined as the behavioural and physiological ability to moderate, overcome, or tolerate the internal and external demands of a demanding and stressful situation.

How a cat copes with a frightening or stressful event can be determined by genetics, previous experience and their behavioural profile - those with a timid temperament often find it more difficult (Stella and Croney 2019). However, like most animals, the cat, tends to cope with a situation in a much better way if we can provide them with a sense of choice because this gives them more control and freedom to act.

Whilst there may be some variation between individuals, as we already know, a cat's primary response to real or perceived threat is avoidance. This includes finding an escape route, retreating, and hiding and, if possible, seeking a raised location to observe the threat from a safe and secure height until it is safe to emerge (DePorter 2016).

Because of the cat's nature, it is extremely frustrating for them if they are denied the opportunity to access their preferred coping strategies. Physical restrictions and poor environmental setups are often responsible but pain can also play a significant role by reducing the cat's ability to escape, defend itself or get to a safe and secure site due to their physical disability. Unfortunately, through learned behaviour, aggression can become part of their first response to threat – especially if they have learned that it works well in repelling the fear-inducing stimulus. Being mindful of what a cat needs in times of stress can therefore prevent aggression from developing.

Top Tip: It's possible to teach some coping skills to kittens during their socialisation period. For example, by providing new experiences and making regular, small alterations in the environment can help prepare them for unforeseen changes such as redecoration or moving house – all things that they may encounter throughout adulthood.

Displacement Activities

During times of emotional conflict or social stress an animal may display a behaviour that seems completely out of context and totally displaced from the situation they are in. These are called displacement activities. Human equivalents might be twiddling the thumbs, wringing the hands or biting the nails. Like us, many of the feline displacement behaviours tend to be self-directed.

A common displacement activity in cats is self-grooming. Whilst it's quite common to see a cat having a short, intense bout of grooming after high arousal or conflict, this can become excessive and sometimes obsessive in some stressed individuals. With time, over-grooming can lead to alopecia (hair loss) and even self-inflicted trauma to the skin. We shall be spending more time exploring this condition and others like it in Chapter 9.

EFFECTS OF CHRONIC STRESS ON CLINICAL DISEASE AND PHYSICAL HEALTH

In feline medicine there are a number of diseases that are well known for their strong associations with stress and negative emotional states. At times it can be difficult to tease the two apart and determine whether stress is the direct cause of disease or an effect of the disease itself. Often, it's a combination of both and a cycle of events is set in motion.

As already pointed out, early life stress can interfere with the cat's physical growth and can compromise brain development. This can affect learning and even the way that they perceive pain in adulthood.

Being in a state of high alert is mentally and physically draining. Accordingly affected cats may be unable to properly relax which can lead to sleep deprivation. Although research is limited in animals, anecdotal evidence (based on numerous personal accounts) suggests that, like humans, lack of good quality sleep increases irritability and anxiety, disturbs concentration, and affects memory retention.

But, in all life stages, if left to continue, the ongoing effect of glucocorticoids (e.g. cortisol) and catecholamines (e.g. norepinephrine and epinephrine) have deleterious effects on body systems leading to a range of debilitating clinical problems some of which include the following:

Suppression of the Immune System

Suppression of the immune system leaves the cat susceptible to infections and medical problems (Amat et al. 2015). These might include upper respiratory (UR) and ocular diseases caused by infectious agents such as Feline Herpesvirus (FHV), Bordetella, and Calici virus. Indeed, UR infections are by far the most common causes of illness in cats housed in rescue centres, most probably because of group housing and the fact that these tend to be stressful environments.

Gastrointestinal Disturbances

The effects of stress may impair blood flow to the gastrointestinal system resulting in digestive upsets. In fact, there is a growing body of scientific evidence to support the idea that intestinal problems are associated with a variety of emotional disorders including anxiety (Fan et al. 2023).

It is widely accepted that, in humans, stress and anxiety leads to indigestion, irritable bowels, and an altogether unpleasant feeling throughout our GI system. It shouldn't be too difficult therefore for us to appreciate that other mammals, including cats, can be affected in similar ways. A feline behaviourist should ask the caregiver about the cat's bowel movements and other GI disturbances as this can be potentially related to distress and environmental factors but would also require referral back to the veterinary clinician for investigation.

The Gut–Brain Axis

The term 'gut–brain axis' refers to the constant bidirectional communication between the gastrointestinal (GI) tract and the brain. This is done through a network of hundreds of millions of neurons collectively called the enteric nervous system, sometimes referred to as the 'second brain'. Put simply, being anxious can lead to gut problems and gut problems can lead to anxiety. Before long a vicious cycle of events can be triggered and this affects the cat's well-being.

As research gathers momentum scientists are identifying interventions that can help, one of which involves the use of probiotics to help restore the gut flora.

Eating Disorders

Stress-Induced Anorexia

Cats can sometimes stop eating as a direct result of stress (Sparks et al. 2016). This is primarily influenced by the hormones released by the hypothalamus as part of the normal stress response. This process affects the hypothalamic circuitry which controls appetite, food recognition, and intake. Stress also seems to increase food neophobia (rejection or reluctance to try new and unfamiliar foods).

Stress-induced anorexia can also lead to a potentially fatal condition that affects the liver called Hepatic Lipidosis (HL). This seems to be more common in cats that are overweight. Prompt veterinary treatment is necessary and will involve fluid

therapy, restoring electrolyte balance, and initiating food intake, often through artificial feeding methods. Cornell University College of Veterinary Medicine have information related to this topic (see reference list).

> **Feline Fact:** Stress-induced anorexia (which can lead to HL) can be more pronounced when cats are given a new food in a stressful environment. Therefore, changing to a prescription diet, or giving a new foodstuff in a veterinary environment, is inadvisable. It's recommended, where possible, to stick with the cat's usual diet and wait to make the transition when they are back home. Other risk factors include long stays in a cattery environment which many cats may find stressful.

Polyphagia (Eating Excessively)

Eating excessively can be attributed to stress (McMillan 2013). In common with stress-induced anorexia, glucocorticoids and other complex molecules are released which affect food intake centres in the brain which can give rise to an increased appetite, not just a reduction. This eating disorder is widely recognised in stressed humans and similar patterns of behaviour have been reported in stressed cats too, often leading to obesity. For instance, stress and obesity have been linked in multi-cat households where tension can exist if the cat(s) sense that their food will be 'stolen' by a competitor. This often results in them gorging food and eating more than necessary.

In addition to feeding in a more cat-friendly way (see Chapter 3), preparing their food out of sight and feeding at separate stations, where cats cannot see or sense each other, is recommended.

Dermatological (Skin) Disorders

Stress is a well-known trigger for many skin disorders in a range of species. For example, in humans there is a higher frequency of allergies and allergy-related problems (asthma) at times of distress. Similarly links between cats that have difficulty coping with stress and the incidence of skin problems that cause pruritus (itchiness) and inflammation have been widely reported (Amat et al. 2015, Sparkes et al. 2016, Stella et al. 2011). Another point to consider is that unresolved pruritus itself can be really quite stress inducing.

Once a full clinical work-up has been conducted and other causes of skin disease have been ruled out (e.g. flea allergy dermatitis and skin infections) and/or if the cat fails to respond to standard veterinary treatments for inflammatory skin conditions, a behavioural component may be suspected and referral to a suitably qualified behaviour practitioner is called for.

Feline Lower Urinary Tract Disease (FLUTD)

Feline Lower Urinary Tract Disease (FLUTD) is a general term that describes a range of different conditions affecting the bladder and urethra. A number of disease processes can be involved such as bacterial infections and uroliths (bladder stones) all of which can cause 'cystitis' a term that describes inflammation of the bladder.

In the first instance a urine specimen is required to help the vet determine whether there are any medical abnormalities. But getting a sample can prove difficult for the caregiver. Collecting a urine sample can be made much easier using a special kind of litter available from the vet. This litter doesn't absorb the urine and instead it drops through to the bottom of the litter box from where it can be collected. The downside of this method is that the urine can be contaminated by bacteria in the box, affecting the sample and subsequent diagnosis.

The best way for the vet to obtain an uncontaminated sample is using a veterinary procedure called cystocentesis. This involves passing a very fine, sterile, hypodermic needle through the abdomen and directly into the bladder, from where a sample of urine can be drawn into a syringe and analysed.

In the absence of any clinical findings, the vet needs to consider other causes. Among the different diagnoses for symptoms of FLUTD is one that currently has no known cause, called Feline Idiopathic Cystitis (FIC). However, what we do know is this condition is linked to stress (Stella et al. 2013). Hence its other common name, 'Feline Stress Cystitis'.

Feline Idiopathic Cystitis (FIC)

There appears to be some common features in certain cats suffering from FIC including an abnormal stress response (possibly due to adverse early life experiences) and defects of the internal lining of their bladder, called the Glycosaminoglycan (GAG) Layer (Buffington 2011). This layer protects it from irritating components found in the urine and the damage to it leads to inflammation and sometimes ulceration of the bladder wall. Other complex neurochemicals released from the brain may also contribute to an inflammatory response (neurogenic inflammation) and this may be an additional factor.

Signs of FIC

- Straining to pass urine.
- Dysuria (pain when urinating).
- Blood in the urine (Haematuria).
- Frequent urination – but not usually full voiding (Pollakuria).
- Urination outside the litter box (Periuria).
- Frequent grooming or licking – around the caudal abdomen (over the area of the bladder) or perineum (around the genitalia) usually in response to discomfort (see Figure 5.5).

Source: (Buffington 2011)

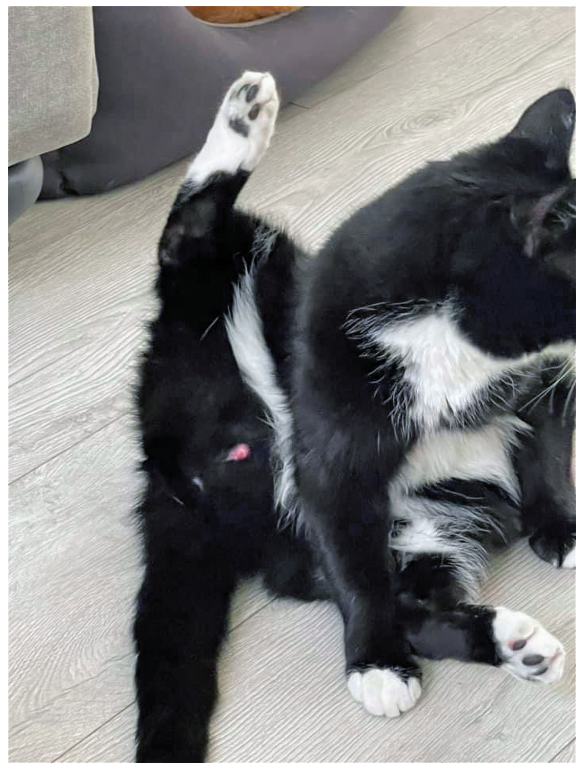

FIGURE 5.5 Cats with FLUTD will sometimes spend more time grooming around their lower abdomen and genitalia. Photo courtesy of Anna Birch-Loizou.

There is currently no diagnostic test for FIC. However, what seems fairly common (but not exclusive) among sufferers is that they:

- Live in multi-cat households.
- Are obese.
- Are kept exclusively as indoor only cats.
- Are known to have had previous bladder issues.
- Are generally described as being anxious or nervous.

Source: (He et al. 2022)

In cases of periuria, it is not unusual for carers to report that their cat chooses to urinate in the bath tub. It's not clear why, although there has been some suggestion that these cats may have FLUTD (FIC) and the cool surface of the bath eases bladder pain.

Treatment and Management

FIC is a painful condition and so, for acute flare-ups, veterinary surgeons will usually prescribe analgesics (painkillers). Antibiotics won't be prescribed unless

bacteria are present in the urine sample when examined in the laboratory. However, this must be collected by cystocentesis to prevent contamination of the sample (Carney et al. 2014).

Encouraging cats to drink plenty of water helps to maintain bladder health and feeding wet diets can help with this too as they contain a high proportion of water. Sometimes vets will prescribe specific prescription diets that help dissolve or prevent the production of certain minerals that, if present, can be irritating to the bladder.

Supplements are also available to help repair and improve the integrity of the GAG layer in the bladder. However, identifying and reducing stress has been shown to be an extremely effective way to help treat and prevent repeat episodes. This largely involves meeting the cat's needs, as described in Chapter 3. Further research of FIC will lead to a greater understanding and more targeted treatments may then be developed.

FIC appears to take on different forms. Some forms clear up themselves and are self-limiting, presumably because the stress passes. Other cats improve with age, which may be because the cat learns how to cope with stress. Unfortunately, some cases repeatedly come and go, so can be missed, and others are chronic and persistent. In all cases a multidisciplinary approach involving veterinary and behavioural input is best.

Other recommendations for the management of FIC include:

- Stopping any form of punishment.
- Reducing exposure to stress, e.g. managing conflict between cats in the same house (see Figure 5.6).
- Carrying out a stress review around the home (or shelter) to assess for potential stressors (see Chapter 8).
- Offering the cat more choice and control in their environment.
- Optimising litter box management.
- Providing a suitable environment, i.e. MEMO, The Five Pillars of a Healthy Feline Environment.
- Providing more opportunities to drink water (to maintain bladder health).
- Controlling bladder pain and discomfort.
- Pheromone therapy may help induce a calm and comforting environment.

Source: Based on Carney et al. (2014)

Stranguria

Stranguria is a medical term that describes a blockage to the urethra (the tube that leads from the bladder to void urine). Blockages may be caused by muscle spasms or from a build-up of debris called urethral plugs, composed of minerals and organic matter, e.g. cells, proteins, and crystals (which make up bladder stones). Blockages tend to be more common in male cats as they have a longer, narrower urethra in comparison to females. Affected cats strain but cannot pass urine. **This is a medical emergency.** Prompt veterinary attention is required to relieve the bladder of urine to prevent damage to the bladder and kidneys (George and Grauer 2016).



FIGURE 5.6 Conflict between cohabiting cats can be a source of stress which may lead to FIC. Photo: Author's own.

KEY TAKE HOME POINTS

- Domestic cats are faced with a number of challenges which can lead to stress.
- A cat's immediate response to stressful encounters is typically avoidance.
- Providing somewhere for cats to escape and hide, with access to elevated locations, can help reduce stress.
- Being unable to access their coping strategies compromises the cat's welfare.
- Fear and anxiety underlie many problematic behaviour problems.
- The stress response is automatic and the cat has no control over the physiological effects.
- Over time chronic stress can affect physical health resulting in a number of stress-related clinical disorders.

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6 Pain and Its Effect on Behaviour

Pain is an unpleasant sensory experience, designed to protect an individual from further injury. An animal feels the painful sensation via sensory pain receptors (nociceptors) which are distributed throughout body tissues. The nociceptive message is then transmitted from the injury site to the brain where the information is processed and the necessary action is taken – mostly related to self-protection. Yet pain also has an affective (emotional) dimension. This relates to the unpleasantness of the experience, often causing feelings such as anxiety, distress, fear, and frustration. This puts an animal in what is formally described as a negative affective state.

TYPES OF PAIN

In basic terms there are two main categories of pain:

Acute pain relates to sudden pain, usually of a short duration. Acute pain may be experienced after a physical trauma such as a fractured bone or following a surgical procedure. This kind of pain often involves swelling and inflammation which can impair mobility – serving as a protective measure and contributes to survival. It is therefore defined as adaptive pain. Acute pain usually resolves after the healing process has taken place; however, it can develop into chronic pain.

Chronic pain is the kind of pain that has a long-lasting duration with no clear endpoint. It is also described as maladaptive because, unlike acute pain, it doesn't have a protective or recuperation function. It is characterised by inflammatory, neuropathic, and functional pain, and quite often a combination of these processes are involved. Chronic pain can exist by itself but it is more commonly associated with an old injury or a clinical disorder. Conditions of this nature include osteoarthritis, inflammatory bowel disease (IBD), cancer pain, feline hyperaesthesia, and dental/periodontal disease (Monteiro and Steagall 2019). Some of the behavioural signs (see list) are similar to those evident with acute pain, although symptoms can be insidious and develop over time, which can make it more difficult to spot.

Analgesia (pain-relieving medication) is an important component of managing acute pain and in relation to surgical procedures, pre-operative, peri-operative and post-operative analgesia should be the norm – even for less timely and invasive procedures such as castration. Without adequate pain control, an animal can develop chronic and persistent post-operative pain that is long-lasting and hard to control.

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BEHAVIOURAL SIGNS OF ACUTE AND CHRONIC PAIN

Similar to stress, recognising feline pain can be problematic. However, in many cases it is behavioural changes that provide the first indication.

- Any of the stress signals (see Chapter 5).
- Changes to temperament (grumpiness, 'depression').
- Self-defensive body language and defensive aggression (hissing, swiping out at the perceived threat).
- Irritability and heightened reactivity.
- Reluctance to be touched or handled (when previously they were not).
- Sudden changes in behaviour (e.g. conflict with other cats in the household or people).
- Reduction in mobility (less time spent upstairs/jumping/climbing).
- Lethargy.
- Changes to appetite (increased or decreased).
- Decreased play.
- Changes to grooming behaviour:
  - Increased grooming in and around a particular region of the body may be related to where the focus of pain is and/or can be a behaviour attributed to stress, caused by the unresolved pain experience.
  - Decreased grooming may be because the cat is physically unable to perform the behaviour or is uncomfortable.
- Changes to sleep patterns – resting more or unable to rest or get comfortable (however, some stressed or pained cats feign sleep, which can be interpreted as them being comfortable).
- Compulsive and repetitive behaviours (e.g. over-grooming).

Source: Based on Campoli and Vettorato (2018) and Steagall et al. (2022)

Top Tip: Pay attention and seek veterinary advice if a cat licks a location on its body more often than usual. This is something they can do in response to an area that is painful or when they are feeling distressed.

DIAGNOSING PAIN

Diagnosis is the domain of the veterinary surgeon although, when it comes to pain, caregivers are vital in the process by reporting their observations. However, because of the cat's lifestyle, there are times when pain and other indicators of clinical disorders go unnoticed. For example, diarrhoea or constipation can indicate GI problems and subsequent pain but it's not easy to observe the bowel movements of cats that toilet outdoors and do not use a litter box.

Anatomically, their small skeletal size, litheness, and likelihood to withdraw in times of discomfort means that conditions such as lameness are not exhibited or go unnoticed.

Pain can even go undiagnosed after a veterinary examination. This isn't a criticism of the vet's know-how but, as a protective strategy, cats have developed evolutionary survival habits of masking pain from potential predators, so it can be difficult to detect. This is especially so when they are in an environment that is less familiar or where they feel threatened and resent handling. Some may resist (fight or flight) while others may 'freeze'. Additionally, at the veterinary clinic, they are often tense which makes examination (especially of the abdomen) much more difficult. Nonetheless, examination by a veterinary surgeon is still important because they can go through a number of checks to rule problems in or out and further diagnostic tests can reveal something that is hidden or being masked (see Box 6.1). However, because of the cat's response to pain, it is still often under-recognised, and therefore fewer cats receive pain relief in comparison to dogs. If there is any doubt, clinicians are always advised to administer analgesia, and reassess the patient, to determine whether there has been any improvement (Campoli and Vettorato 2018).

It's important to remember that cats are more likely to express pain in their familiar surroundings, usually noticeable by changes in their behaviour and deviations to their normal routines. Consequently, caregivers should be fully engaged in pain assessments alongside veterinary input.

BOX 6.1. Ways to Rule Out Pain and Underlying Clinical Conditions

- Caregivers should seek veterinary attention if there are any changes in the cat's usual behaviour (even if there are no obvious signs of pain or illness).
- Veterinary surgeons can prescribe medication that can be given at home to help relax and calm the cat before making the trip to the practice. This will make transportation and the clinical examination easier and less stressful.
- Veterinary investigations may help with the diagnosis or provide a baseline for that individual, e.g. blood screening, more specific laboratory tests relevant to the case, diagnostic scans, X-rays, etc. (see Figure 6.1).
- Some vets may consider trialling analgesics over a longer period to compare the cat's behaviour and response before and during the treatment.
- Video recordings, taken by the caregiver, can be analysed by the veterinary surgeon and the behaviourist to determine if there are any subtle signs of pain.
- Use one of the validated pain scales suitable for making observations in the home and in the workplace (more information coming up soon).
- Keep a diary to log changes in behaviour and alterations to usual routines.

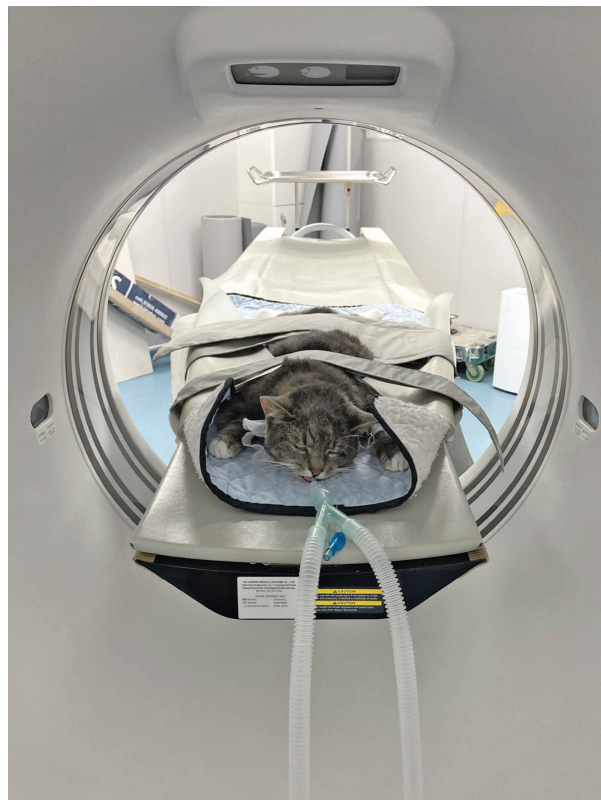

FIGURE 6.1 Abnormalities that cause pain can be diagnosed using computerised tomography (CT scan). Photo courtesy of Rebecca Whitehead.

PAIN AND EMOTIONS

It is accepted that various psychological factors impact pain and that being in a negative affective state can make an individual more sensitive to pain (Horwitz and Rodan 2018). Using our own experience helps to appreciate that being in pain impacts mood. Even suffering a short period of relatively low-grade pain (such as mild toothache or headache) can lower our tolerance levels and makes us feel low and grumpy.

Subsequently a bidirectional relationship is set in motion whereby pain leads to negative emotions which, in turn, sensitises the individual to pain, sometimes amplifying and maintaining it. On the other hand, we also know that positive psychological factors or being in a positive mood can lessen pain. Using strategies that are known to help enhance a cat's well-being (e.g. feline-friendly handling

techniques, using cat-centric feeding methods and providing an enriched environment) should therefore feature in a cat's routine, particularly for cats that may have a degree of pain (e.g. elderly cats with OA).

How Pain Affects Behaviour

Any clinical condition that causes a disturbance to the body or a deviation from what feels 'normal' for the individual can affect their behaviour. We know that a cat in pain is more withdrawn, cautious, and anxious and usually reverts to their preferred response of getting out of the way and hiding somewhere quiet and elevated. This can create further emotional conflict because accessing those kinds of places when in pain can be a challenge. It's these sorts of dilemmas that can compound the problem.

Pain-induced aggression can be seen in even the friendliest cat but is more likely when they are handled or approached. There is some crossover with defensive aggression because they are, in effect, protecting themselves from further pain. This demands the brain's attention, triggering stress response mechanisms (HPA axis and the sympathetic nervous system) all of which can affect cognition and emotional processing (Rusbridge 2024). Depending on the circumstances and the degree of pain the cat is in at the time, aggression might be intermittent and this inconsistency can perplex some caregivers who often describe it as 'random'. However, careful analysis can explain the cat's duplicity. Pain also lowers a cat's threshold for fear which might heighten reactivity and lead to the emergence of new, fear-related problems. For example, if a previous interaction with a person caused them pain, through the process of learned behaviour, a cat may become guarded or react negatively towards being approached, touched or handled by people (Overall 2013).

The significance of pain and its relation to a raft of problematic feline behaviours was illustrated in a review of cases seen by animal behaviour clinicians at Lincoln University in the UK (Mills et al. 2020). They estimated that around a third of referred behaviour cases involved some form of painful condition, although they reported that this figure could in fact be much higher due to under-reporting of the ways that pain is associated with behaviour problems. More worrying is that potentially many cases of pain are missed altogether. More encouragingly, the study did state that, when pain was identified and treated, problem behaviours were likely to improve.

IDENTIFYING AND MEASURING PAIN

As we have established, diagnosing pain in cats is difficult but ascertaining the level of pain a cat is suffering can be tricky too. Pain is after all subjective and they can't tell us how they feel. We know from human experiences that even relatively minor injuries can lead to pain that is disproportionate to the injury (Institute of Medicine (US) 1987) and there is no evidence to state that cats and other mammals are any different – so making an assumption about what kind of pain an animal is in should be avoided at all costs.

Fortunately, there are some useful methods to help combat the problem.

Pain Scales

Within the veterinary setting there are now a number of reliable tools that help clinicians to identify and scale pain much more accurately, e.g. the Glasgow Composite Measure Pain Scale – Feline (Reid et al. 2017), affording a more objective and consistent approach to the evaluation of acute pain.

Another method used specifically for measuring acute pain, is the validated Feline Grimace Scale© (FGS) (2019), developed by a team of veterinarians and scientists based at The Faculty of Veterinary Medicine at Université de Montréal in Canada (see Figure 6.2).

Assessments of the cat are made by observing facial features, specifically:

- Ear position.
- Orbital tightening.
- Muzzle tension.
- Position of the whiskers.
- Head position.

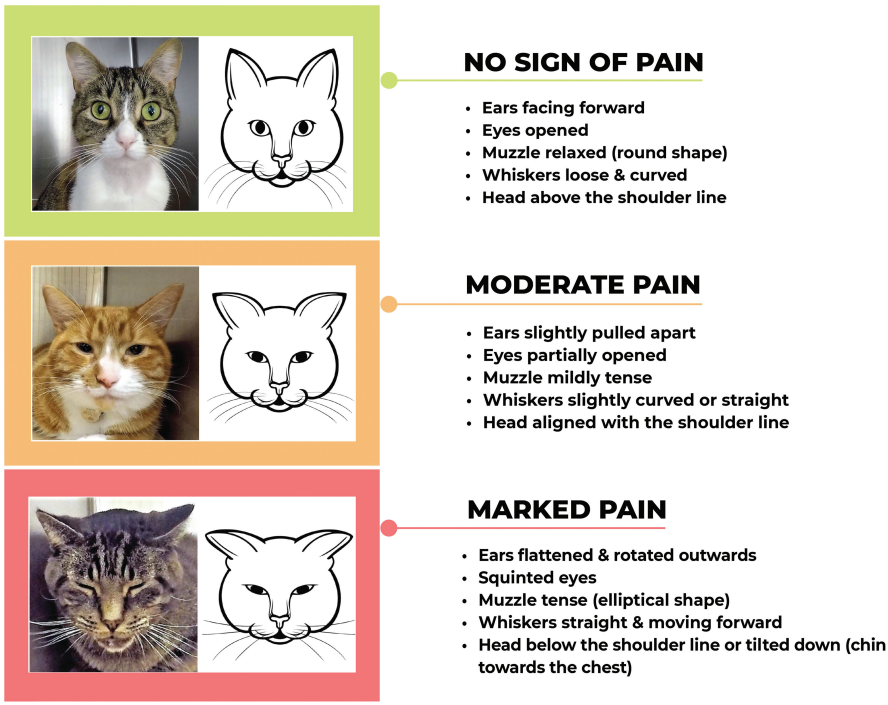

FIGURE 6.2 The Feline Grimace Scale© provides an accurate method of assessing acute pain using various facial features. Adapted from and with kind permission of the Université de Montréal. Refer to references for more details.

A global study, by Monteiro et al. (2023), demonstrated that the FGS could also be used with a high degree of accuracy by non-veterinary caregivers and that scores taken by non-vets were not significantly different to those taken by vets. This provides evidence of its reliability for measuring acute pain accurately outside the clinical environment – great news for educating and empowering caregivers and for safeguarding feline welfare.

Pain scales are also available for measuring chronic pain. Examples of some of the tools suitable for caregivers to use in conjunction with the veterinary professional include:

- The validated Feline Musculoskeletal Pain Index (FMPI) which measures the degree to which the cat suffers from pain associated with long term osteoarthritis and other similar conditions.
- The Client Specific Outcome Measures (CSOM) which is based on the caregiver's assessment of the impact of chronic pain on their cat's ability to perform specific activities that are particular to that individual.

To learn more about some of these pain scales and access a range of resources and training material on feline pain recognition, refer to Appendix 3.

Analgesia Trials

As previously mentioned, when there is a suspicion of chronic pain, but the cat is intolerant of being examined, or when there is a change in behaviour and no clear clinical evidence of the source of pain, veterinary pain specialists often recommend an analgesia trial.

This involves prescribing an analgesic for 8 to 12 weeks duration. This seems quite a lengthy period but experts emphasise that it can take a minimum of four weeks before the effects of the drugs are visible and, in some situations, it can take even longer. They warn that expecting to see visible improvements within just one week is unrealistic. Throughout the trial, the cat is assessed to determine whether their behaviour, physical activity and general demeanour improves or not. If the cat visibly and behaviourally improves it gives an indication that the cat was in pain. Further diagnostic tests may then be required to find the source. It is worth noting that the response to particular analgesics is variable between individuals, so other drugs may need to be trialled to gain an accurate picture. Moreover, the lack of analgesic response does not completely rule out the presence of pain (Monteiro and Steagall 2019).

Collar-Attached Monitors

Collar-attached activity monitors have been found helpful, particularly in the musculoskeletal healthcare of cats. Gathered data can interpret levels of physical activity and sleep quality and this can be an additional tool in the diagnosis of pain

(Yamazaki et al. 2020). Additionally, it could be used to appraise the effects of analgesia and other treatment modalities.

Artificial Intelligence (AI)

AI is the capability of digital systems to carry out tasks that are usually performed by humans, including the analysis of information. Although in its infancy, scientists believe that there is great potential for it to be a useful tool in veterinary clinical settings. With the right input, this might include analysing visual images, e.g. X-rays and ultrasound. In 2023, a study by Feighelstein and colleagues, found that AI systems were able to classify 'pain' or 'no pain' from the facial features of cats with a relatively high level of accuracy (above 77%). By the researchers own admission, the data set is low (only 84 cats took part in the study) and they point out that more robust research is required. Nonetheless, in this particular study, AI proved more accurate than humans who achieved above 65% accuracy. Consequently, research of this kind may pave the way for AI being used in the future to complement the human interpretation of pain in cats and other animals.

PAINFUL CLINICAL DISEASES AND CONDITIONS

There are a number of clinical diseases and conditions that cause pain and discomfort. Some have been mentioned previously, including the degenerative joint disease, osteoarthritis, which can impact cats of all ages – not just the elderly. As you can imagine there are far too many clinical conditions to cover in great detail in this book. Yet certain painful diseases that have been identified as being commonly diagnosed, and therefore assumed to be highly prevalent in the cat population, are some of those that I shall mention here.

Periodontal and Dental Disease

A large-scale study in 2023, led by the UK based Royal Veterinary College (RVC), investigated data from the clinical records taken from a random sample of 18,249 cats. This revealed that periodontal (structures surrounding and supporting the teeth) and dental disease were the most commonly diagnosed conditions. The study, published in the Journal of Feline Medicine and Surgery, recorded that over 15% of cats are diagnosed annually (that's an estimated 1.8 million cats affected every year in the UK) and highlighted the likelihood of many more cases going undiagnosed (O'Neill et al. 2023b).

Periodontal and dental disease gives rise to a range of painful oral health issues, including gum inflammation and loose teeth. The early stages include gingivitis (gum inflammation) often caused by the build-up of plaque which, if left untreated, can progress to periodontitis (end stage gum disease). Older cats are at greater risk so more regular dental checks should be carried out on this group.

Feline Fact: With adequate dental care in the home, dental issues such as gingivitis can be prevented or even reversed. Therefore, in the interest of their well-being, it is recommended that oral healthcare is part of a cat's routine. Details of how to access a mini guide to feline health, including how to carry out effective oral healthcare in the home, can be found in Appendix 3.

Other Conditions

Other very common, painful, and easily preventable disorders were identified in another RVC led study (O'Neill et al. 2023a). These include in-growing claws, where the claw punctures and embeds itself in the skin (more common in elderly and longhaired cats) and flea infestation. The latter can cause skin infections and irritation leading to discomfort and behavioural irritability. However, one of the most prevalent conditions identified was obesity (defined as being 20% and above a cat's normal bodyweight). Whilst obesity isn't usually classified as a condition that causes pain it can most certainly affect the cat's quality of life.

As well as aggravating osteoarthritis, obesity has been linked with diabetes mellitus and can be implicated in cardiovascular health problems due to the additional burden the additional weight places on a cat's heart and vascular system. Obese cats often find it much more difficult to embark on natural physical behaviours such as climbing, jumping, and playing. This exacerbates existing obesity and also reduces the cat's opportunity to live a full life (Cornell University College of Veterinary Medicine 2022).

Inherited Painful Diseases

The domestic non-pedigree cat has derived from a large gene pool and is closer to its ancestor in the way it behaves and looks, whereas the pedigree cat has derived from a small gene pool which can result in inherited health issues.

Some breeds have actually been developed by selecting cats with a genetic defect to create a particular 'look' which sadly may not be in the cat's best interest. Take for example the Manx cat that has a shortened tail or no tail at all except a depression at the end of the spine, causing it to move with a characteristic 'rabbit hop' gait. This defect can also be responsible for other serious and painful spinal problems. Similarly, the Scottish Fold has a gene mutation that affects the cartilage in the ear, making the tips of the ears fold over. This same defect also affects cartilage in other areas of the body potentially leading to painful degenerative joint disease.

Brachycephalic breeds, such as the Persian, have been bred to have short, flat skulls, and as a consequence they may find it difficult to breathe. Furthermore, tear ducts can be malformed leading to runny eyes and tear scalds on the face (see Figure 6.3).



FIGURE 6.3 Persian breeds of cat have brachycephalic skulls that can lead to breathing difficulties and malformed tear ducts. Photo courtesy of lindarczyk from Pixabay.

Persians and Persian types are breeds that may also be at risk of inheriting a condition called Autosomal Dominant Polycystic Kidney Disease (PKD). This disease causes clusters of cysts (fluid-filled pockets) to develop in the kidney, eventually leading to kidney failure. Fortunately, it is possible to screen for this genetic defect so, through testing and responsible selective breeding, we have the power to completely eradicate this condition. Consequently, before buying a Persian kitten (or other high-risk breeds), breeders should be asked whether tests have been carried out and purchasers should ask to see proof of a negative result. As long as certain criteria are met, breeders can actually register cats with a negative result on the PKD Gene Test and Negative Register (iCatCare 2018) – refer to the references for more details of this valuable resource.

Preventing and Treating Painful Conditions

To safeguard feline well-being, prevention of pain has to be the panacea. This can be achieved by responsible breeding, sharing, and raising an awareness of common feline health problems and carrying out regular examinations (both in the home by the caregiver and through regular check-ups at the veterinary clinic). In this way, conditions can be identified early in their onset and the relevant treatment can be initiated.

Difficulties can arise because many cats become stressed with being taken outside the home, handled, and restrained and this can deter caregivers from actually making the trip to the veterinary clinic which can stand in the way of them

getting appropriate healthcare. However, research by scientists at the University of Veterinary Medicine in Vienna (Pratsch et al. 2018) showed that cat carrier training significantly reduced stress during the car ride and led to a shorter veterinary examination. This adds strength to the benefits of habituating a kitten to a cat carrier or undertaking training in adult cats that have existing fears. A subject we shall return to later in the book. Veterinary treatment invariably involves a multimodal (more than one treatment) approach.

Multimodal Approach to Pain Management

- Address emotional well-being and mitigate effects of stress.
- Sensitive nursing care (TLC).
- Veterinary prescribed medication, e.g. analgesics for pain relief.
- Optimal home environment (management of surroundings to make life easier and more comfortable).
- Pain management techniques, e.g. wound dressings, bandages, cold compress.
- Integrated therapies, e.g. physiotherapy, acupuncture, photobiomodulation (previously known as low laser therapy) (see Figure 6.4).
- A veterinarian may refer the cat on to a pain specialist if problems persist.

Based on Goddard and Irving (2011)

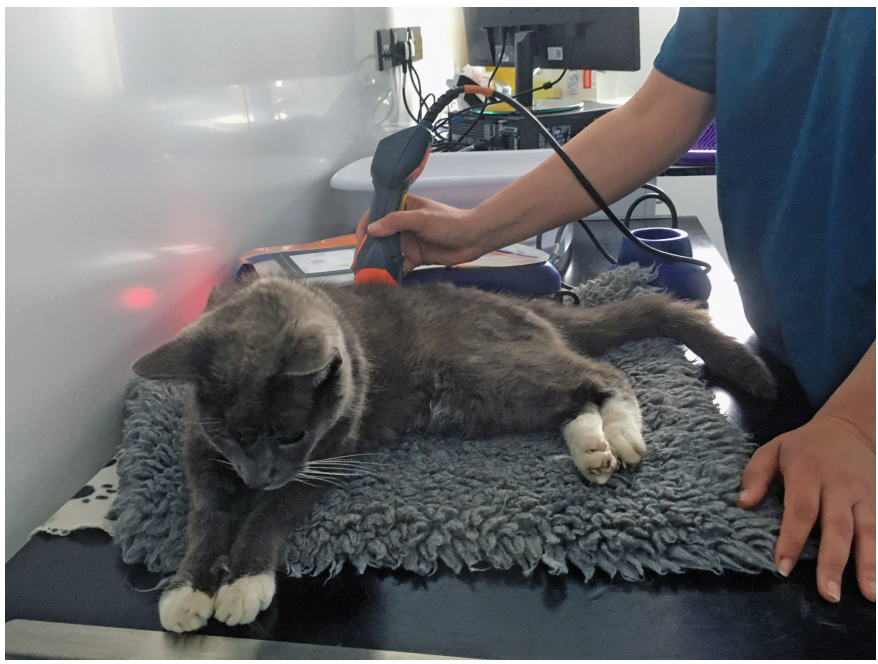

FIGURE 6.4 Photobiomodulation is one of the many therapies that can form part of a multimodal pain management plan. It works by using laser and LED beams of light to stimulate cells in the body, helping repair tissue and reduce inflammation and pain. Photo: Author's own.



FIGURE 6.5 Analgesics in liquid formulations can be easier to administer to some cats than giving tablets. Photo courtesy of Tommy Taylor.

Veterinary Prescribed Analgesics

From a pharmacological point of view there is now a wider range of specifically licensed veterinary treatments for controlling feline pain. The type of drug prescribed by the veterinarian depends on the specific problem and the individual case. For example, acute pain, say after surgery, typically requires a different approach than chronic pain. Other factors, including the cat's health and whether they have any concurrent health issues, may also determine the treatment of choice.

Caregivers may be required to administer medication at home which can be challenging, particularly with tablets. Fortunately, there are a number of drugs available in different formulations. This includes palatable liquid solutions and injectable drugs that have longer lasting effects. These can make the process easier, especially if a caregiver has difficulty giving tablets (see Figure 6.5). Detailed guidance on how to administer oral preparations can be found on the iCatCare website, details of which are given in Appendix 3.

KEY TAKE HOME POINTS

- Pain is a major source of stress.
- Although pain usually serves an adaptive role, it may have adverse effects on functional and emotional well-being.
- As a survival strategy cats hide pain and it can therefore go undetected.

- Being in a negative emotional state increases sensitivity to pain.
- Pain has sensory and emotional components and both should be addressed to improve quality of life.
- There are validated pain scales that can be used with accuracy by veterinary professionals and non-veterinary caregivers.
- The cat is prone to a number of painful medical conditions. With greater awareness these can be prevented, recognised and treated.

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7 Working with Cats
Challenges and Practical Solutions

Working with cats can be extremely rewarding and there are various opportunities within this sector of animal care. Roles are varied and include volunteering or employment within a veterinary setting, in catteries, cat grooming services, shelters or a cat sitting business. Key prerequisites for all personnel should include a sound knowledge of their species-specific needs and an understanding of feline behaviour.

Whatever the setting, challenges exist and these tend to focus around:

- Restricted space.
- Limited access to resources.
- Lack of control and choice.
- Unpredictability and lack of consistency.
- A changing and unstable scent profile.
- Noise.
- The presence of other animals: their sight, scent, and sound.
- Being handled by strangers.
- Invasion of privacy.

Striving for gold standards of care should always be the goal, yet sometimes this can prove problematic. For example, in a shelter, cats may be housed alongside others for prolonged periods of time until a suitable home can be found. In the veterinary setting, hospitalised cats may need to be regularly handled for examinations and restrained for the administration of medication and cat sitters may introduce new and different scents and change their routines. Being mindful of the risk factors and applying methods to mitigate stress will help. Sometimes this calls for ingenuity, especially for rescue organisations who are often working to a tight budget.

Throughout this chapter the focus will centre on potential stressors, with practical methods to help alleviate stress and overcome some of the key challenges, many of which are universal to a variety of work-place settings. Consequently, the information and recommendations given in this section of the book can be applied or modified to suit a variety of workplace environments outside the cat's home.

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JOURNEYS OUTSIDE THE HOME

Trips to unfamiliar places prove particularly stressful for cats (Pratsch et al. 2018). This is made worse by the fact that usually they are confined in a carrier and transported in a vehicle, which may be a new experience or hold negative connotations due to past experiences. It's actually quite common for cats to feel travel nausea too. These factors, combined with other stressors can lead to something called trigger stacking.

Trigger Stacking

You may recall reading about triggers in Chapter 5. The more negative triggers that an animal encounters, the greater the stress accumulation and the higher the probability of an antagonistic reaction. Reducing, managing or, where possible, removing these triggers altogether are the key aims (see Figure 7.1).

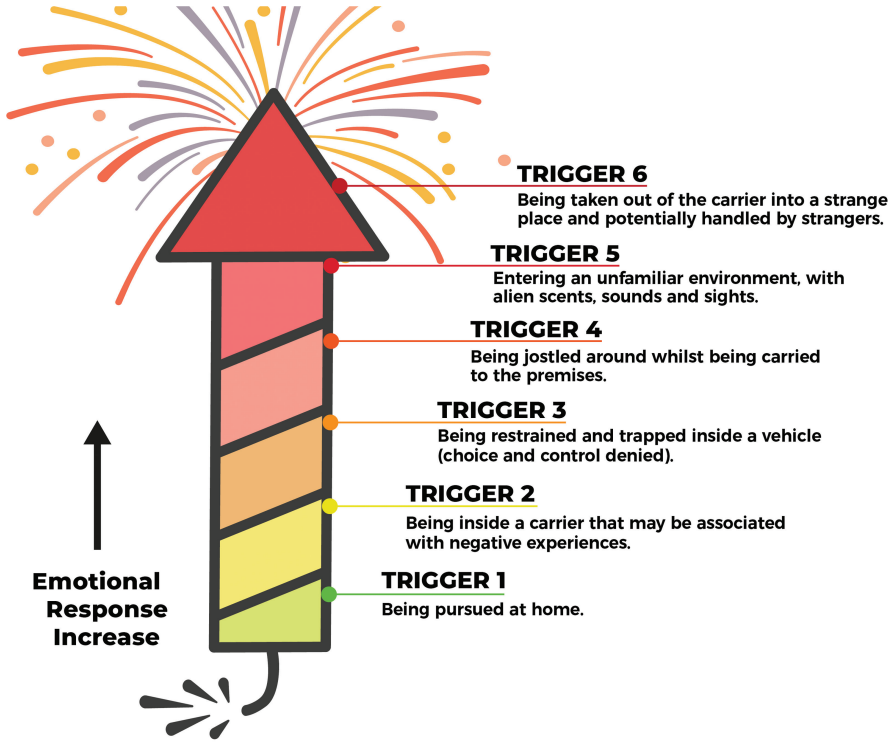

FIGURE 7.1 Examples of triggers that are likely to create stress when the cat is taken out of the home. Single triggers can affect mood states singularly but when combined, they may affect a cat's ability to cope and can induce a dramatic fearful response.



FIGURE 7.2 If a kitten is properly habituated to its cat carrier, it will not show any fear when restrained inside it. Photo courtesy of Hannah Donovan.

Reducing Cat Carrier Stress

Being fearful of the cat carrier poses a major problem for the cat and their caregiver so time spent creating positive associations with it, is time well spent. We have already established that by far the best time to get a cat habituated to travelling in a carrier is during kittenhood, ideally in their socialisation period. That involves placing the carrier where a kitten will routinely see it, so its presence becomes part of their familiar surroundings. Lining it with warm comfortable bedding, dropping treats inside and encouraging play in and around it will help create positive associations. But it's not just youngsters that benefit from this procedure. All ages of cat can be positively introduced to travelling in a carrier using habituation techniques, provided it is done gradually and sympathetically.

Top Tip: Teaching a cat to relax on a specific comfortable mat or blanket can be extremely useful for helping them stay calm during situational events – including trips outside the home. The training steps build an association between the surface they are lying on and their relaxed emotional state, alleviating the stress of the journey as they lie on it in their carrier (see Appendix 1.1).

Choosing a Cat Carrier

Choosing the right carrier can make a difference. A rigid design that can be separated into two parts is highly recommended because it can be dismantled. This allows an anxious cat to be introduced to it in stages. Also, most cats can cope better during an examination if they can stay sat inside the base without being pulled out through the door (see Figure 7.3). Although, with just a few adaptations, other kinds of carrier can be used (see Figures 7.4 and 7.5).



FIGURE 7.3 Being able to dismantle a cat carrier means the cat can stay in the base, where it usually feels safer, during a veterinary examination. Photo courtesy of Paul Knott.



FIGURE 7.4 Towels or blankets can be partially draped over the top of open carriers so the cat inside feels less exposed. Photo: Author's own.

Helping Cats with Pre-Existing Cat Carrier Fears

Cats that have already developed some negative associations with the carrier require a slightly different approach.

Desensitisation (DS) and counterconditioning (CC) are training techniques that can be effective in treating a range of fear-related problems and I'll be explaining them in more detail when we look at training and learning in Chapter 11, but briefly:

- DS involves gradually exposing the cat to the fearful stimulus (in this case, the carrier) but at a rate and intensity that is insufficient to cause the specific behavioural response (fear) to occur.
- CC is used to create a new and positive emotional response to the desensitised stimulus (the carrier). This is accomplished by pairing it with something pleasant that they especially enjoy.
- A vital element of DS and CC is to avoid using the carrier until the training has been completed and the cat is no longer fearful of it as this will impede their progress.

Very often struggles at home may not be obvious to the personnel who receive the cat. So, when working with cats, it is worth asking how the trip went and whether the caregiver had any difficulties. This can open up a conversation so that the necessary advice can be given and they can be directed to suitable training resources.

A step-by-step guide describing habituation and DS and CC to a cat carrier can be found in Appendix 1.2.

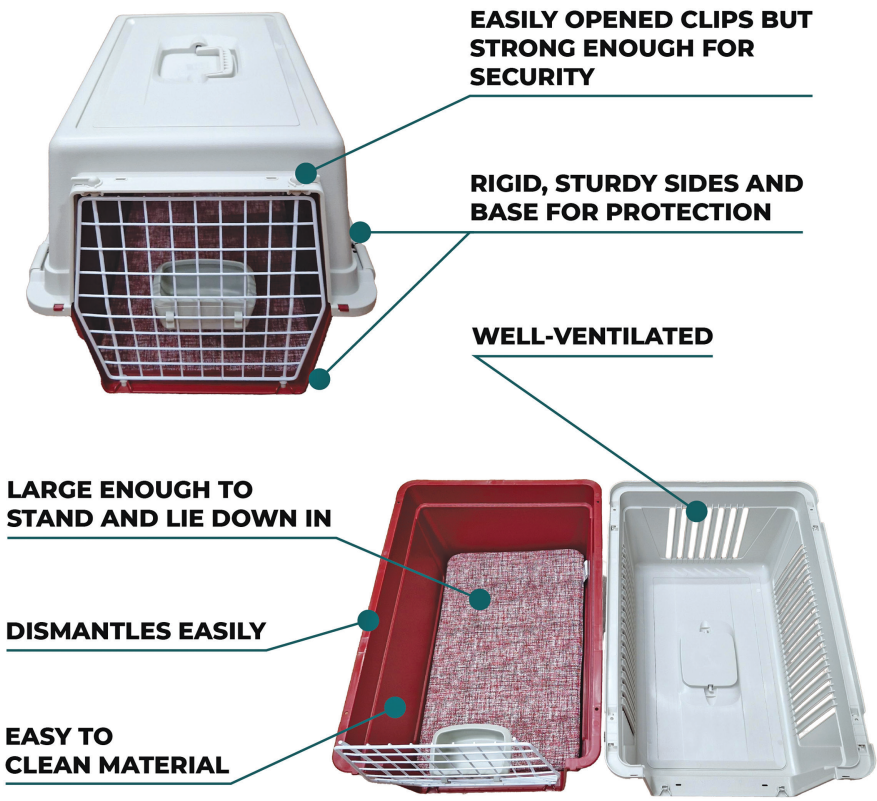

FIGURE 7.5 Features to look for when choosing a cat carrier.

Other Solutions

For cats that are extremely fearful of the cat carrier and journeys outside the home there are some other simple, practical solutions that should also be considered:

- **Veterinary prescribed medication:** Just because a cat isn't physically sick doesn't mean that they don't feel travel nauseous, so anti-nausea medication can be helpful. Also, avoiding feeding them prior to the journey makes sense. Extremely nervous cats may also require medication to help ease the stress associated with trips outside the home. These calming drugs can be administered prior to the journey. Medication may also prove useful in facilitating cat carrier training if it is deemed that the cat's ability to learn is being hampered by their emotive state or if a trip to the vet is required before DS and CC training has been completed.
- **Home pet sitters:** Engaging an experienced home pet sitter can remove the ordeal of travelling and being displaced from a familiar territory. It's important that the person appointed understands and has experience of looking after



FIGURE 7.6 Many professionals, such as cat groomers, provide a home service. Photo courtesy of Emma Chapman at EC CatCare and Shelia Pepper.

cats. Adhering to routines and being mindful about potential problems associated with introducing new scents is crucial. They should also have their own insurance, along with genuine testimonials from clients and professionals (such as a veterinarian) who can endorse them.

- **Mobile services and home visits:** Some professionals such as veterinarians or cat groomers operate a mobile home service (see Figure 7.6).

Irrespective of these solutions it's still worthwhile keeping up with cat carrier training as there may be an occasion (e.g. accident, illness, moving home, etc.) when a cat has to be transported.

PROBLEMS OF ACCOMMODATION CONFINEMENT

Stress among cats kept in 'penned' accommodation is likely to be high, particularly for cats that have previously had the freedom of being outside, if they are timid and prone to anxiety or if they are not well socialised to people. These cats tend

to withdraw and spend a large proportion of their time in hiding. However, even the bold confident types can become frustrated and stressed if they feel a sense of enforced confinement. Signs include pacing along the front of the enclosure, scratching, digging and pawing at the door and vocalising.

Most facilities are incapable of providing an ideal environment although there are a number of measures that can help, mostly based on enhancing their physical surroundings to satisfy their needs and behaviour. Earlier chapters relating to their specific requirements (see Chapter 3) can provide a useful template, albeit with certain adaptations to fit the circumstances.

Cats that simply cannot cope with being in a shelter environment may thrive better with foster carers who can provide more space and relative privacy until they can find a forever home. However, sadly, these kind of homes can be few and far between (Figure 7.7).

Accommodation Design and Management of Housed Cats

The design of the accommodation needs to be considered and, depending on the industry, the relevant statutory regulations must be fulfilled. It is outside the remit of this book to cover all aspects of accommodation design and husbandry in depth although there are some general guiding principles that help foster high standards of care and may prevent the development of behavioural problems:

- When choosing accommodation, pens constructed of stainless steel can be cold, generate more noise, and create reflections. Seeing themselves (perceived as another cat) may induce stress. Where possible source easy-to-clean and well-insulated, ideally sustainable, materials.
- Wherever possible, cats should be housed in separate accommodation to other species. Being in the presence of a predator (e.g. dog) can induce fear and stress and seeing prey species (small mammals and birds) can heighten arousal and frustration – as well as being a welfare issue for the prey animal.
- Where separate housing is impossible the layout of the accommodation can be modified to prevent being overlooked and improve the environment:
  - Arrange the accommodation so that pens are not facing each other (back-to-back or in a line) and ensure that partitions between pens and runs have a solid barrier.
  - For more privacy, visual barriers can be created using towels, by taping grease-proof paper or placing hospital screens at the front of a pen (see Figure 7.8). A small gap can give the cat some choice to look out if they wish and ensures staff can make any necessary observations.
- Accommodation should allow the cat to move freely and ideally have enough space for key resources to be placed at a reasonable distance apart. Where space is limited the placement of resources needs to be thought through (see Figure 7.9).
- Remember the cat's need for height – avoid putting them in floor-level pens.



FIGURE 7.7 Being confined in a pen, in a strange environment, can represent a number of challenges. Photo courtesy of Jo Travers.

- Hiding places and perches should be incorporated into the design to utilise the space and provide a sense of security although, with imagination, these can be provided with minimal cost (see Figure 7.10).
- Cats Protection have developed the multi-functional Hide & Sleep®, designed to incorporate a hiding place and sleeping area, as well as providing 3D space (see Figure 7.11). Details of where these can be sourced are within Appendix 3 at the back of the book.
- Long-term patients or boarders require a place to scratch. A cost-effective idea is to cut down a fresh square of sisal matting for each newcomer. This can then be thrown away at the end of their stay.
- Keep noise to a minimum and prevent bright glare from lights. If natural light is unavailable, use dimmer switches and at night turn off the lights to encourage the maintenance of normal circadian rhythms.
- Provide good ventilation to prevent the build-up of noxious scents and improve air quality.



FIGURE 7.8 Partitions and screens can provide greater privacy or may help if different species have to share a space.

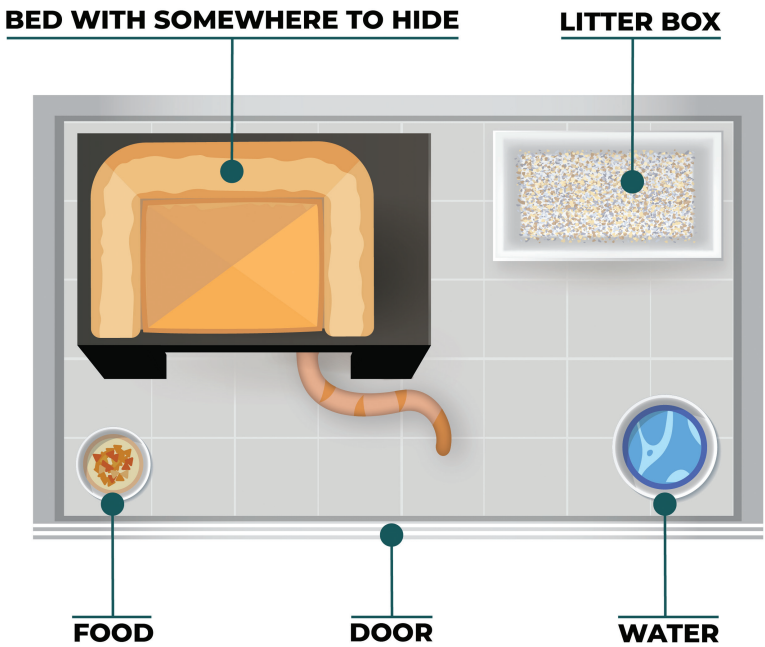

FIGURE 7.9 To optimise a pen, create space between food, water, resting, and toileting facilities.

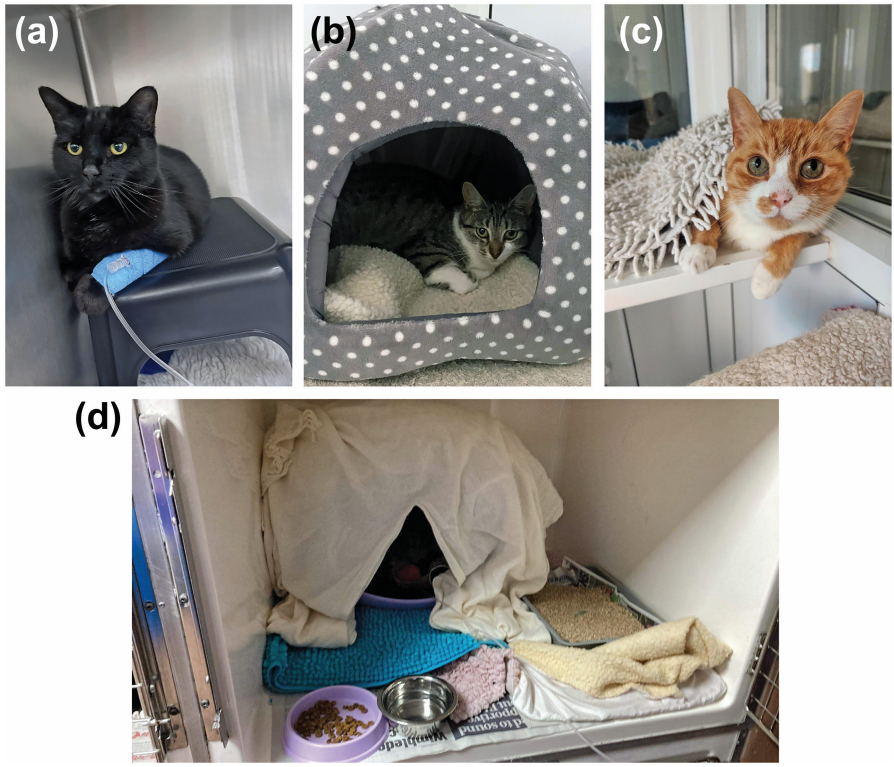

FIGURE 7.10 A low step stool can be adapted as a cost-effective perch and a hide (a). An igloo doubles up as a comfortable place to sleep and hide (b). A shelf or platform creates elevated space (c). A hide can be created with some imagination (d). Photos courtesy of Sally Ward (a), Holly Barker at Hull Animal Welfare Trust (b & c) and Rebecca Whitehead (d).

- Ask caregivers to bring familiar bedding, toys, and feeding bowls, to provide a sense of familiarity and maintain their scent profile.
- To maintain consistency, keep the cat in the same pen throughout their stay and avoid completely removing their scent profile when cleaning their accommodation.
- Operate a double bedding system for scent continuity: two layers of bedding are provided and, on rotation, one layer of bedding is removed and cleaned. This method continually leaves a layer containing their scent.
- Strong smelling disinfectants can be overpowering. Directions for use usually involve thorough rinsing after a certain contact time so adhere to the manufacturer's instructions and select a preparation that isn't too noxious.
- Don't assume that cats that live together in the same home are well-bonded. In the home environment, they have space and choice to move away from one another but cannot maintain their own territory when sharing a small space. Ask caregivers whether their cats are closely affiliated. Specifically ask



FIGURE 7.11 Cats Protection have developed the multi-functional Hide & Sleep®, designed to incorporate a hiding place and sleeping area. Photo courtesy of Frankie Lees.

whether they choose to sleep in close proximity, allogroom or allorub. Even if they are closely bonded it's still important to make ongoing observations to detect and prevent social conflict.

- Exercise, play, and opportunities to explore outside of the pen should be available for long stay, receptive individuals – provided this is in a private and secure space and fulfils their species-specific needs.

Source: Based on Carney et al. (2012) and Horwitz and Rodan (2018)

Chapter 10 looks at a range of therapies that can be used in housed cats which may enhance and improve their well-being.

Scientific Snippet: Research carried out on shelter cats, showed that providing a hide box in their accommodation helped them to cope more effectively in their first few weeks after arrival when compared to cats without a hide box. These findings can be extrapolated to other settings such as catteries and veterinary clinics (Vinke et al. 2014).

Record Keeping

Gathering and recording behavioural responses throughout a cat's stay provides vital information, ensures high standards of care and promotes feline well-being. A number of methods can be used to capture this information.

Questionnaires, completed by staff together with the cat's caregiver, provide the opportunity to ask questions from both sides. These can be designed for the specific workplace but should include: a cat's likes and dislikes, preferred food, and favourite games, etc (Horwitz and Rodan 2018). Less obvious questions such as their litter box setup are useful to ensure continuity as abrupt changes might trigger stress and litter box aversions.

Details of the cat's response to handling respects their individuality and informs all members of staff about any special precautions, helping avoid injuries and promotes good health and safety working conditions.

Quick and easy-to-read signage on the front of the cat's accommodation informs personnel about a cat's willingness to be handled or their level of nervousness. A colour code system is popular. For example, green represents a cat that enjoys human interactions, amber for cats that are a little nervous, and require a more sensitive approach, and red for cats that are extremely fearful and have special measures in place. Some creative veterinary personnel design their own (see Figure 7.12).

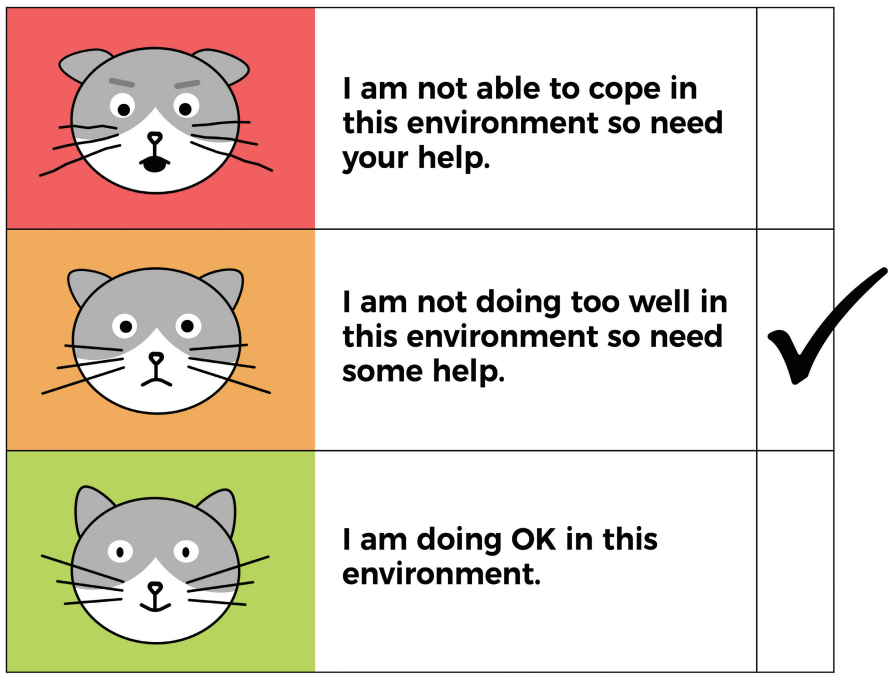

FIGURE 7.12 Easy-to-read signs on the front of the accommodation can provide essential information for staff. Image based on a design by the ISFM 'Traffic Light Assessment Colours' tool.

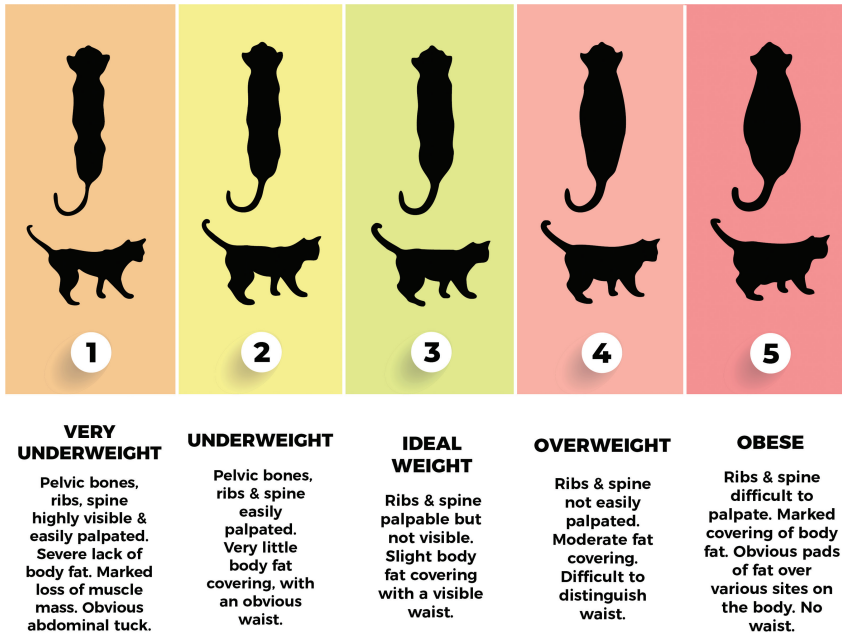

FIGURE 7.13 Body scoring should be carried out for cats that are in long-stay accommodation. Body score chart based on a design by ISFM/iCatCare.

Some nervous cats only appear at times when no one is around so unobtrusive video cameras might help to record when and for how long they emerge. This feedback helps when evaluating their progress or when special measures might be required (e.g. moving accommodation, adapting the pen to create more privacy, or seeking behavioural advice).

> **Top Tip:** Physical condition has been identified as an indicator of quality of life. As such, body condition scoring should form part of the ongoing measures for long stay cats (see Figure 7.13).

Using Music

There is some suggestion that listening to music, particularly classical genres, reduces stress levels in domestic animals within a workplace setting (Bowman et al. 2017). Anecdotal evidence from personnel working in cat shelters and veterinary hospitals advocates playing soothing classical music in waiting areas and cat accommodations for its calming, therapeutic effect on the cats and their caregivers.

We shall return to music therapy in Chapter 10 but there are some things to bear in mind when playing music:

- Avoid vocal and multi-instrumental pieces. Soothing piano pieces seem to work best.

- Volume should not be too loud. Set just below a conversational level.
- Restrict to periods when the cats are active (give them periods of complete peace and quiet).
- Be mindful of an individual's response and look for signs of increased stress.
- To comply with copyright laws, presently, here in the UK, businesses playing music in public places (other than royalty-free recordings) require a music licence.

Feeding

In strange surroundings, cats can go off their food. In addition to nutritional deficits, stress-induced anorexia can lead to hepatic lipidosis (Webb 2018), a serious medical condition mentioned earlier in the book.

Some background knowledge about an individual's food preferences can be useful as abrupt changes can trigger upset GI systems and stress. This isn't always possible, particularly for stray cats entering shelters – so having a variety of different foods that are easy on the gut, to tempt and cajole, is a good idea.

Food can generally be more appealing if it is warmed up. The preferred temperature is usually around 35 degrees centigrade, probably because at this temperature volatile fatty acids are released so it smells and tastes better. This may stimulate a cat's appetite and induce them to eat. However, it must be noted that the intense smell created can induce or worsen nausea in some individuals so it's best to observe the cat's response closely. Large portions can also be off putting so adhering to their species preference for small regular meals should be followed. Removing any uneaten food to prevent it from going stale is another recommendation (Taylor et al. 2022).

There's nothing quite like TLC and, in my experience, receptive cats will sometimes begin to eat when offered food by hand. However, for poorly cats, or those that refuse to eat, veterinary intervention will be required.

In the veterinary context – the decision to discharge a cat after a hospital stay is sometimes based on whether the cat is eating. However, it may be that the cat's appetite is affected by their surroundings. Therefore, if it's practicable, and deemed appropriate by the supervising vet, it might be preferable to allow them to go home, albeit with clear instructions and support from the veterinary clinic.

Learned Food Aversions

An unpleasant feeding experience can have long-lasting effects. For example, if a cat has been fed a particular food during an illness or at the same time that they experience something frightening or aversive, the taste (or smell or texture) of the food can become associated with that unpleasant emotion (Lumbis 2012). We can get a sense of how this feels after over-indulging or following a bout of food poisoning. For example, after a nasty hangover, even the smell of the offending alcoholic beverage can induce nausea and once favoured tipples may never be touched again!

This is a form of associative learning, specifically known as a learned food aversion, and might explain why a cat goes off a food they have previously enjoyed. It's

actually an adaptation, designed to prevent an animal from ingesting something that caused them to feel ill and may be toxic – averting them from eating it again.

The signs of food aversion include:

- Getting as far away as possible from the food.
- Tuning the head away from the bowl.
- Drooling/lip-smacking.
- Trying to 'bury' it.
- It should be noted that these signs are very similar to general nausea so exploring the cause, and initiating the necessary veterinary treatment, is important.

Based on Michel (2001)

Learned food aversions should be considered when caring for ill cats or when trying to change diets that are suited for a particular medical condition. To prevent problems, where possible, it is always advisable to introduce a new diet when the cat is in their home, free from stress, and feeling better.

If a cat does display any signs of food aversion, the food should be removed as soon as possible and, rather than replacing it immediately with something else, a period of time should elapse before offering another food.

Food Preparation

If you recall from earlier chapters – eating alongside other cats can be stressful. When food is being prepared, cats might congregate close to the front of the pens vocalising and reaching out through the bars or scratching at the doors, thus becoming more aware of each other's presence and raising stress. A separate food preparation area can reduce this risk around mealtimes.

Using Food to Create Positive Associations

Tasty treats might help to build a positive association with a handler but anxious cats tend not to consume food. Nevertheless, for cats that are responsive, provided it is not contra-indicated, appetising food might be worth trying. Always place the treats some distance away from you and give the cat the choice to consume them. Never coax or lure the cat or expect them to come close to take food from your hand when they are anxious, as this can make them feel vulnerable and it's possible they will strike out or flee with any sudden movements.

HANDLING AND INTERACTING WITH CATS IN WORKING ENVIRONMENTS

When working with cats it is inevitable that they will need to be handled at some point. However, cats are highly attuned to their surroundings and behave very differently depending on where they are. Most cats usually need time to adjust to a new environment so, wherever possible, give them time to process things going on around them and to settle in before attempting any handling.



FIGURE 7.14 On arrival, a cat can be placed in their pen whilst still inside their carrier, giving them time to emerge voluntarily and providing a secure base. Photo courtesy of Millie Lawton.

In certain settings, such as shelters and catteries, cats do not necessarily need to be handled immediately and if they can be given a few days to acclimatise, that can be helpful, especially for those with a timid temperament.

On arrival, a hands-off approach can be created by placing their carrier inside the pen and opening in situ. The carrier lid or door can be opened or lifted off so they can choose to remain in an area of perceived safety, before getting themselves out. Having somewhere close by to hide or climb on top of offers them a retreat and gives them a sense of safety and security (see Figure 7.14).

Removing a Cat from Their Pen

Once installed in their pen, it can prove challenging to get them out. A quiet, slow, and calm approach is to be recommended. Always be mindful of trigger stacking and the things that elicit fear such as direct eye contact, being loomed over, and heavy handedness.

The procedure can be made much easier and safer by following good working policies:

- Make sure all doors and windows are securely shut.
- Wash and thoroughly rinse hands to remove the scent of other cats and animals.
- Approach the pen from the side.
- Use your peripheral vision to avoid staring and to carry out a quick behavioural assessment
- Open the door quietly and calmly – but to prevent escape do not open the door fully.
- Stay to one side of the door so as not to 'loom.'
- Provided the cat doesn't use any aggression (hissing, swiping), gently and slowly offer the back of the hand with a loosely closed fist but avoid thrusting it towards them.
- If the cat approaches to sniff the hand or leans forward, follow the principles of cat-human Communication outlined in Chapter 4.
- The cat can then be gently encouraged to enter a carrier, which is the safest way to transport them to their destination.
- If the carrier doesn't belong to the cat, for infection control and to remove the scent of previous occupants, ensure it has been thoroughly cleaned.
- Cover the carrier with the cat's own towel and take care not to knock, jolt, or throw the cat around whilst in transit.

Restraining a Cat for Examination

Restraining a cat for an examination is regularly carried out in the veterinary context, although a cat may also need to be restrained for administering medication, grooming, or performing a general check-up in a wide range of working (and home) environments.

Controlling the environment can make a significant difference in outcomes. Simple measures such as dimming the lights, avoiding noxious or strange scents, reducing the number of people present, and decreasing background noise can help reduce the cat's level of behavioural arousal (Clark 2020). This also lessens the risk of behavioural sensitisation**,** a phenomenon I mentioned earlier in the book.

The likelihood of a positive outcome is greater if the handler and other personnel are sympathetic to the cat's unique behavioural needs and apply some of the guiding principles highlighted in Box 7.2.

BOX 7.2. Guidelines for Restraining Cats

- To maintain high levels of hygiene, and to remove the scent of other cats and animals, wash and rinse hands thoroughly. Remember that hand sanitiser products can be noxious.

- Disposable aprons and gloves may be necessary to control the spread of infection. Avoid bright colours.
- Minimal restraint is best as heavy handedness can induce fear and panic.
- Some cats may prefer to stay in their carrier where it should still be possible to carry out the examination. This is made easier when a cat is in a carrier that can be dismantled, as they have the opportunity to sit in the bottom section after the lid has been removed (see Figure 7.15).
- Cats that wish to investigate and take in their surroundings should be given time to do so. When working to a time schedule, such as in a typical 10-15 minute veterinary consultation, use this time to chat with the caregiver and ask questions about the problem whilst, at the same time, observing their movements to determine any obvious abnormalities (see Figure 7.16).
- Use a gentle, confident approach and as far as possible allow the cat to retain a sense of control.



FIGURE 7.15 Cats often feel much more secure at the veterinary clinic if they can stay in the base of their carrier, whilst being examined. Photo courtesy of Paul Knott.



FIGURE 7.16 Cats often feel better in a new environment if they can explore and process their surroundings. Photo courtesy of Paul Knott.

- Never pin a cat down and avoid grasping the 'scruff' of the neck as a means of control.
- During an examination, adapt the style to suit the individual. Some may prefer to be examined in a natural standing position.
- Being lifted up takes away a cat's option to escape, which can induce fear and panic. Adopting the mantra, coined by Cats Protection: 'Less is more, four on the floor' can help a cat feel more secure and safe.
- Avoid signals that can be perceived as a threat. This includes making direct eye contact or looming over them. In most cases, it is still possible to carry out a thorough examination by standing alongside the cat.
- Friendly, confident cats may voluntarily sit on the lap of a handler where, with the right approach, it is still possible to carry out an examination.
- Always try to start with the least intrusive and least stressful part of the examination first.

- Respect the cat's sense of smell and ensure they have their familiar items nearby. Having a towel or familiar bedding that they can bury underneath might be enough to help them cope during an examination.
- Table tops, weighing scales, and stethoscopes, etc. should be thoroughly cleaned in between cats. Sweat left behind via glands in the paws and other odours from another cat can be disturbing.
- Using Feliway® Classic (a synthetic FFP3) on an examination table has been shown to help reduce stress (Pereira et al. 2016).
- Never persist in trying to handle and restrain a cat that is extremely stressed. This will inevitably lead to an escalation of fear and potential injuries to caregivers and personnel.
- In the veterinary context, appropriate chemical restraint, i.e. an injectable sedative, can be administered there and then for extremely stressed individuals.
- If the examination/procedure can wait, it may be better to reschedule. In this way, a calming preparation, prescribed by the vet, can be given by the caregiver prior to the new appointment.
- In the veterinary environment, being restrained for the administration of medication is always likely to induce greater stress. Further guidance can be found in Appendix 2.12.

Based on Carney et al. (2012), Horwitz and Rodan (2018), Rodan et al. (2011) and Rodan et al. (2022)

Scruffing

'Scruffing' is a term that describes grasping and restraining a cat by the scruff/loose skin around the back of the neck. Years ago, this was deemed to be an acceptable method of restraint and because it mimicked the way a mother cat held her kittens it was purported to be a natural method of control. However, we know that a mother only carries her youngsters to transport and control them when they are still only very young and light. Other than during mating, when the tom grasps the scruff of the queen to ensure proper penetration, neck biting is a threatening gesture. Based on this knowledge, this method of restraint is now considered inappropriate and a threat to feline welfare (Rodan et al. 2022).

Health and Safety

Anyone working with animals should ensure they are up-to-date with their tetanus vaccination. At the time of writing this book, a rabies vaccine is not a requirement for people working in the UK unless they are at risk (e.g. working in quarantine establishments). However, people who work, or plan to work, in certain other countries may require a rabies shot and potentially other vaccinations. A GP can provide up-to-date advice.

Cats can inflict very serious injuries and can carry bacteria on their claws and teeth which can give rise to nasty infections in humans. Although rare, these can be potentially dangerous – particularly to elderly people and those who have a compromised immune system. A disease that can be transmitted from an animal to a human is called a zoonotic disease.

Cat-scratch disease (CSD) is the common name of one of the zoonotic infections that can be transmitted from a scratch or bite, caused by the bacteria: *Bartonella henselae*. Another zoonotic bacterial infection transmitted in the same way is *Pasteurella multocida* (Bowen and Heath 2005, Overall 2013).

In both cases, the symptoms include a painful swelling at the site of injury and a few days later a discharge from the wound can be evident, sometimes accompanied by swollen lymph nodes in the region of the injury. Injured personnel may also develop a fever and become ill. Immediate cleansing and flushing of the bite under running water or sterile saline is an important first aid measure but seeking prompt medical advice is another priority.

Restraining Aids

A trip outside the home and being subjected to a procedure will always induce a cat's negative emotions at some level – but heavy restraining aids should not be necessary. They impair the welfare of the cat and may lead to fear conditioning and handling aversions which cause problems in the longer term. It's always best to choose cat-friendly handling techniques and aids that centre on providing the cat with a greater sense of control. We shall take a look at a few here.

Towels

Towels are an excellent aid with the added benefits of being easily obtained and cost effective. Using the cat's own towel provides a familiar scent and can be comfortable to sit and lie on. As well as being a perfect hide-out, a towel can be used to swaddle the cat so that it contains all the limbs to protect personnel and provides the cat with a sense of security (Riemer et al. 2021) (see Figure 7.17).

Different towel wrapping techniques, where forelimbs or other parts of the body are exposed, may help when carrying out procedures such as taking blood samples giving injections, or bandaging limbs. Because many cats operate on a 'if I can't see you, you can't see me', mindset, some may respond well to having the towel covered loosely over their head and eyes.

iCatCare have provided a short but extremely informative video that demonstrates towel wrapping. Details can be found in Appendix 3 at the back of the book.

Gauntlets

Using gauntlets to protect hands and the lower arms may sometimes be necessary. Yet, if personnel are following cat-friendly protocols and/or using veterinary prescribed medication as a calming aid, the need to use them should be minimal.

Unfortunately, many are made of bulky and heavy materials which affect dexterity and lead to heavy handedness. As with other equipment, they must be clean and



FIGURE 7.17 Towels can be useful for restraining a cat without causing additional stress. Photo: Author's own.

free from another cat's scent but this can be difficult as many are made of leather or suede. If they are going to be used in the workplace, opt for a material that is robust but pliable. Spraying them with the synthetic FFP3 may also help.

Restraint Cage

For extremely fearful cats, or those that have never been handled, such as street or feral cats, restraint cages that have a movable partition inside them might need to be used (see Figure 7.18). They are sometimes referred to as a 'crush cage' but rather than physically crushing and harming the cat they are designed to usher them to one side of the cage. This provides a veterinarian with enough time to quickly administer a sedative into the cat's muscle through the bars to help facilitate handling. Some restraint cages are designed to incorporate a trap, commonly used by trap, neuter, and return (TNR) schemes. Whilst they appear fairly intrusive, with practice, the cat needn't be placed in a compromised situation for long before the sedative is given and begins to work.



FIGURE 7.18 Cages designed to incorporate a movable partition, guide the cat to the side so that a sedative can be administered to them through the bars.

Practising Handling

It is always advisable to use manikins or small cuddly cat-shaped soft toys to practise a handling or restraining technique as this helps to hone skills and prevents stress and injuries for the cat and the operator.

One of the most important things to keep in mind is that handling cats is a skill and cultivating proficiency and an awareness of feline body language takes time. Asking for further training or getting help from someone more experienced is not a weakness – it demonstrates professionalism and that the cat's welfare is your top priority.

Recognising and Preventing Problems

Unlike dogs, cats are not equipped to resolve conflict using appeasement behaviours. Dogs' appeasement signals include submissive gestures such as rolling on their back or raising a paw. As previously mentioned, cats tend to flee, freeze, or fight. However, these responses can change in seconds. A cat that is very still and hiding can suddenly display defensive fear aggression and, if frightened and provoked, may inflict injuries to personnel. A raised awareness is key.

Making Observations

The position that a cat poses in their pen or carrier can indicate fear, anxiety, and stress. Some may be at the back, huddled down or trying to hide under their bedding/newspaper or tucked into their litter box if that's all there is to hide in. Others will be more ready for combat, hissing or out near the front – ready to escape.

Getting a cat out from accommodation in these kinds of emotive states can be challenging. Applying some of the cat-friendly initiatives and with the right approach it is possible to minimise stress and the process can be undertaken more smoothly.

Most important is our ability to decipher and understand feline communication signals as this can shape the way we interact with them. An awareness of the more subtle signs of stress can inform us early on about how a cat is feeling and throughout our interactions we should continue making observations to determine how the cat is feeling. Tense facial muscles (especially noticeable around their muzzle), rapid swishing or flicking of the tail, orientation away from the handler and hissing and cuffing with a paw are just some of the signals that indicate a negative mood state (see Chapter 5).

Similarly, knowledge of occurrences such as flooding, learned helplessness, and behavioural sensitisation ensures we can be sensitive in our handling methods and better informed. Nonetheless, there will inevitably be times when the cat's fear is rapidly intensifying, in which case the following tips might prove helpful:

Diffusing Problems

- Apply a less is more handling technique. Minimal restraint implies a sense of control and freedom.
- Carry out procedures in small incremental steps and take breaks when the cat shows early stress signals – giving them time to recover before resuming.
- Give them 'space' and back off as soon as their signalling indicates it.
- Allow them to make choices and take independent actions i.e. access a coping strategy e.g. hiding.
- Stop – re-evaluate your methods and take a different approach.

After a period of fear and reactivity, a cat needs to be given a period to 'decompress' in a quiet and calm, cat-friendly location before any attempts at handling are attempted or repeated. It's been suggested by some veterinary behaviourists that at least 30 minutes should elapse before engaging with the cat again although a case-by-case approach is best as some cats may need much longer. However, if a cat's fear and anxiety are particularly high, as already mentioned, it may be necessary to consider the use of pre-appointment medication or, in a veterinary environment chemical restraint may be required there and then to facilitate the handling.

Secure Base Effect

Having the caregiver present during procedures undertaken outside the home can help to create, what has been called, a 'secure base effect' (SBE). One study has shown that cats did, on average, display a lower frequency of stress-related behaviours when the caregiver was with them (Behnke et al. 2021). However, this isn't always possible. Therefore, in addition to providing the cat with something that holds their own scent, it may be equally helpful to have something left behind that contains their caregiver's scent to act in proxy of their presence.

Rehearsal Visits

Familiarising a youngster with an environment they may have to visit over their lifetime is a good idea (see Figure 7.19). After successful cat carrier and transportation training, scheduling appointments to places during quiet business hours makes sense.

Attempts to introduce them if they are frightened or overwhelmed can have long-term negative effects so it is important that they are relaxed and are finding the experience a positive one. This includes ensuring that the atmosphere is calm, relaxed, and well-managed. Ensure that all staff, not forgetting front-of-house staff who often play a key role in these drop-in sessions, have been trained and know how to safeguard the cat.

These visits should be encouraged as part of a kitten's habituation and socialisation programme but, for a cat with existing fears, it is unlikely that they will be in a positive emotive state to conduct any meaningful training – in which case pre-appointment medication might be best for them.

Socialisation Classes

Socialisation classes for kittens are not nearly as commonplace as those available for puppies. Nevertheless, they have been endorsed by some veterinary behaviour specialists. Kitten Kindy® was developed by veterinary behaviourist Dr Kersti Seksel, whose primary aim was to educate new caregivers and their families.

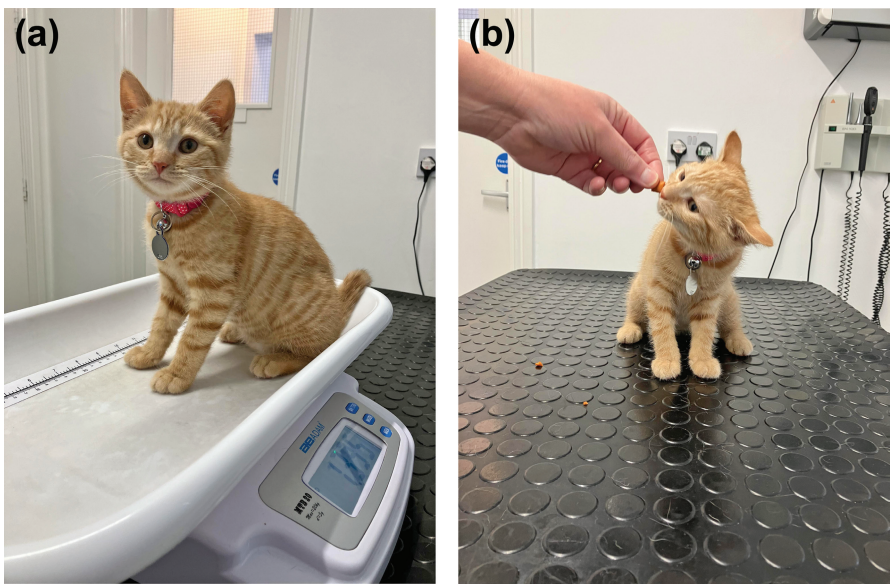

FIGURE 7.19 Familiarising a kitten with places they are likely to visit throughout their lifetime, whilst pairing it with something pleasant, can prevent the development of fear. Photos courtesy of Paul Knott and Michaela Bell.

Unlike puppy socialisation 'parties' kittens are not generally present and the sessions are limited to information giving. Nonetheless, some feline behaviourists and veterinary clinics do choose to host carefully managed sessions, usually with no more than four kittens. These may help develop the social skills of individuals removed from their mother and litter mates early on in their development**.** In these circumstances**,** scrupulous hygiene should be maintained and for safety, the kitten should complete their full vaccination programme before enrolment. Unfortunately, this isn't until after their socialisation period has ended and can therefore limit the benefits. Another potential problem to guard against is that play can sometimes turn into fighting in kittens as they mature (somewhere around 14 weeks of age) which would be counter-productive. Consequently, for interactive sessions, a risk assessment should be carried out to carefully judge the pros and cons.

Other Considerations

- **Cat-only appointments:** These can be scheduled so that other species are not in the waiting area at the same time. This is more likely in a veterinary setting but may apply to catteries that also offer dog boarding.
- **Cat-only/cat-friendly clinics:** In veterinary settings, this means that the whole practice is geared up to cater and care solely for cats. This may suit particularly timid cats.
- **Keeping appointments on time:** This helps because problems will be exacerbated the longer the period the cat is confined to their carrier.
- **Using suitable, cat-friendly holding areas:** If these are not available it is recommended that anxious cats should wait in a secure and well-ventilated covered carrier in the car until they can be checked in.
- **Provide cat parks:** Cats feel more secure in a raised, hidden, location so encourage caregivers to place the cat carrier in a purpose built 'cat parking' space and not at floor level. Benches, chairs and shelves can be adapted (see Figure 7.20).

Preventing Non-Recognition Aggression

Non-recognition aggression can occur when one cat has spent some time away from the home and upon their return is regarded as a stranger or threat by a known, resident cat. This can occur in any scenario but is more likely after a cat has been to the veterinary clinic or groomers where they will pick up different scents.

Trips to the groomers may result in their coat looking and smelling quite different although it is after trips to the vet when problems are more probable. Bandages, dressings, and other medical materials will carry different scents and may change the appearance of the cat. Even their breath can emit a different smell for a time if they have had gaseous anaesthetic (see Figure 7.21). All this causes confusion and alarm and may lead to violent clashes, causing serious damage to the relationship.

To prevent problems, the returning cat should be separated in another room with all their resources, giving them a chance to completely recover. When problems do arise, early intervention is crucial and immediate separation and a gradual reintroduction programme, along with pheromone therapy to help facilitate a relaxing

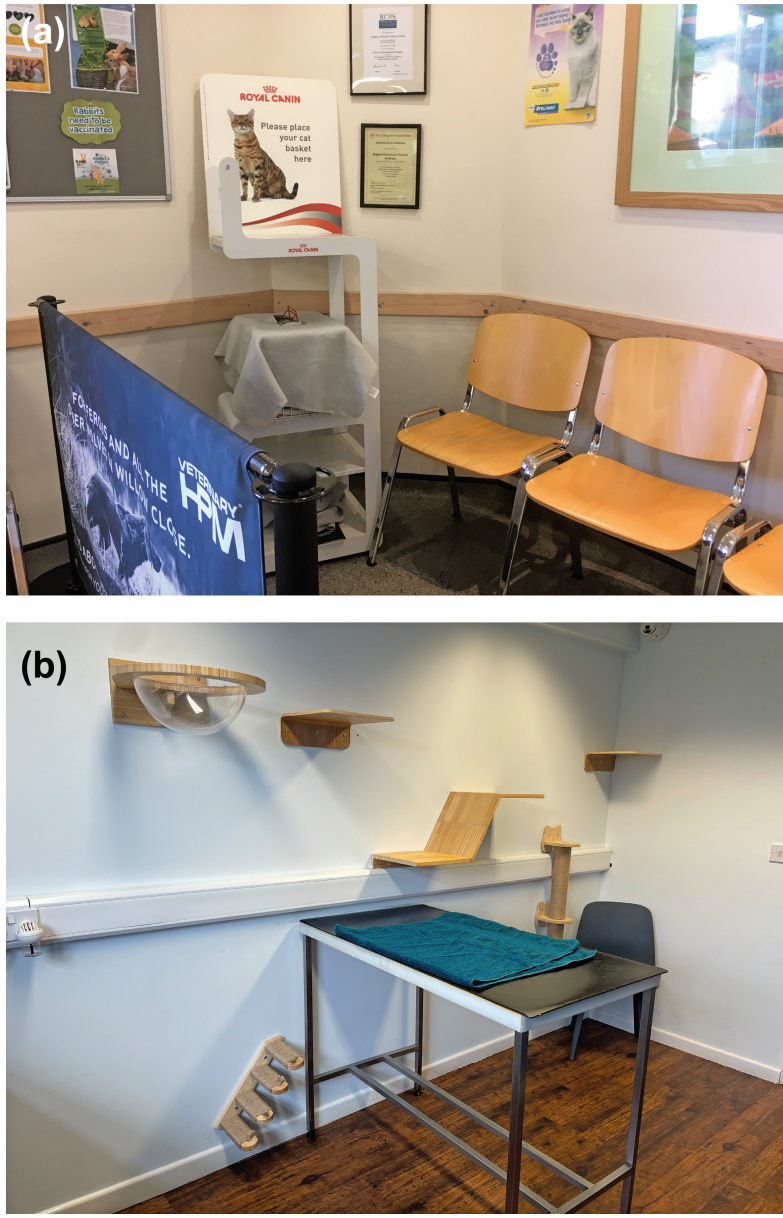

FIGURE 7.20 Cat-friendly facilities can enhance the cat's experience. This can be achieved by providing covers for the carrier and elevated, purpose-built shelving or seating in waiting areas (a) or by adapting a consultation room to make it comfortable and calm and provide opportunities for the cat to get up high (b). Photos courtesy of Aldgate Veterinary Clinic (a) and Georgina Lamb at Edhen Veterinary Surgery (b).



FIGURE 7.21 After a veterinary procedure a cat will return home carrying 'alien' scents. Even their breath can emit a different smell for a time if they have had gaseous anaesthetic. In multi-cat households, this can lead to non-recognition aggression. Photo courtesy of Frankie Lees.

environment, can help the cats get back on track. Under no circumstances should cats be left to 'sort it out themselves' as this runs the risk of a complete breakdown in the relationship. Instructions for re-introducing cats after a trip outside the home and for dealing with non-recognition aggression can be found in Appendix 2.7.

Top Tip for Veterinary Teams: Cats from the same household, that come in together for a surgical procedure, MUST be housed in separate pens when recovering from a general anaesthetic as they will be disorientated and confused. This, along with disturbances in scent profiles, could cause fear and may trigger conflict with a real danger of long-term damage to their relationship if fighting ensues. Once home, caregivers should be advised to separate cats until they are fully recovered.

Human Emotions

Before embarking on any kind of interaction with a cat, we must consider our own emotions. It goes without saying that if we feel stressed it will inevitably affect the way we behave and react, which can affect our dealings with them.

Co-regulation relates to being in a calm, regulated state with oneself, allowing this to influence the way we care for and work around animals. So looking after our own mental health and having some quick self-relaxation techniques to fall back on before interacting with a cat will improve our frame of mind and improve outcomes (see Box 7.3).

Dogs are renowned for their keen sense of smell and studies have shown how they can sense their caregiver's fear but some research by d'Ingeo and colleagues (2023) has shown that cats are also able to respond to a person's emotional odours. Their work found that 'fear' odours from humans prompted higher stress levels than 'physical stress' odours and 'neutral' human odours. Of further interest, the use of the right nostril became more prevalent as stress levels increased. This is thought likely because the right hemisphere of the brain controls most of the physiological and behavioural reactions to stressors.

BOX 7.3. The 4-7-8 Slow Breathing Technique

This is a quick, effective relaxation technique that was developed by Dr Andrew Weil. It can be extremely beneficial for those times when one needs to induce some inner calm during a busy and stressful day:

- Start with a long exhale to empty the lungs.
- Then breathe in deeply through the nose to a count of 4.
- Hold the breath to a count of 7.
- Breathe out slowly and noisily through the mouth to a count of 8.
- Repeat several times.

(Weil 2016)

A CAREGIVER'S PERCEPTIONS AND EXPECTATIONS

Data gathered for the CATS report (2023), one of the most comprehensive surveys of cat caregivers in the UK, has estimated that more than a million cats are not registered with a veterinary practice and that over four million are not getting the veterinary care they need. There are a number of reasons for these statistics, including the cost of pet ownership, although stress for the cat and their caregiver are major factors in reluctance to visit the vet.

In 2022 research was undertaken to investigate caregivers' perception of stress in their cat when visiting the vets, as well as describing their own experiences during the consultation. The survey highlighted that most of the cats (88.7%) were perceived as finding the experience stressful and about half the caregivers felt stressed

themselves. Of interest, the cat caregivers who perceived visiting the veterinarian as being stressful described their cat as being stressed more often than the caregivers who did not feel stressed. Another finding worth noting was that caregivers felt less stress when their cat was being examined by a veterinarian exhibiting a high degree of empathy and a feline-friendly demeanour (Karn-Buehler and Kuhne 2021). With that in mind, a separate piece of research in 2023 showed that clinics enrolled in Cat-Friendly Practice (CFP) schemes had an increased proportion of clinic visits when compared with non-CFP and that more diagnostic tests were performed, identifying a higher number of cats with clinical problems (St. Denis et al. 2023).

What one can conclude from these studies is that the caregiver's stress influences the perception of their cat's stress and adopting feline-friendly handling methods should help alleviate stress in both the caregiver and their cat – encouraging increased visits to the veterinary clinic and promoting optimal feline healthcare.

Adopting Cats: Making the Right Match

It is far more beneficial for an adopted cat to remain with the new caregiver in a stable environment, so trying to get things right from the onset is important.

Expectation is a crucial element in retention after adoption, so matching the cat to the right caregiver is important. This involves carrying out a thorough assessment of the behaviour of the cat and the lifestyle of the new carer to ensure it works out for the best.

Timid adult cats are less likely to adapt to a busy family household with lots going on. Some confident cats may fare better. Adopters who have another cat or pet in the home should be given precise details of how to make safe and positive introductions, ensuring that the temperament of the chosen cat is suitable to cohabit. For families with children, steer them towards resources that help teach them how to interact with cats safely (see recommended reading in Appendix 3).

Using Matching Tools

Behaviour assessment and matching tools have long been used for shelter dogs but assessments for cats are less common. The American Society for the Prevention of Cruelty to Animals (ASPCA) use the 'Meet Your Match Feline-ality™' assessment which was developed specifically to provide adopters with an idea of an adult cat's likely behaviour. The matching process includes a survey for the adopter to complete which encourages them to think about their lifestyle. Conversations sparked by the process have been reported as being helpful in matching cats to the right adopter (Weiss et al. 2015).

Details of the Meet Your Match Feline-ality™ assessment survey can be found in Appendix 3.

Cat-Friendly Initiatives

Showing a willingness to reduce feline stress by adhering to cat-friendly initiatives demonstrates a commitment to high welfare standards.

In 2012 the AAFP and the ISFM, established the Cat Friendly Practice® programme, a global initiative, designed to promote care for cats by reducing stress. Veterinary practices can become an accredited Cat-Friendly Clinic provided they meet certain standards relating to design, equipment, and facilities within the clinic, and of course the level of care for cats. The ISFM also offer a range of distance learning programmes on feline health and behaviour for the whole veterinary team.

The Fear Free® initiative is another reputable organisation offering similar programmes and they provide study materials for a range of pet professionals (vet teams, shelter staff, groomers, etc.). Certified members demonstrate a commitment to providing a better experience for cats in their care.

Both organisations have an online directory for caregivers to find accredited businesses – giving them peace of mind that the company is well versed in working with cats. More details can be found in Appendix 3.

For further protocols for working with cats, specifically for shelter staff and veterinary teams, see Appendix 2.

KEY TAKE HOME POINTS

- Cats find trips to unfamiliar places distressing.
- Habituating a cat to their cat carrier can help to alleviate stress when being transported outside the home.
- Most working environments pose a raft of challenges for the cat but with the right approach these can be controlled and managed.
- Applying cat-friendly methods of handling, and creating an environment that supports their unique needs, enhances feline welfare and improves outcomes.
- A willingness to reduce feline stress by adhering to cat-friendly initiatives demonstrates a commitment to high welfare standards.

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Part 3

Analysing, Understanding, and Dealing with Feline Behaviour Problems

Dealing with feline behavioural issues can be complex and this book is far from a comprehensive text on the topic. Nevertheless, here in Part 3, I offer an overview of some of the problematic behaviours that may be encountered. But first I share some of the principles that are applied by the feline behaviour counsellor when trying to make sense of a presenting problem and the processes involved in formulating a behaviour modification plan. This may well include the inclusion of behavioural adjuncts, including complementary and integrated treatments, some of which are discussed here.

For anyone wishing to develop their knowledge of feline behaviour further, I have provided a list of recommended texts and resources at the back of the book.



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8 The Fundamentals of Behaviour Analysis

The role of the feline behaviourist is to help caregivers understand their cat's behaviour and ultimately resolve or manage problems. Analysing the behaviour in order to arrive at an accurate diagnosis is therefore a fundamental part of the process. This involves gathering as much information as possible in order to get a sense of what is going on. I often liken this process to putting together a giant jigsaw puzzle, with each small piece of information representing a part of the bigger picture. After considering all the evidence and having a clearer view of the problem, a tailor-made Behaviour Modification Plan (BMP) can be designed (Figure 8.1).

As the name suggests, behaviour analysis is studying the cat's behaviour in a systematic way. In its simplest form, it involves observing what the cat is doing and reflecting on their behaviour problem to determine the motivation(s) behind the problem. However, that doesn't mean restricting observations to the actual behaviour itself or limiting thoughts to what happened in the few moments before, during, and after their response. It goes way beyond that.

RULING OUT MEDICAL PROBLEMS

Because so many behaviour problems can be related to clinical conditions and pain, a full health check should be undertaken by the cat's veterinarian. In fact, this and gaining permission to see the cat, are prerequisites that behaviourists who are registered with a recognised body will insist upon before taking on a case. This demonstrates a high level of professionalism. A veterinary examination might involve a number of tests to eliminate certain medical problems. For example, the cat that begins to urinate in the house may require urine and blood tests to rule out problems that affect the urinary system (e.g. bladder and kidneys), or indeed rule out any other disorders that give rise to this symptom.

It's also advisable to go through the cat's clinical history and, with the supervising vet and caregiver's permission, this is something a behaviour counsellor often asks to see. Forging a good working relationship with the vet is essential and, working as a team together with the client, will improve outcomes (Brown 2022).

Information about past or present medical conditions, or medication the cat is being prescribed, can be useful and may shed light on the case. For example, a cat with a stress-related problem may have a history of being treated for repeated cat bite abscesses. This would suggest that conflict and fights with another cat are responsible, or at least a contributing factor, for their stress-induced behaviour. With this knowledge, the caregiver can be advised to try and identify the cat and their owner, so that a time-sharing system can be agreed upon. This would mean that

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FIGURE 8.1 A behaviour counselling session, led by a suitably qualified professional, will provide accurate advice and design a tailored Behaviour Modification Plan. Photo courtesy of Amy Crossley.

each cat has an allotted time when they are given outdoor access, thus avoiding ongoing encounters (Bowen and Heath 2005).

TAKING A HISTORY

Taking a detailed history underpins the whole process and questions about the cat's early life experiences help build a behavioural profile. Sometimes, for adopted cats or those whose background is unknown, one may need to make certain assumptions and fill in some gaps with the limited information available.

Prior to the consultation the behaviourist usually asks the caregiver to complete a questionnaire in order to gather some useful background information. It can also act as a springboard for further questions in the face-to-face session that follows. As well as the basic information (i.e. age, breed, sex, and sexual status) the behaviourist will want to ask a wide range of questions relating to different aspects of the cat's lifestyle and their physical and social environment as this can yield useful insights.

Using Timelines

Once a cat's background and current lifestyle have been explored, the actual problem can be addressed. Timelines can be useful as a simple but effective means of

gathering information (Clark 2022). Basically, it's a list of important events arranged in the order in which they happened.

When I am working with a client, I usually use a timeline to plot the development of the problem behaviour. I find out when the behaviour first began and, if the caregiver can remember, all the relevant events that preceded it, working my way right up to the present day. Very often this exercise provokes useful feedback, prompting recollections of how things developed and isolating a catalyst for the behaviour as well as ongoing triggers. An example of how to use a timeline can be found in Appendix 3.

Describing the Behaviour and the Settings

Once past events leading up to the problem have been explored, we can then move on to the present. I like caregivers to give me a description of the actual behaviour in their own words; what it actually looks like and what happens. I try to encourage facts rather than a version of what they infer from it as this can confuse matters.

I am also interested in the conditions or settings under which the behaviour occurs as well as trying to determine the function of the behaviour. In other words, under what circumstances is the behaviour most likely to occur and what does the cat actually gain from the behaviour? e.g. access to a resource, fulfilling a need, or self-defence. Conversely, but as important, I am also keen to hear about the occasions when and where the behaviour doesn't occur. Answers to these types of questions help me understand motivations and maintaining factors, as well as gaining insight into the physical and social context of the cat's environment, so, if necessary, they can be redesigned (Friedman 2009).

OBSERVING THE BEHAVIOUR

Observing the actual behaviour itself is an obvious part of the process and needs to be approached with a high level of scrutiny. However, cats can 'do a runner' when a stranger comes into their territory so hidden cameras or observing the cat in their usual environment via a video consultation can garner useful evidence. Playing back video recordings can also help reveal things that might have been missed the first time around or highlight a change in the cat's gait that may indicate pain. Images can then be shared with the veterinary surgeon to analyse. A caveat to this is when the behaviour is potentially harmful. Setting up scenarios that involve aggression and conflict, just so the behaviourist can observe what's going on, is not to be encouraged. Detailed descriptions should suffice.

INADVERTENT REINFORCEMENT

Because cats are learning all the time, it is easy for the caregiver to inadvertently reinforce an undesirable behaviour and this may be a part of what is going on and exacerbating the problem further.

Let's look at one behaviour where learning can be a complication and compound a problem: over-grooming can be triggered by stress but when it occurs in the presence of the caregiver it may result in the cat gaining their attention which can be highly rewarding. The positive consequence of their behaviour, such as attention from being talked to (even a verbal reprimand), being followed, touched, or even just being given eye contact, might be enough for the progression and maintenance of a behaviour – even though it may not have been the original cause. With this in mind, it's useful to determine how a caregiver responds to their cat's behaviour and whether the behaviour worsens when a particular member of the family is present. This is one reason why ideally everyone in the household should be involved in the consultation.

CARRYING OUT A STRESS REVIEW

Asking a caregiver to provide a floor plan of the home, plotting all the rooms and where the cat's key resources are located can be helpful. Better still is a physical tour of the home to evaluate the cat's core and outdoor territory, i.e. the garden, their catio, and the immediate surrounding neighbourhood.

Carrying out a visual inspection can be valuable in assessing whether it meets the cat's ongoing physical and social requirements and can be most helpful in identifying what might have triggered a change in behaviour or what may be contributing to, or maintaining, an existing problem. In addition to the physical surroundings, the stress review should encompass husbandry styles as well as the cat's social environment (Halls 2016).

Table 8.1 provides some ideas of the areas of special interest.

It is also worth mentioning that, as part of a preventative health programme, conducting a stress review before acquiring a cat gives them the absolute best chance of settling in right from the start. Most caregivers are capable of this provided they are equipped with the right background information.

A stress review can be modified for cats kept in rescue or cattery environments too as their pens are, in effect, their 'home', sometimes for prolonged periods.

Observing the cat's social interactions with other pets and members of the family can be insightful and hearing what everyone has to say about their experience of the problem can isolate different viewpoints. Body language can reveal a cat's emotions and may be pointed out to caregivers at the time to help them develop an awareness of feline communication. Providing additional educational material on this topic should also be a feature of a consultation and subsequent behaviour plan.

Details of how to access a stress review template can be found in Appendix 3 at the back of the book.

TABLE 8.1 Suggested Areas for the Focus of Interest when Conducting a Stress Review

Focus of Review	Assessment	Things to Consider / Ask the Caregiver
Resources inside the home	• Are they sufficient, plentiful, and well-distributed? (See Chapter 3).	• Check that in multi-cat homes resources are aligned with MEMO (See Chapter 3).
Core territory	• Is the area safe and secure and can the cat eat, relax, sleep, and play without disturbance or stress?	• Has there been any recent disturbance e.g. decoration, renovation, newcomers, etc.
Provision of food and water	• Are there separate feeding and drinking stations? • Is food and drinking provision optimal?	• Ensure there are opportunities to drink inside and outdoors. • Look for a cat centric approach to feeding.
Layout of the home	• Is the home: minimalistic or open plan?	• Cluttered homes tend to be a better environment with more places to hide and investigate.
	• Does it require adaptations?	• Discuss practical solutions to optimise a minimalistic setting, e.g. provide boxes and maximise elevated space using furniture and fittings.
Escape routes and safe havens	• Are there opportunities to easily access safe elevated sites and escape routes?	• These sites should ideally be located close to their essential resources. • Check these are available inside and outdoors.
Mental enrichment	• Is there a variety of toys to prevent boredom? • Can the cat engage with puzzle feeders and games without triggering frustration? • Does the caregiver provide appropriate interactive play?	• Demonstrate play and discuss suitable toys and resources.
Cat flap	• Are resources well clear of the cat flap? • Can it be breached by outsiders? • Are there plenty of camouflage and hiding opportunities immediately outside the cat flap?	• Having resources in the vicinity of the cat flap may encroach security. • A cat flap can represent a weakness in the cat's physical defences. • Microchip-operated cat flaps can protect against despots.

(*Continued*)

TABLE 8.1 (Continued) Suggested Areas for the Focus of Interest when Conducting a Stress Review

Focus of Review	Assessment	Things to Consider / Ask the Caregiver
Visual challenges	• Can the cat be easily overlooked by outsiders? • Is the cat hypervigilant around windows/patio doors?	• Blinds, curtains, and frosted transfers on windows can help reduce visual disturbance. • Food stations, litter boxes, and beds should be in private locations.
Garden and other outside spaces (e.g. catio)	• Is the garden or catio barren? • Are other unfamiliar cats/animals frequent visitors to these spaces? • Have there been or are there any plans to change or disrupt the outside space?	• Shrubbery, trees, pots, and garden ornaments can provide climbing opportunities and hiding places. • Apply measures to prevent 'invasion' e.g. cat-proof fencing, fitting safe deterrent strips to line the tops of fences/walls. • Changes to outside locations may disrupt recognised toileting areas, ability to escape, hide, or take cover.
Range outside the garden	• Is the neighbourhood in an urban/rural location? • Is there a high density of unfamiliar cats, other animals, people, and traffic? • Is there any new building work in the home range?	• Check for potential and actual social stressors. • Construction (e.g. new housing) in the home range can disturb the usual area where a cat roams.
Relationships, social tensions and emotional upheaval	• Assess human–cat relationships • What is the general atmosphere in the home? Is it calm, tense, busy, noisy, etc.? • Any changes to social arrangement? • Any social conflict in the home?	Are there any of the following situations: • Bereavements. • Fostering another animal. • Visitors. • Young adults home from university. • Absent caregiver (hospitalised, vacation). • Divorce. • Newcomers (baby, other pets).
Smells and aromas	• Are there overpowering scents?	Consider: • Air fresheners and diffusers. • Scented candles. • Cleaning products being used.

Based on Halls (2016).

LOGGING BEHAVIOUR

Keeping a diary is extremely valuable. As soon as an appointment is made, I will suggest that the caregiver logs their observations regularly. This can help us both see whether there are any recurring trends or themes that are affecting the cat's behaviour. Details of dates of when the behaviour occurred, who was present, how often and for how long the episodes last can provide meaningful data and, once a plan is in place, it can provide a benchmark to determine whether our interventions are having the desired effect.

IDENTIFYING TRIGGERS AND ANTECEDENTS

Analysing and observing triggers that precede and provoke the behaviour can be immensely useful. I have introduced and talked about triggers throughout the book and, you may recall, they can be anything that reminds and prompts a behaviour. This includes the environmental conditions, in other words, the cat's physical surroundings and what is going on there. In the field of animal learning, things and situations that occur prior to a behaviour can be referred to as antecedents, these are the signposts that signal the behaviour.

Thinking about what precedes a behaviour and formulating a list of triggers is a worthwhile enterprise. Once they have been identified they can help the behaviourist and caregiver predict what might happen next. As previously mentioned, the behaviourist can then provide advice which typically involves changing settings (antecedents), reducing, or where possible, removing the trigger(s) altogether. Depending on the issue, providing the cat with opportunities to replace the function served by the problem behaviour, with an acceptable alternative, may also be a recommendation (Friedman 2009). Details of how to access a trigger diary template can be found in Appendix 3.

Where applicable, we can also use the trigger(s) in their mildest form to carry out systematic desensitisation (DS training). As discussed earlier, this involves reducing the response to a fear-evoking stimulus, by presenting it at an extremely low intensity, to ensure the cat remains in a fear-free state. Over time, and very gradually, the intensity is increased. For example, recordings of sounds that evoke fear (e.g. fireworks) can be played at a low volume, increasing incrementally, to help overcome noise sensitivity. We shall be returning to the subject of DS training again in Chapter 11. Links to free, authentic sound effect recordings can be found in Appendix 3.

FORMULATING A BEHAVIOUR MODIFICATION PLAN (BMP)

Once behaviour analysis has been undertaken a diagnosis can be made and a BMP can be devised with greater clarity. Each plan is individualised, yet most behaviour counsellors tend to follow a general structure in their written report that includes important key features to inform the caregiver and referring vet (see Box 8.1).

BOX 8.1. Some Key Features of a BMP

- **What** the behaviourist has concluded – their diagnosis and how they arrived at it.
- **Why** the cat is motivated to behave in a particular way, e.g. innate drives.
- **What** a cat needs to lead a fulfilled life and how to meet those needs.
- **How** the behaviour developed and what is maintaining it, e.g. early life experiences, inadvertent reinforcement and ongoing triggers.
- **What** the aims and objectives of the plan are.
- Details of **how** to implement practical management techniques (tailored to the caregiver and cat's lifestyle).
- **How** to modify behaviour (training techniques explained, demonstrated, and guides and links to video demonstrations provided).
- **How** to access and implement complementary treatments and integrated therapies that may enhance the plan (see Chapter 10).
- **When** a follow-up is required.

The plan should address the main issues and break things down into manageable steps. Setting short-term, realistic goals, rather than fixating on the ultimate outcome, garners the best results. Regular follow-ups are necessary so that the plan can develop accordingly. A copy of the BMP should always be sent to the referring veterinary surgeon and they should be kept fully informed of progress.

Top Tip: Modifications to the cat's physical environment and changes to their routines that may be advised in a BMP should be made gradually. Altering a whole lot of things can in themselves be stressful and could compound a problem.

Factors Affecting the Success of the Plan

A plan is unlikely to be successful unless the cat (and caregiver) are in the right mood state. Creating a sense of calmness and security is pivotal in facilitating learning. Moreover, harnessing positive emotions can actually help reduce many of the unwanted behaviours. Depending on the specifics of a case this can be achieved by integrating any number of the suggestions already covered within the book, particularly centred around MEMO and the Five Pillars framework. However, a host of additional measures will be explored in forthcoming chapters.

Also if a particular training technique is required as part of the treatment, it must be demonstrated although this can be difficult if the cat decides to disappear or withdraw. In these cases, the caregiver should be given access to clear video demonstrations. Requesting recordings of their subsequent training sessions can help pinpoint problems with their techniques and advice can be given to iron out any glitches.

Lack of compliance may be a problem. For example, if a plan doesn't fit in with the caregiver's lifestyle it is bound to fail so collaboration is vital.

Sometimes sticking to a plan when it doesn't appear to be working immediately can be tough for the caregiver and can be another reason for non-compliance, but change can be slow especially when habits have formed. If a behaviour has taken months (and sometimes years) to develop, it's likely to take at least as long to learn a whole new way of behaving. It really is a case of being consistent and patient. This must be discussed. That doesn't mean that a plan can't be tweaked and sometimes I make some amendments based on the cat's progress. However, making sudden and dramatic changes to a plan is only likely to cause confusion.

Being realistic about what can be achieved is something else to consider. Unfortunately, it's impossible to guarantee a complete resolution. Some cats will always have certain tendencies and it's difficult to completely change a cat's temperament. However, it is possible to manage a problematic behaviour effectively, by ensuring the cat's needs are met and making any necessary alterations to the environment, so that the conditions that maintain it can be changed. Implementing behaviour modification training techniques and following strategies to help restore a better mental state are often part of the plan too. So, in that sense, management is in fact treatment!

Regular support and guidance from the behaviour counsellor most definitely help to keep a caregiver on track. Follow-ups, to encourage and move the plan forward, and to evaluate progress, should be scheduled. In some select cases, additional support in the form of veterinary prescribed medication may be necessary (see Chapter 10) and if there are any doubts about the cat's health a referral back to the veterinarian should be promptly arranged (see Figure 8.2).

We shall be returning to all the concepts introduced in this chapter in a more applied sense, and this should help things fit into place. For example, in Chapter 9, a number of problematic feline behaviours are explored, with ideas for their management and treatment. Also, in Chapter 12, a range of case studies are presented.

KEY TAKE HOME POINTS

- Medical conditions must be ruled out by the supervising veterinary surgeon prior to a behaviour consultation.
- Behaviour analysis is a skill and requires thorough history taking and close scrutiny of the problematic behaviour and the cat's physical and social environment.
- Carrying out a stress review can be a useful exercise in preventing and treating behaviour problems.
- A behaviour plan must be tailored to the individual case.
- There is no guarantee of a complete resolution for any behaviour problem, although most cases can be greatly improved with effective management techniques.



FIGURE 8.2 Analysing a cat's behaviour requires a systematic and stepwise approach.

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9 Understanding and Dealing with Problematic Behaviours

In my role as a feline behaviour counsellor, I am called to help with a variety of problematic feline behaviours. Some of these can seriously jeopardise the cat's welfare and may put a strain on the human–cat relationship. In extreme circumstances, relinquishment or even euthanasia can be the outcome so early recognition and swift intervention are of critical importance.

This chapter focuses on some of the problems that can befall the cat – how they present, what underlies their development, and what can be done to help.

NATURAL, UNDESIRABLE BEHAVIOURS

Behaviours that caregivers tend to seek help with are primarily those that are disruptive to the household. Some of these can be described as natural, undesirable behaviours. That is to say that they are a normal part of the cats' behavioural repertoire but are not socially acceptable to the caregiver. These might include:

- Scratching furnishings.
- Climbing up on to things in the home.
- Boisterous activity at inconvenient times (usually throughout the night or in the early morning).
- Predatory behaviours – sometimes directed to the caregiver.
- Marking behaviours (e.g. using urine as a chemical signal).

Since the urge to perform a natural functional behaviour is strong, suppressing or denying the cat the opportunity to perform it usually won't work. Instead, the cat will simply try to find ways to continue. Moreover, without an outlet or suitable resource, they will very likely become stressed and frustrated which may lead to the development of other concerning behaviours.

After reading previous chapters you will already know that the solutions to most of these problems can be found in the Five Pillars of a Healthy Feline Environment and MEMO, discussed at length in Chapter 3. Yet when a behaviour is potentially injurious to caregivers or compromises the cat's welfare, a more dynamic approach is necessary (Figure 9.1).

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FIGURE 9.1 Many problematic behaviours, such as scratching furnishings are natural and driven by natural instincts. Photo courtesy of Tommy Taylor.

FEAR, ANXIETY, AND STRESS-RELATED PROBLEMS

A large proportion of feline behaviour problems are tightly bound to fear, anxiety, and stress (FAS) and, as we progress through the various categories of problematic behaviour, this will become clear.

As we have discussed, anxiety is damaging to the cats' welfare and requires prompt treatment. Similarly, whilst fear is a normal and necessary emotion, when it is out of proportion to the circumstance or persists in the absence of the frightening stimulus, it too is abnormal and damaging.

Some of the categories of fear-inducing stimuli that have been reported in cats include:

- Fear of other cats and animals (familiar and unfamiliar).
- Fear of people, e.g. strangers, different genders, and children (see Chapter 12, Case 2).
- Fear of the vets and being confined in a carrier/pen.
- Fear of new places and environments (new home, cattery etc.).

- Fear of inanimate stimuli (sounds, objects, and events: thunderstorms, fireworks).
- Fear of being alone/separated from a caregiver (i.e. separation related issues).
- Fear of going outside (agoraphobia) (Figure 9.2).

You have already been acquainted with the signs of FAS, and know how detrimental these emotions can be to mental and physical health. However, it's the emotionally reactive signs of FAS, such as urine spraying and other forms of house soiling, conflict behaviours between familiar and unfamiliar cats and aggression towards humans that tend to be the most widely reported and problematic for caregivers. Other reactionary behaviours triggered by FAS include some of the compulsive disorders (Amat et al. 2015), which can develop insidiously and might therefore be

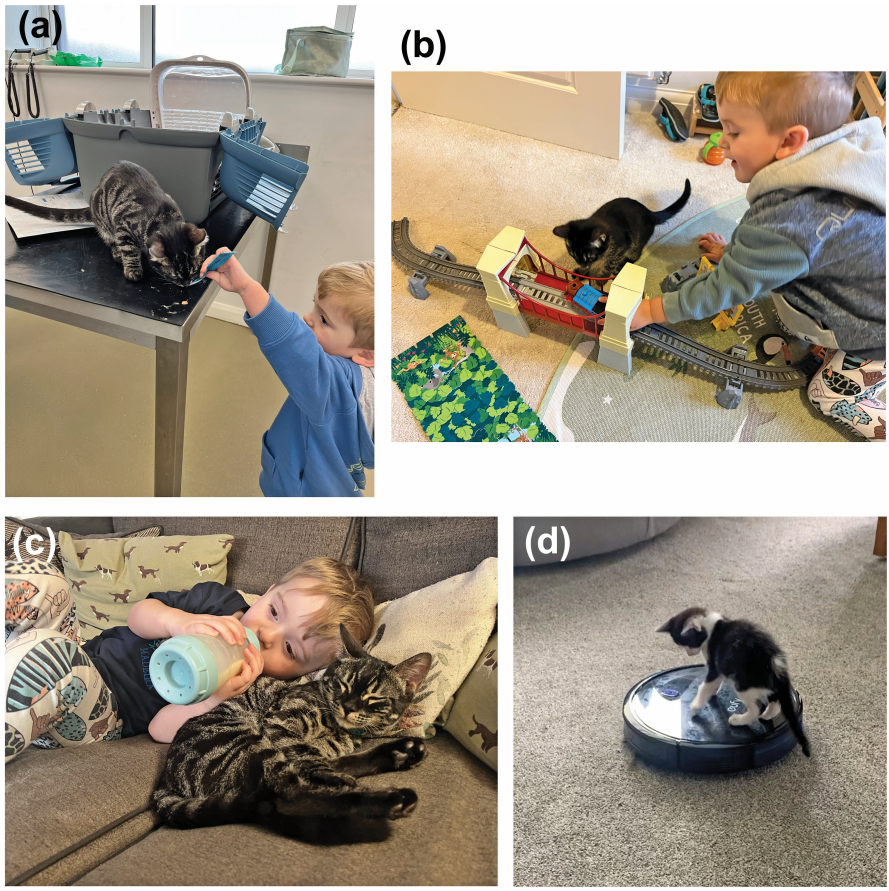

FIGURE 9.2 Positive associations with places, children, and non-social stimuli during a kitten's socialisation period can prevent the development of fear-related problems and lead to enhanced relationships. Photos courtesy of Frankie Lees (a, b & c) and Helen Kubiak (d).

overlooked in their early development. We shall be looking more closely at some of these specific problems soon.

Prevention, Treatment, and Management of FAS

Central to the prevention of many of these problems is habituation and socialisation during the sensitive periods of life, although other factors including responsible breeding, have also been highlighted earlier in the book.

Behavioural first aid follows a similar approach to that outlined in Chapter 5.

Other measures include carrying out a stress review (see Chapter 8) and ensuring all their needs are met, which can go a long way towards getting the cat in a better emotional state. Once medical issues have been ruled out, work can begin on a targeted behaviour modification plan under the guidance of a suitably qualified behaviour counsellor. Selecting the appropriate treatment depends upon the individual case but identifying the cause is a crucial first step. Other aims of a treatment plan include inducing a calmer state and this can be achieved by:

- Reducing stressors/ managing triggers.
- Adapting the environment to provide free access to resources, suitable havens, and retreats (see Chapter 3).
- Considering appropriate complementary and integrated treatments (see Chapter 10).

Training techniques may be necessary and can sometimes form a significant part of the treatment plan. These might include habituation, positive reinforcement training, to teach an alternative behaviour or something new and fulfilling, or DS and CC techniques to help overcome fears of things such as cat carriers and trips to the vets, as described in Chapter 11. To help further, in Chapter 12, there is a case study that features DS and CC techniques and demonstrates how they might be successfully applied. There are also training guides with clear instructions in the appendices.

FELINE AGGRESSION PROBLEMS

Aggressive behaviour is, in certain contexts, perfectly normal and serves a function. For example, aggression is a natural part of survival (the fight response), for protecting offspring (maternal aggression) and for driving away an incomer to protect a territory (territorial aggression). In these scenarios it is contextually appropriate yet, in a pet cat, we may well need to curb or control the behaviour where it is inappropriate, extreme, or poses a threat to others.

Aggression encompasses various responses, from hissing, growling, and swiping out, to more proactive and extreme physical displays. In this sense, the term. 'aggression', can mean different things to different people. A clear description of what the cat is actually doing, the background to the problem, including precipitating influences, the actual sequence of events and how people and other targets (e.g. other animals in the house) respond, are necessary to make an accurate diagnosis (see Chapter 8).

A major part of a behaviourist's work is identifying the underlying motivations for a behaviour. Those that are commonly involved in cases of aggression include:

- FAS.
- Frustration.
- Pain.
- Predatory and play behaviour.

Aggression towards People

Feline behaviourists are often asked to help with feline aggression towards people. This problem can be potentially serious so requires prompt treatment. We have already featured some of the problems that humans can encounter when handling cats and ways to combat them have been discussed in Chapters 4 and 7. Some can develop or be encouraged by inappropriate play and a cat's predatory drive (Bowen and Heath 2005), as demonstrated in Case 1, Chapter 12. Others can be fear related or motivated by one or a combination of the negative states already mentioned (e.g. FAS, pain, etc.). We shall be taking a look at some of these, and how to tackle them in more detail a little later.

The prognosis for a positive outcome when dealing with aggression towards people is reliant on a number of factors:

- The nature of the aggression (including when, where and who the aggression is targeted towards).
- How predictable it is.
- The intensity of the aggression.
- Whether the caregiver can adhere to the advice given relating to human–cat interactions.

Problems can be more difficult to deal with, and the prognosis is worse, if the aggression is intense and attacks are sustained and injuries ensue. Similarly, if it's indiscriminate, occurs without provocation, and is unpredictable. However, if the aggression follows a pattern and triggers can be identified and controlled it becomes easier to formulate a plan and the outcome is more favourable.

Different Motivations for Aggression

Fear Aggression

Fear is a common motivating factor for aggression in cats (Mikkola et al. 2022). Aggression elicited by fear can usually be identified and diagnosed when a cat shows the characteristics of defensive aggression to someone they encounter that

they are afraid or uncertain of. Swiping and hissing can intensify if the cat feels it is under threat.

Fear aggression towards people often stems from a lack of proper habituation and socialisation towards a range of humans (O'Hanley et al. 2021). Sometimes it is being handled, approached, or picked up that triggers the aggression and making these distinctions can be helpful when thinking about management and treatment.

Aggression towards people may be a learned response because of a previous, traumatic experience or because of positive punishment, being used by someone, resulting in the cat anticipating being harmed. Positive punishment will be covered in Chapter 11.

Treatment and Management

- Having a clear understanding of feline behaviour, preferred human–cat interactions and the problems associated with punishment, can help overcome certain issues.
- In some circumstances, the cat may benefit from a programme of DS and CC. However, when people are involved, it's imperative that these sessions are carefully controlled and supervised by an experienced and suitably qualified feline behaviourist.
- Feral cats or those that haven't been socialised with people may never be able to interact with humans and might be better placed on a farm or similar environment where they can lead a happier existence.

Frustration Aggression

This kind of aggression typically occurs when an expectation isn't met or a goal cannot be achieved. At an emotional level, frustration is closely related to anger and evokes similar feelings and responses. Its association with being hand-rearing has been recorded and although it isn't exclusive to this set of individuals, it may influence how a cat copes with situations in adulthood.

Situations where frustration aggression may manifest towards people include:

- When a caregiver doesn't open a door quickly enough if they want to be let out.
- Failure to deliver their food in a timely fashion.
- Being unable to retreat or escape from a situation (e.g. due to: forced restraint, containment).
- Low tolerance petting.
- Secondary to pain or medical conditions that cause irritability.

Treatment and Management

After ruling out medical conditions, treatment usually focuses on giving the cat a greater sense of control. This should be done with human safety very much in mind:

- If not already installed, fit a cat flap (if the cat is an outdoor cat) so they can move freely.
- Provide free access to an abundance of key resources.

- Use timed, automatic feeders to provide a remote and regular supply of food. This means they don't have to wait for the caregiver but also protects them if a cat redirects their frustration towards them during the delivery of food.
- Provide enriched feeding opportunities (making sure puzzle feeders aren't too difficult as this can trigger frustration).
- Provide appropriate, consistent play sessions and finish off with a small meal.
- Handle and interact with cats safely and respectfully.
- Adopt a 'hands off' approach where necessary.

Redirected Aggression

Redirected aggression arises when a cat is stressed, irritated, or behaviourally aroused by someone or something but is unable to direct their aggression to the target of their hostility. There is often some cross over with fear and frustration-related aggression because the cat wishes to repel something fear inducing but is unable to satisfy that desire.

A common scenario is when a cat is on a windowsill and sees another cat enter their territory. Having spied the invader, they become annoyed and irritated by their presence. Because they cannot direct aggression towards the intruder, they become angry and frustrated and can lash out at whoever is close by. This might be the caregiver if they happen to be in the vicinity or can be triggered if they touch and startle the cat. Other victims could include another family pet in the home. It's not uncommon for a one-off clash like this to be the cause of an irretrievable breakdown in the relationship between cohabiting cats that previously had a close and harmonious bond (Figure 9.3).

Redirected aggression may also occur when a person tries to intervene or, worse, lifts a cat off the ground amidst a catfight or standoff. In the heat of the moment, serious injuries can be inflicted.

Treatment and Management

- Reducing the visual stimulus: This can be achieved by blocking visual access to whatever is causing the heightened arousal, e.g. other cats, birds, or wildlife. Blinds, shutters, and frosted transfers on windows or shrubbery outside the window can provide suitable screening.
- Redirect attention: Provide greater mental enrichment (play, feeding) to divert a cat's focus.
- Interrupt impending aggression: This can be achieved by using remote and mild distraction. For example, a ball with a bell inside rolled along the floor.
- Avoiding being the victim of an attack: Caregivers must never lift or touch a cat when they are in an aroused state.
- Restore relationships: If the relationship between cats has been affected by conflict, steps to reduce their contact with each other may be necessary. Initially, this might be complete separation until arousal levels are decreased. After separation, reintroductions should be made, as if the cats were meeting for the first time (see Appendix 2.4).



FIGURE 9.3 These cats are alert and clearly not showing any aggression towards each other. However, this scenario can be risky if cats become annoyed and frustrated with a target they cannot reach and may instead, redirect and lash out to whoever is close by. Photo courtesy of Brenda Delgado.

- Create a calm and secure physical and mental environment: Examples may include pheromone therapy, calming supplements, and plentiful and well-distributed resource provision.

HOUSE SOILING

House soiling is one of the most commonly reported and complex feline behaviour problems (Carney et al. 2014). Urine-related issues tend to be the most prevalent and cause great distress to caregivers, risking the cat–human relationship. Unfortunately, a number of these cases can lead to relinquishment and, even worse, euthanasia.

To emphasise the gravity of this problem, this problematic behaviour takes up a lengthy part of the chapter. Yet, the goal is to provide the reader with sufficient information to help prevent, manage, and hopefully resolve, these problems.

House soiling is the broad term given to the elimination of urine or faeces that the cat deposits within the home, outside of their litter box. When the soiling is related solely to urination, this is known as periuria.

Sometimes deposits (both urine and faeces) are used as marking behaviours, e.g. urine spraying and middening (as discussed in Charlene and Chico's story in Chapter 4). Others may be driven by something else. The key is determining what that 'something else' is.

Investigating House Soiling

Veterinary input, together with detailed behaviour analysis, can help to determine the underlying motivation, which tends to focus on these basic causes:

- Medical origin, e.g. FLUTD (e.g. FIC).
- Marking behaviour (urine spraying and middening).
- Environmental and social factors, e.g. insufficient resources, sub-optimal litter box provision, conflict with other cats/pets, or unsuitable human interactions.

Based on Carney et al. (2014).

Through the process of deduction – always beginning with medical investigations first, it may be possible to pinpoint the underlying cause. However, it's not uncommon for a combination of problems to exist at the same time. For example, in terms of social factors, the stress of conflict with other cats (familiar or unfamiliar) might trigger FIC. This could extend and complicate the case even further if the bladder pain experienced during urination led to a learned aversion to using the litter box. A case such as this would need professional involvement and a multi-faceted approach.

Examples of the medical issues that can underlie house **soiling**:

- FLUTD, i.e. FIC (see Chapter 5).
- Bladder and bowel tumours.
- Gastro-intestinal disturbances that cause irritation of the large bowel, e.g. irritable bowel syndrome, colitis.
- Conditions that cause a cat to drink excessively (polydipsia) and urinate more often (polyuria), e.g. diabetes mellitus and kidney problems.
- Debilitating diseases that affect physical and mental abilities, e.g. osteoarthritis, feline CDS and sensory loss.
- Other medical conditions that affect body systems, e.g. hyperthyroidism (see Chapter 12, Case 3).

Periuria

Periuria takes two forms:

1. Urine marking usually via 'spraying' which functions as a distinct visual and chemical marker. Most usually the cat adopts a typical stance (see Chapter 4).

2. Urinary house soiling – voiding urine usually by adopting the typical squatting posture.

One of the main concerns for caregivers is the smell of urine in the home and cleaning urine contamination can be a huge help whilst treatment to resolve the problem is underway. Another reason for prioritising a thorough cleaning protocol is because, once the urine degrades or any of the spray marks dry, the cat may be inclined to 'top up' their marking – even continuing the habit well after the original cause of their problem has passed. Other cats in the home may begin to mark too, thus compounding the problem. For this reason, complete removal of the visual and chemical signals must be carried out using a suitable cleaning protocol. Many proprietary disinfectants mask the scent rather than remove it and ammonia-based cleaning products may serve to perpetuate the problem. This is because urine is also composed of ammonia, so, using those products usually won't help. A suitable cleaning protocol that eliminates the odour can be found in Appendix 2.10.

Distinguishing between Urinary House Soiling and Urine Marking

It is important to distinguish between the two forms of periuria because this can often determine the nature of the problem, although it should be noted that cats don't always mark from a standing posture – occasionally some squat on horizontal surfaces (Horwitz 2019). This can confuse matters. However, certain other behaviour patterns can help with the investigation.

House soiling and urine spray marking generally have different motivations. If urine is being used as a marker there tends to be frequent, small to medium amounts, in strategic or behaviourally significant aspects. Typically (but not always) on a vertical surface. Objects that carry unfamiliar scents can be common targets. Conversely, cats that house soil and are not using urine as a communication signal, tend to void their full bladder in secluded and quiet locations, such as corners of a room and behind furniture, which are exactly the kinds of private places they would choose as a latrine. This pattern suggests a problem with the litter-box set-up or a training issue.

Another factor that can help with an investigation is that cats that mark, tend to continue to urinate in their litter box some of the time whereas cats that are avoiding the litter box usually don't. That is unless the cat has a FLUTD, in which case they may pass small frequent deposits in various sites if their bladder inflammation is such that they are unable to control when and where they urinate.

Asking about, or reflecting on interactions between other cats, people, and other animals can assist the investigation, particularly if the majority of incidents have any relation to these events.

Urinary House Soiling

Once clinical conditions have been ruled out or resolved, it's a good idea to start looking at the cat's litter box arrangements to determine if that is the cause of the elimination problem. This is a subject that we have already broached in Chapter 3. However, in many cases, problems go beyond the litter box setup alone and these should be investigated as indicated in Table 9.1.

TABLE 9.1 A Range of Possible Motivations for House Soiling (Urine and Faeces) Outside the Litter Box and Examples of the Action That Can Be Taken

Motivating Factors	Action and Relevant Comments
Anticipating threat or disturbance: • Fearful of being overlooked and ambushed by another cat/dog/ toddler whilst toileting. • A dog that gets a taste for cat faeces can disturb a cat whilst they are in the process of defaecating. • Lack of privacy due to inappropriate spacing of litter boxes.	• Place litter boxes in private locations away from busy thoroughfares in the home and away from windows and patio doors to avoid being overlooked from outside. • To avoid disturbance, set up a separate toileting room/ area accessible via a microchip recognition cat flap. • Address any conflict in multi-cat households. • Segregate from dogs/children by using a baby gate that incorporates a cat flap. • Use a house line to control a pup or adult dog*. • Space out litter trays in multi-cat households (see Figure 9.4).
Over-use of the litter box by themselves and other cats.	• Regular cleaning regime to include spot cleaning as the visual presence of even a damp patch can deter some cats from using the box (Ellis et al. 2017) • Provide enough trays to support each cat (one per cat plus one extra is the recommendation).
Competition for a litter box or access being manipulated or blocked by another cat in the household (perhaps as a passive form of aggression).	• Refer to strategies covered in Chapter 3). • Address social conflict. • Avoid closed boxes with only one entrance as these can be more easily blocked by another cat.
Health issues	• Consult a veterinarian for examination. • See advice for osteoarthritis and feline CDS in Chapter 2.
Learned aversion behaviour, i.e. associating the litter box with pain • Pain when toileting, e.g. FIC constipation or diarrhoea (see Figure 9.5). • Pain when accessing the box, standing on or digging the substrate. • Declawing can cause lifelong sensitivity resulting in pain when digging substrates which may set up a learned aversion.	• Address pain and physical health issue. • Consider associative learning aspect and change elements of the litter box to alter negative perceptions e.g. change the appearance of the litter box, explore different substrates. • Seek prompt veterinary attention to rule out/deal with pain and underlying medical conditions.Other than for a genuine medical reason - do not declaw cats.
Noxious scents: • The use of strong-smelling cleaning agents. • A brand new litter box emitting a 'new' (often plastic-like) scent. Fragranced litter	• Choose low scent cleaners and thoroughly rinse and dry the litter box after cleaning. • Wash new trays thoroughly in warm soapy water, rinse, and allow to air dry. Avoid using fragranced litter.

(*Continued*)

TABLE 9.1 (Continued) A Range of Possible Motivations for House Soiling (Urine and Faeces) Outside the Litter Box and Examples of the Action That Can Be Taken

Motivating Factors	Action and Relevant Comments
Preference for urinating and defecating in separate locations.	• Provide sufficient trays in different places to support this preference and give the option of a closed and open litter box for greater choice.
Changed habits or lifestyle: e.g. an elderly cat used to toileting outside might find it hard to dig frozen earth in winter months and toilet inside the home for ease.	• Provide a litter box in the location(s) the cat has chosen to soil in the home. Create an outdoor latrine that is easy to access and maintain the substrate so it is easy for the cat to dig in all weather conditions.

* House-lines are made of 1 cm wide cord of approximately 2.5 m in length. They attach to the dog's collar and, whilst under supervision, they trail behind the dog. If required they can be quickly taken up at the end (like a lead) to control and manipulate the dog's movements.



FIGURE 9.4 Litter boxes placed side-by-side are perceived as just one latrine and do not afford privacy. Photo courtesy of Jessica Wardale.



FIGURE 9.5 The pain from medical conditions, such as diarrhoea, can be associated with the litter box, leading to aversions. Photo courtesy of Rebecca Whitehead.

Issues with Training

Because cats make an association between toileting and the substrate at quite an early age, there may be a learned component to the problem. Perhaps a kitten was raised outdoors and therefore was never exposed to a litter box and a typical substrate. Or maybe they came from an environment where they only had newspaper or used the carpet in the corner of a room to toilet on. In these cases, using their familiar substrate to line the litter box (e.g. newspaper/a piece of old carpet) and very gradually replacing it with the more appropriate litter substrate, can be successful.

Elderly cats with cognitive dysfunction often forget previously learned behaviours and as mentioned, may require some helpful reminders about the location of resources. When my elderly cat began having accidents I found that modifying a very large storage box and turning it into a litter box helped. Although it was still placed in a quiet location, its size made it prominent and, I suspect, acted as a salient visible reminder (see Figure 3.13a in Chapter 3).

Scientific Snippet: A study by Ellis, et al. (2017), investigated litter box use and found that it was not the odour of another cat's urine or faeces in the litter that was avoided by cats but the physical presence of a wet patch or of something that appeared to be a faecal deposit which mattered. This study demonstrates the importance of regular spot cleaning.

Indoor Urine Marking

We have already established that urine spraying in the home is suggestive of conflict, perceived threat, and insecurity and it's usually the pattern of urine deposits that indicate where the threat originated or is still coming from. Cat flaps, windows, and doors to the outside indicate external threat whereas random sites within the home can be more suggestive of internal disturbance. When spraying is on objects with unfamiliar scents this indicates that the cat is generally feeling insecure and reacting to alien scents and potential threats. Yet, once generalised stress has begun, spraying can be in numerous locations throughout the home.

In order to formulate a successful treatment plan and assess its efficacy, it is necessary to establish the number and frequency of the marks over a period of time. For example, measuring how many times a day or week urine is being deposited helps determine whether things are improving with interventions. This can be difficult as urine might not always be clear to see. An inspection of the home assisted with a blacklight (a type of UV light) device can help because, when shone on urine in dimly lit conditions, it will fluoresce a yellowy green colour (see Figure 9.6). There are some limits to its usefulness as other bodily fluids and detergents can also fluoresce. However, it may provide a useful indication. It also means that otherwise undetected dried urine can be identified and included in the cleaning regime.

Treatment and Management for Periuria

After medical issues have been ruled out (including FIC) or whilst awaiting diagnostic results and professional behavioural input, steps that can be taken in the first instance should include:

- Stopping all forms of punishment.
- Distinguishing between urine marking (used as communication among cats) and urinary house soiling due to environmental/social factors (e.g. litter box management issues).
- Determining frequency of deposits to gain a benchmark.
- Identify triggers.

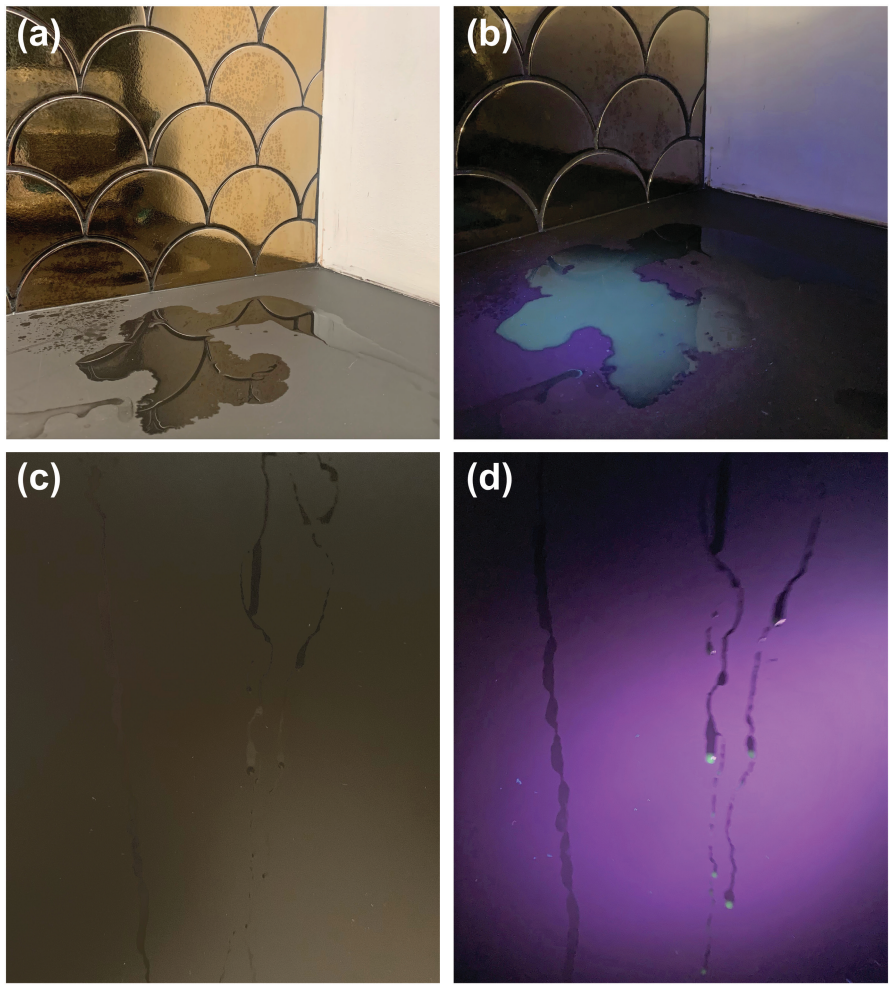

FIGURE 9.6 Blacklight can help to detect urine marks: urine in normal light (a and c) and urine in blacklight (b and d). Photos courtesy of Andrew Jeeves and Nick Moon.

- Carrying out a stress review and adhere to the 'Five Pillars of a Healthy Feline Environment'.
- Dealing with urine contamination using a suitable cleaning protocol.

We have already looked at how indoor spraying was dealt with in Charlene and Chico's case, featured in Chapter 4. In their story, the source of distress was coming from outside the home. In Chapter 12, I present another similar case but this story focuses on distress that originated from inside the home. Together, these cases reflect the various strategies available. It should be noted that there are veterinary drugs that can be helpful as an adjunct to behavioural treatment and work by decreasing the emotional arousal that may motivate urine spraying (Horwitz 2019).

Scientific Snippet: A number of cats are euthanised every year because it is assumed that no one will want to rehome one with a history of house soiling. However, data collected over a six-year period from one cat shelter revealed that affected individuals were adopted at similarly high rates as the general non-house-soiling population. Moreover, they experienced low rates of euthanasia and return for these cats. This information provides a valid argument against the immediate refusal or disposal of cats who present to shelters with this problematic behaviour. It also provides hope for these cats in finding a forever home (Liu et al. 2021).

Using Deterrents and Protecting Sites

There is some dispute as to whether the use of deterrents should be used as part of the treatment. Simply trying to repel a cat from toileting in their chosen location isn't going to address the underlying problem and the chances of them moving somewhere else in the house is high. Nevertheless, sometimes a behaviour is performed out of habit and breaking well-rehearsed activities is sometimes necessary, especially if they pose a danger to electrical outlets and equipment or cause permanent damage to the property. In such cases, and as part of a BMP, deterrents can be used sparingly as taking a blanket approach may well create greater stress.

Methods to deter and protect a location include:

- Sheets of aluminium foil and plastic sheeting can protect appliances, materials, and vulnerable surfaces. Also, the texture and sound of them rustling can act as a deterrent and the pooling of urine feels unpleasant when it wets their paws.
- Double-sided sticky tape applied to surfaces feels uncomfortable to stand on.
- Waterproof mattress covers (used to protect against bed-wetting) can protect sofas.
- Floor length curtains can be protected using cylindrical piping (various widths are available to suit the thickness of the material).
- Increase the number of scratching opportunities to provide an alternative means of scent marking.
- Vanish and water-resistant sealants can protect wooden floors and furniture.
- After thorough cleaning and drying of the area, it has been documented that spraying the area with a synthetic FFF (F3) can help reduce subsequent urine spraying (Horwitz 2002).
- If the location of choice is dark and secluded – consider using a bright light to illuminate the area or place a sensor light that detects movement.
- Some behaviourists have reported success in sprinkling food around the location of the soiling, as cats dislike eating close to their toilet – but I would worry about creating food aversions so prefer not to use this method.



FIGURE 9.7 Creating a 'spraying station' enables the cat to continue spraying in their chosen location whilst treatment is underway and makes cleaning much easier. Photo: Author's own.

- For cats that mark the same area repeatedly, some success has been achieved by setting up a 'spraying station' in the cat's preferred location. This makes cleaning much easier whilst treatment is underway (Horwitz 2019). Once this has become an established site, the setup can be gradually moved to a more acceptable location and hopefully faded out altogether (see Figure 9.7). Another idea is to provide a large high-sided storage box with litter at the bottom, to contain the urine and protect surfaces (see Figure 3.13a in Chapter 3).

Prognosis

As with all problematic behaviours, there is no guarantee of a complete resolution. Addressing the underlying motivation and optimising the environment and resources within the cat's territory increases the chances of success. Nevertheless, there is always a possibility that the cat will relapse (especially for cats with a history of urine marking) particularly if circumstances beyond the control of the caregiver occur, e.g. new cats move into the neighbourhood, changes in family dynamics

arise, etc. Knowing the likely triggers and how to deal with a re-emergence of the problem effectively means that problems can be avoided or swiftly curbed.

MULTI-CAT HOUSEHOLD PROBLEMS

Although cats can happily live together and form strong social bonds, being forced to co-exist in a house, with unrelated or incompatible individuals, is a potential source of stress and may trigger a number of stress-related behaviour issues. Problems can be compounded for indoor cats with limited resources and little space to call their own.

Caregivers often make the assumption that, because their cats eat and sleep in close quarters, they have a close relationship. However, this may have more to do with the location of the food and resting places, leaving their cats with no choice but to congregate around a limited supply. It is only once behaviour problems such as overt inter-cat aggression, or elimination problems manifest that they sense there is something wrong.

There is no known formula for the optimum number of cats that can comfortably share a dwelling but what is of greater importance is environmental composition. Limited resources and competition for space are factors that can affect cohesion of the group rather than the number of cats per se (Ramos 2019). Inappropriate introductions with newcomers, temperament incompatibility, and a changing dynamic after a member of the group ages, becomes ill, has died, or has been rehomed may play a significant part too. For the behaviour counsellor, asking questions and doing a timeline should help to establish whether these are factors (see Chapter 8).

When problems do occur in multi-cat households, the two most commonly reported issues are:

1. Periuria.
2. Aggression between familiar cats.

Periuria in Multi-Cat Households

Many of the causal factors described earlier can be at play and treatment follows a similar path. However, a study conducted by Barcelos et al. (2018), found that periuria was three times more likely in households with more than one cat although marking was more prevalent than litter box–related behaviour. This suggests that social factors play a significant part in the problem and that urine spraying may be being used as an expression of stress, frustration or a demonstration of passive aggression and, very possibly, a combination of more than one. These motivations have to be considered when carrying out behaviour analysis.

Some problems can be addressed by implementing measures discussed in Chapter 3, although all cats in a multi-cat household with spraying problems, and not just the one expressing the urine spraying behaviour, require appropriate management and care. This is because it is extremely likely that all the other cats in the home will be feeling stressed even if they do not exhibit spraying behaviour.

Dealing with Aggression between Familiar Cats

The first and foremost advice is to address resource distribution and to be creative with space so that cats don't feel pressured to congregate or compete for things that they need to gain access to.

When cats live together, it's not unusual for there to be occasional, mild conflict and provided these episodes are few and far between, sensitive interruption strategies can be used. Importantly, these must be remote and relatively unobtrusive as the cat–human bond is fragile and may be affected by what is perceived as a sudden 'attack'. Water pistols and the like must not be used as they can increase fear and lead to further arousal. An unobtrusive distractor, such as rolling a toy across the room to distract and refocus attention is a more sensible approach, followed by a brief spell of separation until they have calmed down and become less behaviourally aroused (Figure 9.8).

Fights and other unfriendly interactions (hissing, swiping, and chasing) between cats sharing the home calls for immediate action. The longer antagonistic encounters go on the worse the prognosis. Leaving cats 'to sort themselves out' is a recipe for disaster and arrangements to reduce the opportunity for them to meet or at least engage in conflict is called for.

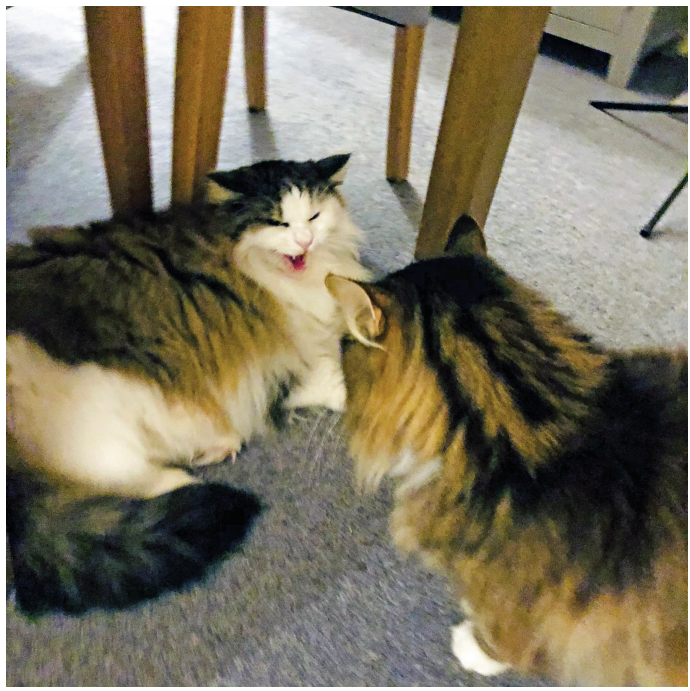

FIGURE 9.8 Ongoing conflict between cohabitating cats can be a source of stress. Photo courtesy of Helen Campbell.

Sudden aggression between cats that had previously had a good relationship or tolerated one another well should be explored. We have already seen what can occur when a cat has picked up new scents after periods away from home but other differentials can include: illness (which can affect a cat's scent profile and demeanour) or the appearance of a new cat in the vicinity which causes the cat(s) to be aggressively aroused leading to indirect aggression as described earlier.

In the first instance, separation of the cats involved in the conflict is recommended (Ramos 2019). This might be operated through a time-sharing system where cats have their own refuge room or space but can access the main areas of the house at different times. Importantly, each cat should always have access to a complete set of their own resources at their disposal, with plenty of elevated places and safe havens to retreat and rest in.

Determining Social Dynamics

Being able to determine the dynamics of a relationship can be helpful. The 'aggressor' often uses offensive body language, stares at, and chases the 'victim' away. In contrast, the 'victim' uses avoidance tactics and elicits defensive body language with fear-based gestures and vocalisations such as hissing. Outward signs of aggression are more easily observed.

Subtle signs of aggression can easily be missed so close observation is necessary. Physically blocking access to resources (including caregivers, who are an important resource), staircases and walkways – with strategically placed urine marks, presumably as a passive aggressive act, can identify the 'aggressor' (see Figure 9.9). Victims tend to be the ones adopting stress signals although it's likely that the cat who feels compelled to displace another is under stress too. Under no circumstances should punishment be used as this will only exacerbate the problem.

Identifying Factions

Where there are several cats sharing a house, observations of friendly exchanges and noting whether certain individuals choose to socially interact with one another is an important part of management (see Figure 9.10). Equally, clashes and passive aggression between cats should be noted. It is possible that a number of smaller factions exist in a densely populated household or there may be some that are loners and do not integrate into any group (Bowen and Heath 2005).

This exercise can be put to good use when distributing resources within the house or when deciding how to separate different cliques effectively. It may highlight that one cat in particular is the main aggressor and clearly doesn't want to share their home with others.

In less severe situations, after separating the cats into their relevant groups and operating a system that reduces tension, a gradual, systematic reintroduction programme could begin as described in Appendix 2.6.

Some households can support the permanent separation of cats. I have been involved in numerous cases where different factions have been given separate 'dwellings' within a home. A bit like having a number of flats in one property. This



FIGURE 9.9 Blocking access to locations within the home can be a passive form of aggression. Photo courtesy of Jessica Wardale.

kind of arrangement suits multi-storey homes with basements or outbuildings and although it can take some managing, and may at first seem to be time-consuming, it can work well and new routines are quickly established by the caregivers.

Prognosis

A successful outcome depends on numerous factors (e.g. space available, social dynamics, and temperament) although early intervention is crucial. Caregivers should be reminded that repeated clashes between cats who have never had a close bond are unlikely to ever become affiliated. Tolerating each other may be the best that can be achieved.

Unfortunately, where relationships have completely broken down and where the welfare of the cats in question is compromised, permanent separation or re-homing of one or more cats may be necessary and the best outcome for their health and well-being.

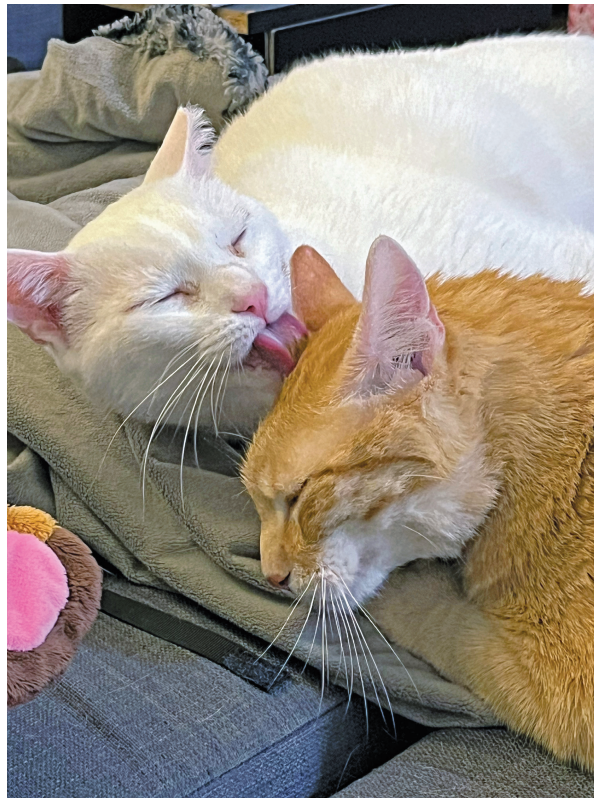

FIGURE 9.10 Observing the social dynamics between cohabiting cats can help determine their relationship. Photo courtesy of Anne Jamil.

SEPARATION-RELATED PROBLEMS

Separation-related problems (SRP) are more commonly reported in dogs most likely because they are a highly social species and, unless they were habituated to spending time alone, can find solitude difficult. Cats on the other hand are innately more solitary and independent and tend to cope better. Nevertheless, they are not immune to separation-related behaviour problems and, due to their nature, signs can be subtle and may go unnoticed.

Separation anxiety (SA) may occur when an animal becomes overly attached and dependent on their attachment figure (usually the primary caregiver) and becomes anxious when they are apart. Cats that follow the caregiver wherever they go in the home might be at a higher risk of developing problems.

Although one study found that cats tend not to attach to their caregivers as a focus of safety and security in the same way that dogs do (Potter and Mills 2015), during the global COVID-19 pandemic that started in early 2020, kittens (and puppies) were acquired in large numbers and throughout lockdown were rarely left home

alone. As creatures of habit, pet cats lapsed into the new routine of having their caregivers with them. Once lockdown restrictions were lifted, and people began spending time away from the home, there were increased reports of separation-related problems in cats.

Fear of being alone (if not properly habituated) or sometimes after experiencing a frightening event when left alone, let's say after a burglar alarm suddenly goes off, or a despot entering the house, can be triggers for SRP, as can boredom and being unable to access resources. Understanding and addressing the cat's underlying emotion and motivation is a key component of the treatment.

> **Top Tip:** Do not think that getting another cat will automatically remedy a separation-related problem. Over-attachment to their caregiver or general loneliness when they are not around doesn't mean they need another cat for company. Remember that cats are very sensitive to maintaining their own territory and may not take kindly to living with another cat!

Signs of SRP

SRP are still not well studied in cats but from research (de Souza Machado et al. 2020), anecdotal evidence and my experience, the signs are varied. These range from mild distress to severe signs of anxiety - with the potential for any of the associated behaviour problems being manifest (e.g. increased scratching, house soiling).

Restlessness and the inability to settle after being left, excessive meowing, and hiding more than usual when alone are other possible signs.

Hidden cameras can capture behaviours and determine whether any environmental stimuli (such as the post arriving) trigger the problem or whether it is simply a matter of the cat reacting as soon as they hear or see the caregiver leave, This kind of background information can help to address the motivating factors which are central to the treatment (Figure 9.11).

Management and Treatment

Separation related issues are complex, with a number of motivating factors potentially involved including fear, anxiety, frustration (most probably about not being able to access resources – which may include the attachment figure) and a lack of environmental enrichment. Management and treatment therefore impinges on identifying the cause. Steps to help might include:

- Carrying out a stress review of the house to determine stressors (see Chapter 8).
- Identifying triggers in order to manage, control, or eradicate them where possible.
- Fulfilling the cat's specific needs (as discussed in Chapter 3).



FIGURE 9.11 Hearing the letter box and the mail carrying an unfamiliar scent might be a factor in separation-related issues. Photo courtesy of Jo Travers.

- Making the cat feel safe and secure within their environment (e.g. DS and CC, pheromone therapy, familiar scent and safe havens).
- Providing mental activities to prevent boredom and refocus their attention on something else other than being alone. For example puzzle feeding, activity centres, and timed feeders.
- Consider getting a cat sitter (as a permanent solution or at least whilst a treatment plan is underway).

FELINE COMPULSIVE DISORDERS (CDS)

Feline compulsive disorders involve repetitive behaviours that an animal seems to be compelled to perform and are diagnosed when all other potential clinical disorders have been excluded. This is an area that has received relatively little scientific study, although frustration, caused by the inability to carry out normal behaviours, and social stress associated with long-term conflict are common factors involved in their development (Leuscher 2002).

Based on what we know about compulsive disorders in humans and non-humans, it is very likely that the actual performance of the behaviour provides a reliable 'release' from the negative emotions the individual is feeling. Coupled with that, there is some suggestion that repetitive and self-injurious behaviours trigger the

release of endorphins, the so-called 'feel-good hormones' (Richards 2024). The act itself can therefore be reinforcing which makes a resolution of the problem more challenging. Some of the CDs that affect cats include the following:

Stress-Induced Over-Grooming (Psychogenic Alopecia)

Cats very often turn to exaggerated self-maintenance grooming behaviours when distressed, most likely as a way to self-soothe and help them cope with chronic stress. This behaviour can rapidly develop into a compulsive disorder and may lead to detrimental self-directed skin inflammation and mutilation through vigorous, perpetual grooming and biting.

Grooming disorders that begin with mental or emotional conflict are referred to as psychogenic skin diseases and when there is hair loss it is known as psychogenic alopecia. In contrast to true alopecia, where the hair falls out without provocation, cats with this condition physically pull out or thin the hair through over-grooming themselves (Calder 2024).

Over-grooming can affect any cat although it appears to be more common in Siamese and Abyssinian breeds. Over-grooming can be focussed anywhere on the body although the places most commonly affected are the flanks (sides of the body), the inside of the thighs and the ventral (underside) abdomen, probably because these are easy-to-reach sites. It should be noted that licking and biting a particular region can be an indication of pain so this should be explored by the veterinarian. Also, given that the bladder lies internally towards the rear of the abdomen, licking, and biting here might indicate the presence of discomfort from FLUTD (e.g. FIC).

> **Feline Fact:** Short bursts of grooming are commonly seen in cats after some conflict or arousal (e.g. in the middle of play). This is a displacement behaviour that, provided it is not excessive, is a normal part of the cat's behavioural repertoire and should not be a cause for concern.

Some cats exhibit over-grooming openly whereas others hide or perform the behaviour when no one is around which can make it difficult to tell whether it is true alopecia or self-inflicted (Overall 2013). Hidden cameras might be beneficial. To help differentiate between the two, self-inflicted pulling out of the hair causes a stubbly texture on the skin surface where the hairs have been broken off. Also, microscopic examination of the hair (trichogram) reveals barbed hair with sharp broken ends where it has been damaged by the teeth as opposed to having just fallen out, as would be the case with some other medical causes of alopecia. At times, before hair loss is obvious, an increase in the regurgitation of fur-balls may be the only sign noticed.

Making a definitive diagnosis of psychogenic skin disorders is virtually impossible as there are no tests available, just the exclusion of other clinical disorders (e.g. parasites, allergies, skin infections) and a compelling history that suggests a

link to stress. Yet, as authorities on the subject concur, it is rare for stress to be the sole factor and other clinical conditions may be wholly or partly responsible (Waisglass et al. 2006). Referral back to a medical specialist with combined input from a feline behaviourist may be necessary if a behaviour modification plan is not (or only partly) successful.

Feline Orofacial Pain Syndrome (FOPS)

FOPS is a condition whereby the cat self-mutilates its face by clawing around the mouth. They also exhibit over-exaggerated licking and chewing. Although it can affect any breed it is more commonly reported in Burmese cats (Rusbridge et al. 2008).

FOPS can be triggered after eating, when they are cutting teeth, the presence of tongue ulceration (as a result of an upper respiratory disease), periodontal and dental disease, or recent dental procedures (e.g. a tooth extraction) (Bowen and Heath 2005).

Environmental stress including conflict with other cats has been reported in a number of these cases and of course, given the breed predisposition in Burmese, there appears to be a hereditary factor. Treatment of the underlying problem is obviously the first step and referral to a dental specialist might be made by the cat's veterinarian. Compulsive behaviour patterns can develop quickly and self-inflicted damage can be extensive. Soft collars to prevent self-harm might be required in severe cases whilst medical investigations and treatment is underway. Soft collars tend to be tolerated better than the hard plastic variety, which can induce stress because they are more restrictive and noisier when knocked against hard surfaces.

Pica (Eating Non-Food Items)

Pica is an abnormal eating disorder. It causes a cat to seek out and eat non-food items. In many cases, the cat has a particular preference, although wool or similar materials tend to be targeted. When taking a history, it is sometimes reported that the cat suckled their blankets or bedding or the clothes of people who were handling them during kittenhood. This may progress to ingestion (although some cats just continue to suck and chew) .

When the cat seems driven to perform the behaviour, pica can be described as a compulsive disorder. There is some suggestion that early life stress (e.g. early weaning) and/or an impoverished environment may be responsible for its development and that generalised stress is the trigger for its emergence and maintenance in adulthood. However, this remains unclear.

Usually, by the time they reach six months of age, kittens outgrow the sucking behaviour described earlier, and this would rule out a compulsion. Nevertheless, rearing kittens in optimal conditions and redirecting them to a more appropriate behaviour, with positive reinforcement for that alternative, would help prevent problems from developing. Genuine compulsive pica in adult cats usually emerges at

maturity (Bowen and Heath 2005) and this can be targeted towards different items including fabric, plastics, cardboard and litter substrates.

As with all other compulsive behaviours, there may be a genetic factor as oriental breeds tend to be over represented. Underlying medical problems may be involved, including gastric disturbances, clinical conditions that increase appetite, such as hyperthyroidism, or pain in the gastro-intestinal system. Once these have been ruled out by a veterinarian, behavioural treatment can begin and we shall look at that soon.

Feline Hyperaesthesia Syndrome (FHS)

As already mentioned in Chapter 4, FHS is an unusual condition giving rise to brief but extreme bursts of sudden agitation, skin rippling and intense grooming, primarily along the lumbar region and base of the tail. The condition, categorised as a neurological syndrome and often described as a CD, has been linked with living in a stressful environment although there is currently no robust evidence to prove this. It has also been suggested that epileptic seizures may be involved (Amat et al. 2015).

Relatively little is known about FHS although sufferers are frequently very sensitive to touch. Being petted and self-grooming can trigger an episode and may induce a state of alarm and aggression which can be self-directed and cause injuries, most usually, to the tail. There is some suggestion that this is not a single disorder but a conglomeration of other undiagnosed conditions.

Exploring underlying pain, skin, musculoskeletal and neurological conditions (e.g. petit mal type epilepsy), keeping touch to a minimum (particularly in the sensitive regions) and identifying and managing stressors underpins the treatment.

Diagnosing CDs

Determining whether a behaviour is compulsive or not can be difficult. Often there is a continuum between ‘abnormal’ and ‘normal’ patterns of behaviour and learned behaviour can be a factor. Also, because a range of neurological abnormalities and medical disorders can produce very similar symptoms, it can be difficult to make a clear behavioural diagnosis. To demonstrate the complexity of these problems, in one piece of research that investigated 21 cases of suspected psychogenic alopecia, 16 had a medical cause, 3 had medical and behavioural causes and only 2 had purely psychogenic alopecia. Most of the medical issues involved dietary reactions, allergies, or parasites and half of the cases had more than one causative factor (Waisglass et al. 2006).

Management and Treatment for CDs

The goal of treatment in behavioural terms is to improve the cat’s welfare and quality of life. This may be achieved by improving their physical and social environment. Carrying out a stress review of their surroundings and making suitable

changes is an important early step. Increasing opportunities and the amount of time they can be engaged in alternative, normal and pleasurable activities, rather than the compulsive patterns of behaviour is key.

It should be remembered that whilst these behaviours appear 'abnormal', they provide the cat with a way to cope, so physical prevention is counterproductive and harmful to their welfare. Obviously, for cats that are self-harming, there may be a need to prevent serious injuries using aids such as soft collars, particularly when the cat cannot be supervised. However, these aids should be used cautiously and only alongside a tailored behaviour modification plan.

Treatment varies depending on the actual CD but usually includes some of the following:

- Stopping any form of punishment and avoiding inadvertent reinforcement.
- Avoiding picking up, handling, or restraining a cat during a compulsive 'event'.
- Consulting a veterinarian to eliminate/rectify any underlying medical conditions.
- Identifying and managing triggers.
- Optimising the environment (see Chapter 3).
- Providing opportunities for an alternative and more appropriate behaviour to be expressed (examples below).
- Redirecting the behaviour to a safe alternative, e.g. for pica – redirect and reinforce to a large piece of dehydrated meat that can take time to chew and not be swallowed whole.
- Providing consistent, routine play sessions and enriching activity feeding to fill time budgets with more appropriate behaviours.
- Positive reinforcement training to teach and reward alternative behaviours (see Chapter 11).
- Seeking specialist help from a suitably qualified and registered feline behaviourist.
- Veterinary prescribed medication may be necessary and certain classes of drug have been shown to help. Lifelong treatment may be required in some cases.

KEY TAKE HOME POINTS

- Many behavioural problems can be related to medical conditions and these must be ruled out.
- A number of behaviours described as being problematic by caregivers are in fact normal.
- Providing the cat with appropriate outlets and meeting their species-specific requirements can help to resolve a number of issues.

- House soiling urine is one of the most commonly reported feline behaviour problems in cats. Sub-optimal litter box provision and stress are both major underlying factors.
- Competing for limited resources is often the trigger for conflict between cats that cohabit.
- Fear, anxiety, stress and frustration are common underlying emotions implicated in many problematic feline behaviours.

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10 Improving Emotional Well-Being

Complementary Therapies and Integrated Treatments

Drawing from human medicine, we know how valuable certain complementary therapies can be for mental and physical well-being and evidence is pointing us in the same direction when addressing animal health. Complementary therapies cover a wide collection of interventions that can be included as part of a cat's regular enrichment routine or integrated into a behaviour modification plan. From simple mind–body therapies, such as play and enhanced feeding, to natural calming supplements, aromas, and music – the list goes on. I offer a few here that are commonly encountered and may prove useful.

Most of the interventions featured are grounded in natural therapies and can generally be implemented safely in the home and workplace. However, at the end of this chapter, I have included information on psychoactive prescription medication which is strictly a veterinary matter and must be given under their direction and care.

MENTAL ENRICHMENT

Being mentally enriched improves the quality of an animal's life. In fact, here in the UK, it is a legal requirement to allow an animal to exhibit their normal behaviours.

The Animal Welfare Act 2006 (England and Wales) and Animal Health and Welfare (Scotland) 2006 place a legal responsibility on the caregiver to ensure that any domesticated animal under their care has to have their welfare needs met. These needs have been categorised as follows:

1. Live in a suitable environment.
2. Eat a suitable diet.
3. Exhibit normal behaviour patterns.
4. Be housed with or apart from other animals (depending on the species-specific requirements).
5. Be protected from pain, suffering, injury and disease.

This law aligns with many of the principles covered throughout the book.

Mental enrichment is especially linked to the third welfare need because it allows an animal to exhibit elements of their species-specific behaviour patterns – most of which are inherently rewarding.

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Mental enrichment improves the quality of a cat's life in numerous ways:

- Enhances the release of mood-enhancing neurotransmitters such as dopamine.
- Increases physical exercise, advantageous for weight management.
- Prevents boredom.
- May help decrease predation (for outdoor cats) and fulfil innate hunting behaviours.
- In a senior cat it helps keep joints moving and the brain active, thereby potentially slowing down the effects of cognitive decline.
- Can be used therapeutically for FAS-related problems as it redirects any nervous energy into a mentally enriching task and allows them to make choices and exercise control over their environment.

Enrichment Methods

Based on the approaches proposed by the Universities Federation for Animal Welfare (UFAW) there are a number of interesting and challenging methods of enrichment as highlighted in Table 10.1.

For the domestic cat, the most fitting ways of achieving mental and physical enrichment are through play and enriched feeding, the virtues of which have been extolled and discussed in earlier chapters. Combining elements of hunting and play during food delivery provides meals in a more stimulating way and, depending on their application, can touch on a variety of enrichment methods, e.g. sensory, physical etc. (as listed in Table 10.1), thus multiplying their effects.

Top Tip: Toys and puzzle feeders needn't be expensive. Gathering feathers from the garden and tying them together on a length of string, recycling boxes and plastic bottles to make puzzle feeders, or scrunching up a paper bag or foil to roll along the ground, can all pique a cat's interest.

TABLE 10.1 The Different Enrichment Methods and Examples of their Application

Enrichment Method	Application
Social (contact and non-contact)	Play, training, stroking, grooming
Occupational	Physiological: puzzle feeders (e.g. seeking)
Physical	Exercise: outdoors/in enclosures, toys
Sensory	Visual, olfactory, taste, tactile, auditory
Nutritional	Presentation, schedule, variety of food

Based on 'Environmental Enrichment' by UFAW

How to achieve mental and physical enrichment through **feeding**:

- Hide and scatter food items around the house so they have to seek out and find it themselves. Make it easy to begin with, using strong smelling food and gradually extend the search.
- Throw pieces of kibble across the floor for them to 'chase' as if they were pursuing prey.
- Use puzzle feeders and hide food in cat activity centres, snuffle mats (a kind of rag rug usually marketed for dogs) or, for cheaper alternatives, in a ruffled-up towel or inside a toilet roll inner to encourage investigation and manipulation.
- Provide several smaller meals throughout the day (timed feeders can be set at intervals throughout the day and night) to provide small, regular meals that align with their normal feeding patterns.
- See Figure 10.1.

As most caregivers will know, cats are curious animals and love bags, boxes, and anything that moves. Making small changes to their environment can provide positive contributions to their mental and physical health (see Figure 10.2).

DIETARY SUPPLEMENTS

When it comes to feline stress-related problems, one of the most common forms of therapy that caregivers turn to are non-prescription calming supplements. Vets may also provide these as a first-line treatment. Supplements are sometimes combined within a commercial diet or given in an oral form (e.g. tablet, capsule, liquid). Whilst scientific evidence is still lacking there are an abundance of anecdotal accounts drawn from caregivers, feline behaviour professionals, and vets who have used different formulas with a degree of success. However, for many deep-rooted behaviour problems, on their own, they are unlikely to be effective. Nothing replaces a tailored BMP.

Many of the commercially available preparations contain selected ingredients, recognised for their calming or mood-lifting properties. Knowing what they do and how they work provides the caregiver with a better understanding and enables one to make a more informed choice.

Alpha-Caseozepine

Alpha-caseozepine is a supplement that a number of vets supply for generalised and situational anxiety. Like many other products, this falls under a category described as a nutraceutical. These are non-prescription food supplements, with purported health benefits. However, the food laws that govern nutraceutical preparations forbid the manufacturers from making medical claims.

Alpha-caseozepine is a natural ingredient derived from casein, a protein found in mammalian milk. If you have ever witnessed newborn kittens and puppies relaxing after suckling it's not hard to imagine why scientists were keen to determine

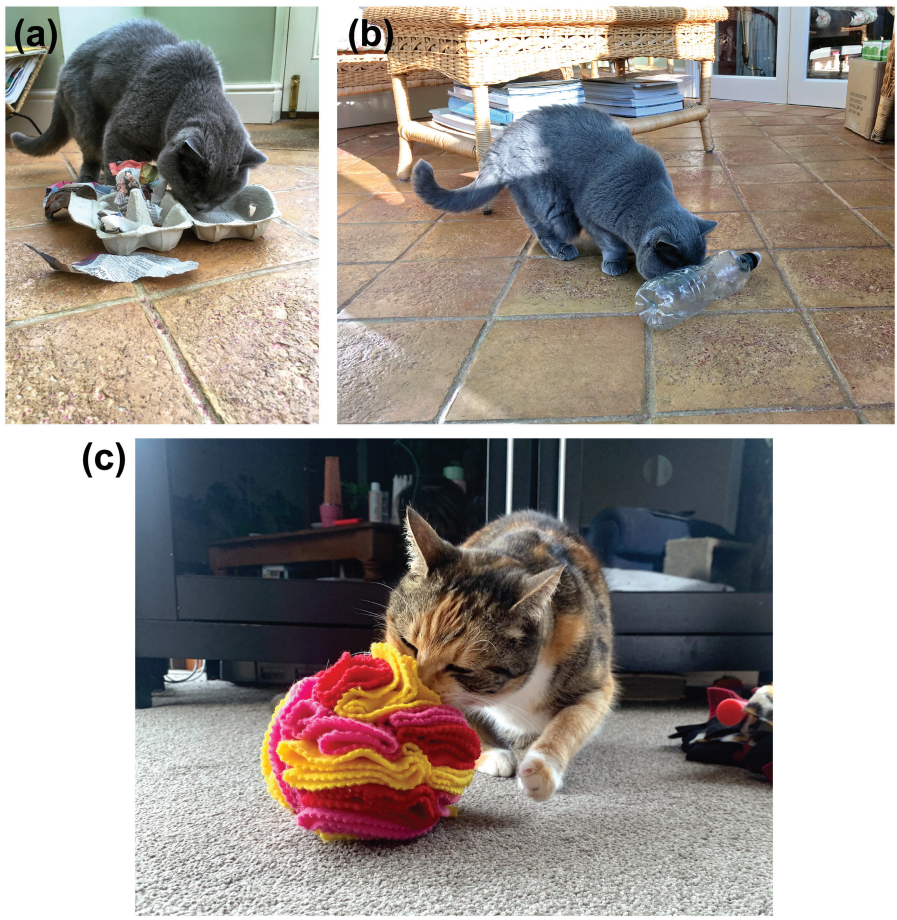

FIGURE 10.1 Enriched feeding can enhance mental well-being. Inexpensive puzzle feeders can be easily created from recycled egg boxes (a), plastic bottles (b) and homemade rag snuffle balls (c). Photos courtesy of the author (a and b) and Siobhan Buttress-Grove (c).

whether this protein could be used in a therapeutic way. Having found that it had an affinity for GABA receptors in the brain and a consequent anxiolytic (anxiety-reducing) effect, it was produced in a variety of formulas including capsules, cat food preparations and treats.

Scientific Snippet: A study showed that alpha-caseozepine had a positive effect in the management of cats exhibiting anxiety in socially stressful conditions. Whilst undergoing the treatment cats also showed improvement in fearful behaviours and fewer physiological signs of stress (Beata et al. (2007).



FIGURE 10.2 Cats like choice and control over their daily activities so providing them with a variety of simple enrichment opportunities is a good idea. Bags, boxes, and TV programmes that appeal to cats are just a few examples. Photos courtesy of Barry Marshall (a), Helen Kubiak (b), Sally Ward (c), and Anne Jamil (d).

L-Tryptophan

L-Tryptophan (tryptophan) features high on the list of ingredients in many calming supplements**.** Tryptophan is an amino acid (a simple molecule that forms proteins). One of its properties is to help in the formation of serotonin, the neurotransmitter involved in mood control and known for its effect on well-being. Constant and regular release of the stress hormone cortisol inhibits serotonin production so using natural supplements that help increase its production could be useful for stressed cats. In one study it was shown to reduce stress-associated house soiling (Da Graca Pereira et al. 2010, cited in Caney 2017) and another study that assessed the anxiolytic effectiveness of a test diet, supplemented with L-tryptophan and alpha-casozepine, suggested that it reduced the anxiety response to placement in an unfamiliar location, but that fear in the presence of an unfamiliar person was not counteracted by the diet (Landsberg et al. 2016).

Importantly, tryptophan supplements may interact with other serotonin-enhancing medications so you must always inform the veterinarian if they prescribe another mood-enhancing drug.

L-Theanine

L-Theanine is an ingredient found in many preparations. It is a non-stimulant, green tea derivative. Research is sparse but experiments have shown that this compound has anti-stress or antidepressant-like effects in mice and improved the performance in recognition tasks in stressed young rats. In humans it has been reported to provide beneficial effects on mental state and improve sleep quality (Hidese 2019).

Neuroprotective Supplements

There has been a growing interest in using certain food components to help guard against and support elderly cats with cognitive dysfunction syndrome (CDS). Dietary supplements have been formulated containing compounds that help enhance brain energy and protect the neurons. Aktivait® and Aprylic® are two products, amongst others, that have a combination of nutrients and antioxidants to support brain function. The idea is that by keeping the signalling systems intact, memory and cognition remain functional. Whilst nothing can cure CDS it's worth chatting to a veterinarian about available treatments. Some of the supplements and their properties can be found listed in Table 10.2.

As mentioned, some supplements are contained in proprietary diets and this can make administration easier. Veterinary-prescribed diets, specifically formulated for cats with FLUTD, are often supplemented with agents including L-tryptophan and alpha-caseozepine to help alleviate stress factors. The results of a small case series of cats suggested an improvement in the signs of FIC and anxiety-related behaviours when they were receiving one of these commercial prescription diets (Caney 2017), although experts agree that more robust studies are still required.

TABLE 10.2 A Selection of Dietary Substances Used in Preparations for their Behavioural and Neuroprotective Effects

Dietary Substance	Some of the actual and potential benefits/comments
Alpha-caseozepine	• Calming and anxiolytic properties
L-Tryptophan	• Precursor to serotonin
L-Theanine	• Relaxation/anxiolytic properties
Medium Chain Triglycerides (MCTs) (MCTs are comprised of a glycerol 'backbone' attached to 3 medium chain fatty acids).	• Provides an energy source for the ageing brain • Studies in dogs suggest an enriched diet/ supplementation can improve the clinical signs of canine CDS (research in cats is currently limited)
Omega-3 fatty acid e.g. Docosahexaenoic acid (DHA)	• Neuro-protection • Plays a key role in early brain development • Anti-oxidant properties useful for the ageing brain • Maintains the integrity of brain cell membranes
Probiotics	• The gut flora plays an integral role in mental and physical health. • Healthy gut bacteria aids digestion and in turn, may alleviate some forms of anxiety.
Selenium (a mineral)	• A trace element with neuroprotective abilities
Vitamin B6	• Helps in the production of serotonin
Vitamin A and E (found in cod liver oil)	• Neuroprotective and anti-oxidant properties

Top Tip: It should be noted that certain human preparations can be unsafe for cats. Over-the-counter treatments, such as St John's Wort (*Hypericum perforatum*), used for human anxiety, although not toxic, can interact with other medications which can pose a serious risk to health. The best policy when using calming supplements is to look at the labels to see what they contain and always liaise with your veterinary surgeon.

PLANTS AND HERBS

The practice of using plants and herbs for health benefits stretches back thousands of years and even today, the World Health Organisation (WHO) estimate that 70% of the world's population uses botanical medicine.

Herbal medicine is often considered to be unorthodox. However, herbs and plant extracts are key ingredients in a number of pharmaceutical preparations used for both human and animal health. Medicinal plants are made up of phytochemicals that can have various positive effects including antioxidant and anti-inflammatory,

properties. Here in the UK, the British Association of Veterinary Herbalists (BAVH) has a register of qualified specialist practitioners who use herbal treatments, often alongside conventional veterinary therapies. Details can be found in Appendix 3.

Some of the plants and herbs used in non-prescription calming supplements include *Magnolia officinalis*, *Phellodendron amurense*, and marigold and these are safe to use. However, because of the toxic nature of certain plants, and the potential for some to interact with conventional medication, I would recommend only using them as part of a veterinary-endorsed preparation or seeking help from a veterinary herbalist.

Grass

Nibbling grass is a normal feline behaviour and is thought to provide trace elements in the diet and help with the movement of food and hairs through the digestive system. Lawns, kept free from toxic pesticides and plants, are fine although edible cat-friendly grass (wheat, oat, rye) is commercially available and seeds can be grown in pots for indoor cats (see Figure 10.3b).

Aromatherapy

Some plant extracts produce aromas that promote feelings of well-being. However, this therapy, and the feedback about its effects, remain largely in the realm of human health. Moreover, the kind of diffusers and candles that we use to create an ambience can be extremely over-powering and can impede the cat's scent profile. Importantly, many of the essential oils for human use can be dangerous to the cat if ingested, inhaled, or absorbed through the skin. For that reason, I'd recommend that essential oils are given a wide berth, unless used under the guidance of a professional.

There are, however, some aromas that have proved useful. Pet Remedy® is a safe, commercially available product formulated in a spray, in wipes and via a plug-in



FIGURE 10.3 The aromas from safe herbs such as bay, can be enriching, especially for blind cats such as Jane shown here (a). Cat-safe potted grass helps provide an enriched indoor environment (b). Photos courtesy of the author (a) and Frankie Lees (b).

diffuser. It contains combinations of valerian oil, vetiver, sweet basil, and clary sage essential oils, all known for their calming properties. A few clinical trials have been undertaken and there is plenty of anecdotal evidence to support its effectiveness in inducing a calmer state in some cats. My preference is to use the wipes or the spray to impregnate a scent cloth and give the cat the choice to advance or retreat. A positive sign would be a cat that approaches it, sniffs and investigates, and stays in the vicinity – showing some signs of a calmer demeanour.

Catnip

Catnip (also known as Catmint) is a non-addictive and safe fragrant herb, derived from the plant, Nepeta. It grows abundantly in most gardens but can also be grown in pots so can be brought indoors or in a catio. For some reason, a number of cats seem drawn to its volatile oil, present in the leaves, stems, and seeds. Some susceptible cats lick, chew, and roll over it in a euphoric state, sometimes becoming behaviourally hyper-aroused whilst others adopt a calm and chilled-out state. There are, however, other cats that it doesn't have any effect on whatsoever. This variation in response appears to be genetically determined (Ellis 2009).

The plant, in all its forms, can be used therapeutically in the following ways:

- Encourages a cat to use a scratch site by sprinkling seeds or rubbing extracts on and around the scratch post or mat.
- Catnip toys (homemade or shop-bought) can encourage play.
- Can act as a mood enhancer for anxious or bereaved cats.
- May relieve boredom.
- Encourages physical exercise.
- May boost and 'stimulate' the brain in elderly cats with CDS.
- Can be planted in pots or in the garden to enrich inside and outside spaces.

It's a good idea to monitor its effects, especially for cats that already have a tendency for high arousal and impulsivity. For example, it wouldn't generally be recommended as part of a BMP for a cat that was showing hyper-arousal or misdirected predatory behaviours as discussed in Chapter 12, Case 1.

Scientific Snippet: Four plants: catnip, valerian, Tatarian honeysuckle (not widely available in the UK), and silver vine (popular in Japan and known as Matabi) were tested for their effects on a group of 100 cats. Nearly all cats responded positively to at least one of these plants. Specifically, 68% of cats responded positively to catnip, 80% to silver vine (available in a stick or powder) and the valerian and honeysuckle attracted positive behaviours in around half of the participants. This study demonstrates the worth of offering plants that have been identified as safe for enrichment purposes (Bol et al. 2017).

Self-Selection of Other Non-Toxic Plants

Self-selection of other non-toxic plants and herbs (e.g. rosemary, chamomile, clary sage, lavender, and valerian) in pots or grown in the garden is a more innocuous method of introduction. Placed where the cat can brush against them, just around nose height, can create a sensory experience (see Figure 10.3a). This arrangement has proved particularly beneficial for cats in shelters or for blind cats as they can offer an additional source of enrichment.

PHEROMONATHERAPY

The discovery that the naturally occurring pheromones could be delivered through a synthetic equivalent has given us an additional complementary treatment for feline stress-related problems. Although more research is still required, there have been anecdotal reports and empirical studies citing their effectiveness, including helping cats adapt to unfamiliar environments, easing the stress of travelling, reducing urine spraying, and supporting cats living in multi-cat households.

Synthetic pheromones are commercially available, with perhaps the most widely obtainable being marketed under the trade name: Feliway®. Various options are available including formulas containing the FFP3 faction and others with the Cat Appeasing Pheromone (CAP) which can help to control conflict between cohabiting cats. Recently, another preparation has been added to the range called Feliway® Optimum, which contains a new pheromone complex which the manufacturers report as providing 'a message of global serenity' to help across a wider range of issues.

Some cats seem to respond to this therapy better than others and there is a limit to the kind of problems they can help with. In all cases, synthetic pheromones should not be expected to work on their own, rather, they should be seen as assisting as part of a behaviour plan.

Because of the different neural pathways involved, pheromonatherapy shouldn't interfere with the aromas from plants and herbs being used therapeutically at the same time. In fact, there have been reports that, when used together, the synthetic version of the FFP3 actually enhances the effects of catnip (Vitale 2018) (Figure 10.4).

MUSIC

I mentioned the benefits of using music therapeutically within the workplace back in Chapter 7. Other occasions when music might be useful is to mask the sound of noises that induce fear such as fireworks or thunderstorms. Also, for cats that have separation anxiety, playing music may provide a sense of someone being around.

Calming classical music has been shown to benefit hospitalised cats but more recently, specific music specially created to calm cats is now available. Frequencies similar to a cat's vocal range and sounds relating to bird chirrups, purring and suckling, have been composed to create a calming effect. A study by Hampton et al., (2019), showed this 'cat music' worked well in decreasing feline stress levels in cats

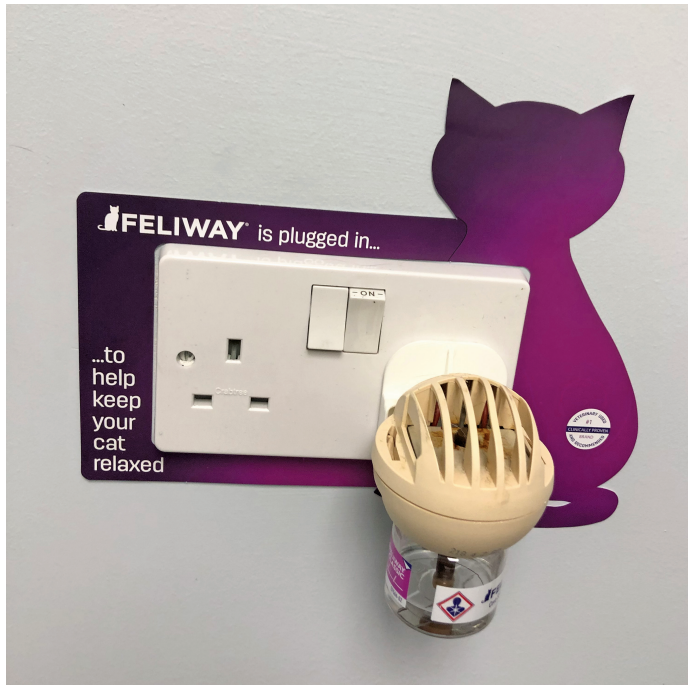

FIGURE 10.4 Synthetic pheromones are often used to create feelings of emotional well-being. Photo courtesy of Frankie Lees.

visiting the veterinary clinic for wellness examinations. However, it could be used in a range of other settings to enhance well-being. That said, it should be remembered that each cat is an individual so their response to music should be monitored to assess whether it is having a positive effect.

VETERINARY PRESCRIPTION MEDICATION

Throughout the book, I have mentioned that some cats may require veterinary-prescribed medication to support their emotional needs. These are sometimes collectively referred to as psychoactive drugs. The decision to use them is largely based on the individual's behaviour problem and the extent that this is having on the cat's welfare and ability to respond to learning. Drugs can address these issues because they are designed to enhance emotional regulation and can therefore ease anxieties and fears and facilitate behaviour modification.

Most importantly, before starting drug therapy, regardless of age, physical health, or category of drug, a medical history (including a list of current medications) and a comprehensive veterinary examination, including an analysis of blood and urine, is necessary.

As mentioned, because some natural non-prescription supplements can induce the same neural effects as prescription medication, if used in combination, serious (even life threatening) side-effects can ensue. Consequently, the vet must be informed if the cat is taking another supplement.

Finding the Right Fit

Veterinary prescribed psychoactive drugs are medications that interact with specific sites in the nervous system to cause changes in mood and behaviour. They mostly work by increasing the availability of certain neurotransmitters e.g. serotonin, GABA, and dopamine (Denenberg and Dubé 2018), and, as well as enhance well-being, act on the neural pathways involved in learning. In this way, they can help modify the cat's behaviour. However, as with other additions to a plan, medication is not a miracle cure. Other behaviour modification techniques and environmental management still underpin the plan.

Some drugs are more suited to short-term situations, such as a firework event or for giving prior to making a trip to the vets. These work fairly rapidly but it's usually a good idea to carry out a trial beforehand because cats can react differently to certain drugs and the dose rate might need to be tweaked. Other drugs are designed for behavioural problems that require long-term treatment and these tend to take around four to six weeks before they achieve their full therapeutic effects.

There are different classes of drugs and choosing the right one is a veterinary matter. Vets without the necessary specialism will often refer the cat to a veterinary behaviourist who has a greater knowledge of psychopharmacology. One size definitely doesn't fit all and that's why a thorough medical and behavioural assessment is required. As with any drug, there can be side-effects and, although problems are rare, the vet will want to monitor the cat's physical health and will often work together with a suitably qualified and experienced behaviourist, who can monitor their mental health and behaviour and liaise with them throughout the period they are being taken. Sometimes, if the first drug of choice isn't effective, there are others to trial and at times a combination of drugs can have a better effect than one used on its own (Mills and Simpson 2002).

Other Points to Consider

- Some medications can cause drowsiness for the first few days or until the correct dosage has been established.
- Some medications can have an amnesic (loss of memory) effect so may interfere with learning. This isn't a side-effect you'd want when trying to teach a cat a new way of behaving. Nevertheless, it can help if you want them to forget something they might find traumatic (such as a fireworks event or trip outside the home).
- Almost all drugs are processed in the liver and kidneys so vets will often advise that blood samples are taken beforehand to confirm that these organs are working effectively. For mid- to long-term usage, bloods are taken regularly to ensure the organs are not being negatively affected by the drugs.

Once a suitable regime has been found, a behaviour modification plan can often be implemented with greater success. When a successful outcome is achieved, the cat can gradually be weaned off the drug. However, in some cases, drugs may be necessary for very lengthy periods, even life. (Denenberg and Dubé 2018).

Weaning Off

Abrupt discontinuation of many of the psychoactive drugs can cause rebound anxiety and even exacerbate a problem. Tapering a drug dosage down over weeks and sometimes months is required. A recommended guideline is a 25% reduction every one to two weeks. This regime also allows the caregiver to report when/if the problem returns, in which case the drug may be continued at an effective, but lower dose rate or reinstated to its original dose if necessary (Reisner 2014).

KEY TAKE HOME POINTS

- Simple complementary therapies can be used to enrich a cat's life whatever their lifestyle.
- Consideration of complementary and integrated treatments can help create a balanced behaviour modification plan.
- Scientific research on many of the complementary therapies is limited and some may be harmful so care must be exercised.
- Psychoactive veterinary-prescribed medication can be useful as an integrated treatment for certain problematic behaviours – but does not replace a tailored behaviour modification plan.

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Part 4

Applying the Knowledge

We have already seen how quickly a cat can learn – even when it involves learning things that don't benefit their health and welfare. Consequently, they can be very responsive to a programme of training which can help them navigate some of the challenges they meet in life. However, training any animal is a skill and, as with most other disciplines, requires us to have some underpinning knowledge before we dive straight in. Therefore, we begin this part of the book by looking at how cats learn.

Seeing how theoretical knowledge is applied in a practical setting can bridge a gap in our understanding and optimise learning. The final part of the book has therefore been designed to bring together elements of what has already been covered throughout the book and, through a series of case studies, demonstrates how theory and practice work in unison.



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11 Training Cats and How They Learn

Although a full and comprehensive account of learning theory and training does not fall within the remit of this book, it is important to acquire at least a basic knowledge of how the cat learns, simply because it helps us appreciate why they behave as they do. Notably, it also provides us with a greater understanding of how and why problematic feline behaviours develop and, in the same manner, can help us to prevent some of them from happening in the first place.

Theoretical knowledge also underpins the practical aspect of training and proves helpful when applying training techniques that help prepare a cat for the various aspects of life that it might normally struggle with, or for simply teaching a cat new behaviours because of the numerous benefits it can bring.

CAN YOU TRAIN A CAT?

The belief that cats are incapable of being trained is a misplaced notion. Most readers will already know how easily they learn. Mine know their names and come when called. As soon as they hear the fridge door open (where I keep their opened packets of wet food and cheese treats for special rewards) they come running, which demonstrates their capacity for learning, even without any conscious training on my part.

Learning and training go hand-in-hand. Learning is the acquisition of information and training focuses on the techniques that we use to bring about a predictable outcome.

As with most animals, cats are continually learning, even when we are not interacting with them or engaged in any training. This includes things that we don't always want them to learn. Take the cat that scratches at your bedroom door every morning and is positively reinforced (rewarded) every time you immediately jump out of bed to oblige them with a bowl full of breakfast!

Despite this inadvertent training – there are still some huge benefits to training as shown in Box 11.1. For me, the number one reason for training a cat is to make a positive difference in their lives. Training them to like their carrier, so trips out aren't as much of an ordeal, or for carrying out healthcare more easily so they don't become stressed, are just two examples.

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BOX 11.1. Benefits of Training

- Promotes the cat–human relationship.
- Enhances communication by creating a common 'language'.
- Provides caregivers with some force-free control over their cat.
- Modifies behaviour without using force.
- Helps prevent, manage, and treat problematic behaviours.
- Improves welfare by increasing mental enrichment and preventing boredom.
- Helps them adapt and cope with some of the situations that they are likely to be exposed to in their lifetime, e.g. being given medication, put in the cat carrier, and trips to the vets (see Figure 11.1).



FIGURE 11.1 Training can help to prepare a cat for medication. Here, Jane is being trained to accept the sensation of a spot-on treatment. Photo: Author's own.

BASIC LEARNING THEORY

I have already mentioned some simple non-associative learning processes such as habituation, sensitisation, and social learning in earlier chapters. However, when it comes to teaching a cat new responses, or when we wish to modify their behaviour, we turn to the kind of learning that relies on them linking their behaviour to events. This is called associative learning of which there are two main types, classical conditioning and operant (or instrumental) conditioning.

Classical Conditioning

Classical conditioning was originally explained through work undertaken by the Russian psychologist, Ivan Pavlov (1849–1936). Under experimental conditions, Pavlov presented his dogs with a neutral stimulus (a sound) immediately before giving them a meal. Naturally, seeing the food, and in anticipation of eating, the dogs salivated. After repeating this pairing, over time, the dogs began to associate the sound with the arrival of food and salivated just upon hearing the sound alone.

Technically, responses that are not taught and just occur naturally, such as salivating, are described as being unconditioned responses (UR), i.e. they didn't require any prior learning to provoke a response. Yet, in classical conditioning, as demonstrated by Pavlov's dogs, a neutral stimulus (e.g. a sound, an object, or situation) known as an unconditioned stimulus (US) can, by association, be conditioned to elicit a response – so then becomes known as the conditioned stimulus (CS) and a UR then becomes a conditioned response (CR).

Don't worry too much about the technicalities and the fact that the animals in this experiment were not cats. The main thing to remember is that classical conditioning influences how and what an animal learns but, although they require conscious thought, they are not directly related to their own actions. Here are some examples of how a cat might learn through classical conditioning:

- A cat that has learned the familiar sound of their favourite treats being poured into their food dish (CS), causes them to come running to the kitchen and most probably produce saliva in anticipation of the food (CR) but that's only because the sound has been repeatedly paired with the presentation of tasty meals which are pleasurable.
- A cat has been groomed without due care and consequently regards the brush with negative emotions (CS). But prior to this association the brush will have just been a neutral object (US) and so will not have elicited a response. However, the response to seeing the brush after associating it with being hurt will instead cause it to respond fearfully, eliciting a CR.

These are examples of conditioned emotional responses and it's being aware of this learning process that gives us an insight into how learning occurs and how certain fear-related problems can develop.

Classical conditioning can also be harnessed effectively in formal training. Counter conditioning (CC) for example is a powerful training technique that helps change negative emotions into more positive ones through paring - provided it is executed correctly. I'll be explaining this method of training in more detail soon.

Operant Conditioning (aka Instrumental Learning)

Operant conditioning is the other way that animals learn and it's this one that we mainly take advantage of when we are carrying out positive reinforcement training.

It differs from classical conditioning in that it is dependent on consequences and outcomes (both good and bad) and these become associated with the cat's actions.

Put simply, if the immediate outcome of a particular behaviour is desirable, such as being given a tasty morsel of cooked meat for sitting in their cat carrier calmly, the more likely they are to repeat that behaviour. This forms the foundation of positive reinforcement training (sometimes abbreviated to R+) and is also known less formally as reward-based training. Conversely, if the immediate outcome is unpleasant (P+) the behaviour will decrease. This can be described as a punisher (see Table 11.1).

It can sometimes be difficult to understand and tease apart the different aspects of classical and operant conditioning. This is because, whilst they work differently, when a cat is learning they are usually making unconscious associations between two things as well as noticing the consequences of their actions. Therefore, both these kinds of learning can be inextricably linked.

REINFORCEMENT AND PUNISHMENT

A **reinforcer** is anything that **increases** the probability of an action or behaviour being repeated. In animal training, it's most usual to turn to **primary reinforcers** which are the ones that are instinctively rewarding and pleasurable. Of these, food tends to be the most important and, for the cat who is an obligate carnivore, animal proteins (i.e. cooked meat or fish) tend to be most favoured. However, when using food rewards, to reap the most successful outcome, there are a number of things that should be considered (see Box 11.2).

TABLE 11.1 A Simple Illustration of How a Cat Learns through Operant Conditioning

Behaviour	Consequence	Outcome
A cat is scratching the sofa	The cat experiences an unpleasant sensation when scratching the sticky tape that has been applied to the sofa (P+)	The cat is **less likely** to want to scratch the sofa (but might scratch something else!!)
A cat enters an open cat carrier	The cat receives some tasty treats when inside the carrier (R+)	The cat is **more likely** to want to enter the carrier

BOX 11.2. Using Food for Training

- Food works best if the cat likes what's on offer.
- Restricting extra tasty treats to training sessions can increase their value and motivate the cat to want to work for them.
- A piece of food about the size of a garden pea is sufficient, provided it is tasty enough! Small pieces mean quick consumption which keeps the momentum of the training session flowing and stops them getting full quickly (which reduces their motivation).
- A food reward dispensed as a paste from a sachet, syringe or tube can be delivered and consumed quickly (see Figure 11.2).
- A long-handled spoon can be used to deliver food rewards for luring or tossed on the ground close by to protect hands if the cat snatches or swipes at the food.
- Strong smelling food might arouse interest.



FIGURE 11.2 Using pastes from a sachet can be delivered and consumed quickly without disrupting the session. Photo courtesy of Tena Kras.

- Having a variety of different kinds of food rewards can keep the cat interested and motivated.
- To prevent obesity, their daily food ration should be reduced.
- A cat will be more motivated by food if it is slightly hungry, so avoid training sessions immediately after they have eaten a meal.
- Especially greedy cats may be preoccupied with trying to get the treats and therefore lack concentration. Use their normal food or less tasty treats. Alternatively, look for other things the cat finds rewarding (e.g. stroking, grooming, or play).

Force-Free Luring

Luring is a force-free technique sometimes used in training. This can be helpful to encourage a cat to interact with something or to entice them to move in a particular direction. Most of the time luring is done using a tasty treat placed in front of their nose and moved slowly in the direction you want them to take (see Figure 11.3). Getting the treat for complying is what keeps them performing the behaviour.



FIGURE 11.3 Luring can be a useful training technique. Photo: Author's own.

Luring can be particularly helpful for encouraging a cat to learn how to use a cat flap for the first time or to adopt a particular posture. Another way to lure a cat is by using a target stick. This works in a very similar way and for cats that snatch, grab, or claw to get food, it can be a safer method (Bradshaw and Ellis 2017). Details of how to teach a cat to follow a target stick can be found in Appendix 1.7 at the back of the book.

Importantly, a cat mustn't be lured towards something they are frightened of as this makes them feel vulnerable. Habituating them to the fearful stimulus is the first step and one should only proceed with training when the cat feels comfortable and relaxed in its presence. Stop using luring if the cat is showing any signs of reluctance, fear, or stress.

Top Tip: Force-free luring can encourage a cat in a shelter to advance from their hidey hole if they have been spending an inordinate amount of time there. In a perfect world, we would wait for a cat to come out themselves but some cats need a little encouragement to see that things outside their retreat are not really much of a threat. To prevent a startle response and injuries, use equipment to present food and wear thick gardening gloves to protect the hands. A long pair of tongs, a long-handled spoon, or meaty stick treats can be good methods of delivery. Food trails can also be used to tempt them out. With this technique it's easier to retreat so they feel more comfortable coming out. Avoid luring them out too far to begin with. Small successive steps are best.

Using Other Rewards

Some cats are less motivated by food than others and sometimes those that are highly motivated can get overzealous trying to get at it. Alternating between tasty and extremely tasty food and other rewards, can be helpful and it can help keep sessions interesting.

Other activities that some cats find rewarding include play and tactile interactions:

- Play is innately rewarding but it can be an arousing activity so might not be the best kind of reward for training, particularly if the task is related to being calm. However, it's worth consideration but still always best to assess the effect it has on the cat's training. Play might be better used to end a training session as a reward for their engagement. Keep in mind some of the advice already given in chapter three, remembering that novelty and variety keep a cat interested. Therefore rotating toys regularly is highly recommended (Herron and Buffington 2012).
- Stroking and grooming can be pleasurable but only if the cat enjoys tactile interactions and the areas touched are agreeable. In some research by Vitale et al. (2017), that investigated free operant preference assessments in domestic

pet and shelter cats, social interaction with humans was the most preferred stimulus category, followed by food (other categories included toys and scent). Some cats however prefer being able to access a grooming device that is presented for them to rub and brush against as a pleasant tactile reward. This may be especially so for cats that are perhaps less familiar to the caregiver or prefer to have a greater sense of freedom of choice.

Schedules of Reinforcement

When teaching a new behaviour, it is important to deliver the reward for every single correct response. This is called continuous reinforcement (CR) and it's this schedule that is recommended when setting out training a new behaviour. In theory, once an animal has learned a behaviour properly and is responding to the cue consistently, the schedule of reinforcement should be replaced with intermittent reinforcement. This means delivering the reward more sporadically, perhaps for every second or third response or after a set interval of time (Overall 2013). Gradually, once a cat has learned and is performing consistently, treats are faded out, although it's important to still reward the cat every now and then to keep them motivated. However, things can get complicated so my advice would be to reward on a continuous schedule to begin with and get a good training manual (refer to the useful resource section for recommendations) or seek help from a suitably qualified and experienced feline behaviourist or trainer to provide guidance.

TRAINING DEVICES

Using a Clicker

When training an animal, it can be difficult to deliver the reinforcer in a timely fashion. For example, the cat may be some distance away or they may change their behaviour by the time you have presented the reward, so, because of the delay, they are unsure what exactly it was that they did that resulted in them receiving the goodie.

To combat this difficulty, some trainers use a device called a 'clicker', a small rectangular, plastic box that has a metal tongue inside it. When it is depressed and released with the finger, it emits a distinct and rapid clicking noise. Through classical conditioning principles, the cat learns to associate the noise with something rewarding e.g. food. Hence it is known as a conditioned reinforcer.

It's worth mentioning that some individuals, especially those with sound sensitivity, can find the noise startling. Muffling the clicker in the hand and keeping it behind the back can help although verbal cues work in exactly the same way. Choosing a very specific word 'Good' or 'Yes' for example or making a clicking sound to mimic a clicker is fine and is an easy hands-free alternative.

After a spell of foundation training, the click is used to precisely mark the aspect of behaviour that is to be reinforced. Taking the early stages of cat carrier training as an example, when the cat walks towards it, the trainer emits a click (to mark the

desired behaviour of walking in the right direction) and the cat is then immediately rewarded with a tasty food item. This continues with each step in the right direction (known as successive approximations) until the desired behaviour is achieved. Gradually the clicker is faded.

A Comfort Mat

A mat (or blanket) that is comfortable, warm and inviting isn't usually considered a training aid although, because a significant part of helping a cat is fostering positive emotions and facilitating a calmer state, I usually advise caregivers to teach a cat to relax on a mat (see Appendix 1.1).

A comfort mat works in much the same way as a comfort blanket does to help a child sleep or feel more secure. Like the tone in Pavlov's experiments, the mat is initially meaningless but when paired with the feeling of comfort and relaxation, it can take on a much more meaningful quality and induces a calmer internal state.

A comfort mat can be extremely useful as a lining for the cat carrier to make trips out less daunting or for helping them to stay calm during situational events such as fireworks and thunderstorms. Additionally, it can be used outside the home to help mitigate the stress of cattery stays or for taking along to the vets where they can lie on it whilst being examined. Therefore, when choosing a mat, make sure it can be rolled up or folded to make it easier to carry. Artificial fleece blankets, that have non-slip and water-repellent properties, such as the ones used in veterinary hospitals, are ideal.

PUNISHMENT

A punisher is anything that decreases the probability of an action or behaviour being repeated. **Positive punishment** (P+) is the term we use when we are adding something aversive. Examples might include: shouting, squirting a cat with a water pistol, or smacking. None of these are to be condoned, not only because they are harmful but cats are much less tolerant and forgiving of punishment than dogs.

Problems with Punishment

Cats will obviously learn that a negative outcome is to be avoided but their natural tendency is to withdraw and this can affect their training, Also, using punishment in cases that are underpinned by fear and anxiety is likely to increase the cat's stress levels, making their behaviour worse and more of a challenge to overcome.

Even what humans perceive to be mild punishers (such as using a raised voice or using a water pistol) can be perceived as a major threat to the cat and close bonds with their caregivers can easily be destroyed. Consequently, using punishment is ineffective and unnecessary. Successful training lies in positive reinforcement methods and setting up the environment to encourage a more appropriate response.

Having said all that, as the example in Table 11.1 demonstrates, we might very occasionally use something mildly unpleasant (P+) as part of a training plan but we must proceed with caution. In the example given, the sticky tape (P+) might

discourage a cat that has begun scratching the sofa but used alone as a first line treatment is less likely to be helpful and doesn't teach them anything. Far better to provide a cat with opportunities to get it right by providing the optimal environment which would include having plentiful scratching resources in suitable locations and using positive reinforcement to reward them for using them right there and then. In training, this is referred to as 'capturing'.

Top Tip: A cat's behaviour can be 'captured' when they spontaneously begin using a new scratch post or when a noise sensitive cat chooses to ignore a noise in the environment and remains calm. This type of regular, informal, and positive reinforcement training can be easier to fit into daily routines but, with consistency, still gets the cat offering the kinds of behaviour we want voluntarily and may well help to reduce some of the unwanted ones.

Negative punishment (P–) is another form of punishment that is sometimes used in cat training. This involves ending or taking something pleasurable away (Mills 2002). I can share an example that I have experienced with my own cat, Jane (see Box 11.3).

BOX 11.3. An Example of Applying Negative Punishment Techniques

Jane would often sit beside me to be stroked but if I stopped, just for a few brief moments, she would paw at me to remind me to start again. This was initially quite cute and I'd happily oblige by continuing – positively reinforcing her behaviour (yes, we behaviourists make mistakes too!). When she began to paw me with unsheathed claws, I knew I needed to take some action before this behaviour got out of hand and so I decided to use negative punishment. This meant that every time she pawed at me - I immediately got up and any chance of engagement ceased.

With consistency, it wasn't too long before she realised that the consequence of her behaviour was the termination of my attention and along with it, the chance of being stroked (which she was enjoying). Having learned this, she soon stopped displaying the inappropriate behaviour…and I no longer had frayed sleeves!

EXTINCTION (NON-REWARD)

Extinction (aka non-reward) is another way to teach a cat but it differs from P– in that instead of having something taken away to suppress a behaviour, nothing

happens at all. So, in a scenario where a cat has come to expect a rewarding outcome - let's say for being given food from the table, one way to stop them from begging and hanging around the dining table would be to stop feeding them at these times. However, there can be a fall-out, because a characteristic of extinction is the 'extinction burst'.

An extinction burst occurs when, once an animal stops getting the reward, they begin to try harder to get it. A bit like a child having a temper tantrum when a parent decides to stop giving them sweets before mealtimes when they've been used to getting them. Consequently, the behaviour appears to get worse some time before it gets better and this can lead to dangerous displays of frustration and that, in itself, can increase stress and frustration-elicited aggression.

Another problem with extinction is that it doesn't teach a cat what to do instead – so it's far better, in tandem with extinction, to positively reinforce another more desirable, alternative behaviour to replace the problematic one and/or to set up the environment to reduce the behaviour. Examples include stopping the cat from being present during mealtimes and instead giving them a mentally stimulating, but attainable, puzzle feeding task to focus on in another location. Finally, extinction is unlikely to work for self-rewarding behaviours (chewing, scratching an itch), innate behaviours (marking) or those with a pathological nature (compulsive behaviours) (Overall 2013).

DESENSITISATION (DS) AND COUNTERCONDITIONING (CC)

Perhaps the most widely used techniques that modify a behaviour are DS and CC. These techniques are most useful for overcoming fear-related problems.

DS is more closely linked to the non-associative learning processes of habituation and sensitisation and involves gradually exposing the cat to the fearful stimulus so they are aware of it but at a rate and intensity that is insufficient to cause the specific fearful reaction to occur. Gradually the intensity, length of time, or proximity of the stimulus is increased whilst the cat remains calm and unreactive at each stage. Once they cease to react to the stimulus in any form, DS is complete.

When working with a range of stimuli that induce fear they should be ranked in order and the least frightening should be desensitised before working on the most aversive. Some of them may have different elements attached to them (e.g., visual, tactile etc.) and each should be separated, ranked and dealt with as separate entities before exposing them to the full effect.

For DS to work effectively, the thing that induces fear must be diluted sufficiently so that the cat remains relaxed and calm at each stage and delivered at increments that they are able to cope with. Always let the cat dictate the pace and feel in control of the session. Going too fast at a level that provokes a fearful response is detrimental and could result in flooding. For this reason, it can be a slow, painstaking process but is well worth the effort.

CC uses associative learning principles and is often used in tandem with DS to create a new and positive emotional response to the desensitised stimulus. It works by changing something already learned (e.g., being fearful of a stimulus) by

associating it with the predictability of something that they find rewarding – such as a favourite food item.

Sometimes CC can be used on its own and built in to a behaviour modification plan. Producing something rewarding in the presence of the scary thing helps create a modified response. So, assuming that a cat loves chicken, they keep on getting those yummy treats, fed in abundance, whenever the frightening thing appears – obviously at a much lower intensity, otherwise the food won't override the fear. This is classical conditioning at play so if you recall – they don't need to do anything for the food because the overall aim is that seeing (or hearing, smelling, or touching) the scary thing predicts that something good is going to happen. Consequently, over time, their fearful emotion in the presence of the frightening stimulus is replaced with more positive and pleasurable ones.

DS and CC underpin the treatment for a wide range of fear-related behaviours, not just for a fear of the cat carrier but for other stimuli such as loud noises like fireworks or for certain categories of people as highlighted in Chapter 12, Case 2.

As with all training, once it is completed, regular exposure to the fear-inducing stimulus and 'top-up' training (with the same sensitivity applied) will be necessary to ensure the response is maintained.

Potential Pitfalls

Recognising the signs of feline stress and fear is crucial when implementing DS and CC techniques in order to assess the cat's emotional state. Finding a reward of sufficient value to outweigh the fearful response represents a challenge but generally, if a food-orientated cat refuses to eat – it's a likely sign that they are not relaxed. This indicates that the conditions you are training under are not right or that you are going too fast.

Because the cat's primary response to perceived threats and negative stimuli is withdrawal, this can hamper the training, so controlled exposure might be required to ward against escape. In some circumstances, and with the right training, a harness and lead can be used to ensure the cat remains during a training session. However, this must be done with extreme caution because forced restraint can induce panic and learned helplessness. Setting a suitable distance from the fearful stimulus is key. However, if it proves difficult to work with a cat because their threshold for fear is low and they are unable to remain in the right frame of mind to learn, then professional assistance is most definitely called for. As previously mentioned, prescribed veterinary medication may be required to optimise learning.

We have only scratched the surface (no pun intended) on learning theory but hopefully, you now have a better understanding and will find it helpful when following the training guides provided later in the book. Perhaps it has even whet your appetite to learn more or got you itching to start some training with your cat. If so, there's a recommended reading list on the subject at the back of the book.

KEY TAKE HOME POINTS

- Cats are intelligent and with the right approach can be successfully trained.
- Cats learn all the time, even when we are not consciously teaching them anything.
- Training cats is beneficial for helping them cope with the challenges of living a domestic lifestyle.
- Cats need to be motivated to learn. Finding a valuable reward is important.
- Desensitisation and counterconditioning are techniques that can be helpful in overcoming fear-related problems in cats but do require a sensitive approach, otherwise problems can be exacerbated.

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12 Case Studies

This selection of real-life case studies reflects the types of problems that a feline behaviourist may be presented with and draws on subjects that have been covered in the book. They are not intended to replace professional advice, nor can they cover the scope and depth of a full behaviour consultation or detailed BMP. They have been designed to provide an idea of the kind of thought processes that underlie a case with key recommendations for the problems presented.

To avoid repetition, in all cases, the following assumptions should be made:

- All the cats were referred by a veterinarian and have undergone a clinical examination to rule out any medical problems.
- All caregivers have been given information and are learning how to recognise feline communication signals – including signs of stress.
- Unless otherwise noted, all the cats are being fed a suitable diet.
- The principles of the 'Five Pillars of a Healthy Feline Environment' have been explained and are being implemented.
- A stress review of the cats' environment was conducted.

The cases presented provide the reader with a list of the main recommendations although, in Case 2, I have demonstrated a staged approach which reflects how most cases are managed. Depending on the individual and their progress, the plan can be broken down into any number of stages. What is most important, especially for cases that involve DS and CC, is that caregivers don't progress until the previous stage has been evaluated or successfully completed.

CASE STUDY 1: SUKI

Presenting problem: Misdirected predatory 'aggression'
Description: Six months old, female (neutered (n)), Domestic Shorthair (DSH)

History

Suki was raised as a singleton kitten in a local rescue shelter. She had been handed in after being found roaming around a supermarket car park somewhere around three weeks of age and, as a consequence, was weaned early. At the shelter, Suki underwent a socialisation programme of sorts and was happy to be handled. She was described as being 'confident and friendly'.

At nine weeks of age, Suki was rehomed as an indoor-only cat and all seemed to be going well. However, when she was six months of age the lady who had adopted her contacted the shelter because she had begun "to show aggression" towards the two children who were 7 and 10 years of age.

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It transpired that, as a young kitten, the children had played games with her that involved letting her chase them and pounce on their feet and make spider-like movements with their hands, allowing her to bite and rake their fingers with the claws on her hind paws. Now that she was getting bigger, she was 'ambushing' them and had sunk her teeth into the daughter's legs inflicting a nasty injury.

Significant pieces of information relevant to the case:

- Based on the history it could be assumed that Suki had stressful early life experiences.
- She is likely to have had a limited socialisation programme.
- Suki was weaned early and raised as a singleton kitten, which may predispose her to some long-term behaviour problems (e.g. frustration-related aggression).
- Suki's behaviour has developed through inappropriate play over several months although help has been sought at an early age.
- The recent 'attack' sounds to have been intense which can make for a more guarded prognosis.

Diagnosis and Discussion

Based on the information given, a diagnosis of misdirected predatory behaviour (sometimes described as misdirected play or play-related aggression) was made.

This problem is more likely to occur in cats that have had a history of inappropriate play as kittens although, in this particular case, the style of play encouraged by the children will have also reinforced her behaviour. Cats with a high predatory drive and/or no appropriate opportunity to hunt or use toys and play as an outlet may also exhibit this behaviour.

In Suki's case, early weaning and being raised as an only kitten may have had a part to play. In normal circumstances, the mother cat and litter mates teach one another to moderate their play and they learn bite inhibition but she missed that social learning opportunity. Now, without any outlets to express her innate predatory behaviour, she is directing her behaviour to her little human 'playmates'.

Rapidly moving targets and high-pitched noises can be especially stimulating. And ankles and lower legs can be pounced on as a person (or other animal) goes by.

The problem is made worse when the human screams out in pain and attempts to dislodge the cat by shaking them off as this just simulates the 'hunt' and the behaviour intensifies, leading to more damaging injuries.

Children may be at greater risk as they run and shriek when playing and, for toddlers, nasty injuries can occur to the face and eyes. For that reason, cats such as Suki should never be left unsupervised with children or the elderly and infirm.

If a cat fails to respond to rehabilitation or if a risk assessment indicates that the risks are too high for a particular person/family – then rehoming to somewhere more suitable, say a farm or small holding, might be a satisfactory solution.

The BMP: Key Recommendations

- Stop all forms of play involving hands, feet, and chasing.
- Health and safety: Never leave the children and vulnerable individuals unsupervised (consider complete separation from those at risk if the 'attacks' appear unprovoked).
- To follow recommendations in accordance with Pillar 3, scheduling regular, consistent play sessions with an adult member of the family and feeding in a more cat-centred way (see Chapter 3).
- Choose toys on rods and provide opportunities for independent play to avoid contact with hands.
- Identify and attend to triggers. For example, problems might occur at certain times of the day or the 'attacks' might always take place in a particular location.
- Manage the physical environment: remove furniture that acts as a 'launch pad' and block access to places Suki springs out from.
- Protective clothing on feet and lower limbs may be required during the treatment plan (sturdy shoes and thick, even padded trousers, e.g. ski or biker trousers).
- In the event of attack, it is better to stay still and quiet. Another person can gain the cat's attention using a suitable interactive toy to act as a distraction.
- If the 'victim' is alone, keeping a toy handy in a pocket to roll or scuttle across the floor will divert their attention away.
- Harness training was discussed with the caregiver as an option if things didn't improve. This method would allow the cat to be controlled on the end of a lead, safeguarding people when they were moving around.
- Integrate some training into Suki's routine to refocus her mental and physical energy (e.g. target training).
- Because this is a potentially dangerous problem, especially with children in the household – rehoming might be an option if the situation does not improve.

Outcome and Prognosis

The prognosis in this case was initially guarded, mainly because young children cannot always understand and follow strict guidelines. However, the treatment and management quickly began to remediate the inappropriate behaviour. Harness training didn't prove necessary and, fortunately, Suki remained with the family.

Helpful Appendices

- Appendix 1.7 Target training: A safe method for manipulating Suki's movements and diverting her attention away from the caregivers' legs when they move around.
- Appendix 3. Diary of triggers template: Listing triggers and thinking of ways to control the environment can be helpful in a case like this.

CASE STUDY 2: HEIDI

Presenting problem: Fear of men
Description: Four year old, female (n), DSH

History

Heidi was a four-year-old tortoiseshell cat that had been in the cat shelter for six months waiting for her forever home. She had previously lived with an elderly single lady who sadly had to go into a care home. Apparently, Heidi had not been socialised with many people, only a handful of female friends of her previous caregiver.

The first three months in the shelter had been difficult for Heidi and she had stayed hidden in her igloo bed most of the time. However, the shelter staff had put in a lot of work, positively rewarding her every time she ventured out of hiding by scattering her dried food close to the entrance of her hide. She was gradually becoming more confident, even letting one lady staff member stroke her briefly around her face and head.

On one occasion a male volunteer had been assigned to spot clean Heidi's pen and had been told to follow the positive reinforcement protocol. Unfortunately, whilst Heidi was approaching the scattered food he was chatting to another volunteer and laughed loudly which really frightened her and she darted back into her hide.

After this one event, Heidi seemed reluctant to venture out of her hide when she heard any of the male volunteers talking or, if she was out when they came into the accommodation block, she would hurry back inside her igloo and wouldn't come out.

Finding a home for Heidi was proving difficult enough so the shelter staff wanted to employ some strategies to help her overcome her fears so as not to limit her chances of being rehomed.

Significant pieces of information relevant to the case:

- Heidi's socialisation with people had been limited to females and it is likely she led a fairly quiet lifestyle with her previous caregiver.
- Changes in Heidi's environment and routine are likely to have had an impact on her current emotional state.
- The focus of Heidi's fear is quite specific which means DS and CC can be targeted.
- Heidi is food-orientated which bodes well for training purposes although the food currently being offered is unlikely to be highly rewarding.
- The rehoming centre is sensitive to Heidi's needs and is being proactive in getting the right kind of advice which bodes well for compliance. However, cascading information to the whole team will be a priority.

Diagnosis and Discussion

This was a classic case of fear. From the information we had been given, Heidi had not previously had much exposure to men so was likely to feel nervous in their

presence. Additionally, it was likely that she was stressed and behaviourally sensitised having been thrust into a shelter environment.

We knew that the sound of male voices was a major trigger for Heidi but chatting to the staff revealed that seeing them was another and the two together caused the most intense response. Having ranked them in order, it was agreed that DS and CC training should begin with the least fear-inducing first.

Because a cat's coping strategy is to withdraw and hide, it can limit this kind of training. However, being contained in a pen enabled us to carry out controlled exposure and, with the right sensitivity, it was deemed the right approach to try and change Heidi's negative association. Being sensitive to Heidi's fear and anxiety was emphasised and staff were made aware of the early and escalating signs of fear to look out for and to be prepared to take a number of steps back in the training if necessary.

The planned training programme was broken down into small incremental steps using a systematic and timely approach. Rushing this kind of training isn't an option.

The BMP: Key Recommendations

The shelter environment is a source of stress to many cats and we already know that Heidi had been struggling to adapt. Therefore, our primary course of action was to reduce her generalised anxiety and stress before beginning DS and CC.

Stage 1

- Optimise the pen by applying the principles already covered throughout the book – primarily featured in Chapter 3 and 7.
- Provide mentally enriching tasks (e.g. puzzle feeding and cat-centred feeding methods) to encourage the natural production of mood-enhancing neurotransmitters (see Chapter 10).
- Classical, soothing instrumental pieces of music were played quietly in the accommodation block to help mask other noises and induce calmness (video cameras were used to ensure this didn't have the opposite effect).
- Working to a tight budget meant the use of calming products was not an option but the shelter staff brought in a variety of herbs including catnip that was growing in their gardens and every day would present a small offering away from her key resources. Using a remote video camera her responses to them were observed. Rosemary and sprigs of lavender seemed to trigger the most positive response (sniffing and staying within proximity of them).
- During this initial phase, male volunteers had been assigned to other cats so that it was only females that attended to her care (signs had been used as a reminder).

Once Heidi had become visibly calmer it was time to work on DS and CC training.

Finding a high value reward is important and up until this training, only her usual kibble had been used. Heidi's absolute favourite food was identified as being tinned tuna but she especially liked lapping up the spring water it was contained in. Consequently, some of this was poured into an ice cube tray. This had the additional

benefit of encouraging greater water intake, something that's always a good idea for cats, especially stressed ones who are at a greater risk of FIC. Being in an ice tray also meant she had to undertake an easy mental work out to consume it and it slowed her down. Additionally, it could have been frozen and an ice cube given during the day as another way of giving her a focus and filling her time budget.

Stage 2: (visual stimuli)

- Every day, a female volunteer would place the spring water broth inside Heidi's pen, close to her igloo. At the same time, they were accompanied by the male volunteer who stood as far back from the pen as possible and remained silent but was in view. Once Heidi had appeared and had lapped the juice, he left the room. This aligns with the principles of CC as described in Chapter 11.
- This procedure was repeated and very gradually the male volunteer advanced closer to the pen whilst the female volunteer presented the tray and Heidi was lapping the broth. Soon, both volunteers were next to one another.
- Next, the male volunteer (still accompanied by the female volunteer) began presenting the juice.
- Gradually, the female drew further away from the male volunteer and pen, eventually leaving the accommodation block altogether. Now it was only the male volunteer offering the juice.

Stage 3: (introducing sound)

Once the visual part of the DS and CC exercise had been successfully accomplished, work was undertaken on the audible stimulus. This involved playing recordings of male voices chatting so that the volume could be controlled.

- Whilst the juice was being presented, the recording was played outside the door at a very low level (almost inaudible to the human ear to begin with).
- Gradually the volume was increased until it had reached a normal conversational level outside the room.
- Gradually Heidi was being exposed to the visual stimulus of the male volunteer and the recordings.

Stage 4: (real-life scenario)

This stage involved the male volunteer beginning to talk to Heidi with background recordings of male volunteers chatting.

- As Heidi advanced to lap the juice the male volunteer used the word 'Good' calmly and quietly and moved away.
- Once Heidi was able to cope well and was relaxed, male volunteers were encouraged to chat outside the room in a normal conversational tone and recordings were faded out.
- Other male volunteers were encouraged to follow a similar approach.
- Gradually male volunteers were able to work together and chat in Heidi's presence although they were reminded to work quietly.

Outcome and Prognosis

Eventually, Heidi began to grow in confidence and she made significant progress. Within eight weeks all volunteers could stroke her around her head and face without her disappearing and she would come further from her igloo when food was presented.

After Heidi had been in the shelter for the best part of a year, she found her forever home with a single lady. However, her training hadn't been in vain as her new caregiver had a son. During his visits, he adhered to the recommendations relating to optimal cat–human interactions and, eventually, she began approaching him. The happiest outcome followed some months later when one day, without any coaxing, she sat on his knee. As you can imagine that was a special day!

Helpful Appendices

- Appendix 1.1 Relax on a Comfort Mat training can be helpful to induce relaxation for cats that are prone to anxiety.
- Appendix 1.4 Touch–Withdraw–Reward training will better equip Heidi for coping with being handled for husbandry and veterinary care.

CASE STUDY 3: NELLIE

Presenting problem: Urine Spraying
Description: 12 year old, female (n), Domestic Longhair (DLH)

History

Nellie was an indoor cat that had, over the previous couple of months, begun urine spraying in the kitchen and always, it seemed, right in front of the caregivers who were feeding her. They responded by throwing a piece of cutlery on the tiled floor to deter her but it hadn't stopped the problem. In fact, the problem seemed to have worsened.

The rest of the time Nellie was still using her litter box for urinating and defaecating but it appeared that the trigger for her inappropriate spraying was having to wait for her meal, most usually at breakfast times, to be delivered. During its preparation, she would vocalise loudly and seemed agitated. It was at this point that she would 'spray' on the kitchen units. Nellie's human family had also noticed that Nellie was eating more ravenously and seemed less inclined to sit with the family and relax.

Significant pieces of information relevant to the case:

- Nellie's behaviour was of a sudden onset and out of character.
- There was a definite trigger and pattern to her behaviour.
- Nellie is an elderly cat.

- There have been unaccountable changes in her appetite.
- Her urine spraying appears reactionary.
- Her caregivers are using positive punishment to deal with the problem.

Diagnosis and Discussion

Nellie had already been examined by the vet prior to the behaviour consultation although there had been certain elements of Nellie's behaviour that the caregivers hadn't mentioned, so a referral back was in order. Once a more detailed history was provided, Nellie's blood pressure was measured and found to be raised and blood tests revealed that this was secondary to a raised T4 (see Chapter 2). Everything else appeared to be normal so, coupled with her behaviour, a diagnosis of hyperthyroidism was made by the vet. Oral liquid medication to help regulate her overactive thyroid was prescribed, with further repeat tests arranged at a later date to assess her response to treatment. Having identified the underlying cause for the spraying, and whilst medical treatment was underway, a plan was formulated.

The BMP: Key Recommendations

- Stop punishment. This is counter-productive and is leading to raised anxiety.
- Provide small regular feeds including one before bedtime.
- Preparing food out of her sight (to prevent frustration).
- Set a timed feeder for early morning so that Heidi has the option to eat at an early hour and is sated when the caregivers get up.
- Clean spray marks thoroughly to remove traces of urine as visual and chemical signals may trigger and maintain the behaviour.
- Synthetic pheromone therapy was used to help create a calmer environment.

After only a few weeks on the medication, Nellie's T4 levels came down within the normal range. However, the new feeding routine was maintained as it represented a more appropriate method of feeding. Because Nellie's condition was controlled and she was no longer frustrated and irritable, puzzle feeders were recommended. Prior to treatment, it's likely they would have induced further frustration. Now they would help enrich her life and, given her age, may help slow down cognitive degeneration. Supplements suited for Nellie's life stage and neuroprotection were another recommendation and a discussion with the vet ensued.

Outcome and Prognosis

After a matter of weeks of her treatment, a complete resolution of the urine spraying was reported and Nellie seemed calmer and more relaxed. This case illustrates how a medical issue can underlie a behavioural response and how urine can be a response to negative emotional states such as frustration.

Appendices that might prove helpful:

- Appendix 1.1 Relax on a Comfort Mat training will be helpful to induce calmness as Nellie will be making regular visits to the vets for monitoring. It can also work well as a medication 'station' for being given her daily medication in a cooperative manner.
- Appendix 1.2 Cat Carrier training will prepare Nellie for her veterinary trips.

CASE STUDY 4: DOMINO AND OREO

Presenting Problem: Stress-induced urine marking
Descriptions: Domino: Seven year old, male (n), Russian Blue
Oreo: Four year old, male (n), DLH

History

Domino had been rehomed from a cat shelter as a 12-month-old cat where he had been for 3 months after his previous caregivers had emigrated, leaving him behind. He had apparently been anxious in the shelter but he had settled in his new home and became extremely affectionate to the lady in the house who was the main caregiver. After a few years, the caregiver acquired a kitten (Oreo) and the cats seemed to get on well, often seen 'hanging out' together but they never slept together or allogroomed. There had never been any signs of fights or conflict.

Problems began when the young couple, who the cats lived with, had a baby. Not long after, Oreo was seen urine spraying. Initially, this had been on items of baby paraphernalia, such as the pram, but then urine was found on the sofa, the baby-changing mat and bundles of clothing in the laundry room, waiting to be washed. They were both still using their litter box which was placed in the utility room.

Both cats gave the baby a wide berth but Domino did have a habit of scratching at the door to the nursery as the top shelf of the bookcase in the room had been one of his favourite places to sleep but now, he was no longer allowed in.

After an examination and urinalysis (that didn't show any abnormalities), the vet had recommended that the caregivers get some specialist behavioural advice and provided them with a plug-in synthetic pheromone diffuser to help create environmental calmness and to reduce their anxiety. Shortly after installation, it had been sprayed on and was subsequently removed.

The main caregiver was extremely distressed and worried that the cats would harm the baby (even though there had been no signs of aggression). During the day she was putting both cats out in the cat-proofed garden and locking the cat flap so they could only come in for limited periods when she allowed entry. However, the situation just seemed to be worsening and urine was now being noticed in all areas of the house, even the kitchen where the cats usually rested and were fed together.

Significant pieces of information relevant to the case:

- Domino had traumatic life experiences during adolescence and a history of anxiety.
- He is particularly attached to the main caregiver.
- He is a Russian Blue – a breed which, in one study, rated highly for shyness towards novel objects and strangers when compared to some other pedigree breeds of cat (Salonen et al. 2019).
- The problem coincided with the baby's arrival and the concurrent changes (e.g. to routines, scent profile and relationship with caregiver).
- Soft furnishings, the baby-changing mat and laundry were provoking stimuli. All these items will be carrying new and disturbing scents (primarily of the baby).
- Domino has been denied access to his safe haven and both cats are being ostracised for most of the day which will be a source of stress and frustration (both emotions can provoke urine spraying).
- The progression of urine to their core territory suggests that urine is probably being used for self-appeasement.
- There is only one litter box that both cats share and are still using.
- At least one of the cats is urinating on electrical items (the pheromone diffuser) which suggests that the changing scent profile is a stressor and a trigger for urine spraying. This is not unusual because as they warm up they can sometimes emit an 'alien' scent (often undetected by human noses). It is presumed that, in a bid to restore their own odour, they urinate on them.
- The caregivers' stress and change in attitude towards them is likely to be a major stressor, especially for Domino who has formed a close relationship with the lady caregiver.
- Due to the increased tension in the home and restricted space, there is a risk that this may lead to conflict (e.g. redirected aggression) between the two cats.
- Oreo has been identified as the 'culprit' but he's only been caught in the act once. It's important to discover whether Domino is spraying too!

Discussion and Diagnosis

Spraying behaviour appears to arise in a generally high arousal (probably stressful) environment (Ramos et al. 2020) and therefore, given the history, a diagnosis of stress-induced urine spraying was made. Common triggers for the onset of urine spraying include physical and social environmental changes and threats to the core area of a cat's territory – all of which feature in this case. Being banished from their core territory for extended periods was a likely cause of frustration and distress and unusual sounds and scents from the baby would have probably been unsettling. Urine marking is thought to act as a self-appeasement signal (Bowen and Heath 2005) and this in itself may be a maintaining factor for the behaviour.

Hidden cameras revealed that Domino was in fact the main sprayer, not Oreo! This wasn't too much of a surprise given Domino's background and temperament.

The fact that he had been banished from his safe haven, now taken up by the baby, will undoubtedly have led to a degree of generalised stress. However, the absence of urine spraying does not mean that a cat isn't feeling stressed (Ramos et al. 2020) so he wouldn't have been discluded from the BMP.

Oreo's motivation to urine spray was probably the same as Domino's although it is possible that the visual presence and smell of Domino's urine may have been another trigger.

Clothing and bedding can also be targets for spraying. The laundry will have undoubtedly been a hub of new and disturbing scents but sometimes, reactionary urinating is performed on the bedding or soft furnishings that the cat associates with the caregiver's scent and, it appears, in those places that represent safety and security. Fortunately, there had been no evidence of the caregivers' bed being targeted.

The BMP: Key Recommendations

- Optimise the environment underpinned by the 'Five Pillars of a Healthy Feline Environment' and MEMO (see Chapter 3).
- Provide another litter box, set it well apart and, if space permits, add one extra to allow for choice, unrestricted access and privacy.
- Separate the feeding stations as being fed together is a potential stressor.
- Increase water consumption to produce more dilute urine and ensure bladder health (see 'Think Drink' in Chapter 3).
- Increase the number and type of suitable scratching sites. This might provide an alternative means of marking and enhance their sense of security.
- Use a blacklight to ensure all urine-marked areas are identified and cleaned appropriately.
- Enhance the cats' sense of environmental security, by using a synthetic pheromone preparation containing F3 in spray formulation. The synthetic Cat Appeasing Pheromone has been shown to be beneficial when used therapeutically in the management of feline aggression in multi-cat households (dePorter et al. 2018). Although this isn't a feature of the case, it may help to prevent conflict.
- Keep baby-related equipment and laundry in a separate location/away from the cats whenever possible.
- Create a safe refuge for each cat so they have somewhere they can retreat.
- Carry out scent swapping on baby paraphernalia and new items that enter the home.
- Provide alternative, elevated, and comfortable resting places (to replace the loss of access to the bookshelf in the nursery) or, if acceptable to the caregiver, allow Domino time there when the baby is in another room.
- Restore human–cat relations by providing consistent and regular interactions.
- Cease locking the cat flap for prolonged periods and establish a routine so they are given more freedom to come inside the home at predictable times.

- Safeguard the baby's security without completely banishing the cats. This would obviously include supervision of the baby whilst the cats were present, with additional safety measures including: sturdy cot covers, floor-to-ceiling cat-proof baby gates/robust screens, indoor baby monitors/cameras and time-sharing so the cats have quality alone time with the caregiver.
- Maintain the new routines to re-establish consistency and predictability.
- The principles of DS and CC were discussed although the caregivers didn't feel able to enter into a full programme of training due to time restraints. However, by using the baby monitor and controlling the volume, it was possible to begin some training with baby noises.
- Consider a therapeutic diet suitable for cats prone to FLUTD and supplemented with calming agents.
- Veterinary prescription medication may be required if problems fail to improve.

Outcome and Prognosis

Treatment for marking behaviours can have a variable response but in this case, the recommendations did help and both cats seemed much happier, although the problem didn't completely resolve. There was a reduction in the number of deposits and these were isolated to just a couple of locations that were easily cleaned. Incidents increased when the baby had cried for longer periods or the caregivers were stressed. However, being able to predict when problems were likely and armed with useful strategies empowered the caregivers to take the necessary steps to get on top of problems quickly. This arrangement was acceptable to the family and they decided not to use prescription medication or supplemented diets due to the associated cost and felt able to manage the problem to their satisfaction. They were given advice in preparation for when the baby began toddling around as that would likely be a trigger for a resurgence of the problem and a potential risk to the child. The case was eventually discharged and I concluded by telling them to get in touch if they needed me. Around six months later I received a message letting me know that, other than the occasional relapse, things were going well.

This case demonstrates that some caregivers are willing to accept certain behaviours provided it is at a level they can cope with. It also shows that cases may not be resolved completely and may always require ongoing management. It's possible that a more favourable outcome could have been reached with calming agents or psychoactive prescription medication, although this wouldn't have guaranteed a complete resolution and one should always respect the caregiver's decision.

Helpful Appendices

- Appendix 2.10 Homemade Cleaning Preparation
- Appendix 2.2 Harvesting and Transferring the Cat's Odours
- Appendix 2.1 Protocol for Creating a Refuge Room

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Appendices



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Appendix 1
Training Guides

TOP TIPS FOR TRAINING

- Be prepared and readily equipped: treats and toys (and other training aids) should be easily accessible. A training pouch containing treats attached to a belt can be handy.
- Use opportunities to train the cat when they are alert, interested, and engaged.
- Avoid training when there are other distractions going on in the environment or when they are sleepy or otherwise preoccupied.
- For the cat to learn what we want, and to avoid confusion, the reward must be paired with or arrive immediately after they have displayed the desired behaviour.
- Use continuous reinforcement when teaching a new behaviour (reward every response).
- Desirable behaviour must be rewarded with something the cat finds rewarding.
- Regular, short training sessions are best to maintain interest and prevent boredom.
- Always make sure the cat is enjoying themselves and that they are in control of the session.
- End the session on a positive note.

APPENDIX 1.1

Teaching a Cat to Relax on a Comfort Mat

Having a specific mat (or blanket) to relax and 'chill out' on is really useful for all cats but especially so for those that are fearful and anxious. Relaxation is fundamental to desensitisation and counterconditioning training and, once a cat is trained, just seeing and resting on it can induce feelings of relaxation which can offset stress and anxiety. To enhance the mat as a place to relax, it can be sprayed with calming herbal aromas (ensuring they have been tried and tested on the cat) or synthetic FFP3 preparations.

This training is to induce relaxation. Therefore, for the cat that gets highly excited when food appears, a nice gentle stroke around the face or grooming in their preferred places might be better. However, if this isn't enough to motivate them it is possible to intersperse tactile rewards with food rewards.

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The Benefits

A comfort mat can be extremely useful for:

- Helping cats stay calm whilst undergoing DS and CC training.
- Inducing calmness during situational events such as fireworks and thunderstorms.
- Mitigating stress for trips outside the home (vets, cattery, etc.).
- Providing comfort for cats that feel anxious when left home alone.
- Acting as a station for carrying out husbandry and medication at home.

Stages of Training

Stage 1: Paws on the Mat

1. Select a specific mat or blanket that the cat particularly likes to relax on. Make sure it can be folded so it can fit in their cat carrier.
2. Choose a time when the cat is already relaxed and showing signs of contentment. After they have had some physical exercise can be a good time.
3. Place the chosen blanket/mat in front of you and close to the cat.
4. As the cat advances towards it, give a quiet verbal marker ('Yes' or 'Good' or click if you're using clicker training) and reward them with a tasty treat.
5. Place the treat a little way from the mat so they have to move away from the mat and work out that it is coming towards the mat that gets them the reward.
6. Continue the process, rewarding each movement to the mat.
7. Once they are getting the hang of it – wait until they place a paw on the mat and mark and reward that behaviour.
8. The idea is to shape their behaviour, gradually progressing to them placing all four paws on the mat.
9. For cats that have difficulty in progressing, luring can be used. However, don't be in a rush to do this as often an animal learns better if they work things out for themselves.
10. Once they begin to have all four paws on the mat, the time they stay on the mat can be slightly increased. In training, this is referred to as building duration.

Stage 2: Building Duration

11. To build duration into the training, wait a little longer before giving the marker and presenting the reward. Start increasing by a fraction of a second, very gradually increasing the time but making sure it's not too long as they may get bored and move away.
12. If they voluntarily begin to settle themselves, they can be given a really tasty treat on the mat – followed by a gentle and loving stroke around the face (but only if they enjoy tactile interactions).

Stage 3: Shaping Relaxation

Shaping involves rewarding small incremental steps towards the desired goal. As we want to shape relaxation, this part of the training has to be done when the cat is in that emotional state. Training them when they are alert and behaviourally aroused won't be effective.

13. Once a cat is moving onto a mat consistently, and staying on it for a longer period, it's time to shape and reward them for relaxing on it.
14. To help them adopt a relaxed body posture luring can be useful. To do this place a treat in your hand (or alternatively, use tongs or a long spoon) and place it in front of their chin moving it away from them along the mat so they are encouraged to lie down.
15. Other signs of relaxation can be rewarded too, such as slow blinking and relaxed body postures.
16. Food might be a bit too arousing as a reward for relaxation training, so gentle stroking or grooming, with only the occasional treat, might be better for some cats.
17. Patience may be required before the signs of greater relaxation are achieved. Sitting quietly close by whilst reading a book, listening to music and relaxing yourself (with your eyes peripherally on the cat) will help you to be able to reward them as they relax further.
18. Outside of training, 'capture' their behaviour with a gentle stroke/praise whenever they voluntarily go on the mat and relax. We really want them to know that going on the mat and chilling out on it is a great thing to do.
19. Over time, with this kind of pairing, the cat will soon recognise the mat as being a place to relax and feel calm.

Adapted from *The Trainable Cat* by John Bradshaw and Sarah Ellis (see recommended reading in Appendix 3).

APPENDIX 1.2

Cat Carrier Training

This training should be done during the kitten's socialisation period. However, cats at any age can be introduced to a carrier in this way.

Remember that habituation is a simple learning process whereas desensitisation and counterconditioning (DS and CC) are most usually carried out as a treatment for cats that already have developed a fearful and negative association with their carrier. This can take longer and requires a much more sensitive and gradual approach as discussed in Chapter 11.

The Benefits

- To alleviate the stress of journeys outside the home.
- To enhance the cat's welfare.

Stages of Training

Stage 1: Getting Used to the Carrier

1. Place the carrier in a location where the cat sees it on a regular basis so it becomes part of their everyday environment.
2. Make it a positive and safe place to be. Line it with their bedding and encourage them there, by scattering treats and engaging them in play in and around it (see Figure A1.1).
3. Positively reinforce any movement towards the carrier with a tasty food treat, ensuring an extra tasty one is given when they voluntarily go inside it, even if it's just one paw to begin with.

Stage 2: Closing the Door and Movement

4. When they are comfortable going in and out of it, very gradually (second by second) familiarise them to the door being shut, still providing rewards with each repetition.
5. Gradually, lengthen the time they remain inside the carrier but always ensure they stay calm and relaxed. Food puzzles can help keep them occupied and create positive associations.
6. To get them used to it being moved whilst it is being carried, briefly and gently rock it from side to side whilst it is still on the floor but avoid anything too vigorous.



FIGURE A1.1 Scattering food inside the carrier and lining it with a comfortable mat/bed can encourage a cat inside and create positive associations. Photo: Author's own.

7. Once they are happy to be secured inside and comfortable with movement, get them used to it being lifted – just a short way off the ground to begin with. Keep up with the rewards.
8. Next, get them used to the carrier being covered as this reduces visual stimuli, a recommendation to lower stress when being taken to unfamiliar locations. Use a blanket or towel that contains their scent.
9. Spraying synthetic FFP3 preparation on the bedding inside the carrier and on the cover may help induce calmness. This should be applied fifteen minutes prior to letting the cat inside as recommended by the manufacturer.

Stage 3: Being Transported in a Vehicle

Once the cat has successfully undergone the first stage of training (which should not be rushed) it's time to introduce them to being transported in a vehicle. As with stage one, take each step slowly and do not progress to the next stage unless the cat is calm and free from signs of distress. Having another person in the back of the car during training is helpful as they can dispense food rewards through the grills of the carrier to create a positive experience.

10. Before exposing them to hearing the car engine, initially place them in the covered carrier inside a stationary vehicle.
11. Place the carrier in a secure and stable position (the Center for Pet Safety recommends that the typical cat carrier should be placed on the floor of the vehicle behind the front seat).
12. Avoid putting the carrier on the front seat as this can distract the driver and in the event of an accident, an airbag can cause damage to the carrier and injuries to the cat inside.
13. Start the engine for a short spell but don't drive anywhere. Reward for calmness.
14. Repeat this stage, very gradually lengthening the time in the stationary car and delivering treats.
15. Next, move the car – just a very short distance to begin with. Very gradually build up to a longer journey but have someone else with you so they can monitor the cat's behaviour.
16. Think about the choice of music being played in the car. Avoid loud obtrusive genres. Quiet and gentle classical instrumental pieces of music or cat specific compositions are preferable.
17. Be considerate when moving the carrier during transportation. Avoid swinging or knocking it into things and drive mindfully.

Other Notes

Teaching a cat to relax on a specific mat or blanket would be a useful training technique prior to, or alongside, this training. In this way the mat could be used to line the carrier, helping to prompt a calmer state (see Appendix 1.1).

APPENDIX 1.3

Litter Box Training

Most kittens and adult cats are clean and litter training usually comes easily but sometimes, after acquiring a new kitten or adult cat, they may need some help.

The Benefits

- To set the cat up for successful litter box training.
- To prevent a breakdown in the cat–caregiver relationship.
- To avoid relinquishment.

Stages of Training

1. Set the cat up to succeed by optimising the litter box setup (see Chapter 3).
2. Cats show a preference for larger litter boxes so seek out the largest one available.
3. It's advisable that each cat should have their own litter box plus one extra.
4. Place the litter boxes in private locations, but make sure the cat knows where they are.
5. For cats that have been house soiling, place them in the locations where they have been eliminating.
6. Observe the cat for signs that it is looking for somewhere to toilet but don't overcrowd them as this might put them off.
7. Kittens can be gently placed in the litter box – sometimes raking the substrate with your hand can encourage them to investigate and begin scratching it with their paws.
8. Cats are very reserved about toileting and privacy is important. Therefore, using positive reinforcement training just before or during toileting isn't a good idea. The act of voiding the bladder and bowels is actually intrinsically rewarding (we all know that feeling of sweet relief when we have been waiting to go!). However, during the training phase, it won't harm to give them something they find rewarding just after they've left the latrine site.
9. If at any point during the training the cat has a house soiling incident, use an appropriate cleaning method to eliminate the odour completely (see Appendix 2.10). Never punish them as this could lead to toileting aversions and damage cat-human relations.

Training Cats That Have Already Learned to Toilet Elsewhere

Sometimes adaptations may be required to the training if a cat has never been taught to use a litter box and has established its toileting habits elsewhere. For example:

- Some cats may have had an impoverished start and only had an inappropriate substrate to toilet on, e.g. newspaper.

- An outdoor cat may need to be confined in the house following surgery or illness so they may have never used a litter box before.
- An elderly cat may be spending more time indoors or has cognitive impairment and requires some training.

Stages of Training

10. For outdoor cats that have only toileted in soil, mimic the substrate by using commercially prepared bagged peat free soils (to prevent introducing parasites and infectious agents). Add some playground quality sand to the mix, for better drainage. Not builders sand.
11. For cats that have been used to using newspaper – line out the litter box with a generous covering to soak up the urine and shred some pieces on top.
12. After the cat first urinates in the litter box – rather than cleaning it all out immediately, leave a small amount behind as their scent might just encourage them to use it again. Do remove faeces.
13. After the cat has used the litter box a couple of times, a small amount of the new substrate can be added to the existing one. However, peat free soils and sand make a perfectly acceptable substrate, although may be more likely to leave dirty paw marks.
14. Gradually, the new substrate can be replaced and the old can be phased out.

APPENDIX 1.4

Touch–Withdraw–Reward Training

This training should form part of a kitten's socialisation programme but can be useful to habituate cats of any age. However, it is unsuitable for cats that have a particular sensitivity for being touched or for those who are extremely fearful of people. These individuals should be referred to a suitably qualified feline behaviourist through the correct channels.

The Benefits

- For carrying out basic husbandry tasks such as grooming, and the administration of flea and worming treatments in the home.
- To prepare a cat for veterinary examinations.

Stages of Training

Stage 1

1. When the cat is alert and responsive to being around you, begin stroking them in the parts of the body they enjoy best. Then, very briefly touch them in a slightly different area, avoiding amber and red zones to begin with (see Chapter 4).

2. Whilst the hand is touching that part of the body, use a verbal mark ('Yes' or 'Good') or click if you are using clicker training.
3. Remove your hand and reward.
4. It's important to follow the described order of things because if the touch and reward are delivered at the same time, the cat will be completely distracted by the food and they won't be learning much about the touch.
5. Here's the sequence:
   a. Touch the body.
   b. Mark with your cue whilst the hand is touching the body.
   c. Withdraw hand.
   d. Reward.
6. It is important to both touch and withdraw the hand gently to avoid startling them.

Stage 2

7. Progress gradually so that different areas of the body can be touched.
8. Eventually, you will be moving from 'green zones' to 'amber' zones and increasing the length of time an area is touched.
9. Try to avoid working on sensitive areas of the body for long periods though. Always intersperse the training with touching areas that are less sensitive.
10. Over time, the cat should become more comfortable being touched in different parts of the body.

Other Notes

Always remember that certain red zones can be strictly NO GO regions. For cats that object to certain locations being touched it is best to respect that and either get some professional training support or speak to a veterinarian about prescribing some calming medication to relax a cat that is going to need examining in those regions.

APPENDIX 1.5

Habituating a Cat to Veterinary Experiences

Caregivers can do a lot to help habituate their cat to some of the stimuli they are likely to be exposed to at the veterinary clinic (or the grooming parlour) and for carrying out home medications. Ideally, this training should be carried out during a kitten's socialisation period but is equally valuable for any life stage.

This training can be enhanced by carrying out Touch–Withdraw–Reward training (see Appendix 1.4).

The Benefits

- To mitigate stress during veterinary examinations.

- To prepare a cat for medical treatments that they may need to have during their lifetime.
- To improve health and welfare.

Examples of experiences to include in this **training**:

- Touch the ears, gently fold back the earflaps, and massage at the base to mimic an inspection and treatment.
- Use an empty dropper bottle and briefly insert just inside the ear (taking care not to insert the nozzle too far down the ear canal).
- Lift the upper lip on either side of their mouth to expose the gums and teeth.
- Touch them all over by running a hand along their body.
- Gently lift the top lid of each eye to prepare for an inspection or drops to be inserted.
- Raise the tail to mimic the procedure for a thermometer being inserted in to the rectum.
- Raise the head by gently lifting under the chin to expose the jugular vein in preparation for blood samples.

Introducing Equipment

Habituate the cat to the sight of the equipment, linking it with something positive. For example, scatter tasty food treats around the item and every time it is presented (and the cat is aware of it) provide a reward and continue rewarding throughout its presentation. Cease to provide rewards as soon as the equipment is removed.

Examples of equipment:

- Nail clippers.
- Syringes (available from vet or pharmacy).
- Stethoscope (a children's toy one will suffice).
- Hair clippers (electric toothbrushes or moustache trimmers work well once the habituation training progresses to recreating the sounds).
- Spot on medication pipettes.

Other Notes

- Everything should be done briefly, gently and only when the cat is in a relaxed state.
- Proceed in bite-sized, gradual stages.
- A reward should be paired with each hand-on experience.
- When the visual part of the training has been successfully accomplished – the same principles can be applied when introducing any sound or tactile sensation the equipment makes.
- Muffling an item that emits a noise (clippers) in a towel can ensure the sound level isn't too intense.

APPENDIX 1.6

'High Five' Training

The Benefits

- Helps to showcase a cat's personality which gets them noticed in shelters.
- Provides physical exercise and mental enrichment.

Stages of Training

Stage 1: Getting Them Interested in the Hand

1. When the cat is alert and close by, sit on the floor in front of them and show them a tasty piece of food in your hand and let them take it. Do this a couple of times.
2. Next, show them a piece of food but this time close your fist around it and lower it to the ground so they can reach it easily.
3. They will hopefully be curious and start sniffing and pawing at your hand to try to get it.
4. Timing is important. As they look, sniff or touch your hand with their paw, you must immediately mark that behaviour with a word ('Good' or 'Yes' or click if you're using a clicker) and allow them to have a treat taken from a training pouch FROM YOUR OTHER HAND as a reward. Swift timing helps the cat learn what it is that they have to do to get the reward. Also, a cat can become frustrated if they have to wait too long and will either lose interest or become frustrated and that might result in them pawing more vigorously – with claws!
5. Patience is required as some cats may not touch your hand straight away.
6. To help them along, reward them for small incremental steps towards the desired goal. Remember that we are looking for successive approximations, not the whole behaviour. That comes with time.

Stage 2: Shaping the Behaviour

7. Once the cat has begun to understand what they need to do to gain the treat (touch your hand with their paw) you need to begin opening your fist on the hand they are touching so the palm of the hand is facing them (but not fully open yet).
8. Once they are touching your hand consistently, you can gradually begin opening up the palm, using a phrase such as: 'High Five'.
9. The sequence will be: present hand and say 'High Five' at the moment the cat touches your hand with their paw. Mark it and present the reward (still from the other hand).
10. As you progress with this, begin to lift your hand higher up so they have to stretch to reach your palm (see Figure A1.2).



FIGURE A1.2 Shaping the behaviour so the cat has to stretch to reach the open palm. Photo courtesy of Helen Kubiak.

Stage 3: Progressing and Perfecting

11. Continue with the training until the cat is consistently performing the behaviour and fade out the verbal mark (or click) and just use the 'High Five' cue.
12. Once they are getting it right consistently, try practising in other quiet environments e.g. other rooms of the house. This might be a bit more challenging for shelter cats but the idea is that the cat learns to perform the behaviour in other contexts.
13. Eventually, once they really know the sequence, you can alter your schedule of reinforcement. In other words, you shouldn't need to offer a treat on every repetition. Every other time they respond and maybe every third time.
14. The idea is that gradually you will fade out the treats, perhaps giving one every now and then to keep them interested and motivated.
15. If a cat become easily frustrated, swipes or snatches food or uses unsheathed claws to touch the hand, an alternative would be to teach them to target something more remote – such as a target stick or a cone (see Appendix 1.7).

APPENDIX 1.7

Target Training

Target sticks can be purchased, although it's quite easy to make your own. A garden cane, with a ping pong ball on the end, or wrapping highly visible white tape on

the tip both suffice. A clear visual stimulus can help pique the cat's interest when beginning training.

The Benefits

- A target stick can act as a lure which, for cats that swipe or grab food, can be safer for the trainer.
- Helps to manipulate a cat's movements in a force-free way.
- Provides physical exercise and mental enrichment (especially useful for indoor cats).
- Can be used as part of a weight reduction programme.

Stages of Training

Stage One: Making Contact with the Target

- Present the target stick when the cat is alert and inquisitive. Avoid thrusting it in their face but gently hold it close to their nose.
- When they advance towards it or begin to investigate it, issue a verbal marker ('Yes' or 'Good') or click if using clicker training. Then remove the stick out of their reach (so they don't touch it when you are not ready) and reward with a tasty food item dropped close-by on the floor.
- Continue in this way, using successive approximations until they progress to touching the stick with their nose.
- A tiny bit of something tasty can be smeared on the end if they are really having difficulty with this bit-but it isn't usually necessary.
- If they bite or paw the end, try and wait till they cease. As soon as they stop, verbally mark and reward them. If you are quick, they will still be touching or at least somewhere closer to where you want them. Eventually, they should realise that biting doesn't get them the reward, but instead, learn what behaviour they have to do to be successful.

Stage Two: Moving the Target

- Next begin to move the stick so they have to follow it.
- Begin with small movements and remember to follow the sequence as described in Stage One.
- Gradually increase the distance so the cat is following the stick further
- As with the 'High Five' training, begin to train in different locations in the house.

Stage Three: Having fun

- You can move the target to different places, touching different surfaces for them to jump up on, or it can be used to encourage them to reach up and touch the end.

- Once they are consistently following and touching the target you can add the word ‘Touch’ as their nose comes into contact with the target.
- Continue with the training until they are consistently performing the behaviour and fade out the verbal mark (or click) and just use the ‘Touch’ cue.

Other Notes

If you are using a clicker, always ensure that it is held in the other hand. Clicking whilst holding the stick can cause a reverberation to run down the shaft. This can feel very much like an electric shock if it touches the end of the cat’s nose which may put them off clicker training or potentially any other kind of training with you in the future.

Adapted from *The Trainable Cat* by John Bradshaw and Sarah Ellis (see recommended reading in Appendix 3).



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Appendix 2
Advice and Guidance

APPENDIX 2.1

Protocol for Creating a Refuge Room

Establishing a refuge room in the home, designed to induce a sense of safety and calm, can be helpful for a range of situations:

- Introducing a new cat into the home.
- When tradespeople or visitors are in the house.
- Firework events or thunderstorms.
- For house moves or during redecorations or renovations.

When choosing a room, select one that doesn't get used much. A spare room is ideal especially if it is set in a quiet part of the house. Make sure the cat has access to all their key resources: litter box, food, and water (spaced apart), several cosy resting places, places to scratch, climb, and hide with opportunities to get up high and to play (see Chapter 3). Work can then begin on creating additional measures as follows:

Creating a Safe and Secure Environment

Ensure Safety

- Carry out a risk assessment to check for anything that might be hazardous e.g. electrical wires that could be chewed, unstable furniture or any loose or sharp fittings.
- Make sure the room (and rest of the house) is escape-proof. A cat will slip through the smallest of gaps and have been known to climb up an open chimney to escape.
- Avoid using cleaning agents that are toxic to cats (e.g. phenol-based products).
- Keep the room free from toxic plants. For example, many forms of lily (Lilium species) are highly poisonous and can result in fatal kidney failure if ingested. All of the plant is poisonous including the flower, pollen and leaves. Even the water that they have been standing in is toxic.

Provide Places to Hide

- Space under, on top of, and inside furniture.
- Line bookshelves with bedding.

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- Cardboard boxes and paper bags.
- Igloos.
- A pile of ruffled blankets and towels.

Create Feelings of Comfort and Familiarity

- For newcomers, ask the shelter staff, breeder or previous caregiver to harvest the cat's scent and then transfer it to their refuge room, just before giving them access there (see Appendix 2.2). During the delay in getting the scent cloth home, place it in an air-tight container so it doesn't degrade..
- Synthetic pheromone preparations (FFP3) or herbal calming aromas, designed for cats, can be installed in diffusers prior to the cat's arrival or sprayed on bedding beforehand (follow the manufacturer's instructions to ensure optimal effects).
- Provide plenty of warm cosy resting sites.
- Play relaxing classical instrumental pieces or custom-made cat music, composed specifically to help calm cats, quietly in the background (but observe their behaviour and body-language to assess their response).
- Make sure artificial lights aren't too bright.

Create Positive Associations

- Placing small tasty food items inside some of the hides and scattered around the room can help create positive associations with their new surroundings.
- Provide puzzle feeders, using strong smelling foods to help draw them in.

APPENDIX 2.2

Protocol for Harvesting and Transferring the Cat's Odours to a New Environment or Object

Suddenly introducing a cat to a new environment, making changes to the home or introducing new objects and furniture can disturb a cat's familiar scent.

This guide provides the steps for harvesting and transferring the cat's unique scent to their new or changing environment in order to maintain their own/group odour. This helps them to recognise it as a safe and secure place to be.

- Prepare several cotton cloths cut into small squares (about half the size of a face cloth). Alternatively, light weight cotton gloves can be used.
- Remove any residual scent by boiling or washing them on a high temperature without using any detergents and then air dry.
- When the cats are relaxed, gently collect odours using the gloved hand or on the cloth wrapped around the hand (see Figure A2.1).
- Harvest odours from the face and head, stroking where there is an abundance of pheromone secreting glands (i.e. the area in front of the ears, where fur is thin, under the chin, and on the cheeks).



FIGURE A2.1 When the cat is relaxed, gently collect odours using the gloved hand or on the cloth wrapped around the hand. Photo courtesy of Tommy Taylor.

- After generously covering the scent cloth, transfer the scent. Do this immediately as scents can deteriorate quickly.
- Rub the cloth on any new items, covering them all over.
- In new environments, or redecorated rooms, focus on the corners of walls and the edges of doors at cat height (where they are likely to rub their bodies and face).
- Follow this regime twice daily for at least a couple of days until they have established their own scent profile.
- This same technique can be used when introducing odours and scent swapping between a newcomer cat and resident cats as part of the introduction process (see Appendix 2.4).
- Links to watch a video demonstration of this technique can be found in Appendix 3.

APPENDIX 2.3

Protocol for Settling a Cat into Their New Home

Step 1: Preparing for the New Arrival

1. Follow the principles laid out in the 'Five Pillars of a Healthy Feline Environment'.
2. Make a shopping list of all the things required.

3. Follow the protocol for Cat Carrier Training to gain tips about how to make their journey more positive (see Appendix 1.2).
4. Set up a Refuge Room (see Appendix 2.1).
5. Conduct a stress review (see Chapter 8) to determine whether there are any areas that require attention.

A basic shopping list of necessary items

- A food bowl.
- Activity feeders (which can be homemade).
- Suitable drinking receptacles.
- A nutritious food suitable for the cat's life stage (to avoid gastro-intestinal upsets, the diet should remain the same or if it is unsuitable, changed gradually).
- A couple of litter boxes and the cat's current litter.
- A selection of toys.
- A brush for grooming purposes.
- A suitable cat carrier.
- A comfortable bed and bedding.
- Somewhere to scratch and climb.

Step 2: Welcoming Your Newcomer

6. On arrival place the cat in the refuge room.
7. Place the carrier on the floor close to hides and high up places. Leave the door open and let them come out in their own time.
8. To facilitate acceptance of the new environment, ask the shelter/breeder to provide a piece of bedding that contains their familiar scent and refrain from washing it until they have settled in. You can also ask them to harvest the cat's scent and on (or just before) arrival, transfer it to their refuge room (see Appendix 2.2).
9. Stick with the same type of litter and food that the cat is used to. If it's necessary to make changes, do so gradually.
10. Allow them a day or two to get used to their new surroundings and try to avoid overwhelming them.
11. Enter the room to provide food and observe their responses. Allow them to lead social interactions (see Chapter 4).
12. Once they appear relaxed, make sure all escape routes are secured and allow them to explore another part of the house, accompanying them on a little excursion. Over time, they can be introduced to the rest of the house.
13. The cat should be allowed access back to the refuge room whenever it pleases and kittens should be regularly returned for rest and toileting.
14. Follow the accepted protocols when introducing a new cat to a home that has a resident dog or cat (see Appendices 2.4 and 2.5).

Step 3: Introducing Them Outdoors

15. If you intend to give the cat freedom to roam freely, don't be tempted to do this too soon. It's generally recommended to wait for a couple of weeks (earlier for homes that have enclosed, escape-proof outdoor spaces).
16. When the time arrives, choose a quiet day and fine weather, accompanying them in the garden. Do this prior to a meal to encourage them to come back for food.
17. Don't leave kittens unaccompanied before they reach six months of age and, to prevent unwanted kittens, get them neutered before they are allowed to go out unsupervised.
18. Teaching a recall is always a good idea so that a cat will come when called
19. If the cat hasn't already been vaccinated, treated for parasites or microchipped, a trip to the vets will be necessary. If a cat has already been microchipped it's important to get the information updated on the relevant database*.

*A microchip is a small implant, containing a unique code that is inserted under the cat's skin. If a cat goes missing the microchip can be scanned and matched to the cat's contact details, giving them the best chance of being identified and returned to their caregiver. At the time of writing this book the British Government announced that from June 2024, all pet cats in England must be microchipped before they reach twenty weeks of age. It is hoped, by the major cat charities, that other countries in the UK will follow suit..

APPENDIX 2.4

Protocol for Introducing New Cats to a Home with a Resident Cat(s)

Step 1: Giving Time to Settle and Adjust

1. Follow the procedure outlined in Appendix 2.3 up to Step Two, **except** when they are ready to explore outside the refuge room, restrict them to a limited area just outside their refuge room, ensuring they cannot escape and that resident cats are in a separate secure location.

Step 2: Introducing Scents

2. Introduce scent before face-to-face meetings.
3. This may naturally occur via the caregiver's clothing but also, on separate occasions, let the resident cats explore the area outside the refuge room, where the newcomer has been so they can familiarise themselves with their scent.
4. This process can also be helped along by using scent swapping.
5. Harvest facial odours as described in Appendix 2.2.
6. Leave the cloths in areas where each cat can investigate the scent of another in their own time. Do not force them to investigate the cloths and make sure they are not placed too close to their key resources.

7. Whilst the cloths are in their vicinity make sure each cat is relaxed and doing something they enjoy (e.g. being given treats or being stoked) as this pairing will help to create positive associations with the new scent.
8. Repeat this process daily for two or three days or until the cats appear generally relaxed and settled.

During scent transference, each cat should either ignore the odour or react positively (sniffing it with a relaxed posture). If there are any signs of distress or alarm it may be that the scent was introduced too quickly or at too close a range. In those circumstances do not proceed to step three. Go back a few steps and leave the cloths some distance away so that the cat has time to process and accept the new odours. Seek professional help if problems persist.

Step 3: Eye-to-Eye Contact

9. Choose a time when the cats appear relaxed and recruit another person to help.
10. Ideally, choose rooms that have a space between them – a corridor or a hallway for example. This way they won't be able to rush towards one another and get too close too soon.
11. If the rooms have glass doors that's ideal. Have each cat in the rooms on either side so they can see one another.
12. If these setups are not available and doors are solid, another option includes: fitting a tall baby-gate (suitable for large dogs) in open doorways. To prevent them from getting through the bars, attach garden mesh or wrap strong cling film securely in place so they can't squeeze through the gaps but can still retain some visual contact.
13. Allow cats to gravitate to their respective rooms themselves rather than carrying them there.
14. Try to relax and let the cats explore. Let them move closer to the boundaries and observe their reactions.
15. Aggression is often indicative of stress so never use punishment. Instead, use mild distraction with toys or food and end the session before they become aggravated.
16. To avoid redirected aggression don't lift cats up when they are behaviourally aroused.
17. If there is mild aggression (grumbling) take a few steps back in the introduction procedure and progress more slowly.

Step 4: Face-to-Face Meetings

18. If things progress well, limited face-to-face introductions can be made. Do not force them together or confine them in a small space.
19. After a session of eye-to-eye contact, open the door/baby gate slightly ajar so they can leave their room themselves.
20. Provide plenty of hiding places and elevated locations for cats to retreat to if they feel uncomfortable. Cat trees and clutter free shelves and bookcases make good spaces.

21. Never force or rush the process. Gradually increase the time that the cats spend together.
22. To reduce any social stress, ensure that they have sufficient space and an abundant supply of key resources.
23. With time, cats can become affiliated but some merely tolerate and accept one another which is acceptable. Don't try and force them to be close friends.
24. Remember that kittens may be exuberant and can pester an older cat. Supervise sessions and don't allow this to happen.

APPENDIX 2.5

Protocol for Introducing a Dog to a Resident Cat

When introducing a puppy to a resident cat, good preparation and gradual, supervised introductions increase the chance of a positive outcome.

Step 1: Preparation

1. When choosing a new puppy, consider looking for a dog breeder that has a family cat and has appropriately habituated the puppy to them. Or when rehoming a rescue dog, try and find out if they have previously lived and had a harmonious relationship with cats and how they respond to unfamiliar cats.
2. Before the dog's arrival, set up a safe refuge for the cat (see Appendix 2.1).
3. Create a separate safe space for the dog too.
4. Puppies and adult dogs can be crate trained using principles aligned with positive reinforcement training. Ask the breeder if they can begin the process before you pick them up.
5. Purchase a house-line as these can come in useful to control the dog's movements and prevent chase behaviours.
6. Place newly purchased doggy paraphernalia away from the cat. Introduce the items gradually but only after transferring the cat's scent to them beforehand (see Appendix 2.2).
7. Install tall baby-gates to control the dog's movements and to segregate them safely. Ideally choose one that has an integrated, lockable, cat-flap in the design so that after training the cat has the freedom to come and go.
8. Cultivate an awareness of feline (and canine) body language in order to interpret signalling so that interactions can be stopped at the earliest sign of stress.

Step 2: Introducing Scent

9. Give the cat (and dog) a few days to settle. Allow them the freedom to access their safe spaces but continue to keep them separated.
10. During this period share your time and attention between them. This way they won't feel neglected and their scent will be introduced to each other via your hands and clothing.

11. Take the time to teach a dog a good recall and some other basic training so they get used to listening and responding to you.
12. Use scent cloths or cotton gloves to stroke them both with and place the cat's cloth in the dog's vicinity and vice versa. Make sure they are not placed close to their key resources (food, water, beds, etc.).
13. Let them explore the scent at their leisure.
14. To help create positive associations, pair the scent with something they enjoy.
15. Use positive reinforcement in both species for signs of positive responses to the scent cloths (e.g. calmness).
16. If everything goes smoothly, progress to Step Three.

Step 3: Eye-to-Eye Contact

17. Follow and adapt the information provided in Appendix 2.4 (Step Three).
18. Keep the dog on a house-line (or regular lead) so it can't rush up to the boundary and frighten the cat.
19. It's important to keep them both engaged in something pleasant. Short positive sessions are best.
20. Practise a recall with your dog (which should have been introduced beforehand). This can be backed up with the attached lead/house-line. Reward them generously for coming to you.
21. Don't be tempted to rush to the next step of training. Build on this stage, gradually allowing the dog closer to the boundary. If all goes well and they both appear relaxed, progress to Step Four.

Step 4: Face-to-Face Contact

22. Follow and adapt the information provided in Appendix 2.4 (Step Four). BUT, as a safety measure and for greater control, ensure the dog is kept on their house-line.
23. As an added precaution, and to encourage the cat to feel safer, the dog can be placed inside a crate. However, this is only recommended if the dog has been properly crate trained, is comfortable with the door being shut and is happy and relaxed in the cat's presence.
24. Whilst the dog is contained in their crate, provide them with a puzzle feeder and actively monitor their behaviour.
25. Never allow the cat to 'taunt' or frighten the dog – some nervous dogs can be more fearful of the cat than the other way round!
26. If things progress well, allow the dog out of the crate, continuing to use the house-line as a safe method of control.
27. Continue to actively monitor and intervene if necessary.
28. Over time the dog and cat should gradually get used to each other and will eventually be able to interact freely (Figure A2.2).



FIGURE A2.2 For safety, use baby-gates during training (a) and always supervise interactions (b). Photos courtesy of Amy Crossley.

A house-line is a training aid that helps control or manipulate the dog's movements in a safe manner. These long, narrow, lightweight lines are around two and a half metres long and are attached to the dog's collar. They trail along the floor until needed but, to ensure safety, they must only be used whilst the dog is under supervision.

APPENDIX 2.6

Protocol for Dealing with Conflict between Cohabiting Cats

- When aggressive outbursts occur between familiar cats, distract them as soon as possible.
- Never lift them up when they are behaviourally aroused as this might lead to redirected aggression, causing serious injuries.
- Avoid using anything with a shrill noise as this can frighten and startle them which may compound the problem. Toys with bells rolled across the floor are ideal.
- For mild altercations (a short spell of grumbling, hissing, spitting), it's usual for cats to disperse to different locations. With a little time, most cats usually settle down without any real issues.

- For a moderate altercation (grumbling, hissing, spitting and the occasional swiping) separate the cats immediately, placing them in familiar locations with their own set of key resources.
- Allow the cats to recover and calm down.
- Synthetic pheromones containing the Cat Appeasing Pheromone have been shown to reduce cohabitation problems, so using this in the environment may be helpful.
- During this time of separation, caregivers may need to operate a time-sharing policy in the hub of the home because confinement for lengthy periods might trigger stress.
- Before reintroductions, the cats must be showing signs of relaxation and freedom from stress.
- Reintroduce the cats, following the steps in Appendix 2.4 (Step Three).
- The aim is to proceed with gradual, positive introductions.
- For repeated problems or more serious conflict (fighting), keep them separated and seek professional advice from a suitably qualified feline behaviourist (see Appendix 3 for details of where to find one).

APPENDIX 2.7

Protocol for Preventing Non-Recognition Aggression

After a trip to the vets, cattery or groomers, a cat will inevitably pick up new, strange scents. Certain procedures (bandages, medical collars, hair clipping, and grooming, etc.) may have altered their appearance too which can compound the problem. Upon their return, it is not uncommon for a resident cat to be alarmed or frightened by the 'alien' smells they bring back with them. This may cause the resident to withdraw, hiss, spit, and even attack the returning cat. This altercation can seriously damage their relationship, sometimes ruining bonds forever. This guide provides instructions to help prevent this problem from occurring.

Key Recommendations

- Separate the returning cat from the other resident cat(s) and place them in a familiar room but with access to all their own necessary resources. Setting up a Refuge Room may be necessary (see Appendix 2.1).
- Synthetic pheromones containing the Cat Appeasing Pheromone have been shown to reduce cohabitation problems, so using a suitable product containing this in the environment may be helpful.
- Give the returning cat a chance to completely recover from their clinical procedure.
- During this separation time, through contact with their home environment, the returning cat should begin to smell familiar again.

- To ensure that the group odour has been regained, once the returning cat has recovered scent swapping can be carried out (see Appendix 2.2).
- If the cats appear calm and relaxed in the presence of each other's scent, proceed to face-to-face meetings as described in Appendix 2.4 (Step Four) or if in doubt Step Three.
- For repeated problems, or after serious conflict (fighting), keep them separated and seek professional advice from a suitably qualified feline behaviourist (see Appendix 3).

APPENDIX 2.8

Protocol for Preparing a Cat for Changes in Their Core Territory

Changes to a cat's physical environment can be disconcerting for them, especially if they are exclusively kept indoors. Being ahead of the game when disruptions such as redecorations, renovations, or even when visitors are due to stay, can prevent emotional upset and the subsequent triggering of behavioural problems.

- Create a refuge room (see Appendix 2.1) and give them the freedom to access it.
- In multi-cat households, if possible, provide several refuge areas for each faction or for cats that prefer to spend time alone.
- The cat(s) may benefit from being given a natural calming supplement and surrounded by a synthetic pheromone and/or suitable calming herbal aromas a week or so prior to the changes.
- If not already done, begin introducing the cat(s) to mentally enriched feeding regimes and a range of different interactive toys and puzzle games.
- When expecting visitors, limit incoming luggage to the guest room away from the cats.
- When expecting tradespeople, limit materials and equipment to the work area or in a garage or shed.
- Increase the availability of elevated space and provide additional places to hide.
- If a cat shows distress at being confined to their refuge space, allow them some freedom to leave and return.
- If work in the house blocks routes to other locations in the house or outdoors, or if the cat feels insecure with strangers in the home, provide alternatives. For example, an open window to get outside, create safe, hidden pathways behind furniture or lay down tunnels so they can stay hidden whilst moving from one location to another (see Figure A2.3).
- When decorations or building work is complete (and tradespeople and equipment have been removed), harvest and transfer the cat's odours to the changed environment. Also, allow fresh air to circulate before allowing them back in. Repeat scent swapping twice daily for at least a week.



FIGURE A2.3 Tunnels can be used for enrichment, but can also help to create hidden pathways for cats that need to move around, without feeling exposed and vulnerable. Photo courtesy of Natalie Wallace.

APPENDIX 2.9

Protocol for Helping a Cat to Adapt to Being Apart from Their Caregiver

Holidays, hospital stays, or new jobs might mean a cat has to be left alone for longer periods or is unable to be with a member of the family with whom they are especially attached. Preparing a cat for these occasions and altered routines can help them cope and may ward against the development of separation related problems.

- Create a calm environment (follow some of the recommendations in Appendix 2.1).
- Follow the relevant strategies provided in Appendix 2.8.
- Introduce and set timed feeders so that regular small feeds can be dispensed remotely throughout the day.
- Very gradually alter the timing of cat–human interactions and other routines to match the new regime.

- If the change involves the caregiver spending less time interacting with the cat, introduce and familiarise them with puzzle feeders and independent, interactive activities so they learn how to use them.
- Begin mimicking the new routine e.g. leaving the house at the new time. To begin the process, return earlier. Gradually the time the cat is alone can be increased to match the new regime.
- If the cat is an indoor-only cat, consider giving them access to a safe and secure outdoor space (e.g. a catio) for greater environmental enrichment and to relieve boredom. Introduce them to this space gradually and well in advance of the changes. Always give them the opportunity to return back into the house whenever they desire.
- For cats that are going to be left for long periods, consider getting a cat sitter but make sure they have been introduced on a number of occasions. A stranger coming in with new scents might make matters worse!
- If a cat is particularly attached to one caregiver, encourage other members of the family to take on some of the cat's care. Play and training can further enhance their relationship. These interactions should be provided in accordance with the cat's unique needs and the principles of positive reinforcement training.

Other Safeguards To Prevent the Development of SRP

- Habituate kittens to periods of alone time during their socialisation period and beyond.
- Follow the 'Five Pillars of a Healthy Feline Environment' to create a safe and enriching home.
- Carry out a stress review and deal with potential stressors. This may include:
  - Installing a post box outside the house if a letter box is likely to disturb and startle a 'home alone' anxious cat.
  - Microchip-operated cat-flaps prevent despots from entering the house.
  - Leave on the TV, radio, or play suitable music in the background to create calmness and a sense of someone being around. Cat TV can act as a boredom breaker and mental enrichment for cats that are responsive.
  - Draw curtains when window cleaners and refuse collectors are due to call.

Other Notes

It should be noted that, when using timed feeders, the cat must be introduced to them first. Use the principles of desensitisation (DS) so that the sound of them opening does not cause alarm as this could be an additional stressor.

For cats that already show marked distress when being apart from their caregiver, it is recommended that help is sought from a suitably qualified and experienced feline behaviourist.

APPENDIX 2.10

Protocol for a Homemade Cleaning Preparation to Eliminate the Scent of Urine and Faeces

House soiling can occur for many reasons although in some cases it can continue due to the cat detecting the remaining scent.

Enzymatic cleaning products are commercially available which, rather than masking the smell, eliminate it. However, the following homemade preparation is an effective alternative.

- Make up three spray bottles and label A, B, and C.
- In bottle **A** mix a solution of one part biological clothing washing powder or liquid with 10 parts of water (10% solution). Allow to dissolve.
- In bottle **B** fill with tap water.
- In bottle **C** fill with clear surgical spirit (not coloured methylated spirit).

Each soiled location should be cleaned as follows:

- Remove the urine/faeces with clean paper towels. Blot the excess urine.
- Spray the area with bottle A.
- Wipe/blot clean with paper towels until all the moisture has been removed
- Spray the area with bottle B.
- Blot excess moisture as before.
- Finally, spray with bottle C and allow to dry fully before allowing the cat access to the area.

Other Notes

- Test this cleaning method on a small inconspicuous area to avoid staining and damage.
- Curtains and other furniture covers can be cleaned as above and then washed according to the manufacturer's instructions.
- Surgical spirit will damage polished surfaces and wooden furniture, so this method is not suitable for these items.

Adapted from '*Cleaning Urine and Faeces Marks in the Home'* in *Behaviour* Problems in Small Animals: Practical Advice for the Veterinary Team *by Bowen, J. and Heath, S. (2005)*

APPENDIX 2.11

Guidance for Shelter Staff

Encouraging Positive Cat–Human Interactions in Shelter Environments

Adopters usually want a cat that they can engage with. Shelter staff can encourage positive cat–human interactions and thereby improve the prospect of a cat finding a new home using some simple steps:

- For less confident cats – just sit quietly in their presence. Read a book or relax with a closed body posture without having any expectations of them interacting. Avoid eye contact and let them lead the interaction. If the cat approaches, respond positively following the recommendations given in Chapter 4.
- When a cat comes to the front of the accommodation always reward their behaviour by giving them attention and a tasty morsel. Even during busy times, it's important to acknowledge them positively because this behaviour should be encouraged. Without being seen they're unlikely to find a home!
- Seeing cats play is charming and from the cat's perspective it's a mental and physical workout. Gauge their interest and preferences by using a few different kinds of toys and ensure they are on hand when adopters come to view them.
- If toys are shared throughout the shelter, ensure that they have been thoroughly cleaned and are free from the scent of other cats.
- Positive reinforcement training sessions help relieve a cat's boredom but can also encourage them to interact with people. Teaching a responsive cat a 'High Five' or Target Training can connect them more quickly with prospective adopters (see Appendices 1.6 and 1.7).

APPENDIX 2.12

Guidance for Veterinary Teams

Administering Medication and Taking Bloods in the Veterinary Environment

- Work cooperatively with the cat and look for signals of consent.
- Make sure personnel have been trained and follow the accepted cat-friendly methods for administering medication and drawing blood samples.
- Always be prepared with equipment and materials at hand.
- Look at alternatives e.g. if cats resent oral medication consider a long-acting injectable alternative if one is available.
- Consider using pill-giving devices (e.g. pill-poppers).
- Try hiding medication in favourite food or tasty treats.
- Drugs can be compounded – i.e. rendered into a flavoured formula by a specialist pharmacy.
- Some injectable drugs can be warmed to room temperature which can make them feel less uncomfortable when being administered (always check the data sheets to ensure this does not affect the product's efficacy).
- For giving injections and taking blood samples, always select the smallest gauge needle possible.

- After withdrawing an injectable solution/vaccine from a bottle, always use a new hypodermic needle prior to administering it into the patient. This is because the tip of a needle will be blunt and the tip may be damaged during withdrawal, which can increase injection discomfort.
- Use topical local anaesthetic creams on the skin for cats that object to being touched with a needle or when multiple injections are required.

Adapted from AAFP and ISFM Feline-Friendly Handling Guidelines. Journal of Feline Medicine and Surgery, by Rodan I. et al. (2011)

Appendix 3
Useful Resources and Recommended Reading

3.1 TRAINING AND BEHAVIOUR

Worksheets to help analyse behaviour:
Including:

- Diary of Triggers template
- Using a Timeline template
- Stress Review template

www.petcourses.co.uk/free-resources

Cat Carrier Training:
www.icatcare.org/advice/encouraging-your-cat-to-be-happy-in-a-cat-carrier-video

Clicker Training:
www.clickertraining.com/cat-training

DS and CC (Sound Effects):
www.dogstrust.org.uk/dog-advice/understanding-your-dog/sound-therapy-for-pets

How to Harness Train a Cat:
www.petcourses.co.uk/free-resources

Preparing Your Pet for Firework Season E-Book:
www.petcourses.co.uk/free-resources

Socialisation Chart for Kittens:
www.cats.org.uk/media/1985/socialisation-chart.pdf

3.2 HANDLING AND INTERACTING

How to safely interact with cats (iCatCare):
youtu.be/eqUpsyAiNn4

How to towel wrap a cat for a veterinary examination (iCatCare):
youtu.be/XCi59dvAz7g

How to harvest odours from cats:
www.petcourses.co.uk/free-resources

DOI: 10.1201/9781003252245-20

3.3 HEALTH AND HUSBANDRY

A Mini Guide to Feline Health:
Including:

- How to locate and measure the pulse.
- How to measure the respiration rate.
- How to restrain a cat for a physical examination.
- How to carry out oral healthcare.

www.petcourses.co.uk/free-resources

Managing and Measuring Pain

The Client Specific Outcome Measures (CSOM):
hospital.cvm.ncsu.edu

Feline Grimace Scale©:
www.felinegrimacescale.com

Guidance on acute pain management for caregivers:
www.icatcare.org/advice-cat-carer-guides

The validated Feline Musculoskeletal Pain Index (FMPI) and other resources designed to assist cat caregivers and veterinary professionals to recognise and manage pain:
www.painfreecats.org/the-fmpi

Medicating Cats

How to give your cat a tablet (oral preparations):
www.icatcare.org/advice/how-to-give-your-cat-a-tablet/

3.4 RECOMMENDED READING

Books

Cat Chat: How Cats Tell Us How They Feel (board book for children aged 2 to 5 years) by Jess French Published by Nosey Crow Ltd.

Cat Sense by John Bradshaw, Published by Penguin.

Feline Stress and Health: Managing Negative Emotions to Improve Feline Health and Wellbeing ISFM Guide, ed. Ellis, E. and Sparkes, A. International Cat Care, Wiltshire.

Kitty Language: An Illustrated Guide to Understanding Your Cat by Lili Chin. Published by Penguin.

Play With Your Cat!: The Expert Guide to a Happier and Healthier Feline by Dr. Mikel Maria Delgado. Published by Souvenir Press.

Practical Feline Behaviour: Understanding Cat Behaviour and Improving Welfare by Trudi Atkinson. Published by CABI.

Purr: The Science of Making Your Cat Happy by Zazie Todd. Published by Greystone Books.

The Trainable Cat by John Bradshaw and Sarah Ellis. Published by Penguin.

Online Material

The Behaviour Guide (2021) Cats Protection.
www.cats.org.uk/media/11548/behaviour-guide-2021.pdf

Blog by international cat expert, Dr Mikel Maria Delgado.
www.whatyourcatwants.com

Enrichment: A one stop resource for information about feeding a cat using foraging toys.
www.foodpuzzlesforcats.com

3.5 PRODUCTS MENTIONED IN THE BOOK

Aktivait® and Aprylic® from VetPlus – available through your veterinarian:
www.vetplus.co.uk

Birdsbesafe®: Cat collar to protect birds:
www.birdsbesafe.com

Catipilla: Wall-mounted furniture:
www.catipilla.com

The Hide & Sleep®:
www.cats.org.uk/help-and-advice/home-and-environment/hide-and-sleep

Pet Remedy: Natural calming herbs:
www.petremedy.co.uk

Protectapet: Cat enclosures and fencing:
www.protectapet.com

Synthetic pheromones:
www.feliway.co.uk

3.6 FINDING A REGISTERED FELINE BEHAVIOUR COUNSELLOR

Anyone can call themselves an animal behaviourist because currently it isn't a protected title. However, without the relevant theoretical and practical knowledge, much harm can be done. Therefore, to ensure you get the right kind of help, the following organisations can be relied upon to guide you to a suitably qualified practitioner in the area where you live. For caregivers outside the UK, who cannot find a

member in the listings given here - it is advisable to speak to your veterinarian for their recommendations.

Animal Behaviour and Training Council
www.abtc.org.uk/practitioners
Association of Pet Behaviour Counsellors (APBC)
www.apbc.org.uk/find-an-apbc-member
Fellowship of Animal Behaviour Clinicians (FAB Clinicians)
www.fabclinicians.org/find-a-behaviourist
The International Association of Behavior Consultants (IAABC)
www.iaabc.org

3.7 FINDING A FEAR-FREE/CAT-FRIENDLY VETERINARIAN AND OTHER CAT PROFESSIONAL

Professionals that practice cat-friendly initiatives demonstrate their commitment to high welfare standards. The following organisations have details for becoming a member and also have lists of veterinary practices and feline professionals that already belong to their membership.

Cat Friendly Clinic
www.catfriendlyclinic.org
Cat Friendly Practice® (CFP) Program
www.catvets.com/cfp/cat-friendly-recognition-programs
Fear Free Pets
www.fearfreepets.com
ISFM Academy
www.icatcare.org/veterinary/isfm/isfm-academy/

3.8 USEFUL WEBSITES

American Association of Feline Practitioners (AAFP)
www.catvets.com

British Association of Veterinary Herbalists
www.herbalvets.org.uk

Cat Care for Life
www.catcare4life.org

Cats Protection
www.cats.org.uk

International Cat Care
www.icatcare.org

International Society of Feline Medicine (ISFM)
www.icatcare.org/veterinary/isfm

'Meet Your Match Feline-ality™ assessment survey
www.aspcameetyourmatch.org

End Note

Thank you so much for reading this book. Those who know me won't be surprised, but I am more of an enthusiastic speaker than a writer and so I find that my passion for the subject can be better conveyed that way. However, when I set out writing this book, my primary aim was to share my knowledge so that this often-misunderstood animal could be a little better understood. I wanted to tell the story of what it is to be a cat and how they came to be. I wanted to convey how they see, feel, and interact with the world around them and what it is that motivates and pleases them. Armed with this knowledge empowers the caregiver to give them the best possible life and the confidence to help when problems strike. I hope this book has gone some way to fulfil some of those objectives and that you have found at least one gold nugget of information that helps you enjoy an even greater bond with your cat and a deeper understanding of those cats with whom you work.

The author can be contacted at www.carolineclarkauthor.co.uk

A Glossary of Terms Used in this Book

Acute: Sudden and short-lived.
Affiliative behaviour: Friendly, peaceful acts exchanged between individuals.
AKA: Abbreviation for 'also known as'.
Allo: Derived from the Greek *allos meaning 'other.'* In allogrooming/allorubbing means grooming/rubbing another.
Amino acids: Molecules that combine to form proteins.
Anecdotal: Based on personal accounts rather than facts or research.
Antagonistic: Showing or feeling hostility towards someone or something.
Antioxidants: Natural or man-made substances that prevent or delay damage to cells.
Anxiolytic: Medication used to reduce anxiety.
Appeasement: A form of behaviour in which one individual attempts, through submissive displays, to avoid injury or conflict.
Arousal/aroused: In behaviour, relates to being physiologically alert or attentive.
Aversive: Unpleasant.
Chronic: Lasting and enduring.
Circadian rhythm: Biological patterns that cycle during a 24-hour period. Sometimes referred to as the 'internal body clock' controlling 'normal' behaviour such as the sleep-wake pattern and eating habits.
Classical conditioning: A form of associative learning when two stimuli are linked together to produce a new learned response.
Cognition/cognitive: The process of gaining knowledge and understanding through thought, experience, and the senses.
Colostrum: The first form of milk produced by the mammary glands of mammals immediately following delivery of the newborn. It is rich in antibodies and nutrients. Without it the offspring is susceptible to infections and may fail to thrive.
Conditioning/conditioned: Pertains to learning. The reaction (or response) to an object or event (stimulus) can be modified by learning or conditioning. The two main classes of learning are operant conditioning and classical conditioning.
Counterconditioning: The process of learning a new response which is different and incompatible with the previously learned, undesirable response.
Crepuscular: Active at dawn and dusk.
Desensitisation: The gradual exposure to aversive stimuli at a level where there is no negative response. Eventually the cat can tolerate the stimulus without exhibiting the undesirable response.

Differentials: (as in differential diagnoses) is a list of possible conditions that share the same or similar symptoms.

Dilated: To make wider/increased diameter.

Disease Relates to an abnormal condition that negatively affects the structure or function of all or part of the animal's body. Sources of disease include: infections (e.g. bacterial, viral, fungal and parasitic), inflammation, degeneration (wear and tear) and trauma from an injury. Diseases give rise to medical conditions that are associated with specific signs and symptoms.

DNA, or deoxyribonucleic acid,: The hereditary material found in all cells of the body. The information in DNA is stored as a code and the order, or sequence is a blueprint for each individual.

Domestic longhair: A domestic cat not belonging to any recognised cat breed possessing a coat of semi-long to long fur.

Domestic shorthair: A domestic cat not belonging to any recognised cat breed possessing a coat of shorthair.

Endocrine gland: A ductless gland that produces a hormone carried in the bloodstream, targeting a specific organ or body-system e.g. adrenal, thyroid, pancreas.

Epigenetics: is a branch of genetic study that looks at how environment can cause changes to the coding (but not the structure) of genes, affecting the way they are expressed**.**

Extinction: The weakening of a behaviour when it is no longer reinforced.

Flooding: Prolonged exposure to a frightening stimulus at the maximum intensity and without any means of escape.

Genetics: A branch of biology that deals with the heredity and variation of organisms.

Gut flora: The collection of bacteria that colonises the gastro-intestinal system to help with digestion.

Habituation: A decrease in response to a stimulus after repeated presentations. The opposite to sensitisation. Can be described as the process whereby an animal becomes accustomed to non-threatening environmental stimuli and learns to ignore them. This can also be termed social referencing.

Heredity: The biological processes by which particular characteristics are transmitted from parents to their offspring.

Homeostasis: The state of steady, internal conditions for optimal functioning for the organism.

Hormone: A chemical substance which excites activity.

Idiopathic: Of unknown cause.

Inherent: Existing at birth (a physical or behavioural characteristic).

Innate : Inborn behaviour.

In-utero: Within the uterus (womb).

Neutering: The removal of the reproductive organs to prevent sexual activity and unwanted pregnancies.

Neurotransmitter: Chemical molecules used by the nervous system to transmit messages between neurons.

Operant conditioning: A procedure that makes a response more or less likely as a result of its consequences.

One-event learning: A single incident that is (or perceived to be) so traumatic that it causes a lasting memory of that event.

Psychoactive medication: Relates to drugs that have a significant impact on psychological processes including emotions, mood and perception.

Probiotics: Live microorganisms that, when consumed, are said to improve or regulate the gut microbiota.

Prognosis: The expected course or outcome of a condition.

Puberty: The phase when an animal becomes reproductively mature.

Queen: An entire (non-neutered) female cat that is capable of breeding.

Reinforcer: A stimulus which, when presented following a behavioural response, increases the probability of that behaviour being repeated.

Sensitisation (Behavioural): In contrast to habituation, sensitisation causes a more exaggerated response to a stimulus with repeated exposure.

Social learning: Refers to learning that can be acquired from observations of, or the interactions with another, most usually the mother.

Stressor: A stimulus that causes a stress response.

Stimulus (singular) Stimuli (plu): Something or things that provoke or cause an action or response.

Successive approximations: Relates to shaping behaviour by reinforcing responses that are getting closer to the desired/target behaviour.

Synthetic: (of a substance) Made by humans, to imitate a natural product.

Temperament: The biologically determined behavioural characteristics and tendencies that a cat is born with and which are consistent over time.

Tom cat: A sexually mature (non-castrated) male cat.

Validated: Within clinical settings, when something has been validated it means it has undergone rigorous scientific testing for both reliability and credibility.

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