Wrexham University Research Online

Journal Article

Feline chronic pain management: the importance of a team approach for optimal outcomes

Monteiro B.P., Taylor S., Dowgray N., Eyre K. and Gruen M.

© The Author(s), 2025. Published by SAGE Publications Ltd.

This article is distributed under the terms of the Creative Commons Attribution-NonCommercial 4.0 International (CC BY-NC 4.0) licence, which permits non-commercial use, reproduction and distribution of the work, provided the original work is appropriately attributed. https://creativecommons.org/licenses/by-nc/4.0/

The definitive published version of this article is available at:
https://doi.org/10.1177/1098612X251374161

Recommended citation:

Monteiro, B.P., Taylor, S., Dowgray, N., Eyre, K. and Gruen, M. (2025) 'Feline chronic pain management: the importance of a team approach for optimal outcomes', *Journal of Feline Medicine and Surgery*, 27(11), article 1098612X251374161.
https://doi.org/10.1177/1098612X251374161

Check for updates

Review Article

jfms Journal of Feline Medicine and Surgery

Feline chronic pain management: the importance of a team approach for optimal outcomes

Journal of Feline Medicine and Surgery
1–21
© The Author(s) 2025
Article reuse guidelines:
sagepub.com/journals-permissions
DOI: 10.1177/1098612X251374161
journals.sagepub.com/home/jfm

This paper was handled and processed by the European Editorial Office for publication in *JFMS*

Sage

Beatriz P Monteiro[1], Samantha Taylor[2], Nathalie Dowgray[2,3], Kelly Eyre[4] and Margaret Gruen[5]

Abstract

This article reviews the importance of a team approach in feline chronic pain management for optimal outcomes. It discusses the role of different stakeholders and the importance of collaboration, communication and strategies for improved experiences for cats and caregivers on their journey. Chronic pain is maladaptive and negatively impacts on all domains of animal welfare. It can occur by itself, but most commonly is secondary to other chronic conditions. Ensuring that cats suffering from chronic pain are managed effectively requires a collaborative approach between all stakeholders, including client care staff, veterinarians, veterinary nurses or technicians, veterinary support staff and clinic management, as well as the cat and the caregiver. The journey starts with clinical signs displayed by the cat and perceived by the caregiver, and ends, for most cases, with end-of-life considerations. Diagnosis of chronic pain and design of a treatment plan result from a partnership between the caregiver and veterinary team. Management of chronic pain is focused on maintaining quality of life while empowering caregivers to be part of the healthcare team, avoiding adverse effects from medication and balancing comorbidities. The journey for cats and their caregivers is influenced by numerous factors, including the clinical condition of the cat and the caregiver's response to different burdens, but mostly by the care they receive from the clinic and veterinary teams involved in the process. Empathetic communication is paramount and helps to optimise the cat's care while supporting caregivers.

Plain language summary

Feline chronic pain management: the importance of a team approach for optimal outcomes

This article reviews the importance of a team approach in feline chronic pain management for optimal outcomes. It discusses the role of different stakeholders and the importance of collaboration, communication and strategies for improved experiences for cats and caregivers on their journey. Chronic pain is maladaptive and negatively impacts on all domains of animal welfare. It can occur by itself, but most commonly is secondary to other chronic conditions. Ensuring that cats suffering from chronic pain are managed effectively requires a collaborative approach between all stakeholders, including client care staff, veterinarians, veterinary nurses or technicians, veterinary support staff and clinic management, as well as the cat and the caregiver. The journey

[1]Global Medical Affairs, Zoetis, Dublin, Ireland
[2]International Cat Care Veterinary Society, Tisbury, Wiltshire, UK
[3]Institute of Life Course and Medical Sciences, University of Liverpool, Liverpool, UK
[4]Faculty of Social and Life Sciences, Wrexham University, Wrexham, UK
[5]Comparative Pain Research Laboratory and Behavioural Medicine Service – Department of Clinical Sciences, College of Veterinary Medicine, North Carolina State University, Raleigh, NC, USA

Corresponding author:
Beatriz P Monteiro DVM, PhD, PgDip, ISFMAdvCertFB, DipI ACAW, Global Medical Affairs, Zoetis, 2nd Floor, Building 10, Cherrywood Business Park, Loughlinstown, Co Dublin, D18 T3Y1, Ireland
Email: beatrizpmonteiro@gmail.com

Creative Commons Non Commercial CC BY-NC: This article is distributed under the terms of the Creative Commons Attribution-NonCommercial 4.0 License (https://creativecommons.org/licenses/by-nc/4.0/) which permits non-commercial use, reproduction and distribution of the work without further permission provided the original work is attributed as specified on the SAGE and Open Access pages (https://us.sagepub.com/en-us/nam/open-access-at-sage).

starts with clinical signs displayed by the cat that are observed by the caregivers. The diagnosis of chronic pain and the design of a treatment plan result from a partnership between the caregiver and the veterinary team. Management of chronic pain is focused on maintaining quality of life while empowering caregivers to be part of the healthcare team, avoiding adverse effects from medication and balancing comorbidities. The journey for cats and their caregivers is influenced by numerous factors, including the clinical condition of the cat and the caregiver's response to different burdens, but mostly by the care they receive from the clinic and veterinary teams involved in the process. Empathetic communication is paramount and helps to optimise the cat's care while supporting caregivers from the initial assessment until, for most cases, end-of-life decisions.

Keywords: Chronic pain; cat-friendly; communication; degenerative joint disease; human–animal bond; osteoarthritis; team approach

Accepted: 18 July 2025

Introduction

Veterinary medicine has evolved substantially in recent decades. Patients are living longer, and a large portion of clinical practice today involves the management of chronic conditions, including chronic pain.[1–5] Chronic pain in cats is likely to be underdiagnosed yet negatively affects quality of life. Identification and management of chronic pain require the participation of specific stakeholders, with the cat being the primary focus and each stakeholder having a different role to play (Figure 1, Table 1).

This article reviews the importance of a team approach in feline chronic pain management for improved experiences and optimal outcomes during the journey that cats and their caregivers go through, from the development of the first clinical signs to diagnosis, treatment and monitoring, until end-of-life considerations. It includes a brief overview of the current literature related to the management of chronic pain in cats, how it impacts on a cat's behaviour and welfare, and strategies for improved experiences for cats and their caregivers on their journey. It also discusses the role of the different stakeholders and the importance of collaboration and effective communication among them, with the primary goals of maintaining quality of life for the cat and reducing caregiver burden.



Figure 1 Stakeholders involved in the care of the cat with chronic pain. The primary focus is the patient, with a team approach being the most effective way to achieve the best outcome

Chronic pain in cats: where are we today?

Chronic pain is maladaptive. It persists beyond the duration of an acute disease and may be amplified by alterations in pain signals, perception and emotional response.[14–16] There are many causes of chronic pain in cats (Table 2) and, although degenerative joint disease (DJD) is the most studied,[22–24] analgesia should be included in the management of any chronic condition that causes pain. For example, dental disease is common in cats of all ages (Figure 2) and is a cause of significant pain.[25–29] Along with management such as extractions, analgesia should be prescribed. Cancer is commonly diagnosed in older feline patients and is likely to be associated with pain, for example, from tissue damage (compression, invasion, capsule distension) (Figure 3)[30] or via paraneoplastic inflammatory mediators.[31] Affected patients often have comorbidities that may contribute to discomfort (eg, DJD). The cornea and other ocular structures are well innervated,[32] hence corneal ulceration, sequestra, uveitis, glaucoma and other eye conditions should be considered painful (Figure 4). Dermatological disease such as otitis or pruritic conditions may be a cause of chronic pain (Figure 5).[33] Neuropathic pain, and postoperative

Table 1 Stakeholders in feline chronic pain management

Stakeholders	Description
Client care staff (reception)	• Often the first point of contact. Via telephone or when entering the clinic, they set the tone for the veterinary clinic and caregivers' experience of it.[6] • Should be empathetic, adapt to a vast diversity of clients and can encourage caregivers to open up and discuss their pets in more detail. • Can be well educated on signs of chronic pain, especially the subtle information that caregivers may provide when chatting in the waiting room. • Can encourage caregivers to seek further advice from a veterinary professional and offer leaflets or questionnaires, which can increase caregivers' education and improve their experience. For example, the Musculoskeletal Pain Screening Checklist (MiPSC)[7] can help to identify cats at risk for degenerative joint disease and helps to create awareness around which clinical signs to watch for. Clients can spend time in the waiting area completing questionnaires to support communication with the veterinary staff.
Veterinarians	• Responsible for diagnosing chronic pain and developing an appropriate treatment plan tailored to the individual cat's needs. • Play a vital role in guiding caregivers through the decision-making process, ensuring they understand the options available and the importance of long-term management. • Chronic pain is often diagnosed during an appointment for something unrelated, such as a vaccination. Preventive care consultations present valuable opportunities to assess the cat's overall health and initiate conversations about potential pain-related issues.[8]
Veterinary nurses or technicians	• Play a pivotal role in monitoring feline patients with chronic pain and provide education to their caregivers. Involving veterinary nurses in managing cats with chronic pain can strengthen the caregiver–clinic relationship and enhance overall patient care outcomes.[9] • Although they cannot provide a diagnosis, they frequently identify signs of chronic pain during discussions with caregivers or during routine health checks. • Within their professional scope, they are highly capable of leading pain monitoring clinics and can play a crucial role in regularly assessing these patients, supported by effective interprofessional communication.[10] Veterinarians can refer chronic pain patients to the veterinary nursing team, where they can continue the journey of educating the caregiver and monitoring the patient. This not only provides job satisfaction for the veterinary nurse but can also be cost-effective for the clinic. Note that legislation regulating the veterinary nurse or technician profession varies across different countries.
Veterinary support staff	• Veterinary support staff, such as veterinary care assistants, often spend time monitoring patients within the hospital wards. Their close observation of the patients allows them to notice subtle changes in behaviour that may indicate pain or discomfort. • Well-trained support staff recognise the modifications needed for chronic pain patients and can communicate any observations to the rest of the team. This results in a collaborative approach, strengthening patient care.
Clinic management	• Clinic management should support the whole team in prioritising identification and treatment of pain in the clinic. This includes ensuring the clinic is equipped with the right tools to diagnose and manage chronic pain patients and that all staff are trained and aligned with the current guidelines, creating an environment that fosters optimal care for patients and their caregivers.
Caregivers	• Serve as the cat's advocate. Their involvement in the chronic pain assessment and treatment planning process is crucial for diagnosing pain and managing the cat's quality of life at home. • Have valuable insights into how the cat might respond to various treatments. • Their circumstances, such as financial limitations or personal preferences, will influence the treatment plan. For example, a caregiver with limited finances may find it difficult to afford medication, and alternative forms of treatment may be necessary to ensure effective management of the cat's condition.[11–13]

(Figure 6) or post-traumatic pain, are characterised by a heightened response to sensory stimulation and central sensitisation.[16,17,34]

Medical pain is an underrecognised, and hence undertreated, cause of chronic pain.[14] Medical pain refers to non-surgical or traumatic pain, encompassing pain associated with distension, inflammation or ischaemia of the thoracic or abdominal visceral organs or cavities.[1] It may be hard to localise, change with time or in relation to feeding, and be accompanied by nausea, inappetence and gastrointestinal dysmotility (eg, constipation, ileus). Management of medical pain may be complicated by contraindications to some analgesics, lack of definitive diagnosis, and interactions between medications used to treat the underlying disease and analgesics (eg, corticosteroids and non-steroidal anti-inflammatory drugs [NSAIDs]),

Table 2 Examples of conditions causing chronic pain in cats

- Osteoarthritis (degenerative process of synovial joints; chronic, low-grade inflammation)
- Degenerative joint disease (degenerative process of all types of joints: synovial appendicular joints, fibrocartilaginous joints and intervertebral joints)
- Medical pain (ie, pain associated with medical conditions)
- Urinary tract diseases (eg, feline idiopathic cystitis, urolithiasis)
- Gastrointestinal diseases (eg, chronic enteropathies, megacolon, oesophagitis)
- Hepatobiliary and pancreatic diseases (eg, pancreatitis, cholangitis)
- Peritonitis, pleuritis
- Feline orofacial pain syndrome
- Traumatic/iatrogenic nerve injury
- Persistent postoperative pain (eg, chronic pain after tail or limb amputation)
- Feline hyperaesthesia syndrome
- Visceral neoplasia
- Osteolytic tumours (eg, osteosarcoma)
- Oral squamous cell carcinoma
- Post-treatment pain (after surgery, radiotherapy, chemotherapy)
- Ocular disease (eg, corneal ulceration, uveitis)
- Dermatological disease (otitis, eosinophilic granuloma)
- Periodontal disease

Note that each of these conditions can have different mechanisms contributing to the pain experience. For example, osteoarthritis can have a combination of inflammatory and neuropathic pain components. Detailed reviews on the topic are available elsewhere[14,17–21]

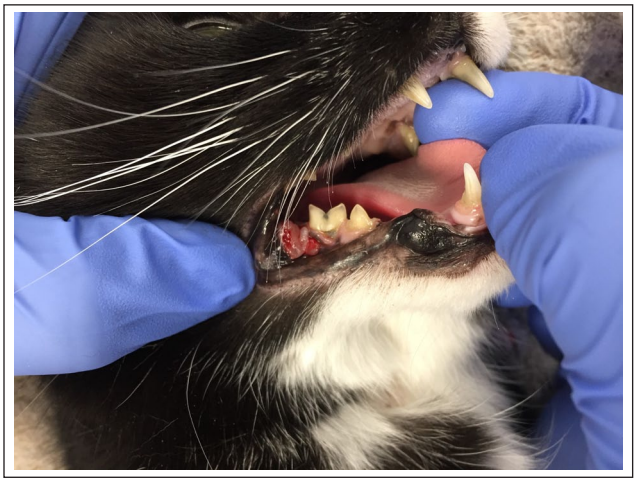


Figure 2 Dental disease is prevalent in cats and a cause of chronic pain. *Courtesy of Samantha Taylor*

as well as difficulty monitoring the efficacy of analgesics. The caregiver burden of administering multiple medications to, and care of, a sick cat should also be considered (see later). Examples of medical pain include prevalent conditions, such as pancreatic and hepatobiliary disease, gastrointestinal diseases, upper and lower urinary tract diseases, and peritonitis/pleuritis.

Although the prevalence of chronic pain in cats is unknown, we can infer prevalence from these associated conditions. Radiographic changes consistent with DJD/osteoarthritis (OA) are common in cats, especially as they age,[35–39] with up to 92% of cats having degenerative changes detected on radiographs. In the UK, periodontal



Figure 3 Oral squamous cell carcinoma in a 12-year-old cat. This type of cancer is painful and has a cyclooxygenase (COX) overexpression pattern. Affected cats should be provided with analgesia including COX inhibitors. *Courtesy of Samantha Taylor*



Figure 4 Uveitis in a cat diagnosed with feline infectious peritonitis. As well as managing the disease process, analgesia should be provided. *Courtesy of Lumbry Park Veterinary Specialists*

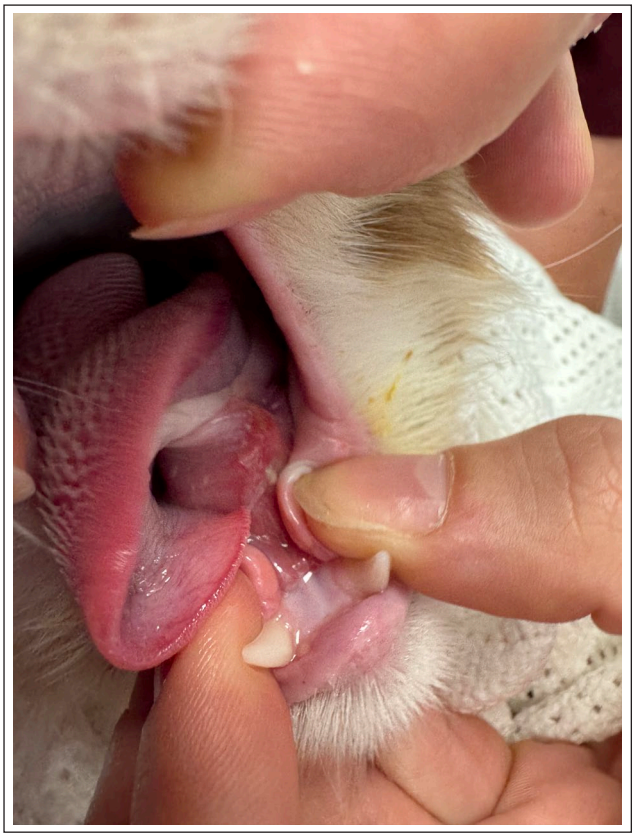


Figure 5 Eosinophilic granuloma under the tongue of a 2-year-old cat, resulting in complete anorexia. *Courtesy of Samantha Taylor*

disease and tooth structure disorders have a prevalence of 13.9% and 1.7%, respectively.[2] Neoplasia (12.3%) and mass-lesion disorders (11.6%) are commonly attributed causes of mortality in cats aged over 5 years.[3] Behavioural



Figure 6 Persistent self-trauma of a surgical wound after removal of a soft tissue sarcoma in an older cat. *Courtesy of Samantha Taylor*

disorders were the attributed cause of mortality in 1.5% of cats aged over 5 years,[3] and there is a growing awareness of the association between chronic pain and problem behaviour.[40] It is a valid assumption that a significant proportion of cats with the aforementioned conditions suffer from chronic pain.

Stakeholders in feline chronic pain management

Ensuring that cats suffering from chronic pain are managed effectively requires a collaborative approach between all stakeholders (Figure 1, Table 1).

The cat

The journey of the cat with chronic pain starts with the disease process leading to behavioural changes that are detected by the caregiver and diagnosed by the veterinary team. It is followed by the initial treatment plan and continued monitoring (Figure 7).

Pain impacts on a cat's welfare Animal welfare can be defined as 'the physical and psychological, social and environmental well-being of animals'.[41] In simple terms,

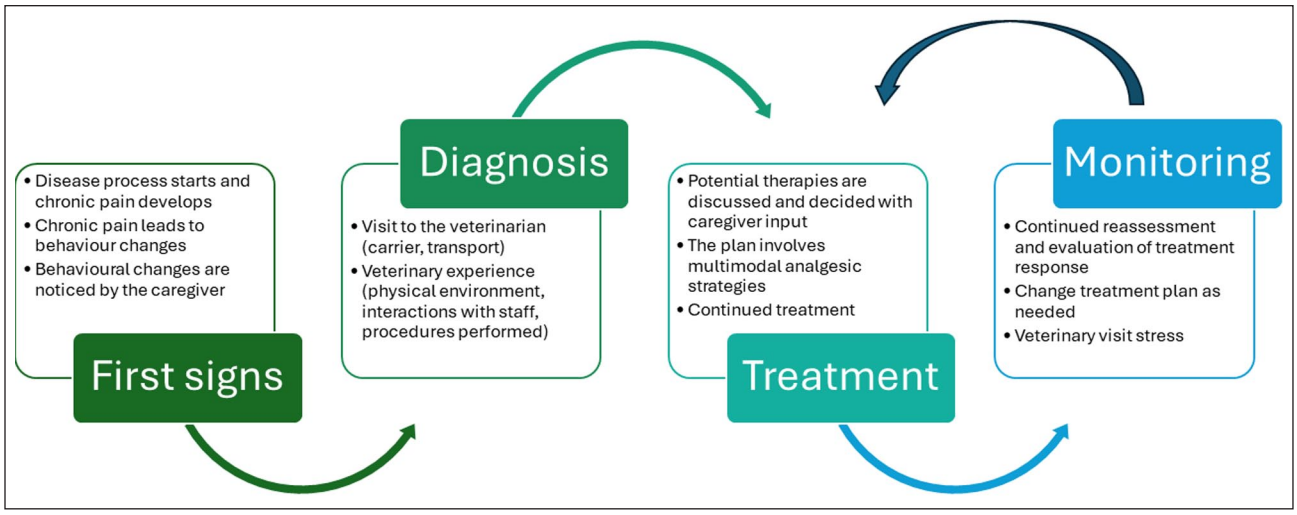


Figure 7 The journey of the cat with chronic pain

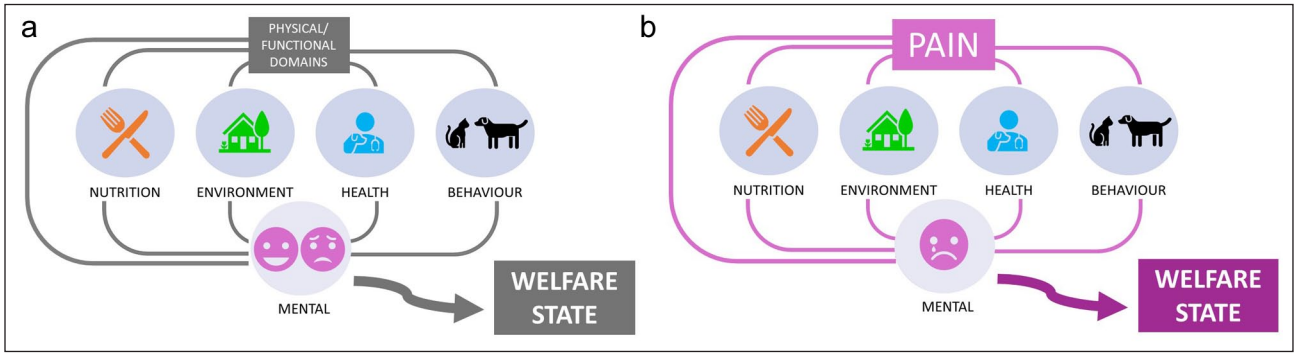


Figure 8 (a) The Five Domains Model and (b) the negative influence of pain in all domains. The first four domains (ie, functional/physical domains) focus on factors that lead to negative or positive subjective experiences. Such experiences result in the fifth domain (ie, the animal's mental state). Adapted from Mellor et al.[43] *Courtesy of Beatriz Monteiro*

it might be thought of as the life experience of an animal from his/her own perspective. It is a state that can change over time, influenced by physical and emotional experiences, and which runs on a spectrum from very good to poor. Good animal welfare involves physical health and positive emotions, such as pleasure and contentment. Poor animal welfare comes not only from ill health, injury and disease, but also from negative emotions such as frustration or fear, which we call suffering.[42] Although there is no single widely accepted definition of animal welfare, modern frameworks, such as the Five Domains Model, have helped advance this science. The Five Domains Model is a device for facilitating systematic, structured, thorough and coherent assessments of animal welfare, and for qualitatively grading welfare compromise and enhancement.[43] If we think about it, pain negatively affects all five domains of animal welfare (Figure 8, Table 3). Pain is, by definition, an unpleasant experience and negatively affects nutrition, use of the environment, health and behaviour. Veterinary professionals are expected to understand the multidisciplinary science of animal welfare,[44,45] and have an ethical and medical duty to prevent, diagnose and treat pain.[46,47]

Pain leads to behaviour changes Pain affects physical, emotional, social and cognitive domains;[48] the behavioural changes seen in cats with chronic pain reflect these multidimensional impacts. Such behaviour changes might be perceived as a problem by the caregiver. When they do, they are called problem behaviours, with the recognition that these are problems from the caregiver's perspective. Problem behaviours that can result from pain include decreased social interaction and tolerance of handling, excessive grooming over a painful area on the body, increased hiding, defensively aggressive behaviours, and house soiling when it is difficult to access the litter tray/box or the litter tray/box becomes associated with pain.[40] Many of these changes are driven

Table 3 Considerations for the assessment of animal welfare based on the Five Domains Model, and examples of the consequences of pain for each domain

Domain	Considerations for assessment	Consequences of pain
Nutrition	• Food and water (availability, quality) • Balanced diet, food variety, taste pleasure • Diet presentation	• Decreased food intake • Decreased ability to eat and/or drink
Environment	• Size, safety, comfort, noise, odours, ecosystems, shelter, flooring • Environmental complexity • Climate (temperature, humidity, air flow, light)	• Impaired mobility and/or ability to use the environment optimally and in his/her favour
Health	• Injury or disease • Physical fitness	• Impaired mobility • Immunosuppression • Impaired healing • Increased morbidity
Behavioural interactions	• Behavioural interactions with the environment, other animals and humans • Agency and autonomy • Species-specific motivated behaviours • Opportunity to engage in positive interactions and to withdrawal from negative interactions with other animals and humans • Human behaviour impacts on animal welfare (eg, attitude, voice, experience, handling)	• Limited ability and willingness to perform behavioural interactions • Increased sensitivity to external stimuli • Decreased interest in and/or pleasure from interactions with other animals and humans • Altered sensory and emotional response to interactions • Negative impact on human–animal bond • Development of problem behaviours
Mental state	• Enables assessment of the overall welfare state of the animal • Subjective • Emotional, affective experiences	• Pain is an unpleasant/negative experience by definition • Decreased opportunities to experience positive emotions (pleasure, autonomy, agency, play) • Increased opportunities to experience negative emotions (fear, frustration, anxiety, boredom)

by fear of pain and its negative emotional impacts. As a feature of their natural history, a healthy environment for cats relies on a sense of safety and the ability to access safe spaces,[49] which includes vertical height. When cats have chronic pain and their ability to access these safe spaces decreases, their sense of safety and emotional wellbeing is negatively affected.

Veterinary visits can cause stress and result in negative experiences An important hindrance to the diagnosis of chronic pain is the effect of the stress of the veterinary experience, including transport, examination and returning home after the visit. Both pain and fear are strong stimuli that animals will work to avoid. Therefore, when veterinary visits become associated with pain and fear, cats will show increased stress and avoidance behaviours, making it harder for veterinarians to obtain meaningful responses from the cat during physical examination.[50–53] It also makes it more difficult for caregivers to bring their cats to the veterinarian or deters them from attending, creating a vicious cycle. Some stress is inherent for cats when leaving their territory,[54] but veterinary teams can implement feline-friendly procedures and environments to mitigate stress and improve the veterinary experience.[49,55] Even small changes can achieve a marked improvement in the cat's and caregiver's experience (Figure 9).

The caregiver

The journey of the caregiver has many opportunities for connection and engagement with the veterinary team to improve the early detection and management of feline chronic pain (Figure 10). Historically, veterinary medicine has taken a paternalistic approach, which has shifted, in line with human medicine, to a more autonomous approach in which a partnership between patient and clinician is developed.[56] However, unlike human medicine, veterinarians operate in a tripartite system including the caregiver (often the legal owner), the patient and the clinician. There remains discussion on who is being given more autonomy: the caregiver or the patient?[57] Language matters; there is a move to start using terms such as contextualised care,[58,59] which considers the individual needs of the caregiver and the cat (Table 4). Interdisciplinary collaboration may be needed to ensure a holistic approach.[60]

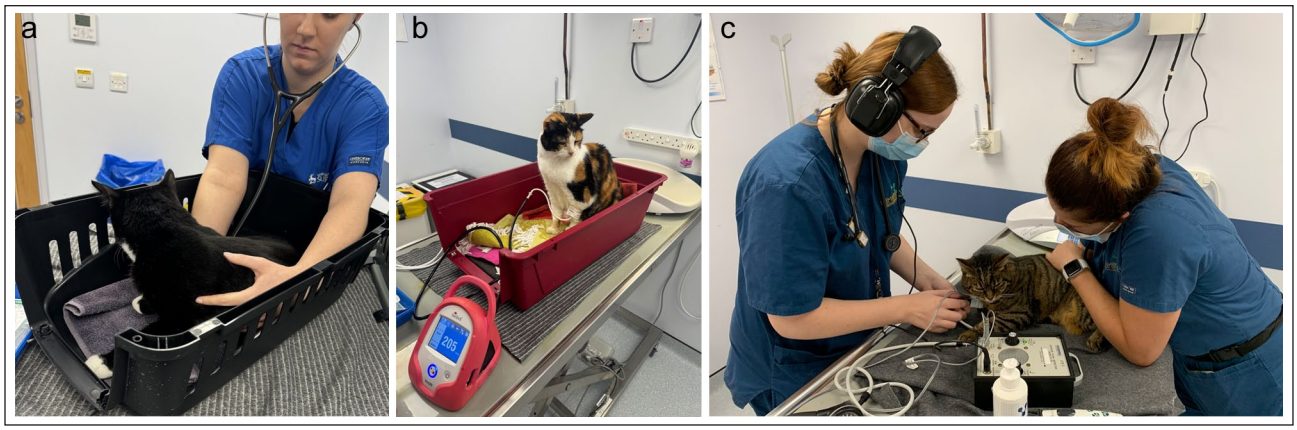


Figure 9 Examples of cat-friendly interactions. Cats can be kept in their carriers for (a) physical examination and (b) blood pressure monitoring. (c) If they must be removed from the carrier for blood pressure monitoring, gentle handling and the use of headphones to avoid noise disturbance to the cat can contribute to reducing fear and stress. *Courtesy of Samantha Taylor*

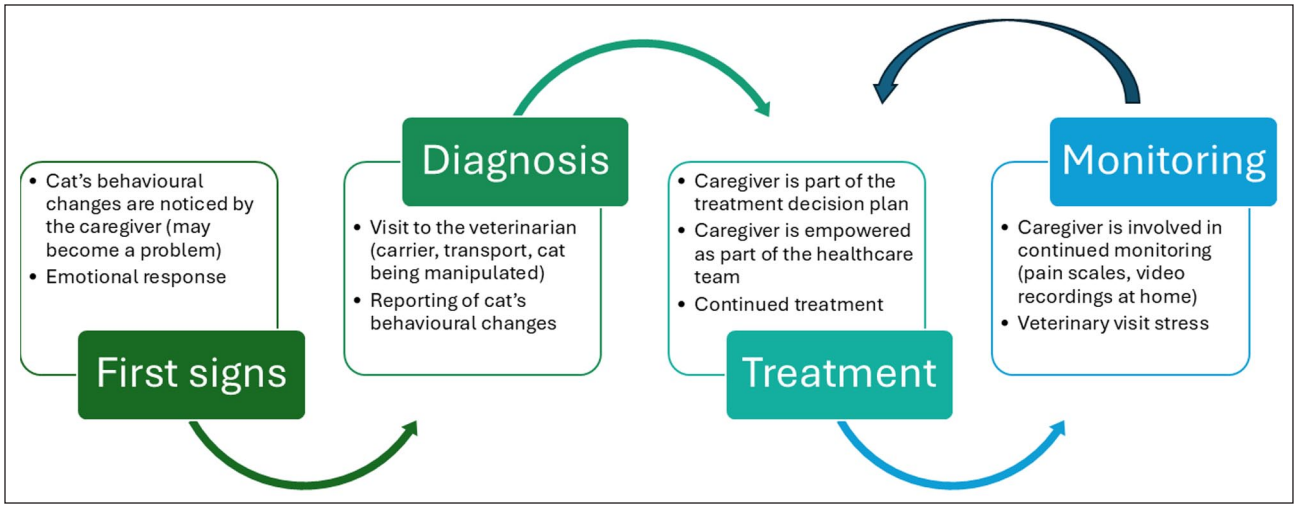


Figure 10 The journey of the caregiver of cats with chronic pain

Caregivers need to be involved in the discussion of how best to manage the chronic pain in their cat; costs, frequency of follow-up appointments, formulation and frequency of medication, adjunctive therapies, modifications to the environment and husbandry, and caregiver and cat factors should be discussed before a final care plan is agreed upon. The caregiver needs to be aware that no care plan is final and if they (or the cat) are not able to meet aspects of it or if the cat is not responding, this is normal and further adjustments will be considered.

One of the main challenges in identifying chronic pain in cats is the low rate of medicalisation in cats, as a significant proportion of cats are not seen by veterinary professionals for routine appointments and preventive healthcare. A study from 2012 showed that 52% of US caregivers had not taken their cat to their veterinarian in the previous 12 months and only 37% said they had attended a routine appointment in the same period.[61] Without cats and their caregivers regularly attending the clinic, the opportunity to diagnose conditions and raise awareness about the behavioural changes associated with common causes of chronic pain, specifically DJD/OA and dental disease, is lost.

Research has shown that focusing on the caregiver's relationship with their pet, tying preventive care into the cat's overall health and happiness, and emphasis on the personal experience with the veterinarian helps caregivers to appreciate the value of preventive health care.[62] We can extrapolate that similar strategies are likely true when discussing the holistic requirements of managing chronic pain in cats. Pain management in cats is most likely to be successful if their caregivers are both willing and able to

Table 4 Contrasting scenarios of two cats of the same sex, age and body weight, and with similar degrees of degenerative joint disease in similar joints

Factors	Cat A	Cat B
Social environment	• Caregivers are a middle-aged couple who work from home most of the time. Interactions are predictable and overall positive. The cat is petted and brushed frequently for short periods of time while being talked to in a gentle voice. • Lives with one socially bonded cat (ie, they choose to sleep together physically touching each other and are frequently seen allo-grooming). • There are no other pets in the house.	• Caregivers are a young couple with four children who frequently fight and scream. Interaction with the cat is unpredictable and changes based on the individual (how the cat is approached, talked to, petted and carried around). • There is a small dog that barks a lot and is constantly chasing the cat trying to play. • There are two other cats that are not in the same social group as cat B, which is prevented from accessing several resources as one of them is frequently guarding the staircase.
Physical environment and resources available	• Two-storey house in the countryside full of windows. • Free access to a fenced/cat-proof backyard. • A litter box with a lowered entrance is available on each floor of the house. • Fresh water is offered in water fountains on each floor of the house. • Different food options are offered three times daily using food puzzles. • There are numerous options of places to hide, rest and sunbathe, and opportunities to explore the three-dimensional space, including boxes, tents, condos, bedding, steps, hammocks etc.	• Two-storey house in a big city where a large building is being constructed beside the house. • No access to the backyard or a balcony. • Only one litter box is available for all three cats on the second floor. • Water is available in bowls but changed only every few days. • The same kibble is offered twice daily in one large bowl that has to be simultaneously shared among the cats. • There are some options of places to hide, rest, sunbathe and climb, but these are mostly on the second floor, which cat B can access only when one of the other cats is not guarding the staircase.
Past experiences	• Adopted as a kitten from a shelter where socialisation and habituation were performed during the sensitive period (between 2 and 8 weeks of age), when learning is maximised, by being presented to different people, animals, objects, odours, noises and manipulations. • No history of physical or emotional trauma.	• Recently adopted after being relinquished by the previous family. • As a kitten, no socialisation or habituation were performed. • History of being attacked by a dog, resulting in superficial lacerations and a midshaft fracture of the radius.
Cognition and physical activity	• Caregivers perform daily training and play activities that stimulate the cat physically and mentally. • Training is based on positive reinforcement. • Play is based on rotating different types of toys.	• Fear of encountering the other cats or some of the children results in cat B spending most of the time hiding and with little mental stimulation. • The same static toys are always available.

Clearly, cat A would experience fewer negative emotions related to the chronic joint pain (ie, less aversion linked to the nociceptive input). Note, however, that the personality of the cat will likely influence both the perception of pain and its impact on routine activities and quality of life. All these individual factors about the cat, its environment and the caregiver should be considered when assessing and managing long-term pain in cats

administer the medication, make the required environmental modifications and return for regular follow-up appointments.

As a feature of their natural behaviour, husbandry and slow disease progression, chronically painful conditions present differently in cats compared with dogs.[14,18,23,48] Recognition and diagnosis of chronic pain in cats lies in part with the need for their caregivers to observe and report changes in their cat's behaviour[63] and to detect changes in those same behaviours when cats are treated with analgesia.[63,64] Experience also demonstrates that when caregivers are aware their cats are in pain, they are motivated to treat them. What commonly occurs, in the view of the authors, is that the gradual decline that is

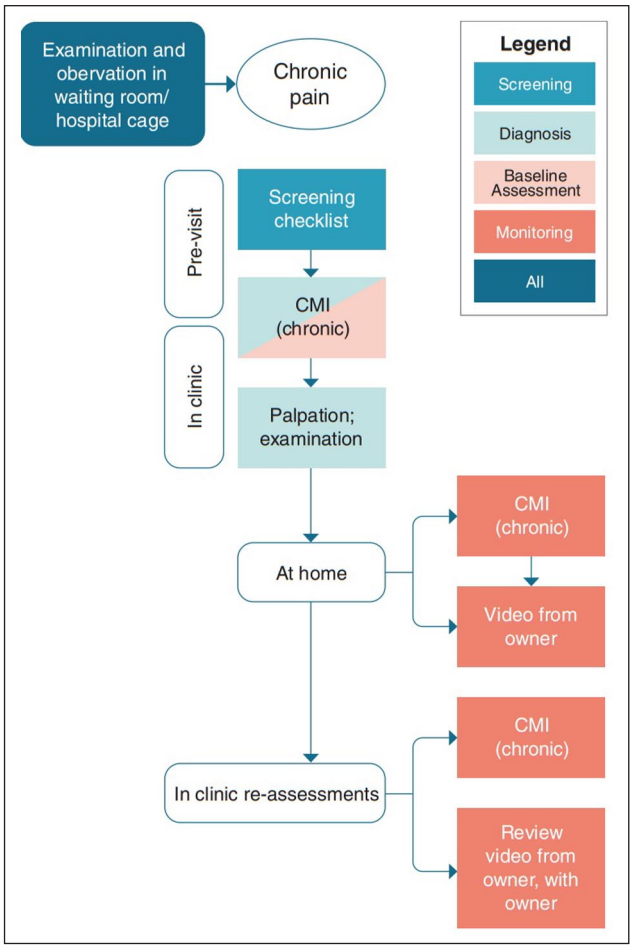


Figure 11 Flow diagram to guide the assessment of chronic pain in cats. The core elements are physical examination/ palpation and the use of pain scoring tools (Table 6). Note how the caregivers and the veterinary team have important roles to play in the initial assessment and reassessments for monitoring response to treatment. CMI = clinical metrology instrument. Adapted with permission from Gruen et al.[18] This figure has been modified from the original and the recommendations for assessment of acute pain have been removed

characteristic of many chronic pain conditions takes time to be recognised and, if treatment lapses, the caregiver's attitude can revert to an acceptance of a cat's behaviour as 'normal ageing' even as the cat's pain worsens. Short video clips of cats in their homes taken by caregivers can be instrumental in reflecting on behavioural change and communicating with veterinarians (Figure 11). Behaviours that should be captured will change for the different pain conditions but represent an important tool clinicians can use for engagement, education and monitoring.

Several tools have been developed to assist with caregiver engagement and education, although little research has been performed on their impact. There is evidence, however, that the way in which caregivers obtain healthcare information has changed,[65,66] and that engagement using animations, social media clips and AI-driven motion analysis apps may increase awareness of painful conditions in cats. Tools such as the Musculoskeletal Pain Screening Checklist (MiPSC),[7] Montreal Instrument for Cat Arthritis Testing (MI-CAT)[67] or a custom message from the clinic can be sent to caregivers before their visits or timed to coincide with dates such as International Cat Day (8 August) or Chronic Pain Awareness Month (September). Instructions and examples of how to capture short videos of their cat's behaviour in the home may be especially helpful for both caregiver and veterinarian.

Caregiver burden As part of the caregiver journey, it is also important to acknowledge the effects on the human–animal bond and caregiver burden that accompany chronic pain conditions. Often, the changes in a cat's behaviour (and 'problem behaviours' as described above) affect the bond between cats and their caregivers, and can affect the entire household. For example, when a cat with chronic pain no longer tolerates play initiation by a younger cat (or a toddler), he or she may display defensively aggressive behaviour to increase distance, especially when the cat's ability to escape by running or jumping is impaired. This can have a lasting impact on the social dynamics in the home.[68] There is also an emotional burden that comes with worry about the pain their cat is suffering, their cat's quality of life and the potential for nearing end-of-life decisions.[66] Administration of medications adds to the care burden (see later). Finally, it is impossible to ignore the financial burden that comes with the diagnosis, treatment and follow-up of chronically painful conditions.[69,70] Taking these factors together, it is critical that the veterinary team recognises and supports cat caregivers throughout this journey.

Challenges with medicating cats It is well known that administering medications to cats, particularly orally, is challenging, and can result in non-compliance, inadequate treatment of illness or management of pain, and human injury.[70,71] In a situation of chronic illness and pain, there may be additional challenges; for example, poor appetite precluding the addition of medications to treats, or pain increasing a cat's resistance to handling or restraint for medicating. For this vulnerable group of patients, the experience of forced medicating may result in pain, stress, protective emotions and avoidance of interactions with caregivers,[70,72] damaging the caregiver–cat bond and even intensifying the experience of pain.[73]

Open dialogue with caregivers, acknowledgement of the difficulties and adapting the pain-management plan

Table 5 Tips for increasing medication compliance in cats with chronic pain

- Prioritising the most important medications, including analgesics
- Researching and discussing options for different medication formulations (liquid, tablets, capsules, injections) based on individual cat and caregiver preferences
- Informing caregivers about the practicalities of giving the medication, eg, administration in food (liquid treats, pill 'putty' products), crushing tablets or opening capsules
- Demonstrating how to give the medication directly into the mouth, if necessary, without causing the cat discomfort
- For painful cats, administering analgesics initially by injection at the veterinary clinic may improve comfort and facilitate ongoing oral medication administration
- Avoiding bitter-tasting analgesic medications or those requiring a large volume to be administered
- Avoiding hiding medication in main meals as this can cause hyporexia
- Following up with caregivers after 24–48 h via their preferred communication route (telephone, text, email) to discuss challenges and alternatives if necessary

to suit the individual cat and caregiver can optimise compliance. Table 5 provides tips for increasing medication compliance in cats with chronic pain.

Environmental modifications at home The caregiver plays an important role in optimising the cat's environment at home while providing for its behavioural and emotional needs, including a safe place, multiple and separate resources, opportunities for play and predatory behaviour, positive and predictable social interactions with humans and other animals, and respect for the importance of a cat's sense of smell.[19,55,74] At home, caregivers may need to adapt the environment by offering steps or ramps using non-slip surfaces to ensure cats have access to three-dimensional space and resources such as food and water (using raised bowls), litter boxes (with at least one side lowered to facilitate entry and exit), scratching substrates (including different options such as horizontal or vertical) and preferred resting areas (with comfortable and warm bedding) (Figure 12).



Figure 12 Examples of environmental modifications for cats with chronic pain from osteoarthritis. The cat in the hammock by the window is a 20-year-old male cat that can no longer jump to elevated surfaces. He is able to access this perching area and enjoy the morning sun by using the window frame as a step. The cat in the cat condo is a 15-year-old female cat with minor mobility impairment that can climb to the highest perching areas. These strategies provide cats with opportunities to exercise, access safe places and have rewarding experiences. *Courtesy of Beatriz Monteiro*

The veterinary team

Identifying and diagnosing chronic pain The recognition and diagnosis of chronic pain by the veterinary team starts with either the diagnosis of a condition that is known to be painful (Table 2), the identification of persistent postoperative pain or from the presentation of a cat with clinical signs (including changes in behaviour) that raise the suspicion that chronic pain may be an underlying cause (Figure 11). The observed behavioural change associated with chronic pain is dependent on the location and type of chronic pain being experienced (Figures 13 and 14). Decreased activity levels, decreased ability to perform activities, changes in appetite, changes in toileting habits, unkempt coat and nails, alopecia, skin rippling, decreased socialisation, general loss of interest and sudden episodes of vocalisation or agitation are the common changes associated with chronic pain.[14,18,20,63,75] Veterinary team members must be aware of these changes to enable further investigation to be performed in a timely manner if a cat presents with them.

The veterinarian will assess the sensory and emotional components of chronic pain with clinical examination (manipulation or palpation) and using clinical metrology instruments (scales to measure pain or quality of life). They may additionally observe pathology that is likely to cause pain, such as dental disease or other inflammation.[14] These are essentially subjective measures and will depend on the force used and the veterinarian's interpretation of the response. Imaging can also be used in some conditions to help support the diagnosis, but findings may not correlate with the level of pain the cat experiences. The veterinary team should be aware that stress-induced analgesia



Figure 13 A cat exhibiting poor coat and demeanour secondary to dental pain. *Courtesy of Feline Healthy Ageing Clinic, University of Liverpool*



Figure 14 A cat displaying an awkward position while sitting secondary to hip pain. *Courtesy of Feline Healthy Ageing Clinic, University of Liverpool*

can occur in the clinic environment. The stress associated with being transported to and visiting a veterinary clinic can affect how pain is perceived. Protective emotions such as fear typically amplify the pain experience.[76] However, in cases of extreme stress, pain or fear, stress-induced analgesia can occur, reducing the pain experience. This survival mechanism allows, for example, an animal with a broken bone to escape a life-threatening situation by temporarily reducing the pain.[77] Once the animal reaches safety, the pain returns. In practice, pain might be underestimated in patients experiencing high levels of stress, including stress caused by the visit to a veterinary clinic.[19]

The whole veterinary team should be trained on how to use validated pain scoring tools for the assessment of pain and monitoring treatment efficacy. However, there is currently no validated scale for assessing feline chronic pain apart from pain linked to DJD (Table 6). Scales that evaluate quality of life assume it is impacted by chronic pain, but these measures are not synonymous with direct pain assessment. They should also recognise that the adaptive component of the cat's behaviour as the result of chronic pain may not respond rapidly to analgesia; time may be required for the cat to relearn what behaviours it can perform without pain. Finally, the entire team should be trained in cat-friendly environment and interactions (Box 1, Figures 15–18).

Managing chronic pain Management of chronic pain in cats is understudied except for DJD. Multimodal approaches should be implemented using pharmacological and non-pharmacological therapies (Figures 19–22), and include consideration of other aspects of chronic pain (eg, nausea, stress, gastrointestinal dysmotility and mental wellbeing) in a comprehensive pain management plan that engages the caregiver.[14] Details of dosages and considerations for prescribing various analgesics are available elsewhere.[14,18,19]

Communication skills Communicating to caregivers that their cat is in pain, and why, can be challenging and requires time and a sensitive approach. Effective communication can result in a better understanding of the patient's welfare and improve the relationship between the caregiver and the veterinary clinic.[90,91] Approaches such as signposting, 'chunk and check' and reflective listening (Table 7) bring emotional preparation, build trust, provide clarity and encourage shared decision-making, which improves the caregiver's experience.[92] Discussing chronic pain with caregivers can be a challenge, particularly in cats, as changes in behaviour relating to pain can be very subtle. A large part of communicating with caregivers surrounding chronic pain entails education to help them understand their pet's condition, using non-technical language.

Effective communication requires recognising the emotional challenges that caregivers face while caring for a cat with chronic pain. Caregivers often experience complex emotions such as anger, guilt and despair, which

Table 6 Tools used for screening and assessing chronic pain and quality of life in cats*

Tool	Type	Condition	Comments	Main references
Feline Musculoskeletal Pain Screening Checklist (Feline MiPSC)†	Screening	DJD/OA	A simple checklist of six items asking if a specific activity can be performed normally or not. Thus, caregivers respond 'yes' or 'no' to each item. If any of the items is scored as 'no' (ie, the activity is not normal), this should prompt further evaluation. Available at: https://cvm.ncsu.edu/research/labs/clinical-sciences/comparative-pain-research/clinical-metrology-instruments/ See also: https://www.zoetispetcare.com/checklist/osteoarthritis-checklist-cat	Enomoto et al[7]
Feline Musculoskeletal Pain Index (FMPI)†	CMI	DJD/OA	The most widely studied of the 'off-the-shelf' CMIs (has been evaluated for construct validity, internal consistency, reliability and discriminant ability). An updated version, the FMPI-Short Form, contains nine items/activities that are assessed on a Likert scale from 'normal' to 'not at all'. Items are related to mobility and ability to perform daily activities. Available at: https://cvm.ncsu.edu/research/labs/clinical-sciences/comparative-pain-research/clinical-metrology-instruments/	Enomoto et al,[78] Benito et al[79,80] and Stadig et al[81]
Client Specific Outcome Measure (CSOM)†	CMI	DJD/OA	Has been widely used but is not an 'off-the-shelf' questionnaire. Rather, it is constructed for each individual case, to include a number of activities that are particular to each cat and home environment. These activities are decided upon with the caregivers and monitored over time. Available at: https://cvm.ncsu.edu/research/labs/clinical-sciences/comparative-pain-research/clinical-metrology-instruments/	Stadig et al[81] and Lascelles et al[82]
Montreal Instrument for Cat Arthritis Testing for use by caretakers (MICAT(C))	CMI	DJD/OA	Preliminary validation has been performed. Includes items pertaining to agility, social, play and exploratory behaviours, self-maintenance and physical conditioning. Available as a supplementary file with the original article.	Klinck et al[83]
Feline Physical Function Formula (FPFF)	CMI	DJD/OA	Preliminary validation has been performed. Includes evaluation of four domains (general activity, mobility, temperament and grooming). Not available for download. The items are described in the article.	Stadig et al[81]
Cat Health and Wellbeing (CHEW)	HRQoL	Any	Preliminary validation has been performed. Contains 33 items divided into eight domains (mobility, emotion, energy, engagement, eyes, coat, appetite, fitness). Available as supplementary material with the original article.	Freeman et al[84]
Feline QoL measure	HRQoL	Any	Preliminary validation has been performed. Contains 16 items divided into two domains (healthy behaviours and clinical signs). Not available for download. The items are described in the article.	Tatlock et al[85]
VetMetrica HRQoL for cats	HRQoL	Any	Preliminary validation has been performed. Contains 20 items divided into three domains (vitality, comfort and emotional wellbeing). Available as a web-based instrument via paid subscription (https://www.newmetrica.com/vetmetrica-hrql/). The 20 items of the questionnaire are listed in the original article.	Scott et al[86]

Reproduced with permission from Monteiro et al[14]
*All instruments are meant to be completed by caregivers
†Recommended for use in clinic because of a higher degree of scientific evidence
CMI = clinical metrology instrument; DJD = degenerative joint disease; HRQoL = health-related quality of life; OA = osteoarthritis

Box 1 Cat-friendly environment and interactions

Consistent, cat-friendly interactions can help minimise stress during veterinary visits and reduce the anxiety a cat may experience in anticipation of future visits.[55] Creating a cat-friendly environment can be achieved by considering the unique needs of cats at every level. Following the AAFP/ISFM cat friendly veterinary interaction guidelines[55] and the ISFM/AAFP cat friendly veterinary environment guidelines[49] can help to provide a framework ensuring these needs are met. Clinics can also receive the International Cat Care Cat Friendly Clinic (https://icatcare.org/cat-friendly-clinic) or Feline Veterinary Medical Association Cat Friendly Practice (https://catvets.com/cat-friendly/cfp/) accreditation, which demonstrates a commitment to meeting both the cat's and the caregiver's needs (Figures 14–17).

Reducing stress and anxiety not only improves the welfare of the cat, but also enhances diagnostic accuracy and treatment outcomes.[87] A clinic that respects the specific needs of cats and their caregivers creates a stronger bond with clients, leading to increased compliance.[52] This bond also benefits the clinic financially, as caregivers are more likely to engage and invest in a clinic that has their cat's wellbeing as a priority. In addition, using cat-friendly handling techniques results in fewer injuries to staff and improved job satisfaction.[88,89]

Tips for a cat-friendly environment and interactions when dealing with cats with chronic pain:

- Cats with known chronic pain could receive analgesia before appointments
- Blood sampling: jugular blood sampling – limit pressure around the mouth due to dental pain, limit stretching of the neck, keep joints as neutral as possible (Figure 18)
- Intravenous catheter placement and management: keep joints as neutral as possible, eg, for the cephalic vein, limit extension of the elbow, place an extension tube to limit the need to handle the limbs
- Physical examination should be performed slowly and carefully to avoid causing pain (eg, when palpating the abdomen)
- Consider additional postoperative analgesia, eg, if manipulating joints for imaging
- Use padding where possible when under sedation or anaesthesia
- Keep the hospital ward warm or provide safe warming devices in hospital cage
- Ensure plenty of soft, non-slip bedding in hospital cage
- Use a low-sided litter tray/box with softer substrate
- Raise food and water bowls
- Provide lower perching opportunities in cages that cats with mobility limitations can access
- Allow long-stay patients time out of the ward to keep joints mobile and maintain muscle mass
- Time monitoring/procedures for after analgesia has been administered



Figure 15 A cat and his caregiver positively interacting during a consultation. The cat is provided with an elevated surface with comfortable bedding to rest while the caregiver discusses with the veterinary team. *Courtesy of Samantha Taylor*



Figure 16 A cat-only ward provides a calm environment for both cats and staff. Covers are used to provide privacy for fearful cats. *Courtesy of Samantha Taylor*

are evident in various forms of grief.[93] Acknowledging and adapting conversations to address these emotions is essential.[94]

Telemedicine Caregivers recognise the benefits of telemedicine,[95,96] especially with regard to reducing the stress they and their cat experience in attending the veterinary clinic.[95,97] The value of telemedicine to help with behavioural concerns[95] and follow-up appointments[96] has also been recognised. Telemedicine is well placed to assist in the ongoing management of chronic pain cases to ensure that



Figure 17 (a) Despite a limited space, clinics can offer multiple resources and resting areas within cats' cages. (b) In this example, a reusable box provides a hiding area for safe space as well the opportunity for perching. *Courtesy of Samantha Taylor*

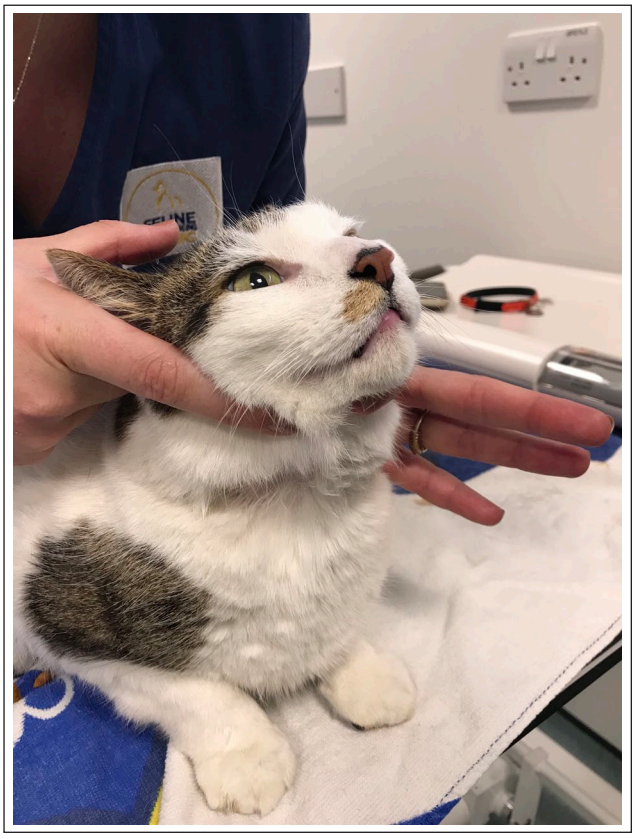


Figure 18 Example of gentle positioning and head tilt for blood sampling. *Courtesy of Feline Healthy Ageing Clinic, University of Liverpool*

medication is being given appropriately,[70] facilitate adjustments to the cat's environment and care to ensure their needs are still being met,[20,49] and to continue to monitor the response to the management plan via repeat use of validated pain scoring tools.[98] Although telemedicine use increased in 2020 during the early COVID-19 pandemic,[97] its overall uptake remains low[95,96] despite willingness on the part of caregivers to pay for this service.[95,96,99] Application of telemedicine should become an important part of the management plan of all feline chronic pain cases.[98]

Hospice and palliative care Hospice and palliative care are critical components of end-of-life care.[100] Hospice care is provided when patients are diagnosed with a life-limiting illness, and the plan changes from curing a condition to caring for their comfort and quality of life. Palliative care is provided when patients have incurable or curable diseases, to ensure relief from clinical signs.[74]

The strengthening of the human–animal bond has driven the evolution of palliative care in veterinary medicine. As pets are increasingly viewed as family members, there is a heightened demand for veterinary professionals to educate caregivers on areas such as quality of life and comfort.[101] The earlier in the disease process these conversations occur, the better. Not only does this prepare the caregiver for future treatment and management, but it also obtains a baseline of the cat's current quality of life, enabling more successful treatment monitoring.

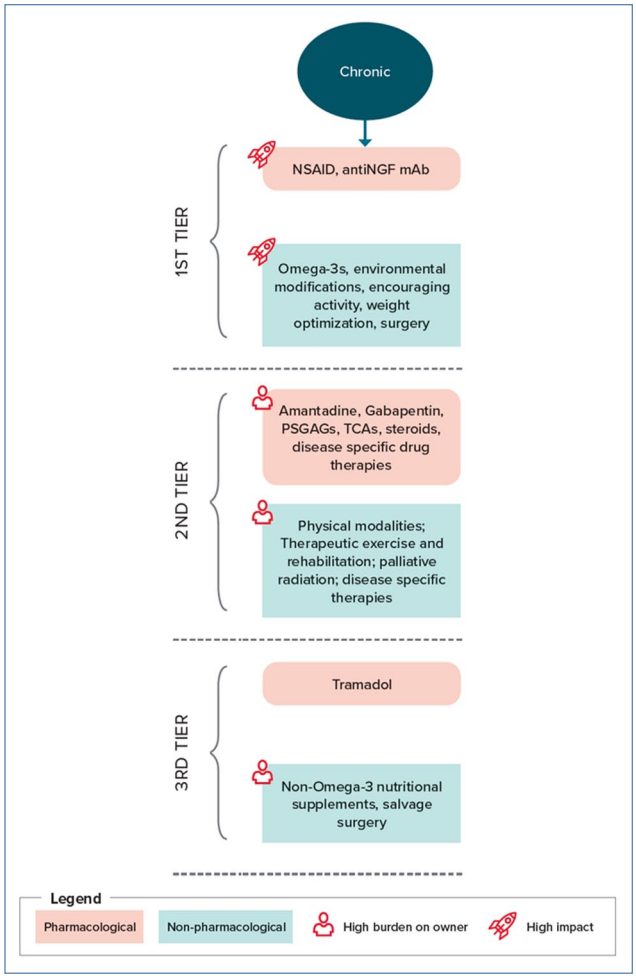


Figure 19 Decision tree for prioritising pain management therapies. This figure outlines a tiered approach to chronic pain management in cats. Tiers are presented from highest recommendation (most evidence for effectiveness) to lowest, although all therapies presented have some evidence to support their use. Physical modalities include laser therapy, pulsed electromagnetic field therapy, acupuncture and transcutaneous electrical nerve stimulation. Surgical procedures for chronic pain include top-tier treatments, such as dental procedures, removal of painful lesions, joint stabilisation and replacement, and amputation, and lower-tier (salvage) procedures, including arthrodesis, denervation and excision arthroplasty. AntiNGF mAb = anti-nerve growth factor monoclonal antibody; NSAID = non-steroidal anti-inflammatory drug; PSGAGs = polysulfated glycosaminoglycans; TCAs = tricyclic antidepressants. Adapted with permission from Gruen et al.[18] This figure has been modified from the original and the recommendations related to acute pain in cats and acute and chronic pain in dogs have been removed

Using validated health-related quality of life or pain scoring tools, such as the Feline Musculoskeletal Pain Index (FMPI),[78,79] the Cat HEalth and Wellbeing (CHEW) questionnaire[84] or the online VetMetrica tool,[86,102] not only monitors the patient, but can also help to educate



Figure 20 A cat being given a tablet in a soft tasty treat. *Courtesy of Laura Watson, iCatCare*

the caregiver. Completing these questionnaires regularly, relying on observations made by the caregiver, allows them to visually understand their cat's needs emotionally as well as physically.

Caregivers experience an emotional burden during hospice and palliative care for their cat, and the veterinary team's role in this is to ensure the right resources are provided and reassurance is given to the owner. When the cat's quality of life begins to deteriorate, caregivers can experience anticipatory grief, which is where the caregiver begins emotionally preparing for the loss of their pet.[93]

End-of-life decisions Although the end of a patient's life is inevitable, careful planning and thoughtful decision-making can ensure that the process is as peaceful and pain-free as possible for the patient and the caregiver. Assisting the caregiver to reach this decision can be difficult and requires a balance between the cat's physical comfort and the caregiver's emotional readiness to let go.

The caregiver's assessment of their cat's health often differs in comparison to the veterinary professional's assessment;[86,101] therefore, using quality-of-life scoring tools can support the caregiver when making the



Figure 21 A 16-year-old cat with osteoarthritis after receiving a subcutaneous injection of monoclonal antibody anti-nerve growth factor. The opening on the top of the carrier makes it easy for the veterinarian administering the injection and less stressful for the cat, which is brought to the clinic monthly for the treatment. The carrier is always accessible to the cat at home and is impregnated with the cat's own pheromones from previous occupancy, helping to reduce stress during transport and veterinary visits. *Courtesy of Beatriz Monteiro*



Figure 22 A cat undergoing acupuncture treatment for chronic pain. *Courtesy of Samantha Taylor*

end-of-life decision. As discussed above, feelings of anticipatory grief can overwhelm the caregiver's decision-making ability. This type of grief can bring a high caregiver burden, bringing feelings of anxiety, dread and guilt. Informing caregivers that these feelings are normal, listening to their concerns, and addressing them with empathy and sensitivity can help them feel supported.[93] Ensuring they are well informed and involved in the end-of-life decision-making process can reduce negative emotions associated with grief.[103]

The experience of the caregiver during the euthanasia process can also impact on grief, especially in relation to the care and empathy offered at the time and the way the animal is handled.[104] Therefore, the euthanasia process itself should be carefully considered and individual to the patient and the caregiver, whether this occurs at home or in the clinic.

Caregivers can be provided with support by the veterinary team after the euthanasia, whether this is through follow-up communication or providing resources that are freely available. By providing this support, the team can prevent the caregiver from feeling isolated or experiencing disenfranchised grief, where they feel their grief is not acknowledged by society.[105]

Conclusions

The journey of cats with chronic pain and their caregivers is influenced by numerous factors, including the clinical condition of the cat and the caregiver's response to different burdens, but mostly by the care they receive from the clinic and veterinary teams involved in the process, through several opportunities for interactions between all these stakeholders. Chronic pain is likely to affect many cats with increasing incidence as they age. Management of these patients is focused on maintaining their quality of life while empowering caregivers to be part of the healthcare team. Empathetic communication is paramount and helps to optimise the cat's care while supporting caregivers on the journey from initial assessment until, for most cases, end-of-life decisions.

Table 7 Tips and techniques for effective communication with caregivers of cats with chronic pain. Based on previous publications[90–92]

Technique	Description
Signposting	Provides clues (verbal or visual) as to where the conversation currently is and where it might be heading.
Chunk and check	Provides the caregiver with a 'chunk' of information and 'checks' the understanding of what they have just been told.
Reflective listening	Provides a summary of what has been said back to the caregiver to reassure the caregiver that they are being listened to. This technique involves simply summarising what the caregiver said, using their own words. This reinforces their own expressions of problems, recognises their concerns, complaints and values, and reveals potential misunderstandings of their concerns. Reflective listening is considered as the first step for unconditional positive regard (ie, caring for them and their pet).[91]

Conflict of interest Beatriz Monteiro works as a full-time employee at Zoetis. The remaining authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding The authors received no financial support for the research, authorship, and/or publication of this article.

Ethical approval This work did not involve the use of animals and therefore ethical approval was not specifically required for publication in *JFMS*.

Informed consent This work did not involve the use of animals (including cadavers) and therefore informed consent was not required. No animals or people are identifiable within this publication, and therefore additional informed consent for publication was not required.

ORCID iD Beatriz P Monteiro https://orcid.org/0000-0002-5722-5687
Samantha Taylor https://orcid.org/0000-0002-8668-0777
Margaret Gruen https://orcid.org/0000-0002-6036-8849

References

1 Egenvall A, Nødtvedt A, Häggström J, et al. **Mortality of life-insured Swedish cats during 1999-2006: age, breed, sex, and diagnosis.** *J Vet Intern Med* 2009; 23: 1175–1183.
2 O'Neill D, Church D, McGreevy P, et al. **Prevalence of disorders recorded in cats attending primary-care veterinary practices in England.** *Vet J* 2014; 202: 286–291.
3 O'Neill DG, Church DB, McGreevy PD, et al. **Longevity and mortality of cats attending primary care veterinary practices in England.** *J Feline Med Surg* 2015; 17: 125–133.
4 Ray M, Carney HC, Boynton B, et al. **2021 AAFP feline senior care guidelines.** *J Feline Med Surg* 2021; 23: 613–638.
5 Nam Y, White M, Karlsson EK, et al. **Dog size and patterns of disease history across the canine age spectrum: results from the Dog Aging Project.** *PLoS One* 2024; 19. DOI: 10.1371/journal.pone.0295840.
6 Page G and Sadiwskyj L. **Valuing veterinary receptionists: setting the practice 'tone'.** *In Pract* 2021; 43: 536–539.
7 Enomoto M, Lascelles BDX and Gruen ME. **Development of a checklist for the detection of degenerative joint disease-associated pain in cats.** *J Feline Med Surg* 2020; 22: 1137–1147.
8 Robinson N, Brennan M, Cobb M, et al. **Investigating preventive-medicine consultations in first-opinion small-animal practice in the United Kingdom using direct observation.** *Prev Vet Med* 2016; 124: 69–77.
9 Belshaw Z, Robinson NJ, Dean RS, et al. **Owner and veterinary surgeon perspectives on the roles of veterinary nurses and receptionists in relation to small animal preventive healthcare consultations in the United Kingdom.** *Vet Rec* 2018; 183. DOI: 10.1136/vr.104773.
10 Kinnison T, May SA and Guile D. **Inter-professional practice: from veterinarian to the veterinary team.** *J Vet Med Educ* 2014; 41: 172–178.
11 Englar RE. **Recasting the gold standard – part II of II: communicating healthcare options along a continuum of care.** *J Feline Med Surg* 2023; 25. DOI: 10.1177/1098612X231215639.
12 Jacobson L and Englar R. **Breaking down the barriers to accessible veterinary care.** *J Feline Med Surg* 2024; 26. DOI: 10.1177/1098612X241283532.
13 Warman SM, Armitage-Chan E, Banse H, et al. **Preparing veterinarians to practice across the spectrum of care: an integrated educational approach.** *Adv Small Anim Care* 2023; 4: 171–183.
14 Monteiro B, Lascelles B, Murrell J, et al. **2022 WSAVA guidelines for the recognition, assessment and treatment of pain.** *J Small Anim Pract* 2023; 64: 177–254.
15 Adrian D, Papich M, Baynes R, et al. **Chronic maladaptive pain in cats: a review of current and future drug treatment options.** *Vet J* 2017; 230: 52–61.
16 Rusbridge C. **Neuropathic pain in cats: mechanisms and multimodal management.** *J Feline Med Surg* 2024; 26. DOI: 10.1177/1098612X241246518.
17 Epstein ME. **Feline neuropathic pain.** *Vet Clin North Am Small Anim Pract* 2020; 50: 789–809.
18 Gruen ME, Lascelles BDX, Colleran E, et al. **2022 AAHA pain management guidelines for dogs and cats.** *J Am Anim Hosp Assoc* 2022; 58: 55–76.
19 Taylor S, Gruen M, KuKanich K, et al. **2024 ISFM and AAFP consensus guidelines on the long-term use of NSAIDs in cats.** *J Feline Med Surg* 2024; 26. DOI: 10.1177/1098612X241241951.

20 Dowgray N and Comerford E. **Feline musculoskeletal ageing: how are we diagnosing and treating musculoskeletal impairment?** *J Feline Med Surg* 2020; 22: 1069–1083.
21 Monteiro BP. **Feline chronic pain and osteoarthritis.** *Vet Clin North Am Small Anim Pract* 2020; 50: 769–788.
22 Adrian D, King JN, Parrish RS, et al. **Robenacoxib shows efficacy for the treatment of chronic degenerative joint disease-associated pain in cats: a randomized and blinded pilot clinical trial.** *Sci Rep* 2021; 11. DOI: 10.1038/s41598-021-87023-2.
23 Bennett D and Morton C. **A study of owner observed behavioural and lifestyle changes in cats with musculoskeletal disease before and after analgesic therapy.** *J Feline Med Surg* 2009; 11: 997–1004.
24 Gruen ME, Myers JAE and Lascelles BDX. **Efficacy and safety of an anti-nerve growth factor antibody (Frunevetmab) for the treatment of degenerative joint disease-associated chronic pain in cats: a multisite pilot field study.** *Front Vet Sci* 2021; 8. DOI: 10.3389/fvets.2021.610028.
25 Watanabe R, Doodnaught G, Proulx C, et al. **A multidisciplinary study of pain in cats undergoing dental extractions: a prospective, blinded, clinical trial.** *PLoS One* 2019; 14. DOI: 10.1371/journal.pone.0213195.
26 Palmeira I, Fonseca MJ, Lafont-Lecuelle C, et al. **Dental pain in cats: a prospective 6-month study.** *J Vet Dent* 2022; 39: 369–375.
27 Watanabe R, Frank D and Steagall PV. **Pain behaviors before and after treatment of oral disease in cats using video assessment: a prospective, blinded, randomized clinical trial.** *BMC Vet Res* 2020; 16. DOI: 10.1186/s12917-020-02302-w.
28 Cave N, Bridges J and Thomas D. **Systemic effects of periodontal disease in cats.** *Vet Q* 2012; 32: 131–144.
29 Watanabe R, Doodnaught GM, Evangelista MC, et al. **Inter-rater reliability of the Feline Grimace Scale in cats undergoing dental extractions.** *Front Vet Sci* 2020; 7. DOI: 10.3389/fvets.2020.00302.
30 Hayes A, Scase T, Miller J, et al. **COX-1 and COX-2 expression in feline oral squamous cell carcinoma.** *J Comp Pathol* 2006; 135: 93–99.
31 Williams K and MacDonald-Dickinson V. **Progress in palliation: managing pain caused by cancer in veterinary medicine.** *Can Vet J* 2023; 64: 789–791.
32 He J, Pham TL and Bazan HEP. **Mapping the entire nerve architecture of the cat cornea.** *Vet Ophthalmol* 2019; 22: 345–352.
33 Noli C, Borio S, Varina A, et al. **Development and validation of a questionnaire to evaluate the Quality of Life of cats with skin disease and their owners, and its use in 185 cats with skin disease.** *Vet Dermatol* 2016; 27: 247–e258.
34 Costigan M, Scholz J and Woolf CJ. **Neuropathic pain: a maladaptive response of the nervous system to damage.** *Annu Rev Neurosci* 2009; 32: 1–32.
35 Hardie EM, Roe SC and Martin FR. **Radiographic evidence of degenerative joint disease in geriatric cats: 100 cases (1994–1997).** *J Am Vet Med Assoc* 2002; 220: 628–632.
36 Clarke S, Mellor D, Clements D, et al. **Prevalence of radiographic signs of degenerative joint disease in a hospital population of cats.** *Vet Rec* 2005; 157: 793–799.
37 Godfrey D. **Osteoarthritis in cats: a retrospective radiological study.** *J Small Anim Pract* 2005; 46: 425–429.
38 Lascelles BDX, Henry JB, III, Brown J, et al. **Cross-sectional study of the prevalence of radiographic degenerative joint disease in domesticated cats.** *Vet Surg* 2010; 39: 535–544.
39 Slingerland L, Hazewinkel H, Meij B, et al. **Cross-sectional study of the prevalence and clinical features of osteoarthritis in 100 cats.** *Vet J* 2011; 187: 304–309.
40 Mills DS, Demontigny-Bédard I, Gruen M, et al. **Pain and problem behavior in cats and dogs.** *Animals (Basel)* 2020; 10. DOI: 10.3390/ani10020318.
41 Ryan S, Bacon H, Endenburg N, et al. **WSAVA animal welfare guidelines.** *J Small Anim Pract* 2019; 60: E1–E46.
42 Dawkins M. **A user's guide to animal welfare science.** *Trends Ecol Evol* 2006; 21: 77–82.
43 Mellor DJ, Beausoleil NJ, Littlewood KE, et al. **The 2020 five domains model: including human-animal interactions in assessments of animal welfare.** *Animals (Basel)* 2020; 10. DOI: 10.3390/ani10101870.
44 Keeling LJ, Rushen J and Duncan IJH. **Understanding animal welfare**. In: Appleby MC, Olsson AS and Galindo F (eds). Animal welfare. 3rd ed. Wallington, Oxfordshire: CAB International, 2018, pp 16–35.
45 Kipperman B and Rollin BE. Ethics in veterinary practice: balancing conflicting interests. Hoboken, NJ: John Wiley & Sons, 2022.
46 AVMA. **Principles of veterinary medical ethics of the AVMA.** https://www.avma.org/resources-tools/avma-policies/principles-veterinary-medical-ethics-avma (2019, accessed 30 December 2024).
47 RCVS. *Code of Professional Conduct for Veterinary Surgeons.* https://www.rcvs.org.uk/setting-standards/advice-and-guidance/code-of-professional-conduct-for-veterinary-surgeons/?&&type=rfst&set=true#animals (accessed 16 September 2025).
48 Lascelles BDX, Brown DC, Conzemius MG, et al. **Measurement of chronic pain in companion animals: discussions from the Pain in Animals Workshop (PAW) 2017.** *Vet J* 2019; 250: 71–78.
49 Taylor S, St Denis K, Collins S, et al. **2022 ISFM/AAFP cat friendly veterinary environment guidelines.** *J Feline Med Surg* 2022; 24: 1133–1163.
50 Riemer S, Heritier C, Windschnurer I, et al. **A review on mitigating fear and aggression in dogs and cats in a veterinary setting.** *Animals (Basel)* 2021; 11. DOI: 10.3390/ani11010158.
51 Mariti C, Bowen JE, Campa S, et al. **Guardians' perceptions of cats' welfare and behavior regarding visiting veterinary clinics.** *J Appl Anim Welf Sci* 2016; 19: 375–384.
52 Choo EK, Feldstein Ewing SW and Lovejoy TI. **Opioids out, cannabis in: negotiating the unknowns in patient care for chronic pain.** *JAMA* 2016; 316: 1763–1764.
53 Dawson L, Dewey C, Stone E, et al. **A survey of animal welfare experts and practicing veterinarians to identify and explore key factors thought to influence canine and feline welfare in relation to veterinary care.** *Anim Welf* 2016; 25: 125–134.
54 Amat M, Camps T and Manteca X. **Stress in owned cats: behavioural changes and welfare implications.** *J Feline Med Surg* 2016; 18: 577–586.

55 Rodan I, Dowgray N, Carney HC, et al. **2022 AAFP/ISFM cat friendly veterinary interaction guidelines: approach and handling techniques.** *J Feline Med Surg* 2022; 24: 1093–1132.
56 Behera NS and Bunzli S. **Towards a communication framework for empowerment in osteoarthritis care.** *Clin Geriatr Med* 2022; 38: 323–343.
57 Hiestand KM. **The autonomy principle in companion veterinary medicine: a critique.** *Front Vet Sci* 2022; 9. DOI: 10.3389/fvets.2022.953925.
58 Skipper A, Gray C, Serlin R, et al. **'Gold standard care' is an unhelpful term.** *Vet Rec* 2021; 189. DOI: 10.1002/vetr.1113.
59 Skipper A, O'Neill D, Serlin R, et al. **Contextualised care: faddish or foundational?** *Vet Rec* 2024; 195. DOI: 10.1002/vetr.4567.
60 Paz BF, Ferreira M, Martins KR, et al. **Practical principles of palliative care in veterinary oncology: alleviating the suffering of the animal, owner, and veterinarian.** *Vet Med Int* 2024; 2024. DOI: 10.1155/2024/5565837.
61 Volk JO, Thomas JG, Colleran EJ, et al. **Executive summary of phase 3 of the Bayer veterinary care usage study.** *J Am Vet Med Assoc* 2014; 244: 799–802.
62 McKay CH, Nichols N and Lefebvre SL. **Effectiveness of various language strategies for helping pet owners appreciate the value of preventive care.** *J Am Vet Med Assoc* 2023; 261: 1–8.
63 Klinck MP, Frank D, Guillot M, et al. **Owner-perceived signs and veterinary diagnosis in 50 cases of feline osteoarthritis.** *Can Vet J* 2012; 53: 1181–1186.
64 Gruen ME, Griffith EH, Thomson AE, et al. **Criterion validation testing of clinical metrology instruments for measuring degenerative joint disease associated mobility impairment in cats.** *PLoS One* 2015; 10. DOI: 10.1371/journal.pone.0131839.
65 Kogan LR, Little S and Oxley J. **Dog and cat owners' use of online Facebook groups for pet health information.** *Health Info Libr J* 2021; 38: 203–223.
66 Park RM, Royal KD and Gruen ME. **A literature review: pet bereavement and coping mechanisms.** *J Appl Anim Welf Sci* 2023; 26: 285–299.
67 Klinck MP, Monteiro BP, Lussier B, et al. **Refinement of the Montreal Instrument for Cat Arthritis Testing, for Use by Veterinarians: detection of naturally occurring osteoarthritis in laboratory cats.** *J Feline Med Surg* 2018; 20: 728–740.
68 Rodan I, Ramos D, Carney H, et al. **2024 AAFP intercat tension guidelines: recognition, prevention and management.** *J Feline Med Surg* 2024; 26. DOI: 10.1177/1098612X241263465.
69 Odom TF, Riley CB, Benschop J, et al. **Medication compliance by cat owners prescribed treatment for home administration.** *J Vet Intern Med* 2025; 39. DOI: 10.1111/jvim.17298.
70 Taylor S, Caney S, Bessant C, et al. **Online survey of owners' experiences of medicating their cats at home.** *J Feline Med Surg* 2022; 24: 1283–1293.
71 Sivén M, Savolainen S, Räntilä S, et al. **Difficulties in administration of oral medication formulations to pet cats: an e-survey of cat owners.** *Vet Rec* 2017; 180. DOI: 10.1136/vr.103991.
72 Traas AM, Fleck T, Ellings A, et al. **Ease of oral administration and owner-perceived acceptability of triglyceride oil, dissolving thin film strip, and gelatin capsule formulations to healthy cats.** *Am J Vet Res* 2010; 71: 610–614.
73 Wiech K and Tracey I. **The influence of negative emotions on pain: behavioral effects and neural mechanisms.** *Neuroimage* 2009; 47: 987–994.
74 Eigner DR, Breitreiter K, Carmack T, et al. **2023 AAFP/IAAHPC feline hospice and palliative care guidelines.** *J Feline Med Surg* 2023; 25. DOI: 10.1177/1098612X231201683.
75 Monteiro BP and Steagall PV. **Chronic pain in cats: recent advances in clinical assessment.** *J Feline Med Surg* 2019; 21: 601–614.
76 Bushnell MC, Ceko M and Low LA. **Cognitive and emotional control of pain and its disruption in chronic pain.** *Nat Rev Neurosci* 2013; 14: 502–511.
77 Butler RK and Finn DP. **Stress-induced analgesia.** *Prog Neurobiol* 2009; 88: 184–202.
78 Enomoto M, Lascelles BDX, Robertson JB, et al. **Refinement of the Feline Musculoskeletal Pain Index (FMPI) and development of the short-form FMPI.** *J Feline Med Surg* 2022; 24: 142–151.
79 Benito J, Depuy V, Hardie E, et al. **Reliability and discriminatory testing of a client-based metrology instrument, feline musculoskeletal pain index (FMPI) for the evaluation of degenerative joint disease-associated pain in cats.** *Vet J* 2013; 196: 368–373.
80 Benito J, Hansen B, Depuy V, et al. **Feline musculoskeletal pain index: responsiveness and testing of criterion validity.** *J Vet Intern Med* 2013; 27: 474–482.
81 Stadig S, Lascelles BDX, Nyman G, et al. **Evaluation and comparison of pain questionnaires for clinical screening of osteoarthritis in cats.** *Vet Rec* 2019; 185. DOI: 10.1136/vr.105115.
82 Lascelles BD, Hansen BD, Roe S, et al. **Evaluation of client-specific outcome measures and activity monitoring to measure pain relief in cats with osteoarthritis.** *J Vet Intern Med* 2007; 21: 410–416.
83 Klinck MP, Gruen ME, del Castillo JR, et al. **Development and preliminary validity and reliability of the montreal instrument for cat arthritis testing, for use by caretaker/owner, MI-CAT (C), via a randomised clinical trial.** *Appl Anim Behav Sci* 2018; 200: 96–105.
84 Freeman LM, Rodenberg C, Narayanan A, et al. **Development and initial validation of the Cat HEalth and Well-being (CHEW) Questionnaire: a generic health-related quality of life instrument for cats.** *J Feline Med Surg* 2016; 18: 689–701.
85 Tatlock S, Gober M, Williamson N, et al. **Development and preliminary psychometric evaluation of an owner-completed measure of feline quality of life.** *Vet J* 2017; 228: 22–32.
86 Scott EM, Davies V, Nolan AM, et al. **Validity and responsiveness of the generic health-related quality of life instrument (VetMetrica™) in cats with osteoarthritis. Comparison of vet and owner impressions of quality of life impact.** *Front Vet Sci* 2021; 8. DOI: 10.3389/fvets.2021.733812.
87 St Denis K, Saffire A, Michael H, et al. **Cat Friendly Practice improves feline visits, resulting in increased laboratory testing and increased diagnosis of certain common

feline conditions. *J Feline Med Surg* 2023; 25. DOI: 10.1177/1098612X231204199.
88 Brown J, Taylor S and Wilson A. **Comparison of cat-related human injury rates in ISFM Cat Friendly accredited clinics and non-accredited clinics.** *J Feline Med Surg* 2021; 23: 855–856.
89 Wallace JE. **Meaningful work and well-being: a study of the positive side of veterinary work.** *Vet Rec* 2019; 185. DOI: 10.1136/vr.105146.
90 Pun JK. **An integrated review of the role of communication in veterinary clinical practice.** *BMC Vet Res* 2020; 16. DOI: 10.1186/s12917-020-02558-2.
91 Braillon A and Taiebi F. **Practicing 'reflective listening' is a mandatory prerequisite for empathy.** *Patient Educ Couns* 2020; 103: 1866–1867.
92 Ito Y, Ishikawa H, Suzuki A, et al. **The relationship between evaluation of shared decision-making by pet owners and veterinarians and satisfaction with veterinary consultations.** *BMC Vet Res* 2022; 18. DOI: 10.1186/s12917-022-03401-6.
93 Spitznagel MB, Anderson JR, Marchitelli B, et al. **Owner quality of life, caregiver burden and anticipatory grief: how they differ, why it matters.** *Vet Rec* 2021; 188. DOI: 10.1002/vetr.74.
94 Shanan A. **Caregivers' emotional burden**. In: Shanan A, Pierce J and Shearer T (eds). Hospice and palliative care for companion animals. 2nd ed. Hoboken, NJ: John Wiley & Sons, 2023, pp 333–348.
95 Lee S, Boone G, Bidgoli A, et al. **US cat caregivers' attitudes on veterinary video telemedicine.** *J Feline Med Surg* 2024; 26. DOI: 10.1177/1098612X241249623.
96 Springer S, Lund TB, Corr SA, et al. **Seeing the benefits, but not taking advantage of them: dog and cat owners' beliefs about veterinary telemedicine.** *Vet Rec* 2024; 194. DOI: 10.1002/vetr.3312.
97 Caney SM, Robinson NJ, Gunn-Moore DA, et al. **Veterinary surgeons', veterinary nurses' and owners' experiences of feline telemedicine consultations during the 2020 COVID-19 pandemic.** *Vet Rec* 2022; 191. DOI: 10.1002/vetr.1738.
98 Boone G, Pang DS, Shih H-Y, et al. **Incorporating video telehealth for improving at-home management of chronic health conditions in cats: a focus on chronic mobility problems.** *Front Vet Sci* 2025; 12. DOI: 10.3389/fvets.2025.1510006.
99 Widmar NO, Bir C, Slipchenko N, et al. **Online procurement of pet supplies and willingness to pay for veterinary telemedicine.** *Prev Vet Med* 2020; 181. DOI: 10.1016/j.prevetmed.2020.105073.
100 Goldberg KJ. **Veterinary hospice and palliative care: a comprehensive review of the literature.** *Vet Rec* 2016; 178: 369–374.
101 Shaw JK and Lahrman S. **The human–animal bond – a brief look at its richness and complexities**. In: Martin D and Shaw JK (eds). Canine and feline behavior for veterinary technicians and nurses. 2nd ed. Hoboken, NJ: John Wiley & Sons, 2023, pp 88–105.
102 Noble CE, Wiseman-Orr LM, Scott ME, et al. **Development, initial validation and reliability testing of a web-based, generic feline health-related quality-of-life instrument.** *J Feline Med Surg* 2019; 21: 84–94.
103 Testoni I, De Cataldo L, Ronconi L, et al. **Pet grief: tools to assess owners' bereavement and veterinary communication skills.** *Animals (Basel)* 2019; 9. DOI: 10.3390/ani9020067.
104 Testoni I, De Cataldo L, Ronconi L, et al. **Pet loss and representations of death, attachment, depression, and euthanasia.** *Anthrozoös* 2017; 30: 135–148.
105 Morris P. **Managing pet owners' guilt and grief in veterinary euthanasia encounters.** *J Contemp Ethnogr* 2012; 41: 337–365.