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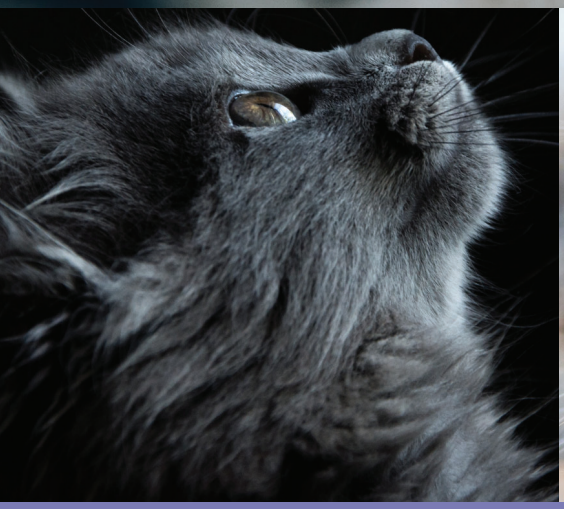
CHRONIC PAIN
EDUCATIONAL TOOLKIT



AMERICAN ASSOCIATION OF FELINE PRACTITIONERS

catvets.com/chronic-pain-toolkit

CHRONIC PAIN
EDUCATIONAL TOOLKIT

Chronic (persistent or long-standing) pain is a common, debilitating condition in all mammals, including cats. Chronic pain has a negative impact on health, behavior and wellbeing, and on the human-animal bond. Unfortunately, chronic pain can be difficult to recognize and treat. This Toolkit is designed to guide the veterinary professional through:

1. An understanding of the pathology of chronic pain and a list of conditions and types of pain that will facilitate both prediction and identification of pain.
2. A variety of tools for chronic pain assessment that will engage both the practitioner and cat caregiver.
3. A description of science-based therapy goals with realistic applications for both the veterinary professional and cat caregiver.
4. A science-based plan for patient support that will include critical information on pharmaceuticals, nutrition, and environmental modification.
5. A discussion of caregiver support, which is often over-looked but critical for success.

Instructions for Use

This Educational Toolkit is an implementation tool for veterinary professionals to access and gather information quickly. It is not intended as a complete review of the scientific data for treatment of chronic pain in cats. We recommend that you utilize the information in the AAHA Pain Management Guidelines endorsed by the AAFP in combination with the information in this Educational Toolkit.

To use the Toolkit, click the tabs at the top in the navigation bar to access each page and learn more about each area, including defining chronic pain, types of chronic pain, its prevalence, conditions that cause chronic pain, assessment, therapy goals, role of each

therapy, patient support, and caregiver support. Each page also has an associated printable PDF that you can use in your practice. Additionally, a link to a printable version of the entire toolkit, which contains information from each page, is included in the left side bar.

Acknowledgement

The AAFP would like to thank Zoetis for their educational grant to develop this Toolkit, and for their commitment to helping the veterinary community improve the lives of cats. We also would like to thank our Task Force for their hard work in developing this Educational Toolkit content – Kelly St. Denis, DVM, DABVP (Feline), Chair; Tamara Grubb, DVM, PhD, DACVAA; B. Duncan X. Lascelles, BSc, BVSc, PhD, FRCVS, CertVA, DSAS(ST), ECVS/ACVS; Sheilah Robertson, BVMS (Hons), PhD, DACVAA, DECVAA, DACAW, DECAWBM (WSEL), CertVA, FRCVS; and Paulo Steagall, MV, Msc, PhD, DACVAA. The AAFP would also like to extend a special thank you to Dr. Steagall; Dr. André Desrochers, DMV, MS, DACVS; and Zoetis for figure use.

Conflict of Interest

The Task Force Members have consulted with various industry companies. The members of the Task Force received no financial support for the research, authorship, and/or publication of this Toolkit.

WHAT IS CHRONIC PAIN?

Defining Chronic Pain

In humans, chronic pain has been defined as pain that persists beyond the expected course of healing/acute disease, often described as lasting longer than 3–6 months. However, this timeline may not apply to cats since their lifespan is shorter than that of humans. Rather than being defined by time, chronic pain is better defined by where it originates, if it is localized or widespread, and whether or not it serves a purpose.

The term 'maladaptive pain' is often used when referring to chronic pain to emphasize the fact that in chronic pain conditions, there is no obvious purpose to the pain, and that pain is being driven by dysfunction of the peripheral and/or central somatosensory system. See the Glossary for further definitions and terminologies.

There are some unique features that differentiate chronic from acute pain:

- Acute pain is 'adaptive' or 'physiologic' because it serves an important (adaptive) physiologic function, which is to prevent or limit damage from tissue injury such as surgery or trauma. From an evolutionary perspective, such pain would prevent the cat from overusing the injured tissue while healing is occurring. However, without pain control, especially if the pain is moderate to severe, the protective benefit is overshadowed by the negative effects of pain on health, behavior, and welfare. In addition, untreated pain can lead to chronic pain. Thus, effective analgesia is imperative for acute pain.

- There are two types of adaptive pain:
  - Nociceptive—pain that is only activated by high-threshold noxious stimuli, including stimuli that cause tissue injury, this serves as a warning system to harmful stimuli
  - Inflammatory—pain that occurs after tissue damage and produces heightened sensitivity (peripheral sensitization) of the tissue associated with a classical inflammatory response
    - In this case, pain generally resolves as inflammation resolves

- Chronic pain is often called 'maladaptive' or 'pathologic' because in large part it is driven by sources other than the original lesion (e.g., pain from nerve damage that persists after surgery or trauma tissue damage has resolved) or persists from incurable conditions (e.g., osteoarthritis), and thus is not protecting the tissue because no healing is occurring.
- Chronic pain is a complex mix of different, often overlapping, types of pain, including chronic inflammatory pain along with neuropathic pain and/or functional pain. These different types of pain are described to enhance understanding of the processes that are driving pain, but an important concept is that no clinical chronic pain condition is driven by only one 'type' of pain.
    - Neuropathic pain arises from gross, obvious damage to the spinal cord or peripheral nerves, or from peripheral neuropathy (e.g., diabetic neuropathy) via either direct damage to nerve endings present in the tissues, or via increased innervation that accompanies joint remodeling and angiogenesis.
    - Functional pain has no evidence of a peripheral lesion or inflammation but there is increased sensitivity to stimuli, spontaneous pain, and abnormal somatosensory processing
- Chronic pain is usually caused by long-term disease or injury but can also be caused by untreated or undertreated acute pain. In most cases, there is no clear end-point as chronic pain can exist without a specific or identifiable source and may not be tied to inflammation
    - Chronic pain is often driven by sustained noxious stimuli with pathological changes and neuroplasticity leading to what has been termed 'central sensitization.' The latter is commonly manifested clinically with hyperalgesia (exaggerated pain response to a mildly painful stimulus) and allodynia (pain response to non-painful stimulus)
- An important concept is that chronic pain in many instances arises from an incurable source or from non-healing tissue and serves no beneficial purpose. **Thus, chronic pain itself is the disease that is being treated.**

CHRONIC PAIN PREVALENCE AND CONDITIONS THAT CAUSE CHRONIC PAIN

Prevalence

The prevalence of chronic pain is unknown in cats. However, the *2021 AAFP Feline Senior Care Guidelines* highlight that cats are now living longer, and the prevalence of chronic pain as well as comorbidities have increased often with a negative impact on the individuals' quality of life (QOL) and the cat-caregiver bond. For example, the prevalence of radiographic degenerative joint disease (DJD) has been reported to be 92% in cats between 6 months and 20 years of age. Radiographic evidence of appendicular and spinal joint disease appears to increase with age. Osteoarthritis (OA) and DJD are defined below.

Examples of Chronic Pain Conditions

Listed here are conditions that commonly cause chronic or sustained pain, tissue/nerve damage, inflammation, and persistent noxious input leading to central sensitization. The impact on the cat's health, behavior, and welfare should be identified and communicated to the cat caregiver.

Degenerative Joint Disease

- DJD is an 'umbrella term,' encompassing degeneration of synovial joints (OA) and non-synovial joints, such as spondylosis deformans. The terms OA and DJD are often used interchangeably in the literature, despite the fact they mean different things. The term DJD will be used here as clinically, cats present with both synovial and non-synovial joints that are diseased and painful.
- DJD can be associated with pain—current estimates indicate that 60% of all cats have >1 site (appendicular joint or spinal segment) with painful DJD and 46% of all cats have >2 sites with painful DJD.
- DJD-associated pain leads to structural damage, functional impairment, decreased activity, mobility, and QOL.
- The pathophysiology of DJD is poorly understood in cats but appears to involve several factors to varying degrees, such as genetic, inflammatory, metabolic, and biomechanical changes.
- Unlike in dogs where most OA is driven by developmental disease, the etiology of OA/DJD in cats is not well understood and so DJD in cats is often referred to as idiopathic. The disease is often bilateral and involves multiple joints.

- Aging, obesity, sedentary lifestyle, and metabolic disease are among the risk factors for joint disease in people and similar risk factors are likely important in cats.
- Commonly affected joints include the elbow, hip, stifle, tarsus, and in the axial skeleton, the lumbar and lumbosacral regions.

There is a poor association between radiographic findings and presence and/or severity of clinical pain. The presence of radiographic changes cannot be used to estimate pain; conversely, the absence of radiographic findings does not rule out joint pain. Therefore, radiographs should not be used to dictate therapy, but should be evaluated in light of the patient history, evidence of changes in mobility (through validated questionnaires and videos), and physical examination findings.

For additional insights on DJD and OA pain, explore the videos presented by Dr. Duncan Lascelles below (scroll halfway down the page to access):

- Keys to a Successful OA Exam
- Assessment of the Cat Prior to the Exam
- Approach to Starting the Evaluation of Joints
- Evaluations of the Major Joints

ACCESS VIDEOS

Cancer

- Complex mechanisms are involved in cancer-induced pain.
- Evidence in humans suggests that pain may be present during all stages of cancer.
- Pain intensity is variable according to the type, size, location, and aggressive nature of cancer. This is particularly true with cancer involving mixed inflammatory and neuropathic pain with tissue infiltration and organ dysfunction.
- Pain can be associated with the primary or metastatic tumor (e.g., feline injection-associated sarcoma; oral squamous cell carcinoma) or therapy for their treatment (e.g., amputation, chemotherapy-induced neuropathy, radiation-induced skin toxicity).
- Pain is exacerbated in the presence of comorbidities.
- Evidence is emerging that the presence of pain may contribute to the progression of cancer locally and to distant metastasis.

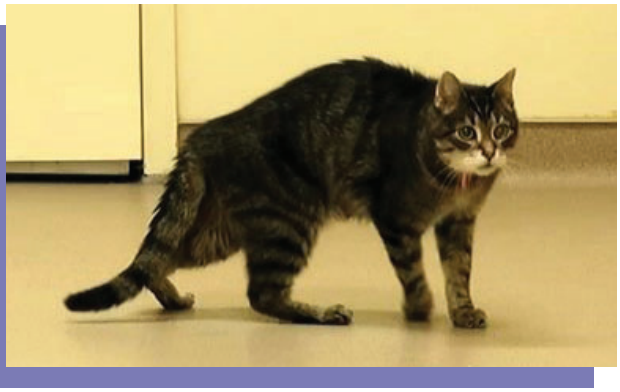
Chronic Eye Conditions

- Can be caused by trauma, infection, neoplasms, and auto-immune disease or other diseases (e.g., entropion, uveitis, corneal ulcer, glaucoma).
- Ocular pain may be related to inflammation or increases in (intraocular) pressure.

Chronic Otitis

- A multifactorial condition that can be related to infection, inflammation, allergic skin disease, immune-mediated diseases, or obstructive diseases.
- Normally challenging to manage and may require total ear canal ablation and bulla osteotomy.
- Clinical signs include pain on palpation, head shaking, scratching or pawing at the ears, excessive ceruminous debris, the development of aural hematomas, and foul odor.

Chronic Skin Conditions



- Any chronic skin condition is potentially painful, including chronic wounds caused from burns, post-surgical complications, infection, or auto-immune disease.
- Pain is caused by chronic inflammation, stretching/pulling of the skin as wounds heal, and scarring.
- Feline Herpes Virus (FHV)-1 dermatoses are associated with vesicular, crusting, ulcerative, and necrotizing dermatitis affecting the face.
- Atopic dermatitis can cause excoriations and pruritus.

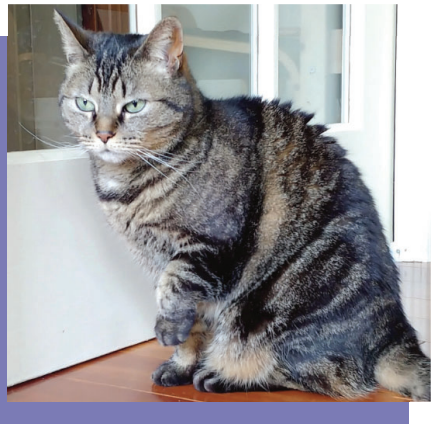
Diabetic Neuropathy

- This syndrome is described as a complication of chronic diabetes mellitus involving plantigrade stance, reduced patellar reflexes, pelvic limb weakness, and neuropathic pain. In people, numbness and tingling, allodynia, and lethargy are reported.
- There is a lack of literature on this subject in cats, but it may also involve somatosensory and behavioral changes such as aversion to touching of the pelvic limbs, excessive licking of distal limbs, and impaired ability to jump.

Hyperesthesia Syndromes

- A condition without a clear etiology and that little is known about.
- A plethora of factors may play a role in the pathogenesis including hypersensitivity dermatitis, focal epileptic seizures, neuropathic itch or pain, and behavioral changes.
- Pain assessment is difficult as the diagnosis must exclude other conditions such as flea infestation, dermatitis, food allergy, compulsive disorder, spinal disease, and other behavioral issues.
- Clinical presentation usually involves abnormal somatosensory changes (i.e., neuropathic pain), tail chasing, excessive grooming, skin rippling over the lumbar area, pain on palpation, and areas of self-induced alopecia.

Persistent Post-surgical Pain (PPP)



- This is defined as development of chronic pain after surgery with duration of more than two to three months in humans, but the reality is that the pain can last for years or for the rest of the patient's life. The onset of PPP can occur within days, months, or years after surgery in humans, and the same is presumed for cats.
- There are usually clinical signs of central sensitization (i.e., allodynia and hyperalgesia) thought to be caused in part by nerve damage and sustained tissue damage during surgery (e.g., onychectomy, tail or limb amputation, thoracotomy, mastectomy).
- Severity of acute postoperative pain, poor peri-operative analgesic practices, anxiety, and pain catastrophizing have been described as risk factors for the development of PPP in humans, and the first two risk factors and anxiety are considered to apply in cats. Currently, pain catastrophizing has not been defined in cats (or dogs).
- Clinical signs of PPP can be observed in cats having undergone onychectomy and include lameness, back pain, house-soiling, licking and chewing at the digits, aversion to the feet being touched, and altered weightbearing (see figure).
- A common cause of PPP is amputation:
    - Amputation may be indicated in cases of trauma, avulsion, non-healing fractures, and/or cancer involving limbs, digits, or the tail
    - Amputation surgery itself is invasive involving tissue damage, nerve resection, and severe inflammatory input with potential advent of persistent postsurgical and/or chronic neuropathic pain

Feline Idiopathic Cystitis (FIC)

- Characterized by a combination of long-term inflammatory and functional pain related to stressors; thus, factors related to stress for example, not meeting feline essential needs, intercat tension, and lifestyle can influence the development of FIC.
- Clinical signs are nonspecific and include dysuria, straining, pollakiuria, periuria, overgrooming around the perineum, ventral abdominal barbering over the bladder, and behavioral changes.

Oral Painful Conditions

- Chronic Gingivostomatitis
  - Affects a large percentage of cats and involves severe and persistent oral inflammation
  - Involves inflammation of the mucogingival junction, buccal and caudal oral mucosa, and periodontal tissues induce erosive, friable, and diffuse lesions, as well as hemorrhage
  - Cats present with reduced grooming, dysphagia, weight loss over time, and repulsive behavior in response to protective emotions
  - A major component of currently recommended treatment involves full- (or partial-) mouth extractions which is another source of severe acute or chronic pain, which often leads to central sensitization.

- Periodontal Disease
  - It is recognized as one of the most prevalent diseases in feline practice, which may induce chronic oral pain and inflammation, changes in behavior, decreased food intake, weight loss, and spontaneous hemorrhage
  - Treatment requires thorough assessment under general anesthesia including full-mouth dental radiography, surgical dental extractions, and aggressive pain management
- Tooth Resorption
  - Tooth resorption is a gradual and progressive breakdown of the tooth structure, which can be associated with chronic pain (e.g., during exposure of the pulp cavity)
  - The prevalence of tooth resorption ranges from 25–75% of cats
  - Often cats will not exhibit pain behaviors until extensive disease is present, underlining the need for regular oral examination
  - Treatment requires surgical extraction of the affected tooth (teeth) accompanied by pre- and post-treatment dental radiographs

- Orofacial Pain Syndrome
  - Similar to trigeminal neuralgia in people, this condition involves acute episodes of pain-induced behaviors that could be triggered by stress
  - Clinical signs appear to be related to mouth movement during eating or grooming and occur spontaneously with pawing at the mouth, exaggerated licking, and chewing. Cat caregivers describe spontaneous vocalization with repelling behavior (i.e., swatting, scratching, biting) and decreased appetite

- Other common causes of oral pain include trauma, pulpitis, neoplasia, abscesses, dental fractures, and invasive surgical procedures (e.g., maxillectomies, mandibulectomies).

CHRONIC PAIN ASSESSMENT

Chronic Pain Assessment

Chronic pain assessment is currently accomplished by using a combination of caregiver and veterinarian assessments, as well as physical examination. The use of validated pain assessment tools and checklists are strongly recommended. A validated metrology tool reliably measures what it is intended to measure (pain, mobility, etc.), and is able to pick up clinically significant changes for which it is being used. These instruments are detailed below and identify the impact of chronic pain on various domains such as activity, activities of daily living, and quality of life (QOL).

'Chronic pain assessment is client-centered'

In general, chronic pain assessment is achieved with the central involvement of the cat caregiver because our profession has moved to an understanding that caregivers know their pets best. However, cats with chronic pain may demonstrate subtle or gradual changes in behavior, which can be overlooked or go undetected by caregivers. Therefore education should be provided, for example during routine checkups for young adult cats, so the caregiver learns to recognize and identify these changes.

It is important to remember that the caregiver questionnaires that have been developed to assess chronic pain have been developed for specific conditions (e.g., musculoskeletal pain), and they may not be appropriate for other conditions.

In the clinical setting, the participation of veterinary technicians and nurses in pain assessment is extremely valuable as part of client education, particularly in a busy practice and/or when providing telemedicine service.

Early Screening

Screening tools can detect chronic pain in its early stages, allowing for early intervention. Early detection will minimize suffering and promote appropriate treatment (pharmacologic, nonpharmacologic, and environmental changes) and may be more successful in the early stages of disease before tissue, joint, or organ damage is advanced and central sensitization has become the main driver of pain.

Clinical Metrology Instruments

Clinical Metrology Instruments (CMIs) or Client Reported Outcome Measures (CROMs) (see Table on next page) are questionnaire-based measurement tools to quantify chronic pain.

- They are based on the observations of the caregiver over time and include differing assessments (depending on the tool) of the cat's daily living activities, function, and, in some cases, QOL
- These tools should be used and tracked over time to assess the efficacy of treatment interventions.
- Selection of a CMI should be based on the patient's condition(s) and needs, as well as the caregiver's willingness/ability to utilize the instrument regularly. The appropriateness of a CMI depends on the condition it was developed to measure (e.g., one developed for musculoskeletal pain is probably not appropriate for oral pain). If there are several CMIs for a given condition, the same CMI should be used for that patient for each condition during reassessment, both for validity and ease of comparison.
- Essential attributes of an assessment tool include reliability, sensitivity, utility, construct validity, and content validity (See box below). More information can be found here.

Desired Attributes of Assessment Tools

- Reliability: if there is more than one observer, is there close agreement among them?
- Sensitivity/Responsiveness: can the chosen tool detect changes over time or after a treatment intervention?
- Utility: is the tool easy to use and suitable for a variety of users (e.g., caregivers)?
- Construct Validity: does the tool measure what it was intended to measure?
- Content Validity: are all the aspects of pain you wish to measure captured?

- Feline tools that have been developed to assess acute pain in cats (e.g., the Feline Grimace Scale) should not be used for chronic pain, just as tools for one species should not be used in another. The ideal use of a tool is for the pain condition it was developed to measure, however future clinical research may define wider applicability of given tools.

TABLE: CHRONIC (PERSISTENT) PAIN ASSESSMENT CLINICAL METROLOGY INSTRUMENTS (CMIS) FOR USE IN CATS

TOOLS	CONDITION	PURPOSE
Musculoskeletal Pain Screening Checklist (MiPSC)[a]	Chronic, osteoarthritis/ degenerative joint disease	Simple Tool Used for Screening
Feline Musculoskeletal Pain Index (FMPI)[a]	Chronic, osteoarthritis/ degenerative joint disease	Simple Tool Used for Screening
Montreal Instrument for Cat Arthritis Testing - Caretaker (MICAT-C)[b]	Chronic, osteoarthritis/ degenerative joint disease	Simple Tool Used for Screening
Client-specific outcome measures (CSOM)[a]	Chronic, osteoarthritis/ degenerative joint disease	Simple Tool Used for Screening

a) https://cvm.ncsu.edu/research/labs/clinical-sciences/comparative-pain-research/clinical-metrology-instruments/

b) https://ars.els-cdn.com/content/image/1-s2.0-S0168159117303271-mmc2.pdf

PLATTER Approach

The acronym PLATTER has been used to describe the continuum of care loop for managing pain. The components of PLATTER are PLan, Anticipate, TreaT, Evaluate, and Return (see Figure below).

Continuum of care

Appropriate pain management requires a continuum of care based on a well thought out plan that includes anticipation, early intervention and evaluation of response on an individual patient basis. It should be noted that response to therapy is a legitimate pain assessment tool. Continuous management is required for chronically painful conditions, and for acute conditions until pain is resolved.

The acronym PLATTER has been devised to describe the continuum of care loop for managing pain. The components of the PLATTER algorithm for pain management are PLan, Anticipate, TreaT, Evaluate and Return (Figure 1). The approach provides individualized pain management for any patient and is devised not on a static basis but according to a continuous cycle of plan–treat–evaluate based on the patient's response.

Figure 1: PLATTER approach to pain management

PLan	Every case should start with a patient-specific pain assessment and treatment plan
Anticipate	The patient's pain management needs should be anticipated whenever possible so that either preventive analgesia can be provided or, in the case of pre-existing pain, it can be treated as soon as possible
TreaT	Appropriate treatment should be provided that is commensurate with the type, severity and duration of pain that is expected
Evaluate	The efficacy and appropriateness of treatment should be evaluated; in many cases, using either a client questionnaire or an in-clinic scoring system
Return	Arguably the most important step, this action takes us back to the patient – where the treatment is either modified or discontinued based on an evaluation of the patient's response

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Quality of Life (QOL)

- Chronic diseases and many related treatments can have a negative impact on QOL.
- Cats live in the moment, therefore, unlike humans, cannot know that "tomorrow may be better" while experiencing pain and going through unpleasant treatments. Our patients do not make choices for themselves - that falls on the caregiver - and we must partner with them to make good, well-informed patient-centric decisions.
- Long before end of life decisions are made, assessment and evaluation of QOL is as important as assessing the impact of diseases, and assessing the benefit or negative effects of individual or combined treatments.
- Despite wide usage, the term QOL with respect to animals does not have a universally consistent or accepted definition.
    - One definition of QOL is "an individual's satisfaction with its physical and psychological health, its physical and social environment, and its ability to interact with that environment"
    - QOL and Health Related Quality of Life (HRQOL) are different. QOL is a broad term and considers all aspects of a pet's life which include physical and mental health. HRQOL refers to the specific impact of a medical condition on an individual's health
        - An HRQOL instrument should be able to detect disease (be discriminative) and measure health changes over time (be evaluative)
    - One tool is a 20-item instrument that is completed online by caregivers and can reliably differentiate sick from healthy cats and shows promise for tracking QOL associated with chronic feline diseases. Currently, this instrument (Vetmetrica) is only available by subscription through NewMetrica (newmetrica.com)
    - The veterinary team should discuss internally among themselves what they mean by QOL or HRQOL so that everyone is on the same page when communicating with clients

Health-Related Quality of Life (HRQOL) Tools:

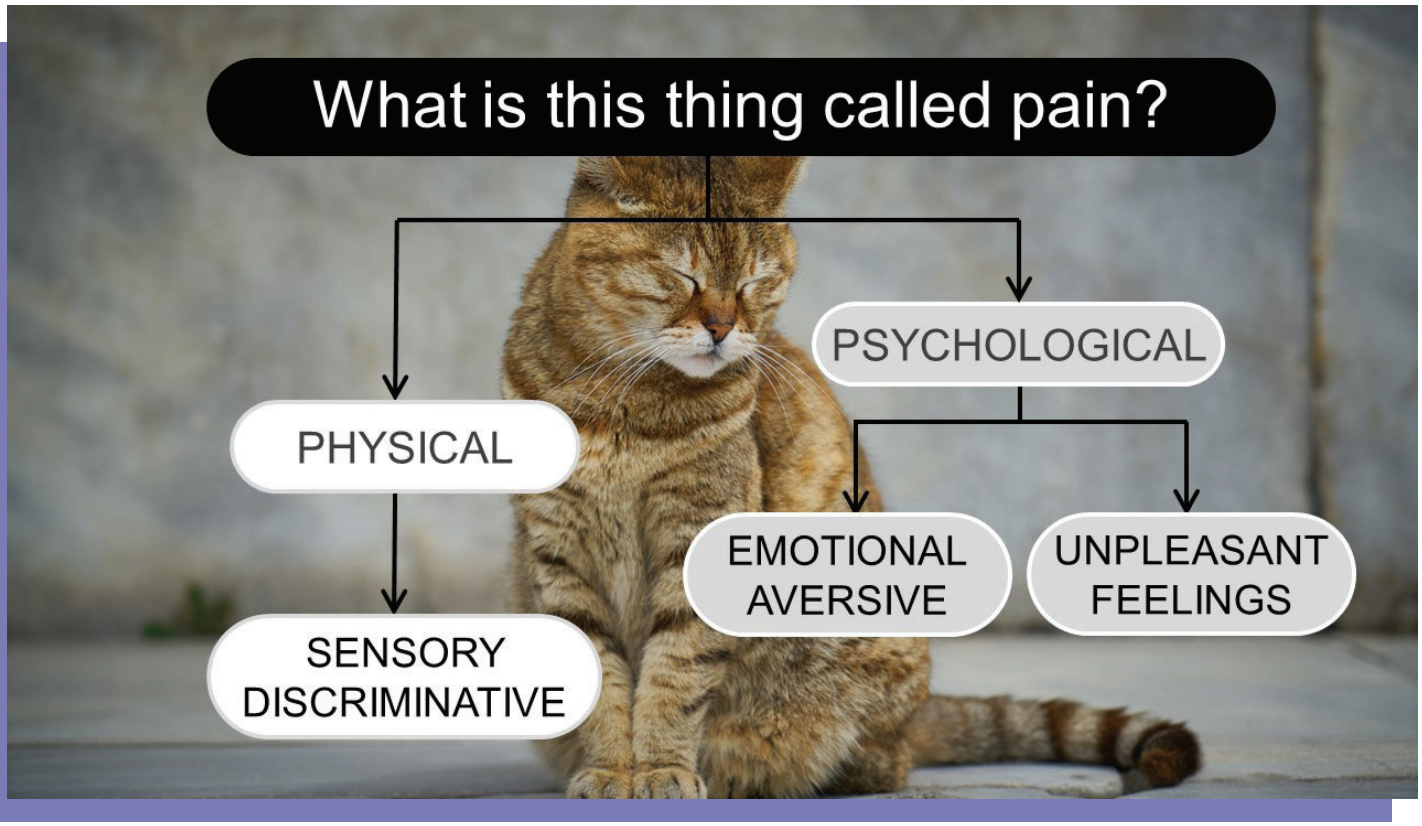
- Vetmetrica: Health-related Quality of Life (HRQoL) Instrument*
- Cat Health and Wellbeing (CHEW) Questionnaire*
- How Do I Know When it's Time?: Assessing Quality of Life for Your Companion Animal and Making End-of-Life Decisions (Ohio State University)
- HHHHHMM Scale
- Care: Quality of Life Assessment (iCatCare)
- Quality of Life Scale (Lap of Love)

**Denotes the resource has some validation (see above for definition)*

THERAPY GOALS

The primary goal of therapy is to minimize the patient's pain. A crucial component of effective analgesia is the knowledge that pain is dynamic (i.e., not static) and needs continued reassessment, both by the veterinarian and the caregiver, which is an integral part of successful therapy. Describing pain as 'dynamic' refers to the fact that pain can both increase and decrease over time and so pain management should be adapted accordingly. All pain conditions require regular re-assessment of the patient.

Pain, by definition, has both sensory (the sensation of pain) and emotional (the impact of pain on the patient) components also crucial to effective therapy is the knowledge that pain management is not solely the administration of pharmacologic or nonpharmacologic treatments, but also the support of the patient's wellbeing. This ladder below is an overview of treatment goals (See flowchart below). Specific therapy will be based on each patient's pain level and the caregiver's ability to treat without being overburdened. If pain is moderate to severe, treatment should be more 'comprehensive' in order to both control pain at the moment and decrease the likelihood that pain will become maladaptive.



TREATMENT

Start with proven effective drugs

Consider degree of pain

Consider caregiver budgets

Choose treatment duration based on degree and cause of pain, and reassess (e.g., every day for severe pain, in one week for moderate pain).

Is the Cat's Pain Managed?

Yes

Continue treatment and reassessment at scheduled intervals.

No

Evaluate treatment dose and dosing interval. Change if needed. If appropriate:

Switch to another proven drug(s) if possible and continue to reassess.
If not possible or not effective:

Initiate multimodal therapy with the goal to decrease pain while not overburdening caregiver. Consider Cat Friendly medication options (e.g., smaller tablets, melting tablets, transdermal, or flavored) and non-oral drugs (e.g., anti-NGF mAbs) when possible and appropriate.

Continue to reassess analgesic success, as well as environmental factors, and increase or decrease treatments as the cat responds to therapy.

PATIENT WELLBEING

1. Decrease fear-anxiety.

   a. Utilize environmental modification as described below.

   b. Utilize anxiolytics (e.g., gabapentin, trazodone, pregabalin) as needed.

2. Ensure normal function in the environment. [a, b, c]

   a. Modify environment for mobility aids (e.g., non-slip rugs, ramps/steps to elevated areas that cat likes to access).

   b. Provide easy access to resources (e.g., food and litterboxes on same floor of house that cat spends most time in).

3. Ensure comfort in the environment (e.g., provide soft bedding, accessible places to rest/sleep away from other household members/pets, if the cat desires). [c]

4. Evaluate social interactions with other pets and humans in the household, and make adjustments based on specific concerns identified.

[a]Additional information can be found in the 2021 AAFP Senior Care Guidelines.

[b]Additional information can be found in the 2021 AAHA/AAFP Feline Feline Life Stage Guidelines.

[c]Additional information can be found in the 2023 AAFP/IAAHPC Feline Hospice and Palliative Care Guidelines.

Additional information on environmental modifications can be found under the Patient Support section of this Toolkit.

ROLE OF EACH THERAPY

Primary Therapies

When choosing treatments, those with the highest degree of efficacy should be chosen, not only because those will be most likely to alleviate pain, but also because they may decrease the pill burden and improve compliance.

Biologics

- Monoclonal antibodies (mAbs): Due to their high-degree of efficacy, anti-nerve growth factor monoclonal antibodies (anti-NGF mAbs) are considered a first line therapy for chronic osteoarthritis related pain (label indication). The once-monthly subcutaneous injection (frunevetmab) decreases daily caregiver burden but does require a monthly trip to the veterinary practice or appointment with a house-call veterinarian. Efficacy in other pain conditions is yet to be established.

Pharmacologic Therapeutics

- Nonsteroidal anti-inflammatory drugs (NSAIDS): Due to their high degree of efficacy, NSAIDs are considered a first-line therapy for most causes of chronic inflammatory pain, but there is no approved NSAID for treatment of chronic pain in cats in the United States. However, both meloxicam and robenacoxib are approved for acute pain use in the United States and for long-term use outside the United States. Guidelines have been published for their off-label use (updated ISFM/AAFP NSAID Guidelines to be published in early 2024).

- Gabapentinoids: Gabapentinoids (gabapentin, pregabalin) can provide mild to moderate analgesia for some patients, but are best used as part of a multimodal protocol. **Based on pharmacokinetic studies, gabapentin should be administered three times/day in most patients.** Pregabalin is a potential alternative to gabapentin and is effective when given two times/day. Gabapentin is a Class V scheduled drug in many US states and pregabalin is a Class V in all US states. Since fear-anxiety can exacerbate pain, drugs with anxiolytic effects, such as gabapentinoids, may play a role in decreasing the intensity of pain. Veterinary professionals should be aware of the regulations in their geographic location.

- N-methyl-D-aspartate (NMDA): NMDA receptor antagonists (ketamine and amantadine) decrease central sensitization by blocking the NMDA receptor in the spinal cord. NMDA receptor activity is an important driver of central sensitization, and therefore persistent pain states. Ketamine and amantadine decrease NMDA

receptor activity and decrease the amount of central sensitization and thus the level of pain. These drugs may be used as part of a multimodal protocol that includes NSAIDs or anti-NGF mAbs. Despite the widespread use of low-dose SQ ketamine, there is no evidence currently to support this practice.

- Opioids: Opioids are not recommended for treatment of chronic pain as they are less effective than other drugs used for chronic pain. The side effects of long-term opioid use can cause conditions that negatively impact patient health (e.g., anorexia, constipation). There are also valid concerns regarding human diversion and abuse of veterinary-dispensed opioids. They can be considered for treatment of acute break through pain in chronic pain conditions (e.g., flare of chronic pancreatitis pain).

Other Drugs

- Injectable 'chondroprotectants': Injectable agents such as polysulphated glycosaminoglycans (PSGAGs) are often used. Evidence for an analgesic effect in cats is lacking, although there is some evidence of an analgesic effect of PSGAGs in other species.

At the time of publication (2023), no drugs listed are licensed for chronic pain treatment in cats in the United States, except the anti-nerve growth factor monoclonal antibody and it is only approved for the treatment of osteoarthritis. In the United States, no NSAIDs are approved for more than three days of treatment, which means they are only approved for acute pain, but both robenacoxib and meloxicam are licensed in some other countries for treatment of chronic musculoskeletal pain. The combined long-term use of an anti-nerve growth factor monoclonal antibody and NSAIDs in cats requires further research.

Nutritional Supplements

- Nutritional supplements, including so-called oral chondroprotective substances, are often used in the hope they will assist in the management of pain
- Currently, there is very little evidence to support their efficacy in painful conditions.
- Diets enriched in omega-3 fatty acids are thought to provide mild to moderate pain relief for joint pain, and there is interest in harnessing the analgesic potential of unique combinations of fatty acids, especially marine-based fatty acids.

Non-pharmacologic Therapy

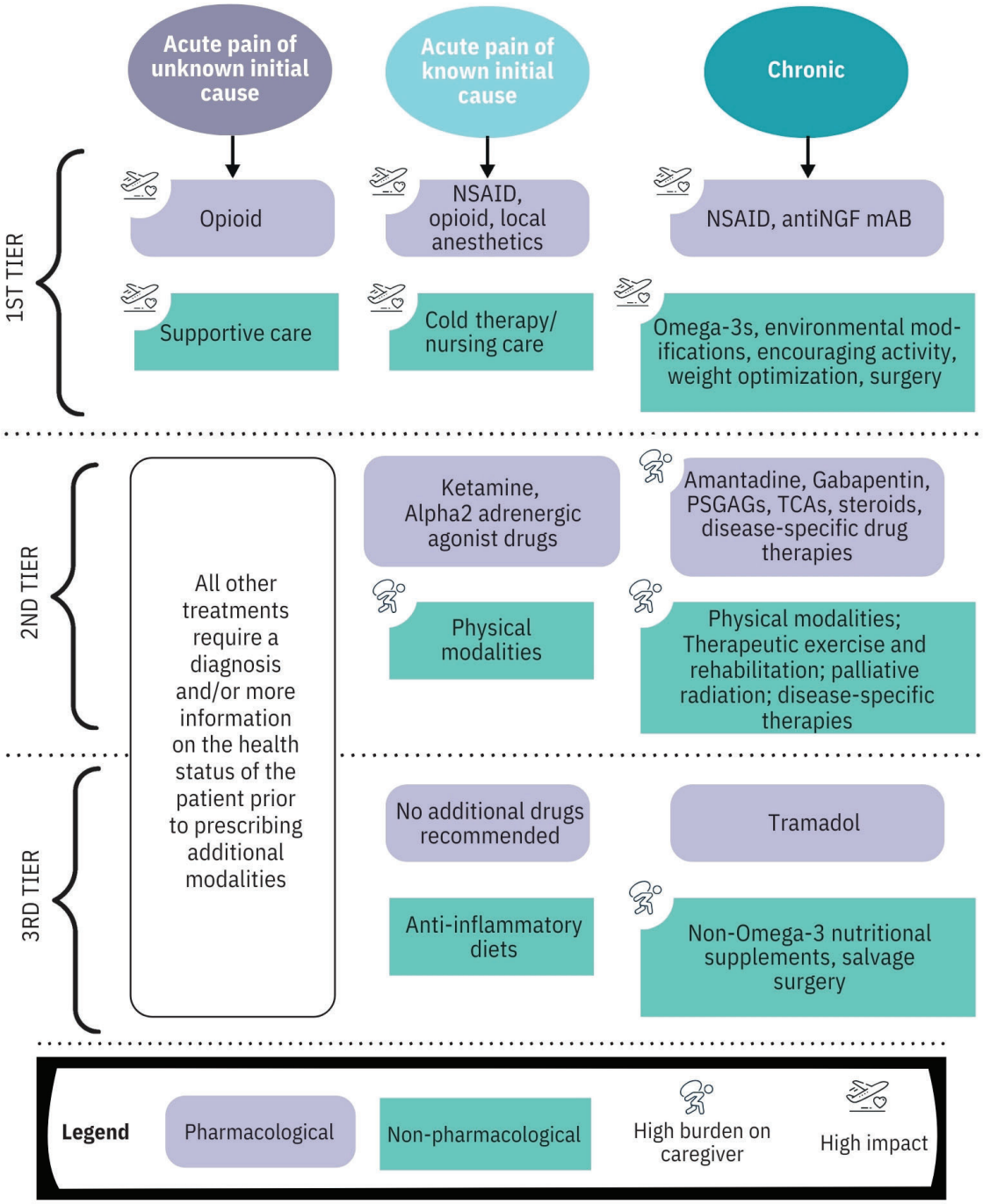
- Integrative medicine modalities might be considered as part of an integrative plan in many cats. Not all cats are amenable to non-pharmacologic therapy options, and repeat visits to the veterinary practice for treatments are necessary for most modalities. Evidence-based medicine supporting the use of these modalities in cats is mostly lacking. Although specific research in cats is limited, the modalities have scientific evidence base in other species. Integrative medicine modalities include physical medicine, traditional Chinese veterinary medicine, nutrition and nutraceuticals, Western herbal medications, and aromatherapy.

Considerations

- Using a multimodal approach, especially if pain is moderate to severe, can provide more profound pain relief since the treatments work at different sites in the pain pathway, or can amplify effects of other treatments even if working at the same site. NSAIDs and anti-NGF mAbs will generally provide analgesia when used alone for mild or moderate pain, and occasionally when used alone in cases of severe pain.
- Consider the patient and caregiver support needed for each therapy in order to reduce stress for both parties. Increasing caregiver burden often results in decreased compliance.
- The caregiver's budgets of care (financial, time, emotional, and physical) must be considered when creating therapeutic plans, all of which impact the cat and caregiver's quality of life (QOL), caregiver compliance, and cat-caregiver bond.
- More on environmental modifications can be found under the Patient Support section of this Toolkit.

Tiered Approach

The figure below outlines a tiered approach to pain management. Tiers are presented from the highest recommendation (most evidence) to the lowest.

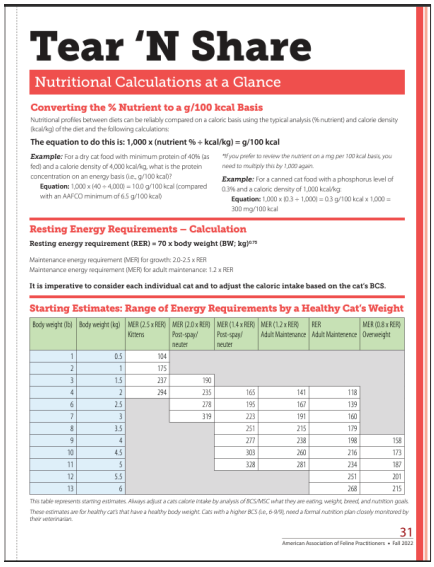


**Adapted from Gruen ME, Lascelles BDX, Colleran E, et al. 2022 AAHA Pain Management Guidelines for Dogs and Cats. Available here.*

PATIENT SUPPORT

Patient support is integral to improving quality of life and reducing the impact of pain. Certain support may be beneficial in reducing pain.

Nutrition



Tear 'N Share

Nutritional Calculations at a Glance

Converting the % Nutrient to a g/100 kcal Basis

Nutritional profiles between diets can be reliably compared on a caloric basis using the typical analysis (% nutrient) and calorie density (kcal/kg) of the diet and the following calculations:

The equation to do this is: 1,000 x (nutrient % ÷ kcal/kg) = g/100 kcal

Example: For a dry cat food with minimum protein of 40% (as fed) and a calorie density of 4,000 kcal/kg, what is the protein concentration on an energy basis (i.e., g/100 kcal)?

Equation: 1,000 x (40 ÷ 4,000) = 10.0 g/100 kcal (compared with an AAFCO minimum of 6.5 g/100 kcal)

**If you prefer to review the nutrient on a mg per 100 kcal basis, you need to multiply this by 1,000 again.*

Example: For a canned cat food with a phosphorus level of 0.3% and a caloric density of 1,000 kcal/kg:

Equation: 1,000 x (0.3 ÷ 1,000) = 0.3 g/100 kcal x 1,000 = 300 mg/100 kcal

Resting Energy Requirements – Calculation

Resting energy requirement (RER) = 70 x body weight (BW; kg)$^{0.75}$

Maintenance energy requirement (MER) for growth: 2.0-2.5 x RER
Maintenance energy requirement (MER) for adult maintenance: 1.2 x RER

It is imperative to consider each individual cat and to adjust the caloric intake based on the cat's BCS.

Starting Estimates: Range of Energy Requirements by a Healthy Cat's Weight

Body weight (lb)	Body weight (kg)	MER (2.5 x RER) Kittens	MER (2.0 x RER) Post-spay/neuter	MER (1.4 x RER) Post-spay/neuter	MER (1.2 x RER) Adult Maintenance	RER Adult Maintenance	MER (0.8 x RER) Overweight
1	0.5	104					
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This table represents starting estimates. Always adjust a cats calorie intake by analysis of BCS/MSC what they are eating, weight, breed, and nutrition goals. These estimates are for healthy cat's that have a healthy body weight. Cats with a higher BCS (i.e, 6-9/9), need a formal nutrition plan closely monitored by their veterinarian.

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- Diet Selection
  - Palatability
  - Nutritional needs specific to the medical condition(s)
  - Caloric density and density of other nutrients may be important considerations
  - Patient preferences may exceed specific patient needs in order to ensure adequate intake

- Intake Amounts
  - To determine the resting energy requirements (RER) for feline patients, calculate RER using the following formula: RER = 70 x (b.w. in kg)$^{0.75}$
  - For further details on nutritional calculations, access the 'Tear 'n Share' supplement of AAFP's T*he Feline Practitioner* magazine (Fall 2022 Issue), available at the end of this section and on page 40. It provides a helpful guide for converting nutrient percentages, calculating RER, and estimating the range of energy requirements by a healthy cat's weight

- Encouraging Food Intake
  - Enhancing smell (i.e., warming food)
  - Consider patient preferences, including textures (e.g., dry, canned, paté, chunks in gravy, etc), flavors, temperature, and freshness
  - Identify and treat inappetence early with appetite stimulants such as mirtazapine (oral, transdermal) and capromorelin (oral)
  - Identify and treat underlying nausea including pharmacologic and non-pharmacologic therapies
  - In multicat households, feed cats separate from each other, provide a visual barrier, and ensure a minimum distance of six feet apart

- Offer small, frequent meals throughout the day to mimic normal feline feeding behaviors and improve intake. This is especially important in hospice and palliative care patients, as stomach capacity may be decreased
- A patient may benefit from encouragement and attention from caregiver to promote food intake; flavor enhancers like lickable treats, tuna juice, or broth (without onions or onion powder) may promote appetite. The goal is to enhance flavor without diluting caloric or nutrient intake
- If patients are consuming insufficient nutrition to meet their needs, feeding tubes are an important consideration. Please refer to the *2022 ISFM Consensus Guidelines on Management of the Inappetent Hospitalized Cat*

More Information:

- 2013 AAFP/ISFM Environmental Needs Guidelines
- 2018 Feline Feeding Programs Consensus Statement
- 2022 ISFM Management of the Inappetent Hospitalised Cat Guidelines
- AAFP Client Brochure: How to Feed a Cat

- Nausea and Vomiting
  - Clinical signs of nausea do not consistently include vomiting
  - Cats experiencing nausea may be inappetent, may be 'finicky eaters,' and/or may lick their lips and turn away when presented with food
  - Cats vomiting hairballs more than once per week likely have underlying nausea unrelated to the ingestion of hair
  - Treatment strategies - maropitant 1–2 mg/kg PO, SC, IV q24h; ondansetron 0.5–1 mg/kg PO, SC, IM, IV (slowly), q8h
- Hydration
  - Water intake should be approximately 40–50 mL/kg/d
  - Improve water intake with canned food, veterinary hydration supplements, preferred water vessels, fountains or dripping faucets, and other strategies
  - Proper hydration (euhydration) is important for cats with chronic kidney disease if considering NSAIDs, as well as IRIS stage, patient status, and individual benefits of NSAID use

Pharmacy

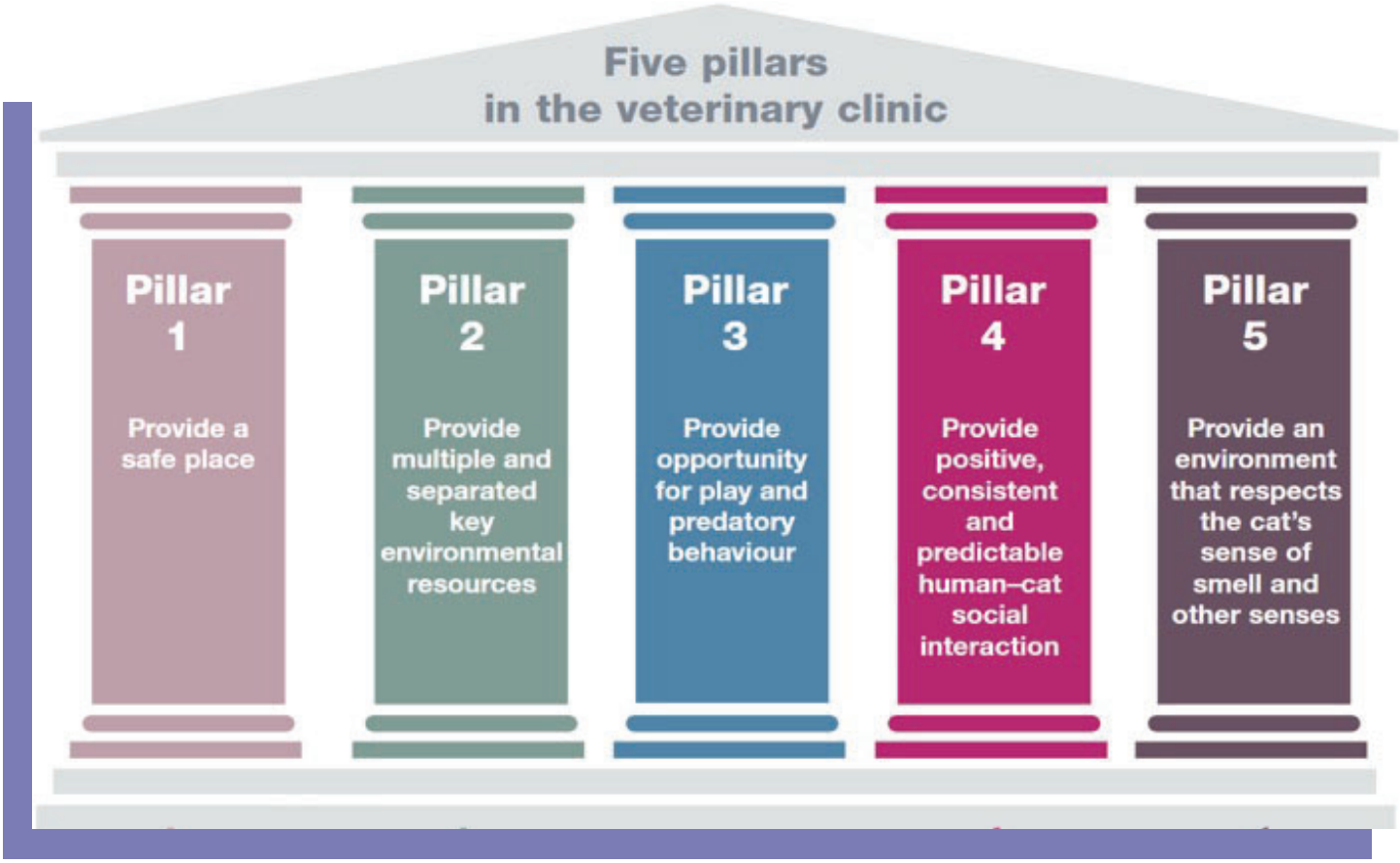
- Avoid Polypharmacy
  - Where many medications are needed or considered, choose those that are most likely to benefit the patient and have known high level of evidence-based medicine to support that benefit
  - Increasing numbers of medications, particularly oral medications, can increase the difficulty with medicating and harm the human-cat relationship
- Palatability
  - Choose products designed with cats in mind
  - As cats are notorious for food aversion in association with distasteful medications, it is recommended to use a different food source if attempting to hide medication in food so as not to compromise the patient's regular eating habits, particularly when using therapeutic foods
- Oral Administration
  - Do not underestimate the caregiver burden of oral administration, nor the potential to disrupt the cat-caregiver bond
  - Where licensed veterinary products do not exist, or administration of the product has been difficult in a particular patient, consider other options for oral administration including smaller tablets, capsules, flavored chews, melting tablets, added flavoring, powders, liquids, and combining medications in empty gel capsules as it might best suit the patient preferences and the medication in question
  - Unless ingested in a pill treat that can be molded to conceal medications or directly with food, always follow medication with high-value/tasty treats, a favorite food, or a meal. Otherwise, 1–3 mL of water may need to be syringed into the cat's mouth to enhance swallowing and reduce esophageal transit time
- Options of Parenteral Administration
  - Subcutaneous options may be available and be easier for the caregiver to administer. Example: injectable steroids in lieu of oral tablets
  - Transdermal medications may be available by compounding, but that does not mean the product will be absorbed in quantities necessary to be efficacious. Review relevant literature on appropriately studied drugs that can be absorbed and are efficacious when administered transdermally

Links for Caregivers:

- How to Feed a Cat – Caregiver Website and Brochure
- How to Feed a Cat – Brochure for Clients and Printable
- How to Give your Cat a Tablet – Video
- Senior Cats Have Special Needs – Caregiver Website and Brochure
- Senior Cats Have Special Needs – Brochure for Clients and Printable
- Tips for Medicating Your Cat – Flyer

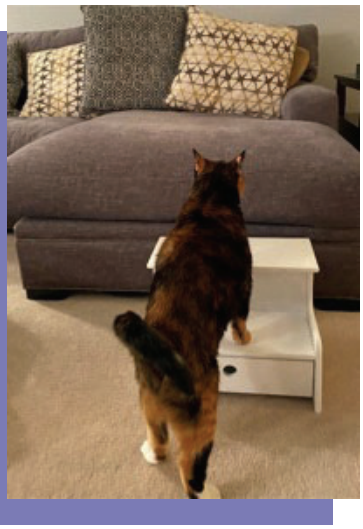
Environment

- Five Pillars of a Healthy Feline Environment
  - Provide guidance to caregivers in order to meet patient needs

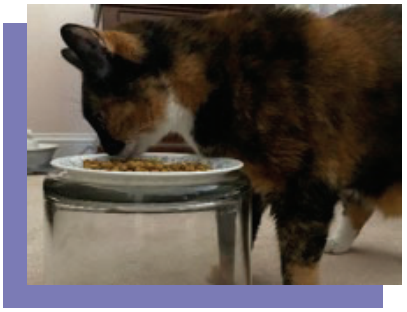


Reprinted with permission from the AAFP. Taylor, et al. 2023 ISFM/AAFP Cat Friendly Veterinary Environment Guidelines, Journal of Feline Medicine and Surgery. Available at catvets.com/environment.

- Adapt the Home to Patient Needs
  - Provide home adaptations to accommodate the patient
  - Examples:
    - Easy-to-access litter boxes (i.e., lower-walled or low-entry into box and easy-to-access location of boxes so they are where the cat spends the most time; ideally a minimum of one litter box on each floor of the house)



    - Stairs/ramps to bed and/or resting places, and favorite perches such as windowsills, etc
    - Preferences for scratching posts and other scratch-appropriate surfaces may change, including the location, number of levels on the post, and surface covering (e.g., many senior cats prefer softer scratching surfaces)
    - Water sources—follow the 'one per cat, plus one' recommendation and distribute throughout the home. Avoid placing water beside food or litter to reduce risk of contaminating the water
    - Night lights for improved vision in the aging and/or chronically ill cat
    - Cats prefer an ambient temperature of 30–38°C (86–100°F); consider safe heated (non-electrical, reflective pad, self-warming) pet beds covered with blankets to prevent burn or injury
    - Preference for food serving—plates, dishes, depth of dish, raised dishes, etc Consider raising the dish to alleviate the cat having to bend over to eat, which could cause pain



    - Preferences for water supply—depth and width of water dishes (e.g., some cats prefer deep, wide water bowls), material water dish is made from, water fountains, etc
  - Consider additional special needs of cats with cognitive decline and/or cognitive dysfunction. See the AAFP Senior Care Guidelines for more information

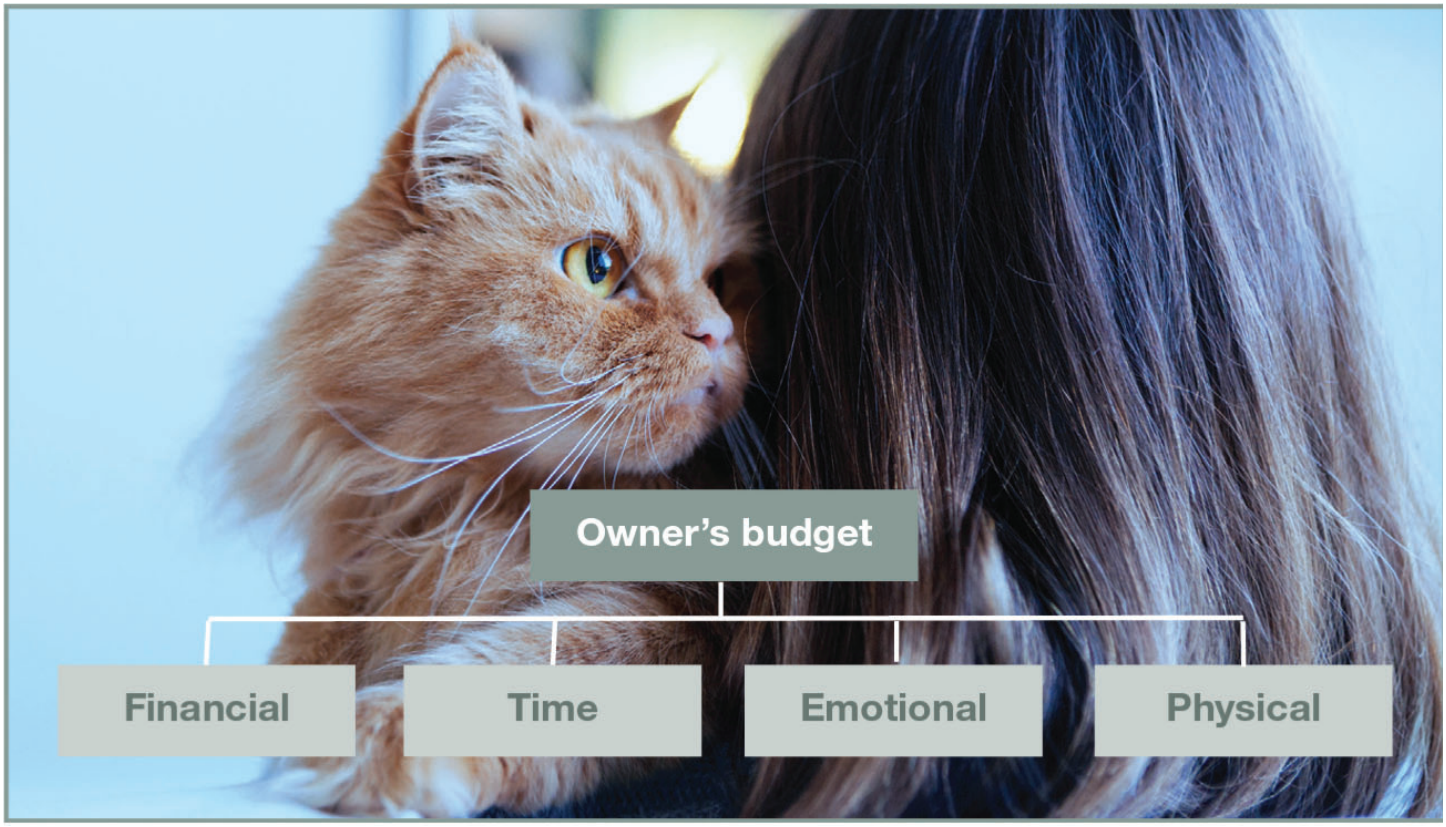
- Reducing Stress/Stressors
  - Ensuring a 'safe place' to hide is accessible (the ability to 'get away' may be compromised in painful cats)
  - Continue routines for consistency and increased sense of safety and control for the cat
  - Review the cat's interactions with human members of household
  - Review the number of cats in household, evaluate intercat relationships, and identify and address intercat tensions; ask caregivers to watch the Friend or Foe video to evaluate these relationships further
- Gentling
  - Gentling interactions with a cat may include long body strokes, brief head patting, soft speaking, and resting a hand lightly on the cat
- Activities of Daily Living
  - Routines are important
  - Encourage caregivers to try and keep everything consistent: feeding schedule, cleaning, human/pet interactions, administration of medications, grooming, etc

The 2023 AAFP/IAAHPC Feline Hospice and Palliative Care Guidelines provide in-depth recommendations and examples for modifications within each of the five pillars. Many of the details can apply to cats in chronic pain.

CAREGIVER SUPPORT

When treating a cat with chronic pain, it is important to consider the caregiver's four budgets of care—emotional, physical, time, and financial. Be flexible when offering treatment options and developing treatment plans in order to accommodate the caregiver rather than developing a rigid plan based on a so-called 'gold standard,' which a caregiver may not be able to follow or implement.

- Emotional Budget, which may be impacted by:
  - Other burdens in caregiver's life (e.g., sick child/parent, own health issues, etc.)
  - Personal mental, physical, and cognitive wellbeing
  - Attachment to cat
- Physical Budget
  - Physical limitations (e.g., senior caregiver with severely arthritic hands may not be able to administer insulin)
  - Ability to administer medication
- Budget of Available Time
  - Employment schedule may restrict ability to administer q8h medications or even q24h consistently
  - Employment or travel schedule may restrict ability to monitor the cat. Home video cameras that can be accessed remotely may be useful in some cases
  - Other responsibilities at home may have an impact on available time to manage the cat's care
- Financial Budget
  - Consider the ongoing care needs and the caregiver's financial budget to meet those needs



Reprinted with permission from the AAFP. Ray M, et al. 2021 AAFP Senior Care Guidelines Journal of Feline Medicine and Surgery. Available at catvets.com/senior-care.

Client Communication

Discuss each budget with the caregiver to find out what works best for the cat, caregiver, and/or the family in order to provide the best care for the cat.

- It is important to have a discussion with the caregiver and be cognizant of what they can realistically do at home.
    - In order to keep the bond between cat and caregiver, avoid prescribing without understanding if administering the medication(s) is achievable by the caregiver
    - Consider if the cat will/does experience caregiver aversion associated with administering treatments or therapy

- Consider what the caregiver can actually manage. Revisit this over time—caring for a cat in long-term pain is a commitment and many caregivers may start off able to implement the treatment plans, but their budgets of care may start to change. It's important not to make them feel bad or guilty for not being able to fulfill the treatment plan—have an open and honest conversation about what is best for their cat and possibly for the caregiver. Do not underestimate caregiver fatigue

- In order to effectively support caregivers, follow-up and outreach is very important. The practice team should be monitoring treatment and compliance, and mentoring and providing support to caregivers.

  - Identify someone in the practice to be the primary contact who will be the champion for caregiver outreach since it is a lifelong pain protocol and it will evolve with the cat's disease, the cat's age, and the cat's changing needs. Identify one back-up at the practice to help as needed. Identifying one person helps keep the communication going in order to support the cat, support the caregiver, enhance the cat-caregiver bond, and build trust with the veterinary practice

    - Develop a process to send and receive communications from caregivers. Incorporate notes and discussions into the patient's records. Include cataloging images of the cat over time and/or videos (i.e., for mobility)

    - Provide links to valuable easy-to-use/read information that can be referred to as needed

- Compliance really does make a difference in the lives of these cats. Caregivers are part of this process and they need our support.

- It is critically important that the practice identify which pain scoring tool they will all use for each particular patient in order to help track pain and detect early changes early.

- It's important to note that pain doesn't just fluctuate with age, but those in chronic pain may have day-to-day changes which include other factors in the cat's life such as other illnesses, environmental stressors, caregiver budgets, etc.

- Ensure time is provided to converse with the caregiver about their needs and how they are managing their own budgets of care.

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