

TREATING CHRONIC PAIN

Combining a variety of treatment modalities optimizes pain management and patient comfort.



PAIN MANAGEMENT

Me-oww!

Managing Chronic Feline Pain


MEET THE AUTHOR

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Alison Gottlieb passed the National Veterinary Technician exam and also the Emergency Critical Care boards sponsored by the Veterinary Emergency and Critical Care Society (VECCS). Her career began at Cat Hospital At Towson (CHAT) where her passion for cats bloomed.

Alison was part of the health care team at the Veterinary Referral Center in Little Falls, New Jersey, serving Senior ICU Nurse. She was also responsible for training new technicians at the hospital, through lectures and hands-on experience.

Ali has served on various boards and professional committees, giving lectures and speeches on her work in the ER/ICU. She is also co-founder of Four Paws Consulting LLC, which focuses on technician education.

Opposite: Johnny Cooker

In recent years, veterinary medicine has made great strides in the treatment of chronic pain in cats. Twenty-plus years ago, painful procedures were performed with chemical restraint alone and without consideration of analgesia or the patient's pain level. The veterinary paradigm has shifted from questioning whether animals feel pain to recognizing and treating their pain.

While significant strides have been made in veterinary analgesia in general, one area has lagged behind: chronic feline pain. Some of the obstacles for treating such pain include difficulty recognizing it, cats' unique metabolism, difficult drug delivery, fear of adverse effects, and ultimately a lack of data regarding the analgesic options for cats. For many of the pain medications used in both cats and dogs, research has focused primarily (if not exclusively) on their use in dogs, requiring most drugs to be prescribed off label to the feline patient.¹ Additionally, cats are living longer,² and older ages increase the need for appropriate and varied treatment options for painful cats.

Recognizing chronic pain in cats is challenging. Acute surgical and traumatic pain is accompanied by visual and anthropomorphic cues that trigger addressing analgesia; for example, incisions, inflammation, or bleeding all look like they hurt (**FIGURES 1 AND 2**). Such prompts are not always discernible with chronic conditions or neuropathic pain.

Many common afflictions in cats result in chronic pain — veterinary colleagues have identified



Whereas canine chronic pain has been well documented, studied, and publicized over the past 20 years,³ the same is not true for cats.

some, while others can be assumed to be painful. Osteoarthritis, chronic dermatitis, interstitial cystitis/urologic syndromes, oral disease, and ocular disorders tend to be accompanied by few overt clinical signs but can cause chronic pain.

Whereas canine chronic pain has been well documented, studied, and publicized over the past 20 years,³ the same is not true for cats. In a study performed at Utrecht University, 100 cats — arriving at the clinic for unrelated and varied issues — had their appendicular skeleton radiographed. Results

showed that 61% of the cats had osteoarthritis in at least one joint and 48% had more than one joint affected. The prevalence increased exponentially with age: in cats older than 14 years, 82% had at least one joint affected by this painful condition. The most common joints affected were shoulders, elbows, hips and tarsal joints.⁴ A U.S. study of 100 cats between 6 months and 20 years of age undergoing orthopedic radiography revealed that 91% of the cats had damage in at least one joint.⁵ Osteoarthritis in cats exists and is much more prevalent than anyone knew. Several studies have shown that lameness is rarely reported in cats with osteoarthritis, further complicating these cases and adding to the log of reasons some pain — specifically osteoarthritis pain — remains underrecognized and, therefore, undertreated.⁶

Neuropathic pain develops when damaged or dysfunctional nerves send inappropriate signals to the brain.⁷ Neuropathic pain can result from diabetic neuropathy, hyperalgesia syndrome, previous trauma, and onychectomy. (Feline hyperesthesia syndrome [FHS] is a pain disorder that often presents as aggression or self-injury. Also, cats will display rippling skin over their lumbar spine.) An important recent study confirmed the severe damage claw amputation poses to the overall well-being of cats and the cat–human bond. This study found declawing cats increases the risk of unwanted behaviors, including aggression

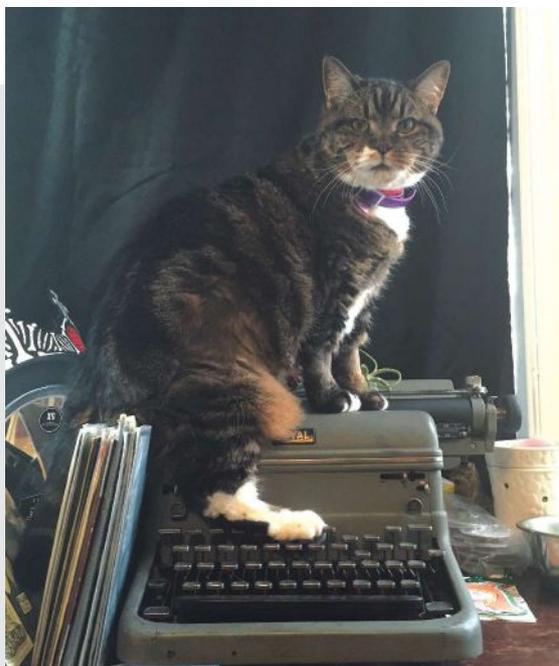


FIGURE 1. A cat after cruciate surgery is at risk for chronic pain associated with injury and surgery.



FIGURE 2. Post abdominal surgery indicators of pain include unwillingness to lie down, narrowing of the eyes, and head-down position. Additional analgesia is needed.

and inappropriate voiding, and pain, including back pain and chronic neuropathic pain. Even using the most ideal surgical technique cannot eradicate the risk of adverse behavior and pain. The researchers established that there is simply no “painless” declaw.⁸

The first step in alleviating feline pain is recognizing it. Difficulties in recognition include a lack of prompts/triggers, lack of data connecting different maladies with pain levels, and the often obscure nature of clinical signs associated with neuropathic pain. Adding to this complicated list is the fact that cats often try to hide pain, especially in the presence of humans and other animals.⁹ Although this assists with their survival in the wild, pain-masking behavior is a hindrance to proper treatment, if any is provided at all. Cats are typically reluctant to even be in the veterinary clinic for examination and, therefore, their subtle pain behaviors cannot be appropriately evaluated. This makes pain recognition and diagnosis more arduous.⁵ In such scenarios, the cat’s owner must be the facilitator in recognizing and treating chronic pain.¹⁰ These difficulties in pain recognition — particularly in the clinic setting — means that veterinary professionals must rely on owners and their experiences with their cats as a significant component of a comprehensive pain treatment model.

Clinical signs and changes in behavior associated with chronic pain in cats can be subtle and are often mistakenly attributed to their age.¹⁰ Owners and even veterinary professionals may inadvertently attribute behavior changes to age or common age-related issues rather than to chronic pain caused something else. Signs of chronic pain can include decreased grooming resulting in a greasy, clumped, or matted hair; the opposite — obsessive grooming — can likewise signify feline pain. A reluctance to jump onto furniture or countertops could be a sign of chronic pain, as could inappropriate urination/defecation; the latter is often quickly attributed to age and thus overlooked.¹⁰ Weight loss or a reluctance to eat dry food can be a sign of oral pain. Less obvious signs of pain include changes in sleep patterns, hiding, behavioral issues and aggression, an overall decrease in appetite, and an objection to being brushed or stroked.¹¹ The signs cats may display when they are experiencing pain are widely varied and vague and, even when present, do not provide much information as to the source or cause of the pain.

TREATING PAIN INVOLVES MULTIMODAL INTERVENTION

Cats are private about displaying chronic pain. Often, initiating treatment can be a trustworthy method to solidify a diagnosis. Profound improvement after a given pain treatment can positively confirm that pain had been present. Treatment of chronic pain in cats should be multimodal,¹¹ consisting of a combination of environmental and lifestyle changes, pharmacologic interventions, and alternative therapies.



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Lifestyle Changes

A cat with musculoskeletal or arthritic pain can benefit from a combination of treatment and lifestyle changes, while employing only one form of treatment may not provide in significant relief.

Including weight loss as part of a multimodal intervention for chronic pain has been shown to significantly reduce musculoskeletal and arthritic pain in people and dogs; the same is true for cats.¹² Weight loss not only reduces the stress on joints but can improve mobility. Therefore, one aspect of treatment for this type of pain is environmental: controlling caloric intake by offering fewer high-calorie treats, eliminating table scraps from the diet, and changing the cat’s diet to a reduced-calorie product.¹⁰ Providing cat owners with a copy of a body condition score to take home helps provide a visual guide they can share with other caretakers.

Small amounts of controlled activity also can help keep muscles and joints active and moving in cats with pain of this nature.¹⁰ Playing with laser pointers, feathers, and toys on strings can strengthen joints and muscles, which will leave the cat less vulnerable to pain while simultaneously improving the bond between the owner and the patient.

Additional environmental changes should be geared toward improving comfort and accessibility. Adding steps or ramps can help the cat reach favored elevated spots without having to jump.¹¹ Providing a larger litter box with low sides for easy access may resolve inappropriate elimination issues. Well-padded bedding and/or heated beds can lessen pain and increase comfort and thus may quickly become favorite sleeping spots. Massage therapy, passive joint manipulation and stretching, and underwater treadmill activity can all help alleviate pain, depending on the cat's temperament and willingness to be



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involved in these activities.¹³ Alternative therapies such as acupuncture and homeopathic remedies may be helpful in lessening chronic pain as long as the therapy does not cause undue stress.

Nutraceuticals have recently gained popularity in veterinary medicine because of their widespread availability and low incidence of side effects. Glucosamine and chondroitin sulfate have been shown to help alleviate chronic pain associated with osteoarthritis in humans,¹⁴ and high levels of

n-3 polyunsaturated fatty acids have been shown to reduce inflammation and decrease cartilage degeneration.¹⁵ Both are commercially available in “feline joint” supplements. In addition, nutraceuticals may help when combined with other pharmacologic interventions. However, owners should understand that they may not notice improvement in their cats for up to 6 weeks and that nutraceuticals are not appropriate as a sole treatment for severe pain. Some other nutraceuticals that are becoming popular in veterinary medicine include milk protein concentrate from the milk of hyperimmunized cows and microlactin (Duralactin, Veterinary Products Laboratories), which impedes inflammation and is helpful regardless of the cause of inflammation. Microlactin can be used safely in dogs, cats, and horses.⁷

Combining a variety of treatment modalities optimizes pain management and patient comfort. Multimodal techniques for managing pain are far more effective than a single treatment method. Even if the severity, source, cause, or exact nature of the pain is not fully diagnosed—a common situation in cats—it is often best to cast a wide net and employ a variety of treatments to help relieve pain.

Pharmacologic Interventions

There are useful pharmacologic interventions for feline pain. Polysulfated glycosaminoglycan (PSGAG), an injectable chondroprotectant, has been shown to increase range of motion and decrease lameness and pain in dogs;⁸ however, the product is not labeled for use in cats. Adequan (Novartis Animal Health; 5 mg/kg SC twice weekly for 4 weeks, then once weekly for 4 weeks, and then once monthly) has been shown to decrease signs of pain. Some suggested regimens call for once weekly injections for 4 weeks followed by once monthly administration. Research on Adequan has not provided concrete evidence that it provides a beneficial effect, but anecdotal information suggests improvement can be seen after a few injections.¹⁶

Gabapentin is another treatment option; it is widely available and inexpensive. Originally developed as an antiepileptic drug, it was eventually found to have a significant effect on many forms of pain. It is thought to interrupt the calcium channels on which pain travels, alleviating the severity and presence of certain types of pain. Gabapentin can be found as a liquid elixir or can be compounded, making it desirable for cats to ingest. Of note: some human formulations

of gabapentin contain xylitol, which can be toxic to cats, and some lethargy may be seen at higher doses. One study found that with the introduction of gabapentin, the affected cat displayed a decrease in pain-associated behaviors including aggression, avoiding human interaction, and loss of appetite. This same study also established, based on cat owners' assessment, that with longer-term use of gabapentin¹⁷:

- Satisfactory pain management was achieved.
- Administration was easy.
- There were no obvious side effects during the period of administration.

Gabapentin is very effective as a pharmacologic element of multimodal analgesia in patients with chronic pain. The recommended dose for cats and dogs starts at 2 to 10 mg/kg PO q8–12h and may be increased to 50 mg/kg PO q8h.⁸ The veterinarian should re-evaluate patients every 5 to 7 days for potential dose increases.

Tricyclic antidepressants, such as amitriptyline, have been used with success as treatment for some types of pain in cats. Amitriptyline blocks norepinephrine and serotonin reuptake, inhibiting the pain pathway. Given at doses lower than those used for depression in humans with chronic pain,¹⁸ this class of medication has few side effects and is readily available. The off-label veterinary dose ranges from 1 to 2 mg/kg PO q24h.⁷ Again, detecting pain in cats is extremely difficult, and pain may present as such behavioral problems as over-grooming and inappropriate urination, which is why these antidepressants have positive results on the cats' signs.

Long-term use of nonsteroidal anti-inflammatory drugs (NSAIDs) in cats is controversial. Currently in the United States, no NSAIDs are labeled for ongoing use in cats. However, quality of life also is important to consider, and thus, severe unrelenting pain may take precedence over potential adverse events.

Injectable meloxicam (Metacam, Boehringer Ingelheim Vetmedica) has been approved for cats in the United States as a single-dose administration.¹¹ Daily administration of the oral formulation is approved in other countries, but such use remains off-label in the United States.¹¹

Robenacoxib is currently approved only for 3-day use in cats. A study on long-term Onsior (Elanco Animal Health) proved it was well tolerated, with no evidence of injury to the gastrointestinal tract,

THE NEW CAT NIP Cannabis

Cannabis is another option in the cadre of feline chronic pain treatment modalities. In the United States, cannabis has been used with success for its medicinal properties since the 1800s. In 1970, it was classified as a Schedule I drug, akin to LSD and heroin with no legal option for medical use. This reclassification limits usage but likewise limits the ability to perform research. (Ironically, much human research regarding medicinal uses of cannabis was performed on laboratory animals.) Cannabis is currently prescribed in humans for a wide variety of afflictions including pain, inflammation, anxiety, seizures, nausea, inappetence, neurosis, and spasticity in spinal cord injuries. Research proved that low doses enhanced twice-daily doses of oral sustained-release morphine or oxycodone morphine in humans, making it a valuable instrument in multimodal analgesia.²⁵ Success with cannabis in humans ultimately led to the creation of cannabidiol ingestible pet products, which can be used to treat a similar variety of maladies; it is made from hemp, which contains no psychoactive component. Cannabidiol is easy to administer as it is offered in a variety of forms such as oils and treats (**FIGURE 3**). The results of using these products for pets are impressive, based on information from pet owners and chronicle evidence from the article's authors.²⁶



FIGURE 3. A cat with chronic arthritis pain taking CBD oil.



Veterinary technicians are patients' advocates, which means serving as client educators, doctor interpreters, and persistent reminders.

kidney, or liver, when administered daily for 1 month in cats with osteoarthritis, including cats with evidence of chronic kidney disease.¹⁹

Amantadine is a centrally acting antiviral drug that is thought to decrease pain sensitization. Canine studies and anecdotal evidence are promising, but to date there are no studies published investigating its use in cats. One study showed that administering amantadine with an NSAID significantly decreased clinical signs in dogs with osteoarthritis.²⁰ An off-label dose of 2 to 5 mg/kg PO q24h has been suggested for cats.²⁷

Buprenorphine is a partial mu opioid agonist. It binds to mu receptors but has only partial clinical effects, making it appropriate for mild to moderate pain, but not severe pain. However, there is good evidence, at least in cats, that analgesic dosages are much higher than described in earlier studies. An increased dose of (0.01-0.04 mg/kg IV) provide improved and longer lasting analgesia, not less.²¹ Buprenorphine was thought to have a ceiling effect, this is when a medication has reached its maximal response. In this case, increasing the dose does not enhance the effectiveness.

The pH of buprenorphine is very similar to that of the saliva of cats. This makes the drug effective when the injectable formulation is delivered oral transmucosal (OTM) in the cat, therefore increasing the ability to send the medication home with the painful feline patient. Chronic daily use is recommended only for severe or neoplastic pain.

Tramadol, an atypical opioid drug, weakly binds to mu receptors. Over the years the efficacy and dose

have been scrutinized and the usefulness and dosing of tramadol have been reevaluated. The activity of tramadol is thought to be attributed to a metabolite O-desmethyltramadol, known as M1. Studies in humans demonstrate that the metabolite is necessary for tramadol to be effective as an analgesic, but research has recently shown that it is a very minor metabolite in dogs. Therefore, Tramadol is not an effective analgesic agent for dogs. Humans and cats produce enough M1 to trigger opioid-like analgesia. Recommended doses in cats are 1 to 2 mg/kg PO q12-24.¹¹ Tramadol has a bitter taste that may make administering it to cats difficult and compounding often does not mask the severe bitterness. Drug interaction and dysphoria are other potential problems associated with using tramadol; both may be related to serotonin syndrome. Combining tramadol with selective serotonin reuptake inhibitors (SSRI), monoamine oxidase inhibitors (MAOI), and tricyclic antidepressants should be avoided. Tramadol may lower the seizure threshold and therefore should be used cautiously in animals prone to seizures, such as patients with epilepsy.

New therapies that inhibit nerve growth factor (NGF) for long-term treatment of pain from osteoarthritis in cats are currently in the field-testing phase. NGF is over-represented in damaged joints, which increases the excitability of nerve fibers and creates additional pain. Nexvet has developed a product called Frunevetmab (NV-02), a formulation for repeated monthly subcutaneous injections in arthritic cats. A study demonstrated significant improvement with no side effects.²²

Stem cell therapy is currently being used with promising results in dogs with osteoarthritis. Studies and the author's experience with her own arthritic dog have demonstrated increased mobility as well as a decrease in lameness in these patients.²³ The cells are harvested from the animal's own adipose tissue and delivered back to the patient via intravenous and/or intraarticular injections. One clinical trial performed at the University of California, Davis, proved that employing fresh, autologous, adipose-derived stem cell therapy was safe and effective for a naturally occurring, chronic inflammatory disease in cats. This particular study was performed on cats with severe gingivostomatitis, but the findings have the potential to be applied to any chronic inflammatory process.²⁴

Glucocorticoids can have significant systemic side effects, and evidence has shown that long-term use for neoplastic or uncontrollable pain may promote

cartilage degeneration, thereby exacerbating arthritis. However, because quality of life needs to be considered in some severe cases, chronic or neoplastic pain may be improved by administering these drugs.

In 2016 Colorado State University (CSU) completed a study on safety, toxicity, and pharmacokinetics of cannabidiol in healthy dogs. The outcome of this study established that the compound was measurable in the blood and safe for use. Additional clinical trials investigating the use of hemp-derived cannabidiol for osteoarthritis and seizure disorders are now underway at CSU. This is also a very promising area for veterinary pain management, and as research continues its uses are sure to expand.

THE VETERINARY TECHNICIAN AS PATIENT ADVOCATE

Veterinary technicians are patients' advocates, which means serving as client educators, doctor interpreters, and persistent reminders. Feline pain can be so elusive and well disguised that it's often overlooked.

Educating clients on detecting pain in their cats is a collaborative effort that begins with client education about behaviors associated with pain and the need to be on the lookout for pain cues at home.

Veterinary technicians are often the "detective" when it comes to feline pain. They should inform the veterinarian about specific behaviors described by owners and ask if such behavior might be indicative of pain; if so, the next step is to discuss whether some type of analgesia should be considered.

As a veterinary professional and pet owner, I witnessed profound behavioral changes caused by pain in my cat, George. George had lower urinary tract disease and his discomfort led to aggression with one of my other cats, Waffles. George subsequently underwent a perineal urethrostomy to decrease his urinary tribulations. Immediately after surgery and until the end of Waffles' life, George and Waffles were the best of friends (**FIGURE 4**). This case acts as an overwhelming reminder to assess for and rule out pain as a source of behavioral issues.



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and well disguised that
it's often overlooked.

As veterinary technicians, we need to be aware of all the options that the veterinarian may discuss with an owner so we can reinforce that information and better educate clients about the benefits of following the recommended multimodal approach to feline chronic pain. Because most pain medications are used off-label in cats, clients need to be reminded to look for adverse events and to immediately report any to the veterinarian.

Sometimes, chronic pain does not become obvious until the cat has become so debilitated that no treatment can restore an acceptable quality of life. When that happens, it is necessary to discuss euthanasia for humane reasons. If chronic pain interferes with quality of life, the staff needs to serve as the patient's guardian and bring up this difficult topic.

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FIGURE 4. George (left) and Waffles (right) bonding after perineal urethrostomy surgery.

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CONTINUING EDUCATION

Managing Chronic Feline Pain

LEARNING OBJECTIVES

Readers will increase their knowledge about treating chronic pain in cats. They will learn tips to help identify pain cues in cats, which can be difficult. Readers will also become familiar with the various therapeutic options that may alleviate chronic pain.

OVERVIEW

This article provides readers with the tools to better advocate for their feline patients. Ethical matters and quality of life issues are addressed, as are therapeutic options and multimodal interventions.

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- 1. Which of the following is the main obstacle in treating chronic feline pain?**
 - a. Recognition
 - b. Owner compliance
 - c. Research findings that it exists
 - d. Cost
- 2. Inappropriate voiding is always a behavioral disorder**
 - a. True
 - b. False
- 3. Which of the following statements is true about osteoarthritis in cats?**
 - a. Osteoarthritis in cats is rare.
 - b. Cats with osteoarthritis are often lame.
 - c. Osteoarthritis is not obvious on radiographs.
 - d. Osteoarthritis in cats is treatable.
- 4. Which of the following is a concern when administering gabapentin?**
 - a. It has a very bitter taste, making it unpalatable to cats.
 - b. Some human formulations contain xylitol, which can be toxic in cats.
 - c. It can cause loss of appetite.
 - d. It cannot be used in conjunction with other pain medications.
- 5. Chronic feline pain must be diagnosed to be treated.**
 - a. True
 - b. False
- 6. Gabapentin is**
 - a. Not safe for chronic use.
 - b. An NSAID.
 - c. Safe and effective for feline pain.
 - d. Nephrotoxic.
- 7. Cannabidiol for pets is**
 - a. Illegal in all forms.
 - b. Dangerous.
 - c. Difficult to administer.
 - d. Being studied currently at Colorado State University.
- 8. NSAIDs**
 - a. directly cause renal disease in cats.
 - b. are all used off label in cats.
 - c. should never be used chronically.
 - d. can be used chronically for severe pain if risks outweigh benefits.
- 9. Increased dosages of buprenorphine**
 - a. Provide longer lasting analgesia.
 - b. Cause hyperthermia.
 - c. Should not be used.
 - d. Are nephrotoxic.
- 10. Serotonin syndrome is possible side effect associated with**
 - a. Buprenorphine
 - b. Gabapentin
 - c. Tramadol
 - d. Cannabidiol

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