



In conversation with Dr. Ken Mould founder of the Canadian Animal Blood Bank

Veterinary Practice News

CANADA

December 2025

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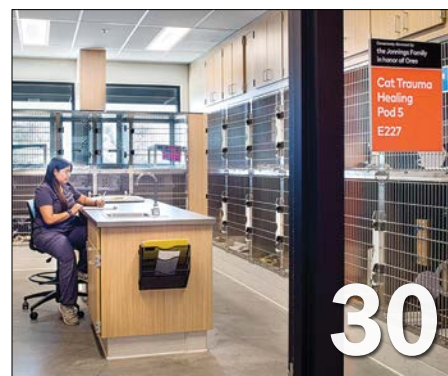
When a veterinary clinic is considering making an equipment purchase, the first question decision-makers typically ask is whether the business can afford what is on the price tag. A more well-rounded approach to assessing affordability includes a full evaluation of cost and the impact that the investment could have on the practice.

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Canine cognitive dysfunction (CCD) has gained some recognition in recent years, as dogs are living longer, and this condition is most prevalent in senior dogs. This article will focus on nutraceutical use for common ailments in aging pets, including cognitive dysfunction, muscle atrophy, and heart health.

By Vanessa Aberman, DVM, DABVP (Canine/Feline)



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Sharing is caring



We cherish our pets, often thinking of them as family members. Whether they are dogs, cats, horses, or reptiles, pets bring comfort, joy, and companionship. For instance, owning a dog is a great way to lower stress, encourage exercise, and improve overall health.

Pets also help ease loneliness for many, and as dogs are living longer, Canine cognitive dysfunction (CCD) has gained recognition. Vanessa Aberman, DVM, DABVP (Canine/Feline), discusses common aging ailments, including cognitive dysfunction, muscle atrophy, and heart health, in her article on page 34. “Owners often need guidance on which supplements make sense for their pets,” shares Dr. Aberman.

Although the house cat is the most popular pet, with dogs close behind, some prefer more unusual companions, not with fur but with scales.

Interest in reptiles as pets has grown over the years, with geckos being a popular choice. With more than 7,000 reptile species available, the options are vast. For those with reptile pets, specific guidance tailored to their species is also essential.

Most veterinarians agree that reptiles can feel pain, but recognizing it in reptiles remains a significant challenge when providing adequate pain relief. Olivia A. Petritz, DVM, DACZM explores this topic in her article on page 6.

“The presence of scaled skin and certain species’ proclivity for self-induced thermal burns (such as from a heating element) pose challenges for designing accurate analgesic efficacy research methods, specifically those that utilize thermal stimuli,” says Dr. Petritz.

As veterinary medicine progresses, so do the expectations regarding how and where patients recover. John Freytag discusses, on page 30, the evolution of veterinary containment through thoughtful design changes. These shifts help reduce stress, improve outcomes, and create spaces that not only provide shelter but also promote healing.

“For decades, veterinary housing has been seen as infrastructure, but the truth is, it is clinical and part of the recovery protocol. It supports or hinders healing, and it either adds stress or reduces it,” shares Freytag.

Another area of concern is jaw chattering in dogs and cats. The jaw-opening reflex is linked to pulp damage and diseases of the periodontium, but it may also occur when other tissues, not involving the pulp or periodontium, are involved. Some conditions affecting the oral and palatal mucosa can trigger the jaw-opening reflex. John R. Lewis, VMD, FAVD, DAVDC dives into common causes of jaw chattering in dogs and cats in his article on page 28.

“It is important to distinguish between chattering and tooth grinding. Tooth grinding can be seen in both dogs and cats, but it is more common in cats,” says Dr. Lewis.

In addition to providing excellent care, it’s also crucial to continually enhance the veterinarian-client relationship by being adaptable in how information is shared with pet parents. On page 14, Greg Bishop, DVM, discusses communication styles and how these skills can be improved.

“Communication is about conveying ideas, and that only works when people are ready and comfortable to receive that information,” shares Dr. Bishop.

Until next time, enjoy! 🐾

Ties Morgan

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What's new in reptile analgesia

By Olivia A. Petritz, DVM, DACZM



There have been substantial advances in the field of reptile analgesia over the last decade, which is critically important for the welfare of these species. However, due to the extreme diversity and numbers (more than 7000 species) within the Class Reptilia, there are still significant gaps in knowledge.

This article will review multiple recent analgesic studies in reptiles, including which drugs are currently recommended and which should be avoided due to their lack of efficacy. It is important to note that most of the referenced studies were performed in healthy reptiles, and the results may be different in a compromised or ill animal.

Pain recognition

Most veterinarians are in agreement reptiles can feel pain, but difficulty recognizing pain in reptiles was cited as a major impediment for providing appropriate analgesia by a recent survey of veterinarians.¹ Only ~33 per cent of veterinarians in that survey believed they had adequate knowledge of analgesia in reptiles, but 82 per cent of respondents reported providing analgesia to their reptile patients.¹

In another published survey, 76 per cent of reptile veterinarians stated they diagnosed pain in reptiles based on extrapolation from other species, and 66 per cent reported they diagnosed pain from “behavioural changes.”²

While grimace scores and other objective measures of pain have become more commonplace for many mammalian pet species, no such scores exist for any reptile species to date.

Reptiles have limited muscles of facial expression compared with most mammals, and most species do not vocalize. Therefore, objective measurements of pain are difficult to evaluate in most reptile species.

According to an informal survey of reptile veterinarians, the most commonly reported pain behaviours across reptile families included decreased interaction with the environment, decreased appetite, decreased movement, and inability to bear weight on an affected limb.³

The anatomic diversity amongst reptiles also poses a challenge for pain assessment, including the lack of limbs in snakes and some lizard species, and the presence of a shell (plastron and carapace) in chelonians.

The term “pain” is often used to imply a higher level of neural processing, encompassing both a physical and emotional response, such as what occurs in the neocortex of mammals. However, since both birds and reptiles lack a neocortex, the terms nociception and antinociception are likely more appropriate to use to describe “pain” and “analgesia” in most non-mammalian species.⁴ However, many veterinarians and publications still use these terms interchangeably.

The presence of scaled skin and certain species' proclivity for self-induced thermal burns (such as from a heating element) pose challenges for designing accurate analgesic efficacy research methods, specifically those that utilize thermal stimuli.

Alternative models have been evaluated in reptiles, and another study found that a decrease in feeding behaviour showed promise to assess antinociception in ball pythons.⁵

For additional information on pain models and comparisons of the pain pathway between mammals and reptiles, the reader is encouraged to consult a recently published review article on this subject.³

Opioids

Full mu opioids have been proven to be efficacious in numerous reptile species to date. However, based on several previous studies, it is still unclear whether mu opioids are efficacious in any snake species.^{6,7}

Morphine

Morphine provided antinociception in bearded dragons (1 and 5 mg/kg SC) and red-eared sliders (1.5 and 6.5 mg/kg SC), but there was no clear efficacy proven in corn snakes, even when administered at an extremely high dose of 40 mg/kg.^{8,9,10} Antinociception was also shown in black and white tegus following single intramuscular injections of morphine at 5 and 10 mg/kg.¹¹ Similar to mammals, respiratory depression has also been seen in higher doses of morphine in reptiles, and clinicians should be aware of this possible side effect if morphine is administered on an outpatient basis or when a respiratory rate cannot be monitored.⁸

Hydromorphone

Hydromorphone is another mu opioid receptor agonist that has been evaluated in several reptile species, with good analgesic efficacy. In red-eared sliders and bearded dragons, hydromorphone was found to provide analgesia at 0.5 mg/kg SC for up to 24 hours.^{12,13} Respiratory depression was seen at higher doses, similar to morphine, and clinicians should plan appropriately for monitoring respiration.

Injections of any drug (analgesic or other) should be performed in the forelimbs (Figure 1) or cranial portions of a reptile's body, as drugs that undergo hepatic metabolism/excretion or renal tubular excretion can have reduced efficacy and/or enhanced toxicity if injected in the caudal aspects of the body/hindlimbs due to the presence of the renal portal system.

Fentanyl

There are several previous studies that have evaluated fentanyl patches in reptile species. Anecdotally, fentanyl patches have shown promise for providing analgesia in several snake species, particularly for alleviating pain associated with chronic conditions such as spinal osteoarthritis.

Figure 1

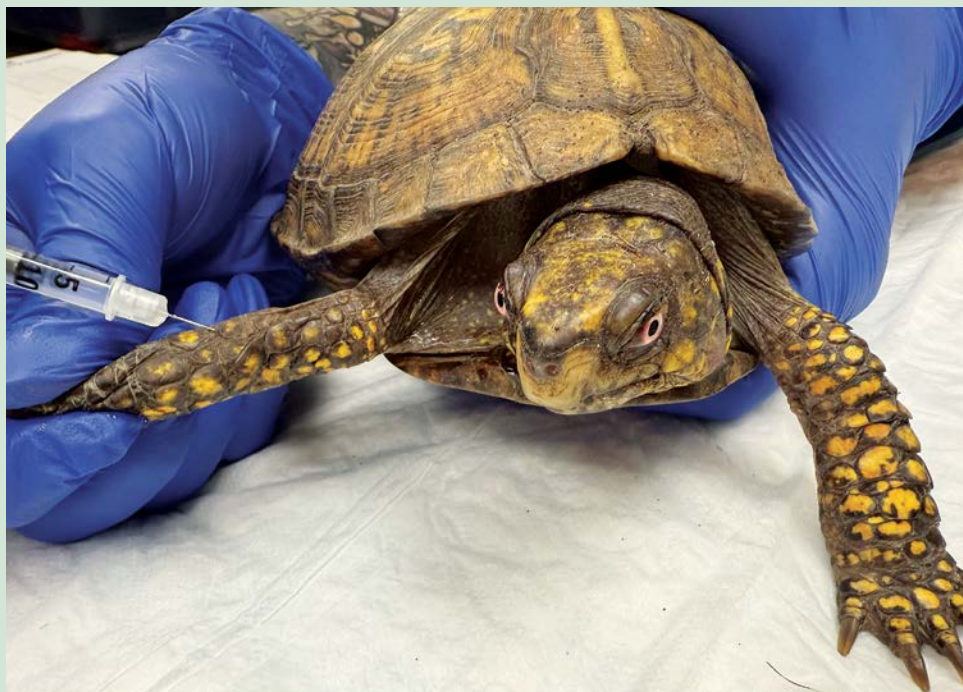


Photo courtesy Dr. Olivia A. Petritz

As there are limited studies demonstrating any effective analgesics in snakes, this was a promising finding. A 2017 study found that ball pythons had similar concentrations of mu-opioid receptors in their brain and spinal cord tissues as turtles and showed respiratory depression after placement of transdermal fentanyl patches, suggesting the physiologic efficacy and route of this drug.¹⁴

In addition, plasma concentrations were high following transdermal administration, suggesting positive transdermal absorption. However, there were no differences seen in response to a thermal stimulus, suggesting a lack of analgesia, at least according to this pain model.¹⁴

A subsequent study has recently been published by this same research group, evaluating serum fentanyl concentrations and behaviours after the placement of transdermal fentanyl patches in healthy corn snakes.¹⁵ The plasma concentrations of fentanyl in those snakes remained above therapeutic concentrations in mammals for approximately four weeks. In addition, the behavioural changes suggested this dose provided analgesia without negative side effects.¹⁵

Buprenorphine

Buprenorphine, a partial mu opioid receptor agonist and kappa receptor antagonist, is frequently used for analgesia in mammals. However, according to studies in green iguanas¹⁶ and red-eared slider turtles,¹⁷ effective analgesia has not been demonstrated in reptiles. Therefore, this drug is not currently recommended for analgesia in any reptile species until proven otherwise by additional research.

Butorphanol

Butorphanol is a kappa receptor agonist/mu receptor antagonist that is commonly used in many avian species for analgesia and was previously used

An Eastern box turtle (*Terrapene carolina carolina*) receives an intramuscular injection of hydromorphone in the forelimb as a premedication for surgical excision of an aural abscess.



Butorphanol does not provide analgesia in species such as ball pythons.

in reptiles for the same purpose. According to several publications, this drug does not provide analgesia in bearded dragons, corn snakes, ball pythons, black and white tegus, and red-eared slider turtles at a wide range of dosages.^{6,7} Therefore, butorphanol is also not currently recommended for analgesia in any reptile species.

NSAIDs

Non-steroidal anti-inflammatory drugs (NSAIDs) are commonly used in many species for analgesia and anti-inflammatory properties, including reptiles. They act primarily by inhibiting cyclooxygenase enzymes (COX), which prevents the production of prostaglandins and several other inflammatory mediators.⁷

The main COX enzymes are COX-1, which are expressed in most tissues, and COX-2, which are elevated secondary inflammatory processes. Consequently, most NSAIDs that are classified according to their COX selectivity: COX-1, COX-2, or both (non-selective).

In addition, NSAID efficacy is difficult to quantify, as plasma concentrations of these drugs often do not reflect the tissue concentrations at the site of inflammation, which further complicates NSAID pharmacokinetic and pharmacodynamic research.⁷

Several studies have found increased concentrations of COX-1 enzymes in inflamed tissues of box turtles¹⁸ and ball pythons¹⁹ compared with COX-2 enzymes, suggesting COX-1 selective NSAIDs may be more appropriate for these reptile species.

Meloxicam

Meloxicam is a primarily COX-2 inhibitor, and widely used in exotic animal medicine, including reptiles. However, there is conflicting evidence of its efficacy in several reptile species, despite numerous pharmacokinetic studies in this Class. Ball pythons administered meloxicam 0.3 mg/kg intramuscularly showed no indications of analgesia for a surgical catheterization procedure.²⁰ Conversely, after

administration of meloxicam (0.4 mg/kg IM) to bearded dragons, signs of successful antinociception were noted.²¹ Intramuscular meloxicam administered at 0.2 mg/kg in red-eared slider turtles reached plasma concentrations sufficient to provide analgesia in mammalian species for ~48 hours, but the oral bioavailability was poor.²²

Ketoprofen

Ketoprofen is a non-selective inhibitor of both COX-1 and COX-2 enzymes and has been used with increasing frequency in reptiles. In green iguanas, ketoprofen had a long half-life when administered at 2 mg/kg IV, but was slightly shorter when administered intramuscularly (~8 hours).²³

The safety of repeated doses of ketoprofen (2 and 20 mg/kg IM for 14 days) were recently evaluated in bearded dragons.²⁴ No adverse systemic effects were noted on biochemical panels or histopathologic examination post-mortem, but there was severe muscle necrosis present at the injection sites of the 20 mg/kg group.

Alpha-2 agonists

Despite the lack of experimental antinociception for many analgesics in snakes, several recent studies have demonstrated positive effects with the alpha-two agonist dexmedetomidine in ball pythons.

Dexmedetomidine is often used in combination with other sedatives for anesthesia in reptiles, at much higher doses than what is typical in most mammals. However, a recent study evaluated the response of ball pythons to a thermal noxious stimulus after administration of 0.1 – 0.2 mg/kg SC dexmedetomidine and found it did produce antinociception at those doses.²⁵ Excessive sedation was not noted, but respiration was depressed, without apnea.

In a follow-up paper by the same investigators, dexmedetomidine was administered at 0.1 mg/kg SC, and antinociception was confirmed.²⁶ In addition, concurrent administration of doxapram (10 mg/kg) helped mitigate the reduced respirations without changing the thermal antinociception.²⁶

While doxapram is not routinely used concurrently with dexmedetomidine in reptiles in clinical practice, the use of dexmedetomidine as an analgesic is becoming more common, as few other proven analgesic drugs for snakes exist. 🐾

Olivia A. Petritz, DVM, DACZM, graduated from Purdue University and then completed several internships and a residency in the field of zoo and exotic animal medicine. Dr. Petritz became a diplomate in the American College of Zoological Medicine in 2013, specializing in zoological companion animals (exotic pets). Petritz started an exotics service at a specialty hospital in Los Angeles, Calif., following her residency, and is currently an associate professor of Avian and Exotic Animal Medicine at North Carolina State University.

References

View references for this article online at veterinarypracticenews.com/reptile-analgesia.



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■ A non-profit veterinary clinic opened in Windsor recently, the first in the region to offer a 24-hour pet microchip scanning station. Located outside the Community Veterinary Clinic – Windsor Essex, the unit has signage explaining how to use it. All it takes is to pass the scanner over the pet's neck and back. If a microchip is detected, the number appears on the display. That number is then entered into a national database of registered chips. From there, the owner can be contacted. The weather-resistant scanning station allows pet owners to locate lost pets without visiting an animal shelter. The clinic was co-founded by Melanie Coulter, the former head of the Windsor-Essex Humane Society, and veterinarian Dr. Kayla Beetham.



■ Canadian-owned EcoStrong, makers of one of America's fastest-growing lines of bio-enzymatic stain and odour eliminators, announced in September that it will start manufacturing its flagship products in Canada. The move keeps retail prices steady despite new cross-border uncertainties and responds to increasing demand from Canadian consumers to support the Canadian economy.

Canadian customers will get the same trusted formula as in the U.S. – a plant-powered, bio-enzymatic blend bottled closer to home. The initial bottles produced in Canada were sent to leading pet specialty retailers and Amazon.ca in August. Distribution will grow across the country throughout the fall and into 2026.

■ The Nova Scotia government approved the construction of a whale sanctuary on 83 hectares of Crown land and coastal waters. Whale Sanctuary Project, the organizers of the plan to create North America's first coastal refuge for captive whales, announced they received the green light to begin building on the province's eastern shore. This approval allows them to start constructing a large, floating net enclosure for whales and dolphins retired from marine theme parks like Marineland in Niagara Falls, Ont. "We are grateful to the Nova Scotia government and the Minister of Natural Resources," said the group. "This is a great day for the Whale Sanctuary and for the whales." The 20-year lease granted to the American non-profit organization has an option to renew for another 20 years. The cost of building the 40-hectare underwater enclosure is estimated at US\$15 million and will take approximately eight months from the start of construction to completion. The annual operating cost is about US\$2 million.

■ Togetherall has expanded its partnership with the Canadian Veterinary Medical Association (CVMA) and the Alberta Veterinary Technologist Association (ABVTA) to improve mental health support within the veterinary profession. This enhanced collaboration will increase access to Togetherall's anonymous, clinically moderated, 24/7 mental health platform for thousands of veterinary professionals across Canada, including veterinarians, veterinary technologists, and technicians, students, and all veterinary support staff.



■ A public health notice has been issued, alerting the public about a salmonella outbreak linked to dog food and treats, as reported by the Public Health Agency (PHAC) of Canada. The outbreak has affected 31 individuals across four provinces and territories, with seven people hospitalized. No deaths have been reported. Cases are in Alberta (14), British Columbia (14), Ontario (2), and the Northwest Territories (1). The health agency recommended that people practice good hand hygiene and wash their hands thoroughly after contact with dogs, their food, treats, and waste to help prevent illness. The outbreak involves specific Puppy Love and Puppy World treats and food. The investigation is ongoing. 🐾

People in the News

■ **Angela Nisbett**, RVT, has been named the 2025 recipient of the prestigious Canadian Registered Veterinary Technologist (RVT) of the Year Award for her mentorship of others and dedication to excellence. The award was presented at the Canadian Veterinary Medical Association's Award Gala on June 25, 2025, in Victoria, B.C., by Francis Rousseau, RVT (president of RVTTC), and Shaneka Willer, RVT (Hill's representative). Nisbett graduated from the Saskatchewan Institute of Applied Science and Technology (SIASST) (SaskPolyTech) in 2004 and works with small animals in Regina, Sask. She is committed to ongoing learning and has been pursuing a Veterinary Technician Specialist (Dentistry) designation.



Photo courtesy RVTTC

■ At the annual CVMA Awards Gala in June, **Kelly Butler**, DVM, was honoured with the 2025 Canadian Veterinary Medical Association (CVMA) Distinguished Member Award for her extensive career in public health, international work, animal welfare, and promoting gender equity in science. Dr. Butler, an Ontario Veterinary College (OVC) graduate, has held various influential roles nationally and internationally, including emergency practice, federal laboratories, and work with the World Health Organization (WHO). She was also a founding member of the World Women's Veterinary Association (WWVA), dedicated to advancing veterinary medicine's support for rural women and children worldwide. Butler's role at the WHO Western Pacific Regional Office was particularly impactful in advancing global public health, overseeing a regional laboratory network dedicated to polio and measles.



Kelly Butler

Photo courtesy CVMA

■ A team of researchers from the University of Saskatchewan (USask), the University of Calgary, and the University of Veterinary Medicine, Hannover, are calling for significant reforms in the way laboratory animal experiments are designed, conducted, analyzed, and published. Their call comes after uncovering widespread failures in review processes meant to ensure proper study design in published biomedical literature. In the paper published in *Scientific Reports*, the team suggests that improved experimental designs will lead to more valid, precise, and accurate results while also reducing the waste of time, resources, and animals.

The team of researchers include: Hugh G. G. Townsend, DVM, MSc; Klaus Osterrieder, DVM; Murray D. Jelinski, DVM, MSc; Cheryl L. Waldner, DVM, PhD; Douglas W. Morck, DVM, PhD; William R. Cox; Volker Gerdt, DVM, PhD; Andrew A. Potter, BSc, PhD, NSERC senior industrial research chair; Lorne A. Babiuk, PhD, DSc; James C. Cross, DVM, PhD.

■ In honour of **Murray Jelinski** (DVM, MSc), the Western Canadian Association of Bovine Practitioners (WCABP) announced the launch of the Dr. Murray Jelinski Scholarship Fund. The scholarship will be awarded annually starting in fall 2026 and will support fourth-year students at Western College of Veterinary Medicine (WCVU) and the University of Calgary Veterinary Medicine (UCVM) who have already shown a specific interest in bovine medicine. It will help students cover the costs of bovine-specific externship experiences in bovine and rural practices, enhancing their education and building their expertise in this field before graduation—an important step towards becoming rural or bovine veterinary practitioners. Jelinski has been a vital member of the WCABP for the past 21 years as the secretary/treasurer. He earned his DVM and an MSc degree in epidemiology from WCVU. 🐾



Murray Jelinski

Photo courtesy WCABP

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How to get clients to submit online forms



BUSINESS BUILDER

By Wendy S. Myers, CVJ

When pet owners complete online health forms before appointments, veterinary teams benefit. Veterinarians and technicians can save up to 10 to 15 minutes of history taking at the start of appointments. They ask follow-up questions, zeroing in on chief complaints and enjoying more efficient exam time.

Use these strategies to get more clients to complete forms in advance:

Let clients know when to expect forms

At the end of scheduling calls, summarize appointment details and when to expect the next communication. Say, “We will see <pet name> for a wellness appointment with Dr. <Name> on <date, time>. Please bring a stool sample for an intestinal parasite screen. You will get a text/email confirmation shortly. Two days before <pet name>’s appointment, you will get a link to an online health form to complete and submit before the appointment. These are important health questions to help our medical team prepare for your pet’s appointment. We look forward to seeing you and <pet name>.”

Immediately upon booking appointments or procedures, clients should receive automated confirmations through your practice information management system (PIMS) or third-party client communication platform. Two days before visits, pet owners will receive another confirmation with the health form based on the reason for the visit (Figure 1).

If clients book same-day appointments, they will receive confirmations and forms at the same time.

When clients schedule procedures, use benefit statements to reinforce the importance of completing anesthetic consents in advance. Say, “We will see <pet name> for a surgical admission appointment on <date, time>. Two days before the procedure, you will receive fasting instructions and an anesthetic consent form to review and complete on the day before <pet name>’s procedure. This will help our medical team prepare for your pet’s procedure and let us know how to contact you on the day of surgery.”

Create forms based on the reason for visit

The appointment type will trigger confirmations with corresponding forms through your PIMS or third-party client communication platform. A dog owner with a wellness appointment will receive a canine adult wellness form, while a cat owner with a dental procedure will get an anesthetic consent.

Team up in creating forms for a better workflow (See: “Forms that work”).

Forms that work

Have doctors and technicians collaborate to create forms for appointment types, such as:

- Canine adult wellness appointments
- Canine senior wellness appointments
- Feline adult wellness appointments
- Feline senior wellness appointments
- Progress exams
- Puppy appointments
- Kitten appointments
- New client appointments
- Technician appointments
- Sick patient appointments
- Urgent care appointments
- Anesthesia/surgical consent
- Quality of life consultation 🐾

Make forms easy to complete

Include hyperlinks and buttons in text and email confirmations that link to corresponding forms on your website. Buttons increase click-through rates by 15 per cent over hyperlinks.¹ Many clients will complete forms on cell phones, so have mobile-friendly designs. Use checkboxes with an option to check all that apply.

When asking, “Have you noticed any health changes or concerns with your pet?” give clients an easy-to-skim list, such as increase in appetite, decrease in appetite, bad breath, vomiting, diarrhea, urination issues, difficulty rising, skin masses, etc. Have a comment box where clients can share details of symptoms and when they started.

Ask permission to use photos and videos on social media with yes or no checkboxes. Share your financial policy and cancellation/late/no-show policy with a checkbox of “I have read and understand.”

Have a prominent “submit” button at the end of forms. Depending on your third-party provider, forms may be sent to a clinic email, such as records@, or may be written back to your PIMS.

Call clients who have not submitted forms on the day before appointments or procedures

Client service representatives (CSRs) should call during the morning and explain the benefits of completing forms, such as a smoother check-in, better communication with the medical team, or faster access to care.

Say, “This is <name> with <hospital name>. Dr. <Name> asked me to call you because we have not received your completed form for <appointment type/procedure>, which has important questions for our medical team to prepare to deliver care. Please complete and submit your form by __ p.m. today. I will text you the link now. If you need help completing the form or have questions, please call us at 555-555-5555.”

Give clients a deadline of two hours before your hospital closes today. This gives CSRs time to save completed forms to patient records before the end of the workday, so details are available for morning appointments and admissions. Some forms may automatically write back to your PIMS depending on the third-party provider. Use the doctor’s name to bring authority to the call and urgency to the request.

Because 67 per cent of people do not listen to voicemails, send texts as backup communication.² Send this text: “<Pet name> has an appointment/procedure tomorrow at <time>. Please complete and submit this online health form by X p.m. today so Dr. <Name> and our medical team may prepare to deliver care. Please call us with questions at 555-555-5555. We are open until X p.m. today.”

Consider an option to complete forms on tablets upon arrival

If clients arrive a few minutes early, CSRs could say, “Hello, <client name> and <pet name>. Here is a tablet with the online health form for your <appointment type>. Please take a seat and answer the questions so Dr. <Name> may ask you follow-up questions.

“With automated confirmations and courtesy reminders, you will increase the likelihood of clients returning online forms.”

Figure 1

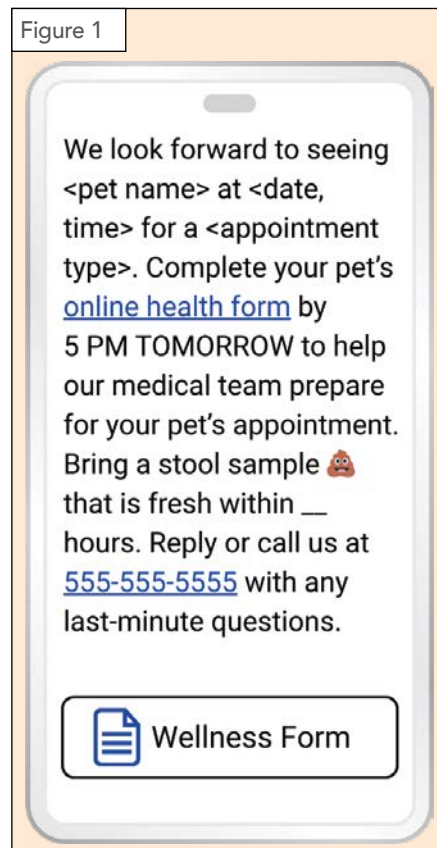
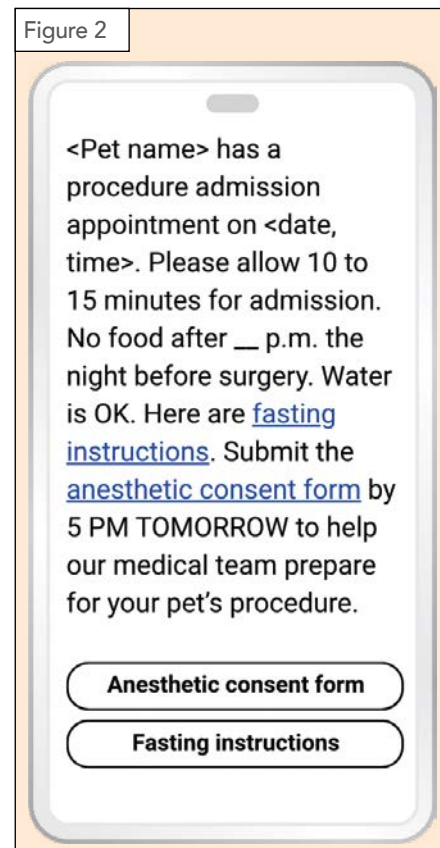


Figure 2



When you are finished, click the submit button and return the tablet to me. I will let Dr. <Name> and the technician know that you have arrived and are completing the questionnaire.”

If clients are technology-challenged or visually impaired, offer to have staff help them. If CSRs can step away from the desk for a few minutes, they can escort clients to seating areas and interview them to complete and submit forms. As a last resort, the technician takes a verbal history at the beginning of the exam.

With automated confirmations and courtesy reminders, you will increase the likelihood of clients returning online forms. As a result, you will streamline history taking and have more time for engaging exam conversations. 🐾

Wendy Myers, CVJ, knows the right words will lead clients to accept your medical advice, driving patient and practice health. As founder of Communication Solutions for Veterinarians, she teaches practical skills through online courses, conferences, and onsite consulting. Myers’ experience as a partner in a specialty and emergency hospital helped her understand issues that owners and managers face. Learn how she can train your team at csvetscourses.com.

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SEND FORMS TWO DAYS BEFORE APPOINTMENTS OR PROCEDURES. Ask clients to complete and submit forms 24 hours ahead. Use ALL CAPS to emphasize deadlines.

Rethinking your client communication skills and styles



Learn how thoughtful flexibility in the way we exchange information with pet parents may improve the veterinarian-client relationship and, ultimately, patient outcomes.

By Greg Bishop, DVM

Picture this: a perfect sunny afternoon in the park. You're on the grass, barefoot, tossing a Frisbee around. It glides through the air in beautiful, lolling arcs, back and forth between you and your partner, but then, this graceful and pleasant experience is interrupted in a terrible way. As the Frisbee nears your outstretched hand, the light plastic disc suddenly transforms into a cold hunk of iron—a shot put ball.

Catching a 16-lb hunk of metal is a lot different from catching a Frisbee, obviously. You can imagine most people would prefer one over the other, and there's a reason Frisbee is a team sport, whereas shot put is a one-person game.

It's also a perfect analogy for communication styles—not my own but shamelessly stolen from Jane Shaw and Jason Coe, in their textbook on veterinary communication, *Developing Communication Skills for Veterinary Practice*.¹

Drs. Shaw and Coe break down clinical communication into two styles: The Expert and The Partner. They describe how veterinarians can choose either style in communicating health information. Each one can be thought of as hurling a piece of sporting equipment at a partner, albeit in very different ways.

The Expert is a shot putter, heaving a dense ball of information with maximum effort toward the client. The Partner lightly and thoughtfully passes ideas and thoughts back and forth between themselves and their clients.

At first glance, being an expert is what you are supposed to be, right? After all, the client came to you for help. If they do not want your expertise, what do they want? A free month of heartworm prevention? Possibly. However, the point is, The Expert's communication style is the equivalent of a biomedical lecture—dense with information, but not necessarily digestible. We spend a lot of time thinking this way as veterinarians, but

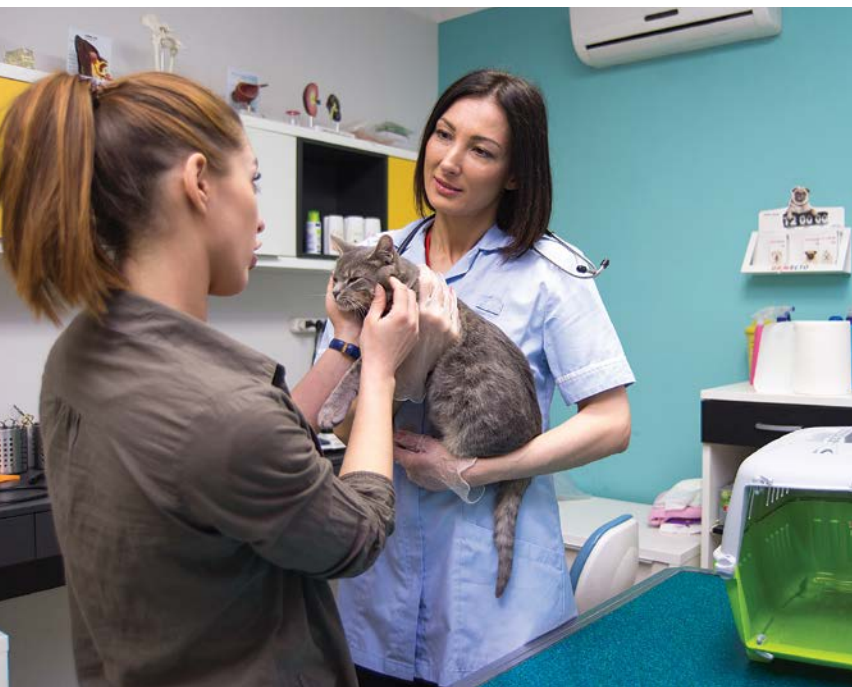


Photo Slavica / E+ / Gettyimages

Taking the time to make clients feel seen and heard makes them more likely to follow through on our recommendations. They are more likely to trust us with relevant information.

treating your client like a lawn full of fresh sod to hammer with shot put balls does not actually lead to better health outcomes.

The Expert is knowledgeable, but they do not have much time for dialogue. A speech packed with terms like “monoclonal antibodies” and “dysbiosis index” tends to lose a lot of folks’ attention. Experts pack in a lot of relevant information but end up sacrificing retention. More importantly, it reduces the quality of the veterinarian-client relationship.

You might think, so what? But it has been shown (and bears a moment’s reflection) that improved client relationships lead to better satisfaction for both pet owners and veterinary personnel, as well as improved compliance (*i.e.*, better health care for animals).²

Now compare The Partner’s style, which leads with curiosity. Partners pause and reflect, sending back small, easily handled pieces of information as though they are throwing a Frisbee. In other words, the conversation is, well, actually a conversation. That means the client participates, getting a chance to contribute and feel heard.

You might think that opening Q&A time to your clients sounds about as fun as smearing compost on your body and lying down in a seagull colony. It’s completely understandable—we’re busy people! You might have 15-minute appointments, 20 cases on your schedule, and a tech who just called in sick. Slowing down and inviting Mrs. Jones to speak about her theories on the origins of Fluffy’s diarrhea might be enough to make you start Googling “non-clinical careers for veterinarians,” but here’s the deal: The Partner model, while seemingly slow and laborious, is actually faster in practice. A 2006 study showed that the Partner-model appointments were 13 per cent shorter³—and over a 200,000-appointment career,⁴ that adds up.

It is not every day you come across a way to save yourself half a million minutes. Just like a drop of lidocaine on a cat’s arytenoids before intubation, the wisdom of using The Partner style ends up saving you a lot of frustration. Plus, it is just plain old better medicine. Taking the time to make clients feel seen and heard makes them more likely to follow through on our recommendations. They are more likely to trust us with relevant information. It prevents confusion, backtracking,

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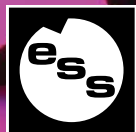


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Making an MPACT That Lasts:

Shockwave Therapy for the Hard-to-Heal Equine Suspensory

Author: Steve Adair, MS, DVM

Suspensory ligament injuries remain one of the most challenging conditions in equine sports medicine and equine musculoskeletal injuries. Whether affecting the proximal attachment or the branches, these injuries can disrupt training, limit performance, and, if inadequately treated, lead to chronic pain or compensatory damage in other musculoskeletal structures. The longer a horse compensates, the greater the risk of progressive pathology that may eventually require surgical intervention, retirement, or other deleterious options.

For clinicians, the goal is clear: intervene early, promote functional regeneration, and reduce pain - all without the complications of prolonged medication use or invasive treatment. Shockwave therapy has become a key tool in achieving that goal, offering a scientifically validated way to activate repair processes, restore circulation, and accelerate recovery in ligament and tendon injuries.

The Science Behind Shockwave Therapy

Shockwave therapy uses focused acoustic pulses to stimulate a biological response within damaged tissue. The process, known as mechanotransduction, transforms physical energy into a cellular signal that initiates repair. These high-pressure waves increase local circulation, stimulate fibroblast activity, and upregulate key growth factors such as vascular endothelial growth factor (VEGF), transforming growth factor beta (TGF- β), and insulin-like growth factor (IGF) (Bosch, 2009).

This biological cascade leads to angiogenesis, collagen remodeling, and improved cellular metabolism. In parallel, shockwave exerts an analgesic

effect by temporarily disrupting nociceptive transmission and desensitizing nerve endings (Waguespack, 2011). The combination of regenerative activation and pain reduction allows earlier reintroduction of controlled exercise - an essential component of ligament rehabilitation.

Histological and imaging studies provide clear evidence of these effects. In an induced desmitis model, McClure (2004) demonstrated that horses treated with shockwave exhibited superior ultrasound and histological healing characteristics compared to controls. Improved fiber alignment and vascularity were noted after three treatments spaced at three-week intervals. Similarly, Gillis (2005) reported positive outcomes in horses with proximal suspensory desmitis treated with focused extracorporeal shockwave therapy, reinforcing its clinical relevance in hard-to-heal suspensory lesions.

Why the Suspensory Ligament Responds

The suspensory ligament is particularly well-suited for regenerative treatment because of its complex vascular and collagenous composition. Chronic injuries in this structure often show poor intrinsic repair and high recurrence rates when managed conservatively. Shockwave therapy directly targets these limitations by restoring microcirculation, stimulating extracellular matrix renewal, and reducing fibrotic deposition.

King (2018) noted that the strongest reported effects of shockwave are in ligamentous and tendinous tissue, with proximal suspensory desmitis among the most consistently improved conditions. In a more recent evaluation, Stein (2023) found that repeated electrohydraulic shockwave

sessions in horses with suspensory and flexor tendon injuries significantly reduced lameness between the first and third treatments, confirming that cumulative effects occur with serial therapy.

Although ultrasound changes do not always correlate immediately with clinical improvement, shockwave's ability to modulate pain and stimulate cellular repair makes it a valuable early intervention strategy. This allows the horse to begin controlled exercise earlier and to start the multimodal approach of healing.

Advancing Clinical Outcomes with MPACTVet Technology

The evolution of shockwave technology has transformed how clinicians approach equine rehabilitation. Traditional electrohydraulic units were powerful but loud, often necessitating sedation and clipping before treatment. The emergence of piezoelectric and impact systems, such as MPACTVet, have addressed these limitations.

MPACTVet piezoelectric shockwave technology is quiet, precise, and efficient. Treatments are typically performed with the horse standing calmly, eliminating the need for sedation. The applied coupling gel ensures effective acoustic transmission without clipping the hair coat, improving both workflow and animal comfort. This noninvasive approach makes it easier to treat horses in barns or on the road while reducing stress for both patient and practitioner.

The lack of procedural barriers—no sedation, no clipping, no loud discharge—represents a major advance in the practical application of shockwave therapy. Horses tolerate MPACTVet therapy calmly,

allowing accurate targeting of the lesion and more consistent dosing. These refinements are particularly valuable when treating elite performance horses that require precision and repeatability.

The Power of Synergy: Shockwave and Super Pulsed Laser Therapies

While shockwave initiates a regenerative cascade, the addition of super pulsed laser therapy (SPLT) enhances the modulation of inflammation and accelerates tissue repair. The rationale for combining the two is grounded in the complementary nature of their biological effects.

Shockwaves produce microinflammatory activation, increasing blood flow and cytokine signaling within the injured tissue. This transient inflammation is necessary for tissue repair but can become detrimental if excessive or prolonged. SPLT, - delivering ultrafast, high-peak light pulses - acts at the mitochondrial level to balance this process. It stimulates cytochrome c oxidase, enhancing ATP production, reducing oxidative stress, and regulating inflammatory mediators (Leal Junior, 2019; Eells, 2020).

Pluim (2020) demonstrated that high-power laser therapy significantly improved healing in equine suspensory branch lesions, resulting in enhanced Doppler vascularity and collagen organization. Zielińska (2022) confirmed similar findings in tendon models, with laser-treated tissues showing superior fiber alignment and less edema. Giannini (2020) also reported significant clinical improvements in pain, swelling, and lameness in horses treated with high-intensity laser therapy compared to conservative management. Together, shockwave and SPLT form a sequential

regenerative strategy: shockwave stimulates angiogenesis and cell recruitment, while SPLT refines the inflammatory environment, guiding the tissue toward organized collagen formation. This synergy can produce more complete healing with less fibrosis and shorter recovery time.

Clinical Application and Timing

Effective treatment begins with accurate diagnosis through ultrasound or MRI to localize the lesion. Once the extent of suspensory involvement is established, the therapeutic plan should integrate both mechanical and photobiological stimulation.

Shockwave is typically applied in one to three sessions spaced 14 to 21 days apart, delivering 1500–2500 impulses per session depending on lesion depth, lesion size, and device type. Treatments should be initiated early in the healing process to maximize regenerative

activation. SPLT can be introduced immediately after injury and again after the first shockwave session and continued multiple times per week throughout the early inflammatory and proliferative phases. SPLT treatments are allowed at FEI events and barns.

Clinically, practitioners often observe a marked reduction in pain and swelling within the first few treatments. Horses become more comfortable under load, allowing a gradual reintroduction of controlled exercise. Follow-up ultrasound commonly reveals improved fiber patterns and decreased lesion cross-sectional areas within two to three months.

Making an Impact That Lasts

Shockwave therapy — especially when combined with super pulsed laser therapy—has reshaped how clinicians manage hard-to-heal equine suspensory injuries. Its ability to reduce pain, stimulate healing, and avoid sedation or invasive

procedures aligns with the growing emphasis on regenerative medicine in equine care.

The MPACTVet piezoelectric shockwave therapy system embodies these principles. Its quiet operation, portability, and precision targeting make it a practical and powerful therapeutic tool in the field. More importantly, by addressing the underlying pathophysiology of suspensory ligament injury — rather than simply masking pain — it helps clinicians truly make an impact that lasts

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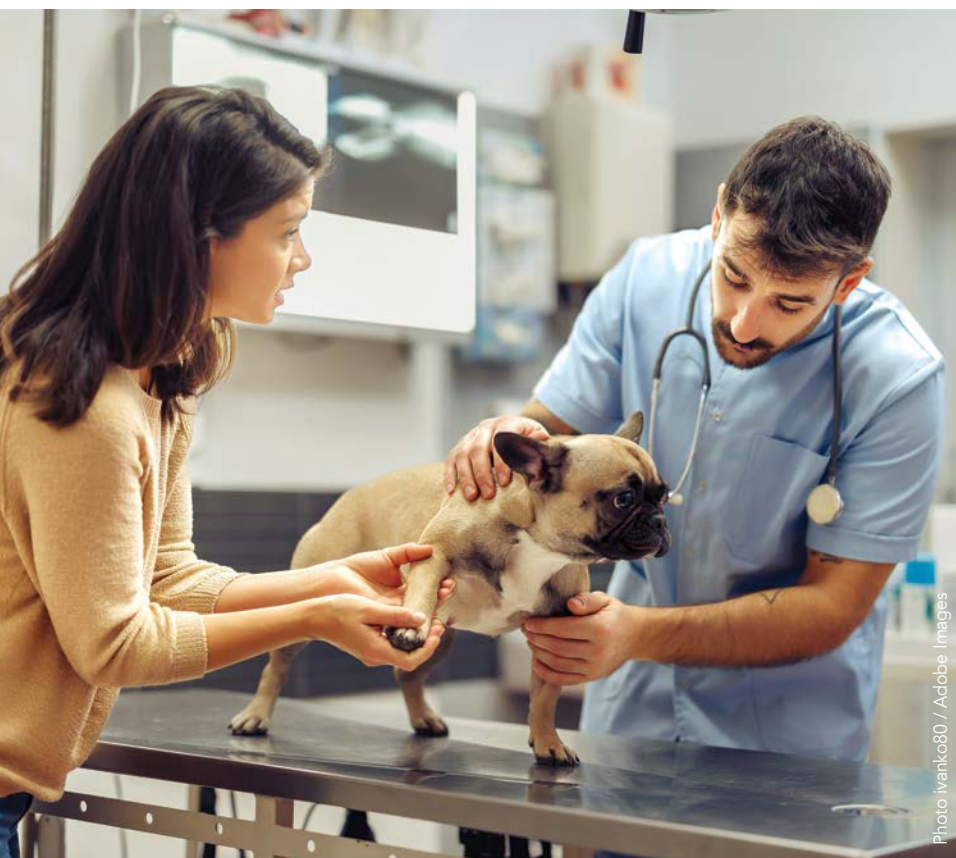
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Show your trustworthiness by asking questions, pausing, and allowing your clients to speak. Then, listen—not just for their answer, but for their intention—because communication is not just about throwing facts at people.

and that thing where the client says, “Wait, what are we doing?” just as you’re reaching for the doorknob.

The reality is that communication styles are just tools, and just like every other tool, from a scalpel to a linear accelerator, knowing how and when to use them makes all the difference in medicine. There’s no one-size-fits-all approach. The Expert is awfully handy in high-stakes emergency situations, when decisions must be made rapidly. If a situation is severe and urgent, light and relationship-building conversations are about as useful as a personal essay contest would be on the sinking Titanic.

Sometimes there’s no time to build rapport—you just have to move. When the only ethical option is fast, decisive action, pick up the shot put and switch on Expert mode.

But honestly, even in emergency practice, the number of true, red-alert, seconds-counting, crash-cart-flying-across-the-room cases is relatively small. The vast majority of veterinary interactions fall into a lower-stakes category: skin problems, weight loss, arthritis, diabetes, weird coughs, picky appetites, and the existential dilemma of which ear cleaning solution to use.

For these situations, consider playing Frisbee.

Even if you are a massive introvert whose ideal day in the park is secretly watching the squirrels rather than playing Frisbee, understanding communication styles will make you a better animal doctor. For the most part, pets are attached to their owners, and modern veterinary medicine is moving into an era of relationship-centred care.⁵ It does you no good to alienate the humans on the other end of the leash.

Thoughtful flexibility lets you match the style to the moment. If it is not the time to be the Partner, that’s okay! Some clients don’t want to play Frisbee. They would rather have a whoppingly dense ball of

information lobbed in their general direction. If that’s the case, go for it.

However, veterinarians are probably over-reliant on shotput. In one study, we used the Expert style 46 per cent of the time, compared to only 16 per cent for the Partner style.³ We have to because the human-animal bond is changing, and to protect animal health, we need to get better at understanding this dynamic. We are not just diagnosing and treating anymore; we are navigating a messy world of human emotions.

Plus, you know what? It is pretty fun to play Frisbee! Give it a try, and you will see that this light back-and-forth, although it may not satisfy your urge to explain the Krebs cycle 15 times a day, may make your job more enjoyable.

Collaboration with clients is the path forward.

Of course, you may be rolling your eyes so hard right now you’ve just pulled your m. superior oblique. Isn’t the job hard enough with all this touchy-feely stuff? Who has the time, the bandwidth, the patience, and the interest in other humans to worry about “relational dynamics?” Can’t we just do the medical part, and let everyone else figure it out?

Playing the Expert with every case, with every client, is the actual time waster. If you are not listening in a dynamic way to your clients, on some level, you are already alienating them, at least partially. That will erode the relationship faster than accidentally misgendering a gonadectomized pet.

So, don’t deliver monologues. That’s what villains do. Show your trustworthiness by asking questions, pausing, and allowing your clients to speak. Then, listen—not just for their answer, but for their intention—because communication is not just about throwing facts at people. Communication is about conveying ideas, and that only works when people are ready and comfortable to receive that information. No one wants a shotput to the face when they came to play catch. 🐾

Greg Bishop, DVM, is a small animal veterinarian and a part-time veterinary technology instructor in Portland, Ore. The author’s opinions do not necessarily reflect those of Veterinary Practice News Canada.

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Extracorporeal shockwave therapy: What is it and why should I care?



EVIDENCE-BASED MEDICINE

By Narda G. Robinson, DO, DVM, MS, FAAMA

Extracorporeal shockwave therapy (ESWT) has fast become the darling of animal rehabilitators. When this modality first came on the scene, it produced far more noise and discomfort than it does today. Modifications in shockwave equipment and energy protocols have largely eliminated the need for general anesthesia.¹ Clinical targets of ESWT can reach beyond recalcitrant wounds and disorderly joints to assist in the recovery of injured nerves and compressed spinal cords.

How does it work?

ESWT sends strong acoustic impulses into tissue, producing pressures that rapidly rise and fall. This biphasic sequence kickstarts reparative cell-signalling pathways into gear, especially those in fibroblasts. Through “mechanotransduction,” fibroblasts convert the mechanical energy of pressure changes into biologically based restorative responses that build and repair.

The fact that fibroblasts respond to mechanical forces by activating their metabolism was initially discovered by Helene Langevin, MD, director of the National Center for Complementary and Integrative Health (NCCIH), and a team of researchers at the University of Vermont. In so doing, Dr. Langevin found that acupuncture signalling begins at the needle-tissue interface.³ This phenomenon helps us understand how other physical medicine modalities, such as ESWT, support cellular survival, proliferation, and differentiation.⁴ That is, pummeling cells with shockwaves gets them going, too.

Clinical applications

ESWT has long been sought for orthopedic issues such as tendinitis, fractures, osteoarthritis, and general musculoskeletal pain problems.⁵ More recently, research indicates that ESWT offers hope



Ruth Altman, DVM, CRPM, treating Scarlet, a French bulldog, with ESWT in her work as a mobile practitioner.

Photo courtesy Deanna Rogers, PT, CCFT, CCRP

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for patients with neurologic diagnoses.⁶ Applying acoustic waves to an injured spinal cord augments the repair, protection, and regeneration of nerve fibres. Mechanistically, the initial increase in inflammation from the barrage of pressure changes incites a significant down-regulation of expression of acute-phase pro-inflammatory cytokines.⁷ Brain-derived neurotrophic factor (BDNF) levels increase, as well. This protein plays crucial roles in the growth, survival, and maintenance of nerve cells in the brain and spinal cord. For example, BDNF supports synaptic plasticity and the interconnectivity of neurons, which expands individuals' ability to adapt to environmental stimuli. ESWT may also reduce spasticity and improve ambulation, urologic function, and quality of life.

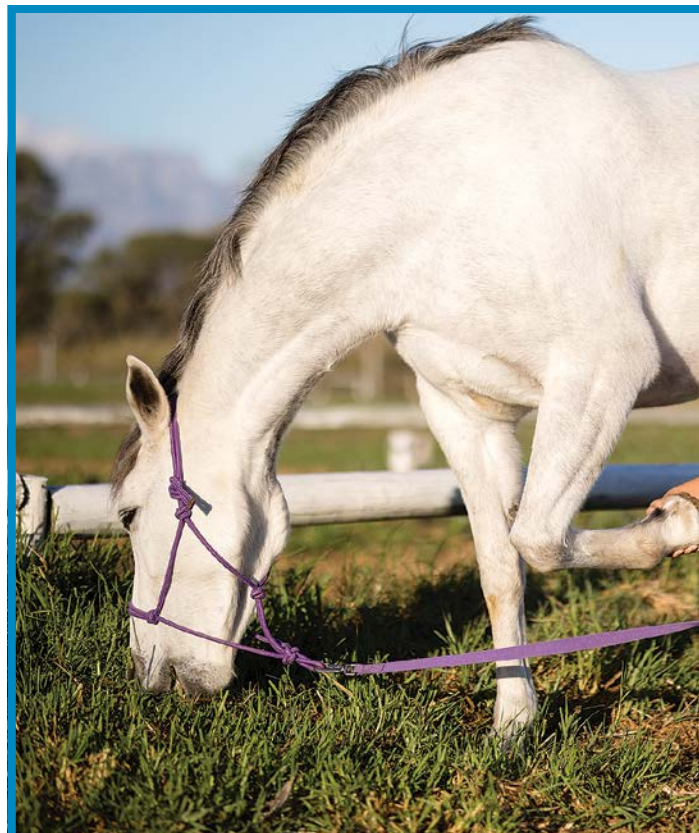
Patients with peripheral nerve injury (PNI) may benefit from ESWT at least in part from the stimulation of stem cell proliferation and differentiation. As stated by Cao *et al.*, “ESWT can induce nerve regeneration via accelerating the removal of damaged axons, promoting the proliferation of Schwann cells and enhancing axonal regeneration.”⁸ Experimental animal studies have begun to test different dosing levels for PNI recovery, elucidating ideal frequencies and intensities of stimulation for problems such as sciatic nerve damage.⁹

Could ESWT help those with brain injury? Animal models of ischemic stroke have shown that ESWT can inhibit neurologic dysfunction and reduce the volume of brain infarct post-stroke. Cerebral blood flow levels increase, with no adverse effects noted.¹⁰

Veterinary clinical research

Clinical trials of ESWT in large and small animals are growing in number. Equine orthopedic applications include osteoarthritis, thoracolumbar pain, navicular syndrome, tendinopathy, and proximal suspensory desmopathy.¹¹ Investigators are working to determine optimal parameters for speeding the repair of bones, tendons, ligaments, and wounds.

A systematic review published in 2022 evaluated the strength of research for ESWT in horses, dogs, and cats and noted the following: “The review revealed that only weak scientific evidence exists for favourable effects in conditions affecting bones, ligaments, tendons, and muscles in horses and dogs. No scientific article on the use of shockwave therapy in cats was available. Reasons for the weak scientific evidence were that studies were few, most involved only a small number of animals, many had methodological problems, or, when favourable results were reported, they were not replicated in independent studies. Thus, in sport and companion animals, the scientific evidence for the clinical effects of ESWT in horses, dogs, and cats is limited. For a few indications, notably short-term pain relief, ligament ailments, and osteoarthritis, some results appear promising, warranting further exploration in high-quality studies.”¹²



Safety

What is the safety profile we should think about when treating patients with ESWT? When treating horses, “Safe, efficient application of ESWT can often be facilitated with light, standing sedation (as permitted under sanction guidelines for actively competing horses), patient restraint, and potentially earplugs, particularly in rooms with tiled or stone walls that amplify noise reverberation. The use of earplugs/hearing protection for the veterinarians/technicians administering the ESWT and/or holding the equine patient has also been advised due to its loud, ballistic noise and the potential (although unproven) ability to induce hearing loss.”¹³

Additional research is needed to determine, more specifically, how many shockwave pulses to use, at what frequency and energy flux density, and with which probe. Like photomedicine therapy, “doses” of ESWT are typically provided by the commercial device manufacturer, and many lack rigorous research substantiation.

Contraindications mentioned in veterinary papers include focusing shockwaves on tumours, weakened bones, open growth plates, active infection, and bodily cavities where air or gas exists (e.g. the thorax and abdomen). Caution is advised for pregnant patients and those with severe coagulopathy.

Importantly, some have asked whether practitioners should avoid treating cancer patients altogether, or if avoiding the tumour might suffice.

The authors of a 2019 paper in *Supportive Care in Cancer* noted this: “Malignant tumours in the treatment area have to be seen as a contraindication for the use of ESWT treatment. Cancer itself—in the form of the underlying disease—is not a contraindication for the treatment with radial and focused shock wave



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"Clinical trials of ESWT in large and small animals are growing in number. Equine orthopedic applications include osteoarthritis, thoracolumbar pain, navicular syndrome, tendinopathy, and proximal suspensory desmopathy."

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therapy with low or high energy. Plantar fasciitis and calcaneal spurs, calcified shoulder, tennis elbow or Achilles tendinopathy, and delayed healing and chronic wounds are typical approved standard indications for ESWT and are allowed when the malignant tumour is not in the treatment area. There are also other musculoskeletal and non-musculoskeletal indications (e.g. myofascial syndrome, erectile dysfunction, polyneuropathy, and lymphedema) that are relevant for cancer survivors. These indications are recommended by the International Society for Medical Shockwave Treatment (ISMST) for "common empirically tested clinical use" and as exceptional indications/expert indications."¹⁴

From an occupational safety perspective, one final note of caution: Practitioners should consider how the audible clicking from ESWT devices may adversely affect those in the treatment area. Some individuals who are sensitive to auditory stimuli may experience a feeling that they are about to have a seizure, reminiscent of the condition known as "reflex epilepsy," in which certain sounds, especially when emitted at regular intervals, could become epileptic triggers. 🌸

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How cat parents are driving veterinary innovation

The rise of consumer-led technology adoption

By Susan Groeneveld, BSc. (Ag)
Photo New Africa / Adobe Images

A new paradigm is emerging where informed pet owners are becoming the primary drivers of practice management technology adoption.

Love it or hate it, the Canadian veterinary landscape is shifting. Traditional adoption models—where innovations flow from professional conferences to gradual practice implementation—are being disrupted by an unexpected force: informed pet owners themselves and the technology that they are embracing on a consumer level.

The consumer-technology bridge

In my experience working with veterinary clinics globally, I'm seeing a new adoption pattern emerge: digitally native pet owners are arriving at clinics already familiar with AI-powered assessment tools, using AI and search tools to understand their pet's

health needs. Many of our clinic users for our AI solution have asked for integration into their existing pet-to-vet practice management systems—creating immediate demand driven by informed consumers rather than professional recommendations.

We know that the pet tech market has exploded to \$7.63 billion in 2024, driven by post-pandemic pet ownership and growing demand for preventive care solutions.

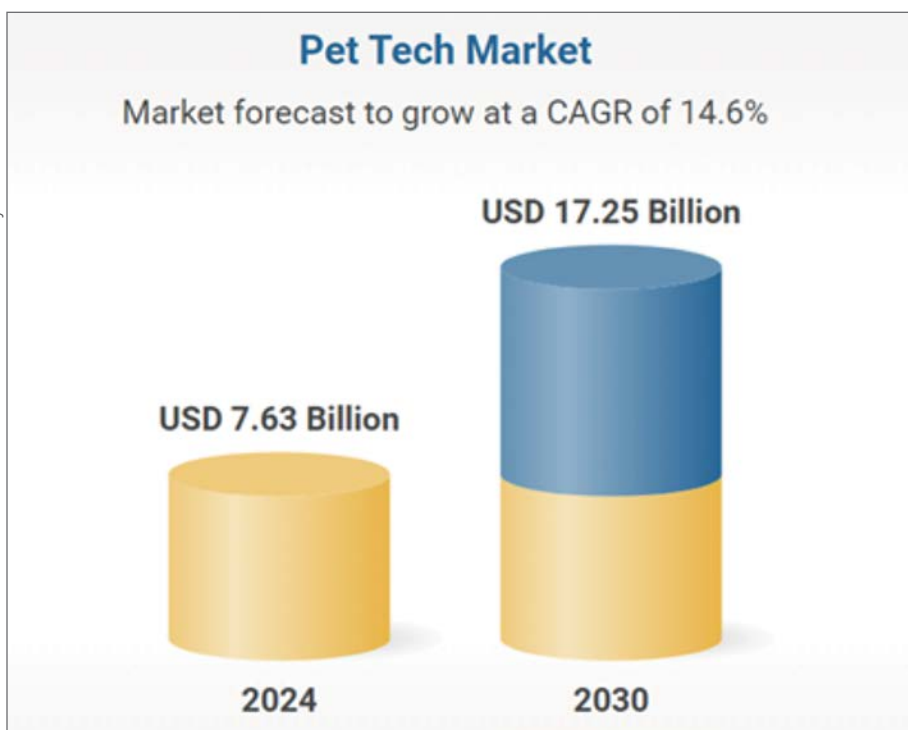
Pet owners increasingly embracing AI-powered tools that provide objective health insights—think everything from monitoring systems that analyze behavioural patterns and vital signs for early illness detection, smart wearables like GPS-enabled collars and monitoring devices (the largest market segment), integrated smart home solutions including video and monitoring



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The Pet Tech Market was valued at USD 7.63 Billion in 2024, and is projected to reach USD 17.25 Billion by 2030, rising at a Compound Annual Growth Rate (CAGR) of 14.56%.

systems that include real-time pet behaviour alerts, as well as mobile applications offering comprehensive health tracking and AI-powered photo-based assessments.

This bottom-up technology adoption represents a fundamental shift in cat owner education. Rather than practicing educating clients about new capabilities, informed pet owners are actively requesting specific technological solutions and driving professional adoption through direct demand.

Veterinary professionals are, of course, mindful of what's actually going to move practices forward and help animals, and what is simply more tech-noise and/or software that the industry is trying to sell them.

The veterinary practice challenge

Canadian veterinary practices face a complex reality: 50 per cent of pet owners skipped needed veterinary care in the past year. The reasons? Financial barriers, not wanting to traumatize cats in particular with unnecessary trips, and simply not knowing when care is needed. This leaves practices with finding innovative ways to maintain client engagement while managing capacity constraints and rising costs.

For feline patients, this challenge is amplified by cats' evolutionary programming to mask pain and illness. Traditional approaches often result in cats being seen only when conditions reach emergency status—creating unpredictable workflow demands and suboptimal outcomes.

The economic impact is significant. According to Gallup News, 8.2 million cats in Canadian households—outnumbering dogs by more than a million—and 50 per cent of Canadian pet owners have skipped needed veterinary care in the past year due to financial barriers. Practices are missing substantial revenue opportunities while failing to provide optimal preventive care for this large patient

population. The challenge is particularly acute for feline patients, who have evolved to mask pain and illness, making regular professional assessment even more critical.

AI tools as practice extenders

Artificial intelligence applications in veterinary practice management offer Canadian practices something unprecedented: the ability to extend clinical expertise beyond physical facility constraints without proportional increases in staffing overhead.

We know that AI-powered assessment tools can achieve remarkable accuracy in pain detection and health monitoring through smartphone-based analysis.

For practices, this creates multiple operational advantages:

- **Capacity management:** Remote monitoring capabilities enable practices to maintain oversight of patient populations between scheduled visits, identifying cases requiring intervention while optimizing appointment scheduling.
- **Preventive care enhancement:** Early detection capabilities shift patient interactions from emergency-driven to preventive-focused, creating more predictable workflow patterns and improved patient outcomes.
- **Staff efficiency:** AI-assisted assessment tools provide objective data that supports clinical decision-making while reducing time spent on subjective evaluations during appointments.
- **Client engagement:** Regular remote monitoring strengthens the veterinarian-client relationship through consistent touchpoints, building loyalty while providing data-driven insights that support treatment recommendations.

The implications for practice management are profound:

- **Workflow integration:** Pet owners familiar with remote monitoring technologies expect seamless integration with practice management systems, creating pressure for interoperability and data sharing capabilities.
- **Client communication:** Technology-savvy clients arrive with objective data and specific questions, requiring practices to adapt communication protocols and staff training accordingly.
- **Revenue optimization:** Consumer-driven technology adoption creates new revenue streams through subscription-based monitoring services while improving client retention through enhanced engagement.

The future of practice management

Forward-thinking practices are discovering that AI-powered tools don't replace veterinary expertise—they amplify it. By enabling remote monitoring and early detection, these technologies allow veterinarians to provide more comprehensive care while optimizing practice efficiency.

The key to successful implementation? Recognizing that technology adoption is

increasingly consumer-driven. Practices that effectively integrate consumer-preferred technologies into their workflows while maintaining clinical standards will thrive in this evolving landscape.

Cutting through the tech noise

So how do vets navigate to find the right tools? As a pet caregiver with decades of experience in animal care and agriculture, my main driver in founding an AI-based company for cats was ensuring the technology was continually tested and developed by veterinarians, behaviourists and leading computer vision experts. We have demonstrated 89 per cent precision in our product, and continue to train with labelled data sets from medicalized cats through data licensing agreements with shelters.

When considering AI and new technology to drive your clinic forward, here are key recommendations to help you properly vet the vet-tech:

Key recommendations for feline-specific technology practice adoption

For veterinary practices considering AI integration:

- Start with targeted feline client education: Begin implementation with cat-owning clients who have expressed concerns about their pet's comfort or have cats with chronic conditions. Educate clients on how remote patient monitoring can provide objective data between visits, emphasizing that this technology specifically addresses cats' natural tendency to hide pain and discomfort.
- Implement graduated assessment protocols: Establish clear protocols for when clients should use the patient monitoring tools, such as weekly monitoring for senior cats, post-surgical recovery tracking, or when behavioural changes are noticed. Create decision trees that help both staff and clients understand when app results warrant immediate consultation versus routine monitoring.
- Integrate assessment data into clinical workflows: Train veterinary teams to interpret remote patient monitoring alongside traditional clinical examinations. Develop standardized documentation processes for incorporating remote patient assessments into patient records, ensuring continuity between remote monitoring and in-clinic evaluations.
- Create proactive care pathways: Use the AI-powered technology's capabilities to shift from reactive to preventive care models. Establish protocols for follow-up when assessments indicate developing issues, creating opportunities for early intervention that can prevent emergency visits and improve patient outcomes.
- Develop client communication frameworks: Train staff to discuss AI-powered tools with clients, explaining what the benefits are in practical terms and how to interpret results. Create communication templates that help explain when remote assessment data supports continued monitoring versus when it indicates the need for professional evaluation.

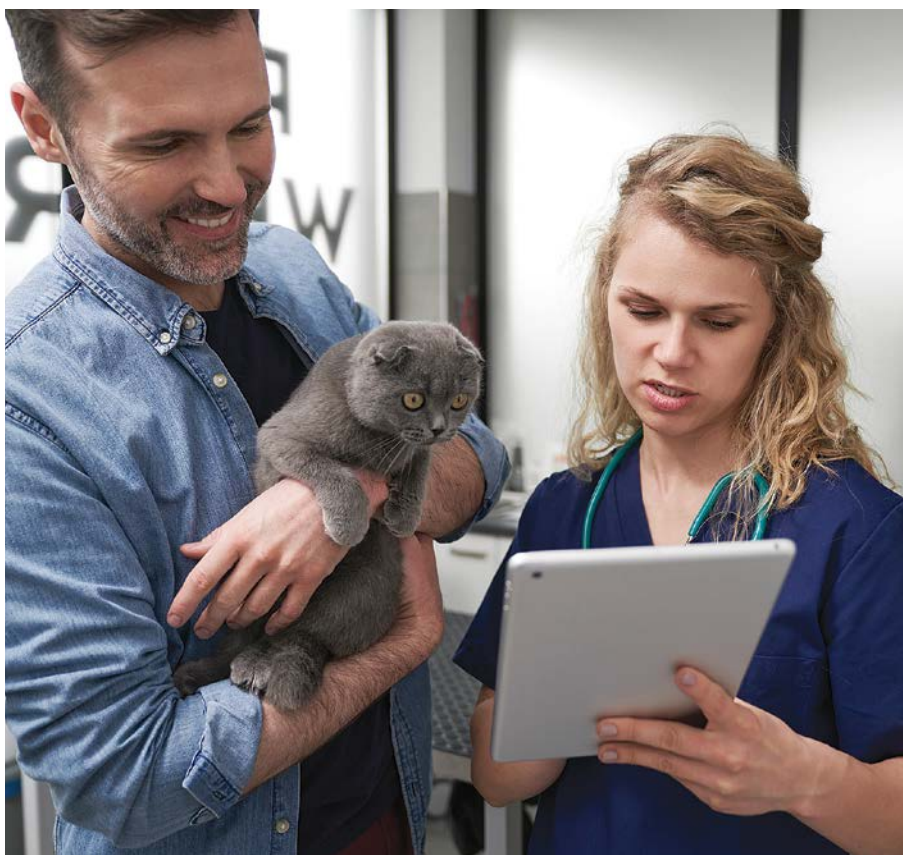


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- Establish revenue models for technology-enhanced care: Develop pricing structures for monitoring plans that reflect the enhanced value of technology-assisted care, follow-up consultations based on app data, and preventive care recommendations. Consider subscription-based models that provide ongoing value while generating predictable revenue streams.
- Ensure seamless practice management integration: Work with your practice management software provider to ensure remote patient assessment data can be automatically imported into patient records. This integration eliminates duplicate data entry while creating comprehensive health timelines that combine remote monitoring with clinical visits.
- Build referral networks through technology demonstration: Use AI-powered tech capabilities as a referral tool for specialist consultations, providing concrete data that supports treatment decisions and helps communicate patient status to specialists or emergency clinics. 🐾

Practices that effectively integrate consumer-preferred technologies into their workflows while maintaining clinical standards will thrive in this evolving landscape.

Susan Groeneveld, B.Sc. (Ag), is the founder and CEO of a Calgary-based AI company revolutionizing feline healthcare through smartphone-enabled pain detection technology. With over 25 years of experience in animal health and agriculture, she has built strategic partnerships with veterinary organizations across North America, Europe, and Asia. Groeneveld was recognized as a top five finalist for Women in AI's Entrepreneur of the Year across North America in 2023 and is a graduate of the Birthing of Giants Fellowship Program. Her mission to bridge the gap between cat caregivers and veterinary professionals has resulted in technology now used by thousands of pet caregivers and supported by veterinary professionals worldwide.

What's all the chatter about?

A primer on jaw-opening reflex

By John R. Lewis,
VMD, FAVD, DAVDC

Photos courtesy
Dr. John R. Lewis

A) A very subtle area of redness and gingival enlargement at the buccal gingiva margin of tooth 104 in a cat that presented with jaw-opening reflex. B). A dental radiograph shows the full extent of resorption.

Have you ever seen a feline or canine patient whose jaw chattered? I bet you have. Sometimes, chattering is the presenting complaint noted at home by pet owners. When you saw chattering in your patient, what disease manifestation was it associated with? This article will discuss common causes of jaw chattering in dogs and cats.

What is jaw chattering?

Early papers on the subject referred to it as “reflex jaw opening” and “jaw-depression reflex,” but these days, it is most commonly called “jaw-opening reflex.” As you may recall from anatomy class, while there are multiple muscles of mastication that close the mouth, there is only one muscle responsible for opening the mouth (the digastricus). The jaw-opening reflex is a protective, involuntary response that causes the jaw to open when a force is applied to the teeth or jaw, triggered by stimulation of sensory receptors, brain-stem centres, and motor neurons, primarily through the trigeminal nerve.

One of the earlier descriptions of jaw-opening reflexes in cats was in a manuscript published in 1969 in the *Archives of Oral Biology*. This study noted the reflex was in response to stimulation of periodontal mechanoreceptors,¹ but other studies showed elicitation of the jaw-opening reflex when nerves within the pulp were stimulated.²

What causes chattering?

Clinically, the jaw-opening reflex is associated with pulp injury and diseases affecting the periodontium. However, it can also occur when tissues other than the pulp or periodontium are involved. Certain diseases of the oral and palatal mucosa can result in the jaw-opening reflex.

Tooth resorption

Perhaps the most common oral condition that results in jaw chattering is tooth resorption.

This condition competes with periodontal disease as the most common dental problem of domestic cats. Of all the teeth in the mouth, the mandibular third premolar is the most commonly affected tooth in cats. Most cases of tooth resorption are a type of external root resorption that may eventually manifest as loss of crown structure in the cervical portion of the tooth.

A student named Meredith, who went through the dentistry rotation when I was a professor at Penn, once stated, “It seems gingiva is the ‘omentum of the mouth,’” which I felt was a very thoughtful metaphor. Gingiva fills the resorption defect and covers a portion of the cervical crown. Even under anesthesia, lightly running an explorer along the gingival margin may detect an area of resorption, resulting in the tip of the explorer “catching” in the defect and a quiver or chatter of the lower jaw (Figure 1). When

Figure 1A

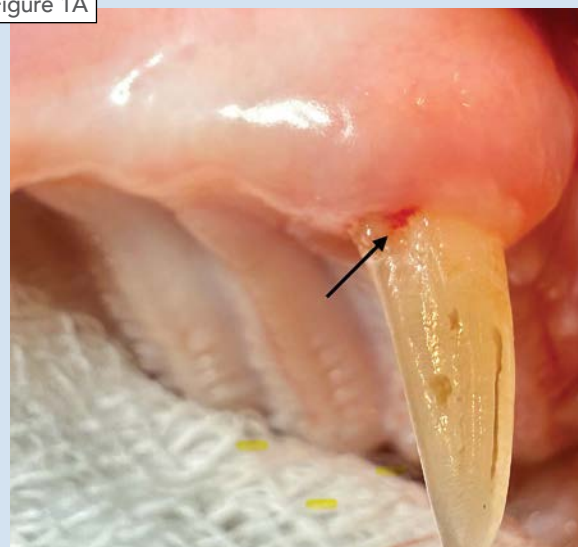


Figure 1B



tooth resorption reaches the crown and results in exposed dentinal tubules, discomfort occurs when fluids, air, or a dental explorer passes across those exposed dentinal tubules, resulting in the jaw-opening reflex.

Tooth fracture

Acute fracture of a tooth results in exposed nerves. An uncomplicated crown fracture results in indirect exposure of the pulp by exposing dentinal tubules, which contain odontoblastic processes and nerves. A complicated crown fracture directly exposes the pulp, which contains a bundle of nerves and vessels. When a complicated crown fracture occurs acutely, possible clinical signs include bleeding, ptialism, and jaw-opening reflex. Interestingly, most dogs that incur complicated tooth fracture show no outward signs at all, and the fracture is noted days, months, or years later.

Eosinophilic oral disease

Eosinophilic oral disease has been documented in the literature in both dogs and cats for years, but to my

knowledge, only recently has a connection been made between it and chattering of the jaw.³ A retrospective study from 2019 described features of eosinophilic oral disease in dogs, identified possible risk factors or predispositions to the condition, and reported overall treatment response.

Canine medical records from a veterinary teaching hospital and private referral practice over a 17-year period were reviewed for a diagnosis of eosinophilic oral disease. Twenty-four dogs with 26 lesions met the inclusion criteria. Patient mean age and body weight were 6.8 (3.8) years and 13.4 kg, respectively. The most commonly affected breeds were Cavalier King Charles spaniel (16.7 per cent), Labrador retriever (12.5 per cent), and West Highland white terrier (12.5 per cent). Eosinophilic lesions were found in the palate (65.4 per cent), tongue (26.9 per cent), and other oral locations (7.7 per cent).

Palatal and tongue lesions were more likely in smaller dogs, whereas lesions in the other category (lip or mucosa) were more likely in larger dogs. There was a correlation in lesion location and resolution: all dogs with palatal lesions became asymptomatic at their last recheck. Seventy per cent of asymptomatic dogs resolved without medication or with allergen therapy alone, suggesting that asymptomatic dogs may respond well to conservative management. Although Siberian huskies were not a commonly affected breed in the 2019 retrospective study, they have been documented in other studies to be prone to oral eosinophilic disease.⁴

Cats and dogs may deal with eosinophilic oral disease differently. Clinically, nearly every case I've seen of canine eosinophilic oral lesions has presented with a history of chattering, whereas cats affected by oral eosinophilic granuloma do not seem to show chattering as a consistent finding.

Periodontal disease

Severe periodontal disease can stimulate a jaw-opening reflex, likely due to sensory stimulation of mechanoreceptors in bone or exposed root surfaces. One breed with a prominent jaw-opening reflex in the face of periodontal disease is the greyhound, particularly when the periodontal disease has severely affected the incisor regions.

A "telltale" sign

It is important to distinguish between chattering and tooth grinding. Tooth grinding can be seen in both dogs and cats, but it is more common in cats. Grinding can

Figure 1A



be a manifestation of oral pain, but it can also be due to discomfort further down the gastrointestinal tract, such as gastric ulcers or a gastric tumour. Teeth grinding can also be unrelated to underlying discomfort, similar to people who grind their teeth in their sleep.

Hopefully, now you know what all the chatter is about. 🐾

Eosinophilic palatitis in an Italian greyhound. This dog exhibited decreased appetite, ptyalism, and jaw-opening reflex.

John R. Lewis, VMD, FAVD, DAVDC, practices at Veterinary Dentistry Specialists and teaches at Silo Academy Education Center, both in Chadds Ford, Pa.

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Housing that heals

The quiet evolution of veterinary containment

By John Freytag

Photos courtesy Midmark

Right, top: By combining patient-centered housing with dedicated work areas, clinicians can deliver attentive care in a healing space that benefits both animals and staff.

Right, bottom: Bright, open recovery spaces help patients feel secure while giving clinicians room to connect and provide attentive care.

Veterinary containment has long been viewed as utilitarian—a necessary fixture in the recovery room. However, as veterinary medicine advances, so do the expectations around how and where patients recover.

Today's best housing systems are evolving not with flashy reinventions, but with subtle, thoughtful design shifts that support the goals veterinarians care about most: reducing stress, improving outcomes, and creating a recovery space that heals as much as it holds.

This is not about radical innovation. It's about purposeful progress—about understanding that a cage is never just a box. It's a clinical environment, a transitional care unit, and temporary housing that reflects how a practice thinks about patient well-being.

Why recovery starts with the right environment

Surgical recovery is more than rest—it is a phase of active healing. The quality of that environment directly impacts patient physiology, behaviour, and outcomes. Stress is a variable that deserves attention. Elevated cortisol levels in recovering patients can slow healing, increase susceptibility to infection, contribute to potential injury, and even alter how animals respond to care.

Housing design elements that reduce visual stimuli and noise can help reduce stress to support better patient outcomes. Quiet-closing latches, privacy-enhancing panels, and stable construction all work together to create calmer conditions for recovery. These may seem like minor enhancements, but they serve a major function: creating a recovery space that actively supports the body's healing process.

As patient needs and care protocols evolve, so too must the environments that support them. Care spaces are expected to adapt over a facility's life, and housing systems should be designed with that same flexibility in mind.

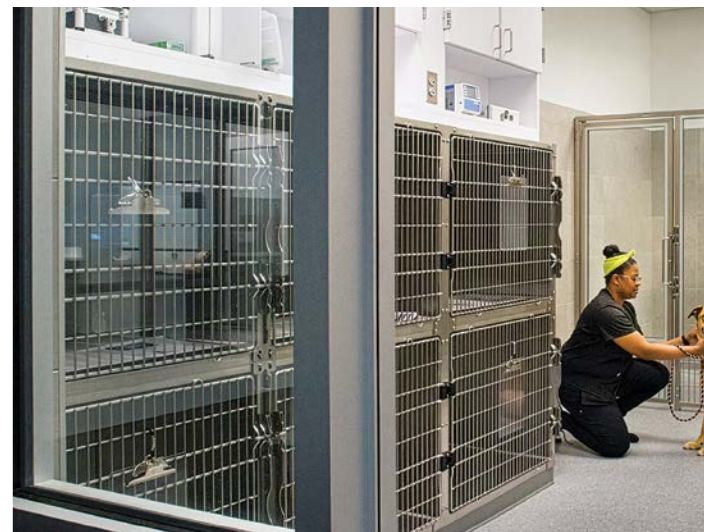
Containment that calms, not complicates

Traditional stainless-steel housing, while durable and cleanable, has long carried a reputation for being cold and clinical. Modern iterations of these systems are anything but harsh.

Today's thoughtful designs consider not just sanitation and longevity but also the animal's emotional and physiological experience. Quieter materials, privacy-enhancing features, and robust structural integrity provide a stable, reassuring environment for animals as they recover.

The clinical case for durable, adaptable housing

Veterinary teams also need clinically reliable recovery spaces that help ensure safety for both the

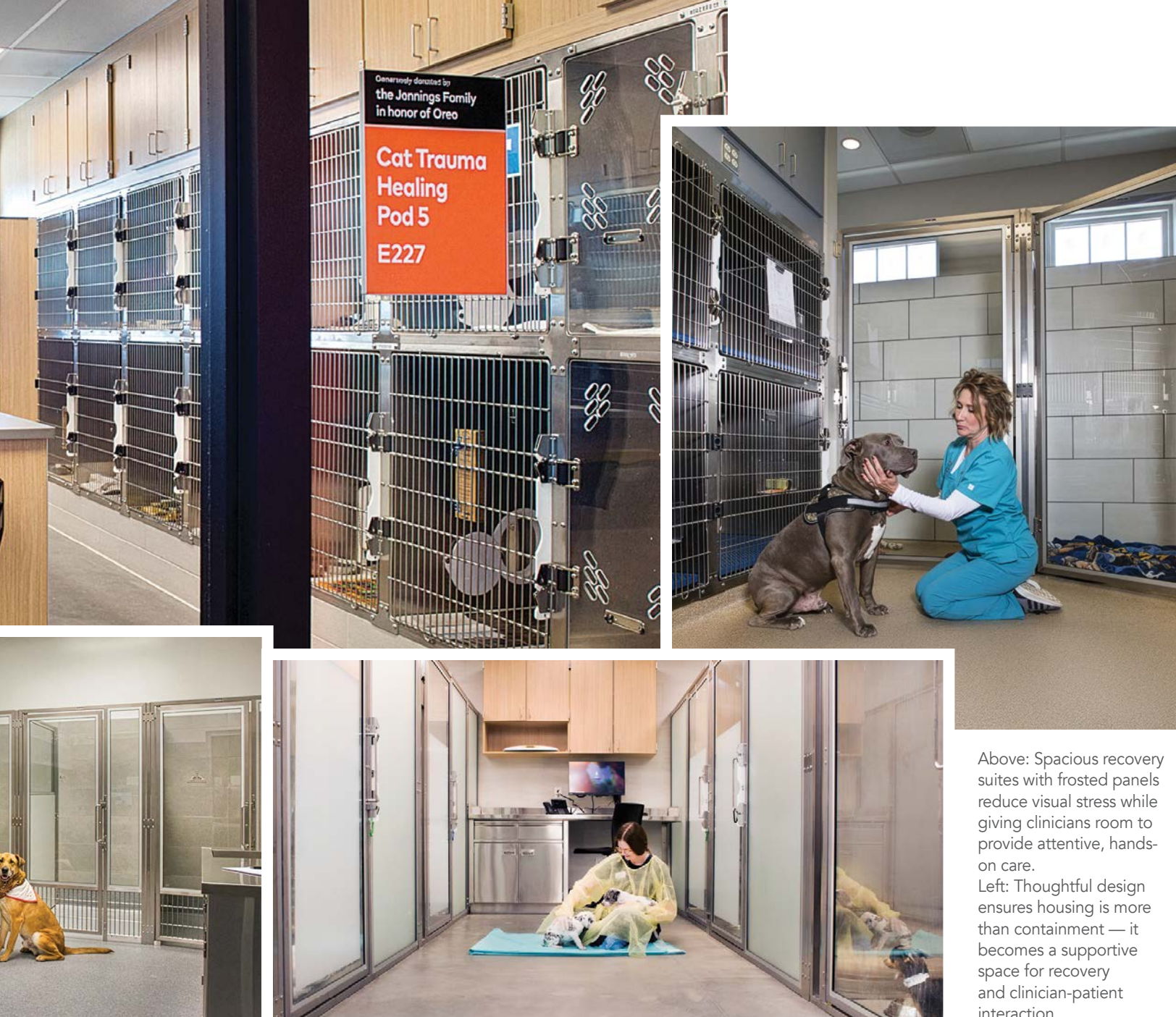


patient and staff, especially during vulnerable post-operative phases.

Housing units constructed with fewer joints and reinforced corners offer enhanced stability. This reduces movement underfoot, helping create a more secure environment for recovering patients. Smooth, nonporous surfaces prevent microbial buildup and allow for thorough disinfection between uses—a non-negotiable in a recovery environment.

Adaptability is equally important. As caseloads fluctuate and care needs change, so should the housing. Think beyond single-purpose solutions. Convert a holding unit into a temporary oxygen therapy enclosure by swapping the standard door with an oxygen-capable one. This flexibility allows practices to expand capabilities without expanding square footage and serves the necessary purposes of the facility without added complexity.

Adjusting divider panels to create a more private recovery space can transform a standard holding area into a calm environment for post-procedure patients. At the same time, airflow is an important



Above: Spacious recovery suites with frosted panels reduce visual stress while giving clinicians room to provide attentive, hands-on care.

Left: Thoughtful design ensures housing is more than containment — it becomes a supportive space for recovery and clinician-patient interaction.

consideration when evaluating containment. Adequate ventilation supports patient comfort and recovery but must be balanced with cleanability to support infection control protocols.

Containment should grow with your needs, supporting multiple stages of care and patient flow while reducing the need for additional infrastructure investments.

The recovery space as a reflection of care philosophy

Recovery is not just a phase; it is a continuation of the surgical plan. The recovery space is where anesthesia wears off, vitals stabilize, and comfort is re-established. It is where the patient transitions back to awareness and readiness for discharge.

A recovery room that is quiet, clean, and deliberately designed communicates that the practice prioritizes well-being at every stage. Clients may only get a glimpse of these spaces, but that glimpse carries weight. A calm patient in a calm environment sends a powerful message, reflecting a philosophy of care that extends beyond the procedure into the environment that surrounds it.

Housing supports care

For decades, veterinary housing has been seen as infrastructure, but the truth is, it is clinical and part of the recovery protocol. It supports or hinders healing, and it either adds stress or reduces it.

Veterinarians who view containment as a support tool—not a backdrop—are reaping the benefits of calmer patients, smoother recoveries, and safer staff interactions. With today's quiet evolution in housing design, making that shift does not require major renovations. It simply requires intent.

While aesthetics may appeal at first glance, containment that supports proper patient care with adaptability, comfort, and consistent performance delivers lasting clinical value. When we treat animal housing as care, we elevate patient outcomes. Recovery becomes smoother. Stress becomes manageable. And the box becomes something better: a space that heals. 🐾

John Freytag serves as senior marketing manager for Midmark Corporation, working to support veterinarians and animal care teams with solutions that aim to improve efficiency and enhance the experience of both patients and staff.

The real cost of equipment acquisitions



By Randall Knick, MBA

Adding equipment to an in-clinic lab can help streamline diagnosis and treatment implementation.

Photos courtesy Bionote USA

When a veterinary clinic is considering making an equipment purchase, the first question decision-makers typically ask is whether the business can afford what is on the price tag. While this is an important and understandable consideration, it can sometimes lead to a narrow-minded approach to cost analysis that does not account for the dimensions of price, nor does it allow the practice to consider the income that could be added.

A more well-rounded approach to assessing affordability includes a full evaluation of cost and the impact that the investment could have on the practice. This approach to financial decision-making can help clinics better understand the true value of a potential purchase while preventing sticker shock from getting in the way of financial decisions that can elevate a practice.

Peeling back the price tag

At a fundamental level, nearly everyone understands the basics of cost comparison. The option with the lowest price that can correctly and reliably accomplish the goals driving the purchase is usually the best way to go. However, for some businesses and practices, the “lowest” price may still not be low enough. It is easy for decision-makers who find

themselves in those situations to give up on the acquisition, but several options may still remain to help them further lower the cost.

First, practices should examine what they are being sold. Many equipment options come with a variety of high-tech features, but how many of those capabilities will the clinic actually use? Cutting out the bells and whistles can help clinics maximize financial efficiency with a model that will provide the desired improvements without unnecessary add-ons.

Many manufacturers will offer promotions and discounts, often seasonally or for a limited time, that can provide additional help in lowering the price to a more affordable range. Purchasing programs, such as lease-to-own or deferred payment plans, may also be an option, though in these cases, veterinarians should be careful to review the terms of the agreement and not sign any overly restrictive contracts. Some of these agreements have large minimum purchasing clauses that can contribute to an added expense and cause veterinarians to buy additional products that they do not need.

End-of-year tax write-offs may also be available to help further reduce the cost of the purchase, though contracts may impact how much the benefits can be realized in this area.

Supplemental costs related to the use of the equipment should also be considered before the initial investment. While some items may only require one larger acquisition, many will need additional smaller purchases, such as tests for a diagnostic analyzer. Some companies will take advantage of this need and sell the larger item for a relatively low cost, with the additional components bringing the real expense. The ink cartridges for at-home printer manufacturers are often an example of this concept. In addition to a lower price tag on these extra items, cost stability is another important consideration in this area. A manufacturer that habitually increases prices can be a real problem for clinics looking to understand, manage, and stabilize their expenses in the long term.

Suppliers in the veterinary industry may use less-than-transparent business models, which can understandably make some clinic leadership hesitant to pursue a purchase that seems “too good to be true.” However, equipment acquisitions with affordable price tags, both for initial and supplemental purchases, that offer financial stability and flexibility are out there. These are the types of investments that can have a substantial positive impact on a clinic.

Bringing home the bacon

One way that a new equipment acquisition can positively impact a veterinary clinic is by bringing in additional revenue. After all, the veterinary industry is not an exception to the saying, “You have to spend money to make money.” Investing in tools to add to a clinic’s arsenal often means increasing the services available to clients. This allows practices to retain additional income that may have previously been lost to referral clinics or as send-out costs to other third parties.

Bringing new services into the clinic also generally makes them more affordable for the veterinarian or practice owner and, by extension, the client. For example, diagnostic testing without an in-clinic analyzer requires clinics to pay for the tests to be sent out, run, and analyzed by a reference lab. With a high-end in-clinic analyzer, the only cost per test is the test kit and the time spent by employees running it, which results in significant cost savings.

One diagnostic analyzer manufacturer found that most of its customers saved over 50 per cent on testing costs. Many clinics will opt to pass these savings down to clients as well, with some manufacturers offering clinics return on investment (ROI) tools to help them calculate how much they would need to charge for the machine to pay for itself and subsequently turn a profit. This kind of financial transparency is also a good indicator of a trustworthy vendor. Even with an upcharge to help the clinic recoup on the initial equipment investment, this still creates a win-win scenario for everyone involved. The business is keeping more revenue in-house and lowering costs, while the clients are paying less for services with more options to improve their pets’ health available to them.

With the cost of living continuing to increase, decreasing the cost of important care resources,



such as diagnostic testing, could not come at a better time. Not only will this help bring in more revenue for clinics, but it will also reduce barriers preventing patients from receiving care that will help them live happier, healthier lives.

Adding equipment to an in-clinic lab can help streamline diagnosis and treatment implementation.

Investing in quality care

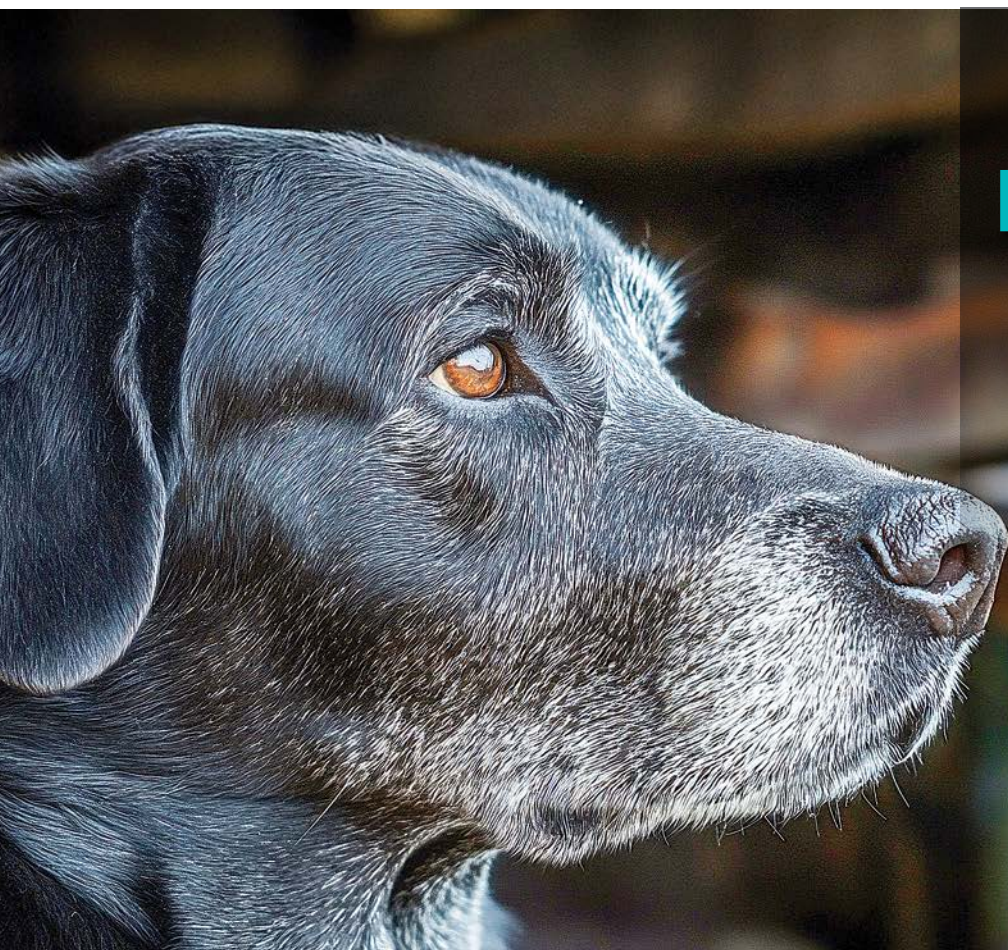
Reducing costs is not the only way practices can optimize patient care. Some elements of veterinary medicine are simply better for the patient and practitioner when they are available at the point of care, and with technological advances across the industry, those options are increasingly becoming available.

Quantitative NT-proBNP testing, for example, was not offered in-clinic until recently. This cardiac biomarker is a highly sensitive indicator of heart disease and underlying conditions, but samples start to deteriorate after just 120 minutes, making it difficult to obtain reliable data from send-out tests. The availability of NT-proBNP as an in-clinic test allows veterinarians to better utilize this diagnostic resource, particularly in time-sensitive cases such as anesthetic planning.

Equipment with more capabilities and a more intuitive user interface can also significantly improve staff experience. Burnout is a well-documented issue among veterinary professionals, and the right technology acquisition can help lighten their workload. Many machines also feature intuitive, fast, and easy clinical procedures that can increase productivity while decreasing stress and the need for employees to work overtime.

Ultimately, every veterinarian’s goal is to practice medicine to the best of their capability and on their own terms. Investing in equipment that aids in elevating patient care and boosting the practice’s bottom line is the way to accomplish that mission. 🐾

Randall Knick, MBA, president and CSSO of Bionote USA, a medical diagnostics research and development enterprise providing veterinary diagnostic solutions for nearly 30 years throughout the U.S., Latin America, Australia, Canada, and the Caribbean.



Nutritional nutraceuticals for the aging patient

By Vanessa Aberman,
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Feline)

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This article will focus on nutraceutical use for common ailments in aging pets, including cognitive dysfunction, muscle atrophy, and heart health.

For cognitive dysfunction, melatonin, valerian root, homotaurine, apoaerquin, and carnitine/α-lipoic acid will be discussed in depth. Ursolic acid, resveratrol, and α-tocopherol acetate will be discussed regarding building muscle due to sarcopenia. Coenzyme Q10 will be considered in regard to heart disease, specifically mitral valve degenerative disease.

Cognitive function

Canine cognitive dysfunction (CCD) has gained some recognition in recent years, as dogs are living longer, and this condition is most prevalent in senior dogs. There is no cure for CCD. Pathophysiology includes beta-amyloid plaque accumulation in the brains of the affected dogs. This also occurs in humans with Alzheimer's disease.¹ Most dogs affected are >8 years old, and in between 14 and 35 per cent of the dog pet population.

Clinical signs include confusion, anxiety, disturbances in the sleep/wake cycle, and decreased interaction with owners.² A simple way to screen for this is using the acronym DISHAAL: disorientation, interaction changes with owners or pets, sleep-wake cycle changes, house soiling, alterations in activity and anxiety, and learning and memory changes; as well as increased vocalization for cats.³

In a recent survey of approximately 400 pet owners with age-related behavioural change, more than 50 per cent of affected animals received dietary supplements. These included CBD oil, antioxidants such as vitamin E, L-carnitine, and alpha-lipoic acid.¹ There are diets that

are supplemented with fatty acids, antioxidants, and/or mitochondrial cofactors that may show improvement with signs of CCD.⁴

Melatonin

Melatonin is a derivative of serotonin that acts on mood, temperature, immune system rhythms, and other metabolic pathways. It has been used to treat insomnia and anxiety.⁵ In one study of 14 dogs with sleep behaviour disorders, melatonin did not improve their clinical signs. Thirteen did not show any improvement with insomnia. It is unknown if dosing or changes to frequency would show benefit.⁶

Valerian root

Valerian root has been studied for stress-related behavioural problems (14 behaviours, including auto-grooming, whining, and digging). Twenty-eight dogs with known stress-related behaviours were placed in an unfamiliar environment and were video recorded for their response in a double-blinded study. Dogs were exposed to both a placebo and a plug-in diffuser with valerian root for 30 min, with an intervening period of approximately seven days between conditions. Those exposed to the valerian root did not have a discernible effect on the behaviour of dogs placed in a non-familiar environment.⁷

Homotaurine

Homotaurine acts as a potent GABA receptor agonist and may have antioxidant properties as well. One study investigated the effect of homotaurine on cognition



Pronounced sarcopenia in a senior dog.

in dogs and yielded positive results. In the one-year trial, 24 dogs aged 10-16 years old, sheltered in the same kennel, were randomly assigned into two groups: one group receiving homotaurine supplementation (500 mg once daily), and the other living in the same environment, without any supplementation. Cognitive testing was conducted using a T-maze T zero (immediately before supplementation start) and repeated after four, eight, and 12 months. The homotaurine-supplemented dogs were able to maintain a better performance in learning and memory trials. The results suggest dietary supplementation with homotaurine, together with the additional stimulation and exercise of a learning activity, seems to slow down cognitive aging in dogs.⁸ These findings are promising, but more studies are needed to confirm these results.

Apoaequorin

Apoaequorin, a calcium-buffering protein, has demonstrated cognitive benefits in learning and executive functions in two clinical trials, likely by reducing excitotoxicity and preventing ischemic cell death associated with calcium dysregulation.⁹

In a 32-day trial, apoaequorin improved learning and executive functions without affecting memory in dogs. A higher dose resulted in better cognitive outcomes, and a second trial showed greater performance compared to selegiline.¹⁰ Combinations of Acetyl-L-carnitine (ALCAR), L-carnitine, and α -lipoic acid (LA) have been investigated in terms of cognition in dogs. Interestingly, a few studies report that L-carnitine and alpha-lipoic acid need to be supplemented together to have any positive effect on cognition. The combination of ALCAR and LA demonstrated improved cognitive outcomes, particularly in memory, in two out of three trials that tested this pairing alone. This highlights the potential synergistic effect between the two compounds.

In the three clinical trials reviewed, L-carnitine was associated with positive effects, but was always administered in combination with other compounds. In the only study using ALCAR alone (27.5 mg/kg), cognitive performance tended to be worse in the

treated group.⁹ However, care should be taken when recommending antioxidant supplementation use in dogs and cats because they are not always indicated for both species. For instance, low doses of alpha-lipoic acid can be toxic to cats and should generally be avoided.³

There have been relatively few clinical trials conducted on dogs and even fewer on cats. The variability in protocols, particularly in cognitive assessment methods and the choice of supplements, has made it difficult to draw definitive conclusions.

Moreover, supplements are often administered in combination to enhance nutrient effects and counteract the multifaceted mechanisms of cognitive decline.⁹ There is a need for more evidence-based studies to differentiate cognitive dysfunction in veterinary patients that may stem from different causes when compared with cognitive dysfunction syndrome, because prevention, treatment, and progression may differ.³

While findings on melatonin and valerian root may not strongly support their use with cognitive dysfunction in dogs, there are promising studies that point to the benefits of the use of homotaurine, apoaequorin, and carnitine/ α -lipoic acid combination products.

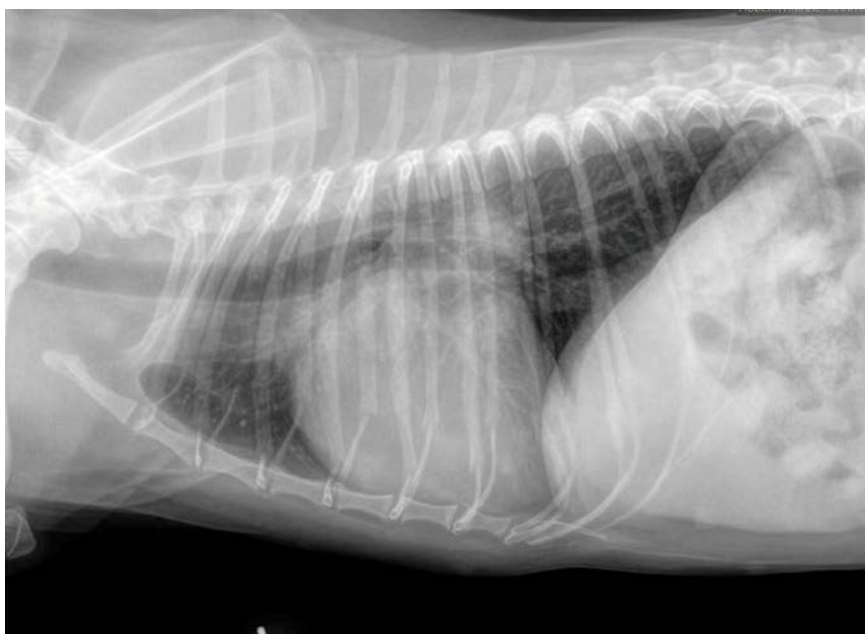
Muscle strength

Ursolic acid

Ursolic acid has been shown, in non-canine species, to be beneficial for skeletal muscle health because it inhibits atrophy-associated mRNA expression and improves skeletal muscle health. It also generated numerous beneficial molecular changes in the skeletal muscle of older dogs, which were associated with significant improvements in exercise participation and performance.

A placebo-controlled study was done to show efficacy in older beagles with age-associated muscle atrophy.¹¹ One group was given a daily supplement of this compound for 60 days, while another was given a placebo. To assess if there were changes in mRNA expression associated with atrophy, the quadriceps muscle was biopsied.

Ursolic acid inhibited numerous mRNA expression changes that are known to promote muscle atrophy



Lateral thoracic radiograph of a 10-year-old dog with congestive heart failure.

and weakness. The dogs were evaluated on exercise participation and T-maze performance as well. Those on the supplement improved exercise participation and T-maze performance. Unfortunately, the sample size was small (10 dogs per group). The study was funded by the manufacturer of the ursolic acid supplement for dogs, so there is risk of bias.¹¹ Another study was conducted investigating resveratrol and α -tocopherol acetate due to their antioxidant properties, and the authors' description that oxidative stress and chronic inflammation can contribute to sarcopenia.¹² In this trial, blood samples of CPK (creatinine phosphokinase) and ALP (total alkaline phosphatase) were obtained before the trial. CPK and ALP are considered useful biomarkers for sarcopenia, bone formation and speed in bone remodelling. Twenty-two dogs were observed for two periods of 45 consecutive periods, where half were supplemented with 30 mg resveratrol and 20 UI α -tocopherol acetate in their diet, and the other group was not given supplementation.

Days 45-90 were considered a washout period without supplementation. Supplementation with resveratrol and α -tocopherol acetate reduced serum concentration in CPK and ALP, indicating positive modulation of these biomarkers.

At D90, new examinations and collection of venous blood samples were performed and returned to baseline. The correlation between supplementation and effect was confirmed by the second treatment period, in which the values of the two biomarkers returned to the baseline.¹²

It appears that providing select antioxidants and ursolic acid to sarcopenic dogs may be beneficial, but more studies need to be done before recommending this.

Cardiac health

Numerous studies of the effects of CoQ10 supplementation have been conducted in humans with cardiovascular diseases, and several of them show clinical benefits.

One study investigated myocardial Q10 concentrations in tissue samples from Cavalier King Charles spaniels (CKCS) diagnosed with myxomatous mitral valve disease

(MMVD) in ACVIM stages B1, B2, and C, and compared them with a group of dogs with no evidence of heart disease. The main finding of the study was reduced concentrations of myocardial Q10 in CKCS diagnosed with MMVD in stage C compared to each of the other groups. The study concluded that depleted myocardial concentration of Q10 is associated with congestive heart failure (CHF) in CKCS diagnosed with MMVD.¹³

Another study to evaluate CoQ10 effects was done on 13 dogs with stage C MMVD. The effects evaluated were preventing myocardial injury, cardiac function, and autonomic balance in dogs. CoQ10 was given at 100 mg/dog twice daily for 28 days. Systolic function (*i.e.*, fractional shortening [FS] and ejection fraction [EF]) increased significantly by eight per cent and nine per cent, respectively, in the group after CoQ10 supplementation.¹⁴

In another study, 43 MMVD dogs in stages ACVIM B2, C and D received coenzyme Q10 (100 mg twice daily) or placebo for three months, and 12 non-supplemented healthy dogs served as controls. All parameters were measured before and after supplementation in MMVD dogs and once in healthy dogs. CoQ10 supplementation had a positive impact on neutrophil percentage, lymphocyte percentage, and lymphocyte concentration in groups C and D. This indicates this supplement may decrease inflammation in dogs with CHF.¹⁵

Based on these studies, supplementation with CoQ10 is reasonable in patients with stage C and D MMVD.

Conclusion

Several nutritional supplements treat common conditions, especially in aging dogs and cats. Owners often need guidance on which supplements make sense for their pets. Unfortunately, there is not as much scientific data on the benefits of these supplements, and often, the studies are funded by the manufacturers of said supplements, or there are issues with the design of the studies.

However, there is support for the use of homotaurine, apoaquorin, and carnitine/ α -lipoic acid combination products in dogs with cognitive dysfunction. Supplementation of resveratrol α -tocopherol acetate, and ursolic acid may benefit dogs with decreased muscle mass, but more studies need to be performed before recommending these products. Finally, there does seem to be evidence that CoQ10 is beneficial for patients that have been diagnosed with CHF secondary to MMVD. 🐾

Vanessa Aberman, DVM, DABVP (Canine/Feline), has worked in private and corporate practices as an associate veterinarian, relief veterinarian, medical director, and area medical director. Dr. Aberman's professional interests include surgery, dentistry, and pain management. She is currently the director of medical quality at Modern Animal, where she ensures the veterinary teams practice the latest evidence-based guidelines. She is also a regular speaker at local and national venues.

References

View references for this article online at veterinarypracticenews.com/nutritional-nutraceuticals-aging-patients.

5 questions with... Ken Mould, DVM, founding president of the Canadian Animal Blood Bank (CABB)



Most people are familiar with the concept of storing blood for humans to be used in emergencies. But before 1996, storing blood for animals was foreign to Canada. That all changed when Ken Mould, DVM, had a patient that needed blood; he became aware of the need for an animal blood bank.

“A canine patient was in need of red blood cells, and I had to resort to a whole blood transfusion to supply them. Although that was lifesaving, there was a better way,” explains Mould.

The “better way” came to fruition with the creation of the Canadian Animal Blood Bank (CABB), now in its 30th year of operation.

Mould took the initiative and filled a need he saw. Such leadership has been instrumental in transforming emergency veterinary care in Canada and has since earned Mould an appointment as a member of the Order of Canada in 2024.

A retired veterinarian, Mould has a long track record of caring for animals. He graduated from Western College of Veterinary Medicine in 1975 and has worked with a wide range of animals since then.

When the animal blood bank first opened its doors, its focus was to provide high-quality blood products for veterinarians in Manitoba. Before long, it became clear that animal blood products were needed nationwide.

Partnerships with the CABB, the Northern Alberta Institute of Technology (NAIT), and the University of Montreal Centre Hospitalier Universitaire Veterinaire followed to supply blood products across Canada.

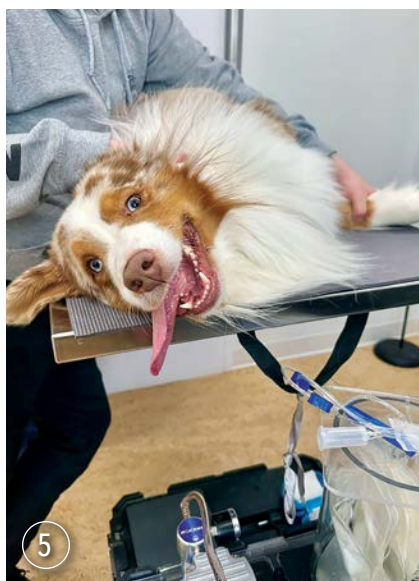
Veterinary Practice News Canada caught up with the founding president to discuss the history, challenges, and trajectory of the CABB and its impact on veterinary professionals.



1) How did the idea come about to establish an animal blood bank, and what was your vision for it?

Blood banking, where blood is collected and separated into its component parts, provides the opportunity to supply the patient with what they require and not burden them with what they do not. I was motivated to start a blood bank after attending a lecture by Dr. Bernie Feldman, who was encouraging the practice of blood banking as a way of both improving medical practices and as a form of community outreach by having pet owners register their dogs as donors. At that point, my vision was to supply regional needs for blood products by getting the space and equipment required to bank animal blood. I received the co-operation of my provincial veterinary association (Manitoba Veterinary Medical Association) and also Red River College (now Red River Polytech). They supplied the seed capital required for equipment, and

1. Regional Veterinary Technologist Ariana Pierre (far left) having fun with CABB supporters and canine donors Evie (left) and Griffon (right) in Nova Scotia.
2. Ken Mould, DVM, founding president of the Canadian Animal Blood Bank (CABB).
3. Regional Veterinary Technologist Breann Irwin (far right) with Ontario canine donor Maple. In 2024, CABB facilitated 3,059 blood collections from canine donors nationally.



4. Canadian Animal Blood Bank (CABB) Operations Manager/ Regional Veterinary Technologist Michael Philippot with Manitoba canine donor Sophie. CABB was founded in Winnipeg in 1996.

5. Nova Scotia canine blood donor Dexter is all smiles. CABB is currently active in Alberta, Manitoba, Ontario, Quebec and Nova Scotia, and will be expanding operations into British Columbia in spring 2026.

6. Regional Veterinary Technologist Ariana Pierre (far right) collects blood from canine donor Troll in Nova Scotia. The collection process is quick, safe and painless - with lots of love and treats afterwards.



Red River College provided a home base for operations in exchange for participation in their teaching program, which offers a course in Animal Health Technology. Very early on, we had demand for blood products from other provinces and quickly rebranded as the Canadian Animal Blood Bank (CABB), a not-for-profit corporation now operating in five and soon to be six provinces.

2) What role have technological advances played since the inception of the blood bank?

The core processes of collecting, fractionating, storing, and shipping of blood products remain much as it was at CABB's inception 30 years ago. Technological advances have been primarily in computer software, allowing better tracking of blood product storage and distribution. In addition, all blood is tested at reference labs for blood-borne disease, and there have been technological advances in that area.

3) What is the process for donating to the animal blood bank, and how can veterinarians get involved?

The Canadian Animal Blood Bank relies entirely on networking with veterinarians across Canada to enable us to supply them with high-quality blood products when needed. We ask them to host donor clinics in their facilities and to assist in recruiting suitable blood donors from their client base. The CABB has animal health technologists serving as CABB regional unit managers who co-ordinate this activity in their respective regions. What years of operation have shown is that people who own pets love the fact that their pet can

help save the life of another pet. Once the awareness of the need of blood banking exists for animals as it does for people, registering donors is not difficult. The actual donor clinics where blood is collected is a very positive experience for donor owners who are present as their pet donates. Many owners ask to participate in the program beyond the eight timed donations asked of their pet. We strive to have the participating veterinary hospitals and clinics recognized for their contribution to the program through social media postings and other means.

4) Regarding awareness about animal health, what impact has the animal blood bank had on the communities you serve and beyond?

The Canadian Animal Blood Bank is a community outreach program as described above, and awareness is the challenge. After 30 years of existence, the "average citizen" is still unaware of the Canadian Animal Blood Bank and the need for animal blood banking. Most pet owners are fortunate in not having their pet encounter a situation where blood product availability is essential and lifesaving. Most Canadians don't rely on the products supplied by Canadian Blood Services, and yet most are aware of its existence and the role it plays in our medical system. That awareness facilitates their ability to recruit blood donors. Awareness, therefore, remains a challenge for the CABB, and I appreciate this opportunity to shed some light on the organization and its mission. The need for animal blood products continues to grow, and we struggle to keep up with the demand. The existence of more specialty and referral veterinary hospitals has increased the quantity and quality of veterinary services being offered to Canadians. The availability of blood products is part of the profession's ability to supply a higher level of animal health care.

5) Why have you continued this work for as long as you have, and how will the blood bank ensure scope for maximizing its reach and effectiveness in the future?

The first mission statement goal of the CABB is to be the supplier of high-quality blood products on a timely basis for veterinarians in all 10 Canadian provinces. After 30 years, we are still striving to reach that goal. As the CABB has grown, so has the need for the products we produce. Along the way, we have grown and strengthened the staffing required to deliver the products we produce. I see the need for my "mentorship" diminishing, and I am anxious to pass the torch as the head of this organization. Many challenges and opportunities exist for the CABB. We do not currently bank feline blood, and there is unquestionably a demand for that product. Transfusion medicine education within and outside the profession is another mission statement goal, and the CABB continues to offer more in that regard. All of these challenges have kept me engaged in the work of the CABB as a part of giving back to the profession in which I have been privileged to participate. Future growth and success will depend on the engagement of others who appreciate the need for and vision of the Canadian Animal Blood Bank and who understand how it can further evolve to better serve the profession and animal-owning public. 🐾

~ Ties Morgan

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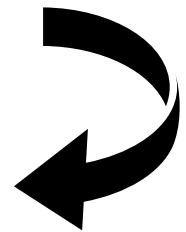
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