And you thought cannabis was progressive?

“Magic mushrooms” make their debut in the veterinary field as potential therapy for canines.

By Stephen Cital, RVT, SRA, RLAT, VCC, CVPB, VTS-LAM (Res. Anesthesia)

It’s been about 4 years since the cannabis discussion became polarized in veterinary medicine, with the lingering controversy of safety, efficacy, and legality.

Well, you better get ready, folks, because what is next on the horizon may make you cringe or fly or experience ghosts of the past, present, and future. That’s only, of course, if you take this next “big” natural product.

If you haven’t guessed it yet, I am talking about psilocybin (aka “magic”) mushrooms. Yes, veterinary community, get ready.

Although this mushroom is still a Schedule 1 drug on federal and state levels, 3 American cities have already decriminalized the psychedelic fungi, and integrative and holistic-minded veterinarians are quietly using the mind-bending buttons (a term used for the caps of the mushrooms) in practice today. Popularity may increase more with the success of the new

Essential information for veterinary practitioners about hemangiosarcoma

A veterinary cancer specialist discusses key facts about the disease to help clients make the best decision for their pet.

By Kate Boatright, VMD
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1. Assessment was conducted by IDEXX® and leveraged veterinary clinic PIMS transaction level data for 2019. This analysis included data from approximately 7,000 U.S. clinics that had consistent data from 2017 to 2019. To be included, patients needed to have at least one parasite transaction in the baseline year (2018). The analysis was limited to loyal patients, where loyalty was defined as having one flea/tick control brand during the full three-year period. A management metric of control of NexGard® was used, calculated as the ratio of the number of patients for whom the brand was selected as the control of the total number of patients for whom any brand was selected as the control. Calculations were made for each month of the year and for each control product. For NexGard® the management metric was calculated as the ratio of the number of patients for whom NexGard® was selected as the control of the total number of patients for whom any brand was selected as the control. The management metric for each month was averaged across the three years of the study, and the average was compared to the management metric for the full three-year period, corresponding to the difference between the control and the baseline period. The analysis was limited to patients with at least 12 months of data from 2017 to 2019. The average number of months of NexGard® purchased per year was 6.64, compared to 6.69 for BRAVECTO®. This analysis overestimates the duration of efficacy for BRAVECTO®. For comparison purposes, each BRAVECTO® chew was assessed as providing three months of flea & tick protection versus the labeled 12-week coverage for fleas and three species of ticks, and 8-week coverage for Lone Star ticks.

2. Data on file at IDEXX Laboratories, Inc. Westbrook, Maine USA.

3. Data on file at Boehringer Ingelheim.
The number of stray dogs and cats is at an all-time high in Puerto Rico following Hurricane Maria¹

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² Data on file.
Brief Summary: Before using NexGard® (afoxolaner) Chewables, please consult the product insert, a summary of which follows.

CAUTION: Federal (USA) law restricts this drug to use by or on the order of a licensed veterinarian.

Description: NexGard is a soft chewable for oral administration to dogs and puppies according to their weight. Each chewable is formulated to provide a minimum afoxolaner dosage of 1.14 mg/lb (2.5 mg/kg).

Indications: NexGard kills adult fleas and is indicated for the treatment and prevention of flea infestations (Ctenocephalides felis), and the treatment and control of Ixodes scapularis, Dermacentor variabilis, Amblyomma americanum, and Rhipicephalus sanguineus infestations in dogs and puppies 9 weeks of age and older, weighing 4 pounds of body weight or greater, for one month. NexGard is indicated for the prevention of Borrelia burgdorferi infections as a direct result of killing Ixodes scapularis vector ticks.

Dosage and Administration: NexGard is given orally once a month, at the minimum dosage of 1.14 mg/lb (2.5 mg/kg). See full product insert for dosing table and details.

Warnings: Not for use in humans. Keep this and all drugs out of the reach of children. In case of accidental ingestion, contact a physician immediately. Keep NexGard in a secure location out of reach of dogs, cats, and other animals to prevent accidental ingestion or overdose.

Precautions: Afoxolaner is a member of the isoxazoline class. This class has been associated with neurologic adverse reactions including tremors, ataxia, and seizures. Seizures have been reported in dogs receiving isoxazoline class drugs, even in dogs without a history of seizures. Use with caution in dogs with a history of seizures or neurologic disorders.

The safe use of NexGard in breeding, pregnant or lactating dogs has not been evaluated.

Adverse Reactions: In a well-controlled US field study, which included a total of 333 households and 615 treated dogs (415 administered afoxolaner, 200 administered active control), no serious adverse reactions were observed with NexGard.

Over the 90-day study period, all observations of potential adverse reactions were recorded. The most frequent reactions reported at an incidence of > 1% within any of the three months of observations are presented in the following table.

Table 1: Dogs with Adverse Reactions.

<table>
<thead>
<tr>
<th>Treatment Group</th>
<th>Afoxalaner % (n=415)</th>
<th>Oral active control % (n=200)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vomiting (with and without blood)</td>
<td>17 4.1</td>
<td>25 12.5</td>
</tr>
<tr>
<td>Dry/Fissy Skin</td>
<td>13 3.1</td>
<td>2 1.0</td>
</tr>
<tr>
<td>Diarrhea (with and without blood)</td>
<td>13 3.1</td>
<td>7 3.5</td>
</tr>
<tr>
<td>Lethargy</td>
<td>7 1.7</td>
<td>4 2.0</td>
</tr>
<tr>
<td>Anorexia</td>
<td>5 1.2</td>
<td>9 4.5</td>
</tr>
</tbody>
</table>

*Number of dogs in the afoxalaner treatment group with the identified abnormality.

*Number of dogs in the control group with the identified abnormality.

In the US field study, one dog with a history of seizures experienced a seizure on the same day after receiving the first dose and on the same day after receiving the second dose of NexGard. This dog experienced a third seizure one week after receiving the third dose. The dog remained enrolled and completed the study. Another dog with a history of seizures had a seizure 19 days after the third dose of NexGard. The dog remained enrolled and completed the study. A third dog with a history of seizures received NexGard and experienced no seizures throughout the study.

Post-Approval Experience (July 2018): The following adverse events are based on post-approval adverse drug experience reporting. Not all adverse events are reported to FDA/CVM. It is not always possible to reliably estimate the adverse event frequency or establish a causal relationship to product exposure using these data.

The following adverse events reported for dogs are listed in decreasing order of reporting frequency for NexGard: Vomiting, pruritus, lethargy, diarrhea (with and without blood), anorexia, seizure, hyperactivity/ restlessness, panting, erythema, ataxia, dermatitis (including rash, papules), allergic reactions (including hives, swelling), and tremors.

Effectiveness: See full product insert for details regarding Effectiveness.

Animal Safety: In a margin of safety study, NexGard was administered orally to 8 to 9-week-old Beagle puppies at 1, 3, and 5 times the maximum exposure dose for a total of six treatments. There were no clinically-relevant effects related to treatment on physical examination, body weight, food consumption, clinical pathology (hematology, clinical chemistries, or coagulation tests), gross pathology, histopathology or organ weights. Vomiting occurred throughout the study, with a similar incidence in the treated and control groups, including one dog in the 5x group that vomited four hours after treatment.

In a well-controlled field study, no adverse reactions were observed from the concomitant use of NexGard with other medications.

Contact Information: For a copy of the Safety Data Sheet (SDS) or to report suspected adverse drug events, contact Boehringer Ingelheim Animal Health USA Inc. at 1-888-637-4251. For additional information about adverse drug experience reporting for animal drugs, contact FDA at 1-888-FDA-VETS or www.fda.gov/reportanimalae.

The information provided here is not comprehensive. The full FDA-approved product insert is available at www.nexgardfordogs.com. Consult your veterinarian for further information.

Product approved by FDA under NADA #141-406

Marketed by: Frontline Vet Labs™, a Division of Boehringer Ingelheim Animal Health USA Inc. Duluth, GA 30096

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Reference package insert: 1050-4493-09 Rev. 11/2019

Brief summary preparation date: 08/2020

US-PET-0735-2020

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Promoting a brighter future for veterinary medicine

The dvm360® team recently met with our esteemed Editorial Advisory Board, a diverse group of 20-plus veterinary leaders including technicians, veterinarians, and practice managers, who assist us with identifying key industry trends, editorial content ideas, and partnership opportunities. We welcomed brand-new members, highlighted new programs, and discussed content ideas for 2022 including the latest in veterinary oncology, dental health, cannabidiol research, well-being, diversity, equity and inclusion, leadership, technician critical care, One Health, and behavior. The team also discussed strategies for promoting engagement and offered up some fun facts about themselves that might just surprise you. We don’t want to spoil the surprise, but let’s just say some of these veterinary experts are also singers and shoe collectors, and one board member nearly had a career as a blackjack dealer. To learn more about our advisory board members, visit dvm360.com.

As you read through this month’s issue of dvm360®, you’ll notice that it’s much thicker. We have added our new continuing education (CE) inbook to expand our portfolio of educational opportunities. Our goal is to cater to readers with diverse learning modalities and increase awareness of our CE opportunities. In this section, you’ll find informative CE abstracts and articles as well as interactive online CE tests.

To learn more about our CE opportunities, visit dvm360.com. To inquire about CE instruction, email Adam Christman, DVM, MBA, chief veterinary officer, at achristman@mjhlifesciences.com. Our hope is that by including more CE-related content, we can provide the information you need to help you to continue to advance and evolve along with this ever-changing profession. Happy reading!

—Mike Hennessy Sr
Chairman and Founder,
MJH Life Sciences™

A glance at our new veterinary education offerings, plus some important updates

It has been a while since I’ve updated you on some of our current and new veterinary education initiatives. Let’s get to it!

Expanding our weekly podcast
It has been officially 1 year since the launch of The Vet Blast Podcast, which has garnered thousands of listeners. We are thrilled to continue to provide you with fun, digestible information you can enjoy at home or on the go. I want to especially thank all our featured guests—more than 60 so far—who have highlighted their diverse specialties and experiences. I enjoy hearing your stories and encourage anyone interested in being a guest to contact me at achristman@mjhlifesciences.com.

Growing CE content
We have also created a robust online presence of continuing education (CE) and now feature CE content in our dvm360® print magazine. Be sure to take advantage of all our informative and engaging live CE webinars. If you are unable to attend a live webinar, they are available on demand.

Tapping into the minds of veterinary experts
Our dvm360® Editorial Advisory Board, a diverse team of talented veterinary professionals who help enhance our content and CE efforts, continues to grow. We met with this team last month to help complete our 2022 editorial content calendar and discuss new initiatives, topics, and more.

Getting students involved
Additionally, the dvm360® student ambassador program, comprised of more than 70 veterinary students continues to thrive. This unique platform allows students to discuss topics such as well-being, diversity, equity and inclusion, school debt, and other student-related concerns.

Creating long-lasting partnerships
The dvm360® Strategic Alliance Partnership program has provided a platform for our partners to share content, connect us with thought leaders, and coordinate interviews with experts in the field. We are working toward establishing additional partnerships with organizations, veterinary schools, and various nonprofit organizations.

Celebrating veterinary heroes
Finally, we know that we are all heroes in this profession, but at dvm360®, we want to celebrate those veterinary professionals who really go above and beyond the call of duty. That’s why we recently launched our new recognition program, dvm360® Veterinary Heroes™. Nominations closed last month, so stay tuned at dvm360.com or on social media for winner announcements. We will celebrate all winners at our formal awards gala the day before the start of our Fetch dvm360 Conference in San Diego, California, on December 1, 2021. Thank you for your participation in this exciting program. We were overwhelmed by your numerous submissions and look forward to your participation next year.

None of these initiatives would have been possible without you. We hope you enjoy our latest CE offerings and continue to learn and grow with us as we evolve to meet the needs of this ever-changing profession.

—Adam Christman
DVM, MBA
Chief Veterinary Officer

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A closer look at hemangiosarcoma

A veterinary cancer specialist discusses key facts about the disease to help clients make the best decision for their pet.

Kate Bootright, VMD

Strategic Alliance Partner

Advancing skill sets and educating veterinary professionals to elevate the standard of patient care
James Barr, DVM, DACVECC, chief medical officer, BluePearl Specialty and Emergency Pet Hospital

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Advancing skill sets and educating veterinary professionals to elevate the standard of patient care

Ensuring staff members are adequately prepared to handle changes in the pet care ecosystem is imperative.

By James Barr, DVM, DACVECC, Chief Medical Officer, BluePearl Specialty and Emergency Pet Hospital

Between the pet health care we have and the care we wish to practice lies a gap. The profession continues to face medical quality and patient care shortcomings, although these are not yet extensively documented in veterinary literature. The reasons for persistent issues in the delivery of pet care are complex. Still, they may be attributed to a shift from acute, general management care to more advanced, chronic care; continual technological, procedural, and pharmaceutical innovations; increased pet ownership and pet care spending; changing patient-clinician relationships; and, perhaps most importantly, a deficiency in organized education and skill-building opportunities.

With changes to the pet care ecosystem consistently under way, it is imperative leaders in the veterinary field ensure their people and those who will one day enter the profession are adequately prepared.

Responding to change

When it comes to enhancing medical quality and elevating the standard of patient care, it is usually discussed in the context of improving hospital processes or systems. However, there is another aspect that’s critical to improve medical quality and patient care in the veterinary profession: education and skill development.

To respond to the ever-changing needs of pet owners, meet the desires and needs of veterinary professionals, and ensure we are making use of new, evidence-based knowledge as it becomes available, it is essential that veterinary professionals develop new skills and assume more advanced roles. At the same time, veterinary organizations need to allow for innovation by proactively encouraging their professionals to reach their full academic and career potential through ongoing training, increased certification opportunities, and enhanced compensation.

Veterinary professionals should be educated and trained in the clinical or administrative areas that are of most interest to them while also learning standard skill sets, including leadership behaviors essential to taking on more advanced roles within the practice. Although the individual is responsible for taking advantage of the advancement opportunities presented to them, laying the foundation for an always learning, always growing” practice culture, one that invests in and sees human capital as a key priority, is the responsibility of veterinary organizations’ leadership teams.

Understanding how education and advanced skill sets elevate the standard of care for patients and bring value to the profession, BluePearl Specialty and Emergency Pet Hospital remains committed to creating clear career pathing for its assistants, technicians, paraprofessionals, and other support team members. Announced earlier this month, BluePearl’s multiyear investments in associate well-being include increased continuing education incentives and CareerTrax, the industry’s largest electronic leveling and compensation system, which allows our associates to work at the top of their license to deliver service and care second to none.

CareerTrax (see Figure) tracks veterinary professionals’ skill set development for career advancement (leveling up) and provides full transparency into skill and leveling requirements for each role, level, and specialty.

With direct and organized paths to advance, we aim to:

• foster a culture of learning, collaboration, and innovation;
• boost doctor and client satisfaction (Trained and experienced staff provide doctors with the skilled support they require to perform advanced medicine, and clients are offered additional time with a medical expert, aiding in treatment plan competency and compliance); and
• improve quality of patient care, bringing more qualified and credentialed professionals onto the practice floor and across the profession.

Enhancing teams

No matter how experienced a clinician, they simply cannot function on their own, independent of a trained and qualified support staff. This is especially true when treating patients with chronic conditions, geriatric patients, those in need of critical acute care, and those nearing end of life. These complex cases require smooth team functioning—from the front desk employee to the veterinary technician specialist.
For example, the trained and experienced veterinary technician who works alongside a specialist may be able to recommend treatment options for complex cases, assist in specialized treatment, consult with pet owners on diagnostic tests and results, administer medications, prepare animals for procedures or surgery, and even assist with advanced procedures. This collaborative, advanced-care system makes for a quicker diagnosis and treatment plan for the pet and an improved experience for the pet owner.

Front desk and client care staff can also level up. Three levels exist for front desk workers:

- **Entry level**—hands-on, day-to-day administrative task development
- **Middle level**—soft skills development, including expanding knowledge in client interactions, conflict resolution, de-escalation training, and more advanced training in technical skills such as onboarding and staff scheduling
- **Third level**—hospital management, animal-handling education, beginner pharmacology, patient discharge, and leadership skills

From there, associates can grow into a leadership position, such as a financial coordinator role or the more advanced position of practice manager. The leveling buckets developed specifically for front desk staff allow them to learn both front-end and back-end functions of a hospital system so they can one day efficiently and effectively manage a hospital and lead a team.

This “systems thinking” environment—in which a professional sees themselves as part of larger cross-functional team dedicated to meeting the needs of patients—coupled with pathways to advance, breeds a new hospital culture of continued learning and engagement. This culture nurtures employee satisfaction and fuels the engineering of new, efficient medical solutions that elevate the standard of care for all.

**Lifelong learning**

Veterinary medicine must embody a culture of lifelong learning and offer careers that professionals can feel proud of. It is hoped that through the combination of changes under way across the pet care ecosystem and career-pathing programs like CareerTrax, other industry leaders will be motivated to move beyond system and culture challenges to create meaningful change for their own essential workers.

When we empower our people, together, all aspects of the pet care system—patient care, career value, and worker livelihoods—improve.

Looking for our past issues? Hover your phone’s camera over the QR code or go to www.dvm360.com/publication/dvm360-magazine to access our digital magazine library.
Every clinic has a model or photo of a heart, teeming with adult heartworms to help educate clients about heartworm disease. So it’s no wonder adult heartworms get most of the attention. After all, adult disease. So it’s no wonder adult heartworms cavalo syndrome. hepatic or renal disease and, in some cases, hypertension, right-sided cardiac hypertrophy, and potentially contributing to pulmonary hypertension, right-sided cardiac hypertrophy, hepatic or renal disease and, in some cases, caval syndrome.

What garners less attention, perhaps because they’re less visible, are the tiny, motile microfilarial offspring, which far outnumber the adults, that circulate through the dog’s body. Because domestic dogs are the definitive hosts for *Dirofilaria immitis*, a heartworm-positive dog can harbor a large number of microfilariae—as many as 60,000 or more in a single milliliter of blood. As microfilariae circulate through tissue, they can cause structural damage to organs, such as the lungs and kidneys. Eliminating these microfilariae is critical for a dog’s health and reducing reservoirs of infection that pose a risk to other pets and wildlife, including other dogs, cats, coyotes, and wolves. But a way to safely and effectively kill microfilariae hasn’t always been available.

**A life cycle review**

After mating, adult heartworms release microfilariae into the bloodstream. Microfilariae must be ingested during a blood meal by an immediate host, a mosquito, to become infective. When investigators collected mosquitoes from the kennel of a single heartworm-positive dog, they found that 74% (84/114) of those mosquitoes were infected with *D immitis* microfilariae.

Within the mosquito, microfilariae molt several times, eventually becoming infective third-stage larvae (L3). The next time the mosquito vector takes a blood meal, it deposits L3 larvae on the skin surface that enter the dog through the puncture wound. Within days, the larvae molt to fourth-stage larvae (L4), which travel between the muscle and subcutaneous tissues. With another molting, the larvae become immature adults and enter the bloodstream and eventually to reach the pulmonary arteries, where they grow into adults and the life cycle begins again. If left untreated, microfilariae can keep circulating in a dog for as long as 2.5 years.1

**The trouble with microfilaricides**

Over the years, a number of compounds were used as microfilaricides, including stibophen, diethylcarbamazine citrate (DEC), fenthion, and levamisole. Although some were effective, they often came with serious adverse effects and toxicities. Veterinary professionals eventually moved to macrocyclic lactones, an effective and safer class of drugs, for off-label use as microfilaricides. Current compounds in this class include ivermectin, selamectin, milbemycin oxime, and moxidectin. However, most heartworm products containing these compounds, when given at preventive doses, are not designed to be completely microfilaricidal. Because microfilariae are generally less susceptible than L3 and L4 larvae to macrocyclic lactones, higher doses may be necessary. For example, to effectively remove microfilariae, ivermectin would have to be administered up to 8 times the preventive dose.1 Still, the American Heartworm Society advises caution when
administering macrocyclic lactones to dogs with high microfilariae counts due to the potential for anaphylactic reactions associated with rapid kills. As more people travel with their dogs, and homeless dogs are increasingly transported to other locations for adoption, safe and effective macrocyclic lactones are crucial to help reduce the spread of *D. immitis* from microfilarial dogs.

Transdermal moxidectin is labeled as a microfilaricide

Transdermal Advantage Multi® (imidacloprid + moxidectin) for Dogs is a heartworm prevention approved by the US Food and Drug Administration (FDA) to kill circulating microfilariae in heartworm-positive dogs. This approval was based on studies with experimentally and naturally infected heartworm-positive dogs that focused not only on efficacy but safety too.

In a controlled laboratory study, adult heartworms were surgically implanted in 20 dogs 82 days before product application. Participating dogs were required to have at least 300 microfilariae per milliliter of blood. On study days 0 and 28, Advantage Multi was applied to 10 dogs, and an equivalent volume of mineral oil was administered to 10 control dogs. Blood samples were drawn for microfilarial counts on the first 3 days, then weekly through day 28, and once more on day 42. Mean microfilarial counts for the treated dogs were reduced by more than 99.7% on days 14 through 42. No treatment related adverse events were noted.

Another study evaluated the effects of Advantage Multi on dogs that were naturally infected with *D. immitis*. To qualify, the 22 heartworm-positive dogs were required to have at least 300 microfilariae per milliliter of blood. Like the previous study, half the dogs were treated with Advantage Multi on study days 0 and 28, and the control dogs were treated with mineral oil. Blood draws for microfilarial counts were performed based on a similar schedule. In this case, the results were similar to the previous study: On days 14 through 42, microfilarial counts were reduced by more than 99.9% in treated dogs. No treatment related adverse events were observed.

Finally, a multicenter field study evaluated 181 client-owned, heartworm-positive dogs that had circulating microfilariae. Dogs were split into 2 groups. All dogs were treated with Advantage Multi on study days 0 and 28; however half the dogs were also treated with melarsomine on days ~14, 14, and 15. After microfilarial counts were performed on days 28 and 42, the group that received Advantage Multi and melarsomine experienced a reduction in microfilaria of 99.6% and 99.7%, respectively. The group treated with Advantage Multi demonstrated similar success with reductions of 98.8% and 99.2%, respectively. Advantage Multi was well tolerated when administered to heartworm-positive dogs alone or in combination with melarsomine.

Treat microfilaria early

Currently, the American Heartworm Society recommends treating heartworm-positive dogs with a macrocyclic lactone and doxycycline at the time of diagnosis. As a product with an FDA-approved indication to treat circulating microfilariae in heartworm-positive dogs, Advantage Multi can be a useful part of any clinic arsenal, especially in heartworm endemic regions of the country.

The transdermal formulation is designed to safely deliver the highest approved dose of moxidectin (2.5 mg/kg) on the market. When applied, moxidectin is quickly absorbed through the skin and enters the bloodstream. It concentrates in the fat and tissues and remains active all month long. Advantage Multi kills adult fleas, treats flea infestations, treats and controls sarcoptic mange and intestinal parasite infections, and of course prevents heartworm disease and treats circulating microfilariae.

REFERENCES


CAUTION: Federal (USA) law restricts Advantage Multi® for Dogs to use by or by the order of a licensed veterinarian. WARNING: DO NOT ADMINISTER THIS PRODUCT ORALLY. For the first 30 minutes after application ensure that dogs cannot lick the product from application sites on themselves or other treated animals. HUMAN WARNINGS: Children should not come in contact with the application site for two (2) hours following application. Advantage Multi, Elanco and the diagonal bar logo are trademarks of Elanco or its affiliates. © 2021 Elanco or its affiliates. PM-US-21-15/74
Investing intelligence: Tech companies with industrial clothing

Investing in such companies can be a lower-risk way to position for returns driven broadly by the ongoing digital revolution.

By Dave S. Gilreath, CFP

Market outlooks aplenty make optimistic predictions about the near-term future of autonomous vehicles, but few investors are aware that Caterpillar (CAT) has been producing the unmanned variety since the 1990s.

These vehicles work in mining, tirelessly, night and day, never stopping for lunch. As no humans are aboard, there isn’t the same hand-wringing over safety that there is with Teslas, which the company touts as being viable for autonomous fleets to carry nonowning passengers. (Don’t hold your breath waiting for this.)

Though you’ll never summon a behemoth earthmover to take you to the dentist and then pick you up after chauffeuring others around, CAT’s autonomous behemoths are arguably tech products. Yet, as they do industrial work, CAT is in the industrials sector.

The company also makes semi-autonomous vehicles, including human-driven earthmovers loaded with advanced technology to guide grading to specifications for boundaries, depth, and slope—sonic lasers and GPS (eliminating the lines of staked-out string once ubiquitous at construction sites). And the company’s newest tech ventures include 3D printing capabilities to eventually enable the production of parts on job sites to reduce downtime; CAT has a dedicated plant where engineers are testing this technology.

Tech without the category
CAT, founded in 1925, is in a growing category of companies that use technology not as an add-on but as an integral part of products that are nevertheless viewed by the market as being anything but technical. Some of these companies are developing and/or producing autonomous vehicles and/or systems. Others are pursuing different digital endeavors.

Unlike many new tech companies, these quasi techs don’t trade at share prices hundreds of times earnings; they don’t carry this onus. Rather, these are long-established companies with real value, real profits, and real earnings that keep their price earnings (P/E) ratios down-to-earth instead of up in the stratosphere. (CAT had a forward P/E ratio of about 20 on August 3.)

Unlike many high-flying tech companies listed on NASDAQ, CAT didn’t pop up a year or 3 ago with venture-capital funding aimed at driving share price largely from market sentiment agog over all things tech. In 2025, CAT will celebrate its 100th birthday.

This story was originally published in our sister publication Medical Economics®.
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CAUTION: Advantage Multi® is only available from a licensed veterinarian. Dogs: WARNING: DO NOT ADMINISTER THIS PRODUCT ORALLY. For the first 30 minutes after application, ensure that dogs cannot lick the product from application sites on themselves or other treated animals. Children should not come in contact with the application sites for two (2) hours after application. (See Contraindications, Warnings, Human Warnings and Adverse Reactions for more information.) Cats: Do not use on sick, debilitated, or underweight cats. Avoid oral ingestion.

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Advantage Multi® for Dogs and for Cats (imidacloprid + moxidectin)

BRIEF SUMMARY: Before using Advantage Multi® for Dogs (imidacloprid/moxidectin) or Advantage Multi® for Cats (imidacloprid/moxidectin), please consult the product insert, a summary of which follows:

CAUTION: Federal (U.S.A.) law restricts this drug to use by or on the order of a licensed veterinarian.

Advantage Multi® for Dogs:

WARNING: • DO NOT ADMINISTER THIS PRODUCT ORALLY.
• For the first 30 minutes after application ensure that dogs cannot enter treated areas or sites on non-treatment days or enter the area within the first 30 minutes after application
• Children are at risk of contact with the application site for up to 2 (two) hours after application.

(See Catching the waves: Weather Warnings, and Adverse Reactions for more information.)

INDICATIONS: Advantage Multi for Dogs is indicated for the prevention of heartworm disease caused by Dirofilaria immitis and the treatment of D. immitis heartworm infections in dogs with heartworm-positive dogs. Advantage Multi for Dogs kills adult fleas and is indicated for the treatment of flea infestation in dogs. Advantage Multi for Cats is indicated for the treatment and control of sarcoptic mange (scabies) on cats and in the treatment of ear mites (Otodectes cynotis) on cats.

CONTRAINDICATIONS: Do not administer this product orally.

Cats: Do not use the Cat product (containing 2.5% imidacloprid) on cats kills adult fleas (Ctenocephalides felis) and is indicated for the treatment of flea infestation. Advantage Multi for Cats is also indicated for the treatment and control of sarcoptic mange (Sarcoptes scabiei) on cats. Advantage Multi for Cats is contraindicated for the prevention and treatment of ear mites (Otodectes cynotis) on cats.

Ferrets: Advantage Multi for Cats is indicated for the prevention and treatment of ear mites (Otodectes cynotis) on ferrets. Advantage Multi for Cats is contraindicated for the prevention and treatment of sarcoptic mange (Sarcoptes scabiei) on ferrets.

CONTRAINDICATIONS: Do not administer this product orally.

Do not use the Dog product (containing 2.5% moxidectin) on cats

WARNING: For Dogs: For the first 30 minutes after application ensure that dogs cannot enter treated areas or sites on non-treatment days or enter the area within the first 30 minutes after application

Advantage Multi for Dogs: Do not use on sick, debilitated, or underweight cats. Do not use on cats less than 9 weeks of age or on cats weighing less than 2.2 lbs (1.0 kg) at initial dosage. Do not use on cats with known hypersensitivity to benzyl alcohol, imidacloprid, or moxidectin. Should administer the product with caution to pregnant or lactating females. Avoid contact with skin. Wash hands thoroughly after using. Discontinue if signs of irritation develop.

Children should not be allowed to administer the product to animals. Avoid contact with eyes or mucous membranes.

Dirofilaria immitis: See Animal Reaction Card (Amer. Assoc. of Veterinary Laboratory Diagnoses and Pathology) for proper identification.

CONTRAINDICATIONS: Do not administer this product orally.

ADVERSE REACTIONS: For Dogs: The most common adverse reactions observed during field studies were pruritus, scratching, hyperactivity, and hyperventilation. Hair loss and alopecia have been reported. Allergic reactions to Advantage Multi for Dogs have not been evaluated in heartworm-positive dogs with Class 4 heartworm disease.

Investing in such companies, where appropriate for your portfolio and goals, can be a lower-risk way to position for returns driven broadly by the ongoing digital revolution—an economic engine that will continue to drive growth in pretty much all stock sectors, not just among tech companies per se, pushing the Dow Jones Industrial Average upward over the next few years.

Stealth tech companies

Here’s a look at the tech prowess of some of these stealth tech companies:

Deere & Co (DE), Founded, 1837. Forward P/E about 20, as of August 3. Known for its consumer products—riding lawn mowers and small tractors (one that’s fully electric)—Deere also manufactures a line of commercial vehicles for agriculture, forestry, and construction; fully autonomous aerial and semiautonomous ground, autonomous aerial drones to spray crops, AI-equipped vehicle attachments that can distinguish different species of weeds and choose the best way to kill them, and high-precision command cabs for manned vehicles.

Rockwell Automation (ROK). Forward P/E, about 33. Though this company is squarely in the industrial sector, its products are nonetheless technical. It manufactures a diverse range of products: systems for manufacturing, control and monitoring, security infrastructure management, safety, motion-control, and timing.

Corning. Founded, 1852. Forward P/E about 19. Expertise with ceramics and glass has taken the company on the “journey of glass” to making screens for cell phones and computers, and optical fiber. Corning makes products that are used in pharmaceuticals (including vaccine vials) and life sciences. This is no longer your great-grandfather’s glassware company.

Paccar (PCAR). Founded, 1905. Forward P/E about 14. This manufacturer makes long-haul trucks (including its trucker-prized Kenworth 18-wheeler tractor), the category expected to be the first widely available automated vehicles. Paccar is a leader in electrification and is advancing partnerships researching emerging technologies, including advanced driver assistance, artificial intelligence, machine connectivity, augmented reality, electric and hydrogen fuel cell power trains and applications of data analytics. This company is unique for its transparency, as it routinely publishes research findings online.

Raven Industries (RAVN). Founded, 1956. Forward P/E, about 72. This company makes GPS steering systems, specialized membranes and liners, high-altitude balloons, radar systems, field computers, guidance and steering systems, machine control systems, and field computers. Global users include industry, agriculture (driverless farm machinery), energy, construction, and defense.

Magna International (MGA). Founded, 1957. Forward P/E about 11. Magna makes electric powertrains, automated driving systems, and automobile wiring subassemblies—a product line likely to benefit from Biden administration-favored subsidies for electric and autonomous vehicle technologies. Its website includes a word that sums up the application of electronics to cars: “mechatronics.”

A potential buying opportunity

The industrials sector stands to grow significantly in coming months from increasing demand in the postpandemic economy, though constructed supply chains may take a while to open up because of the Delta variant. Moreover, the infrastructure bill before Congress that, as of early August, seemed likely to pass, would give the sector a boost.

So much for tailwinds. A likely yet temporary market headwind would be a correction (a 10% drop) or a pullback of 5% to 7%. We’re long overdue for a correction, and the chances of this happening every August are increased by people going on vacation, meaning lower trading volume and potentially higher volatility. A resulting correction or pullback would be a good buying opportunity.

Dave S. Gilreath, a certified financial planner, is a 40-year veteran of the financial services industry. He established Sheaff Brock Investment Advisors LLC, a portfolio management company based in Indianapolis, Indiana with partner Ron Brock in 2001. The firm manages more than $1 billion in assets nationwide.

REFERENCES:


Trimbly (TRMB). Founded, 1978. Forward P/E, about 35. Though Trimbly is an actual tech company—it makes digital products and is traded on NASDAQ—the customers who use its products—from handheld range finders to onboard GPS systems to 3D real-time data communication systems and remote sensing technology (LIDAR) for coordinating smart machines to construction site data collection robots—aren’t nerds staring at computer screens because no one is doing real work. Products are used in surveying, mapping, construction, public safety, transportation, utilities, shipping, infrastructural management, multinational project management, farming, mining, and forestry. Trimbly has been in partnership with Caterpillar since the 1990s.

Lockheed Martin Corp (LMT). Founded, 1912. Forward P/E about 14. This company, renowned for its supersonic jets, Sikorsky helicopters, and defense systems, is also becoming known for natural technical offshoots that have broad potential applications across various commercial and consumer tech markets. Directly or through partnerships, Lockheed is pursuing robotics, data analytics and artificial intelligence, materials science, nanotechnology, and information science.

To a considerable extent, these are technical companies in industries’ clothing. Yet Cathy Wood, the technology savvy founder of Ark Funds, which manages the ETF ARKQ (Autonomous Technology and Robotics), apparently sees through the industrial garb, for the fund owns shares of Deere, Caterpillar, Paccar, Magna International, Lockheed Martin, and Trimbly.
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Why you should invest in your employees' happiness

By Eleasha Martin

According to a recent Vivian Health study, 53% of healthcare workers surveyed don't feel optimistic about the future of healthcare in the United States and 27% say they are unsure whether the future holds any promise for their careers. In the same survey, 43% of respondents said they are considering leaving the healthcare profession in 2021 compared with 80% who just 1 year before said they'd likely continue working in the healthcare field post COVID-19.

Numbers like these are popping up on surveys across the country and the world as healthcare professionals begin to leave their posts and start their careers over from scratch in different industries. What that means for healthcare employers is that finding licensed professionals to fill vacant roles is about to get even more competitive than it already was.

Employers should start planning their recruitment strategy without further delay and make it a priority to incentivize their existing employees so that they are more inclined to stay, forgoing any plans to change careers so that they are more inclined to stay, incentivize their existing employees further delay and make it a priority to incentivize their existing employees.

Finding the right fit

Finding sufficient numbers of qualified, licensed healthcare employees in the reams of resumes these days can feel a little bit like hunting for needles in a haystack. But there are recruiting strategies employers can use to narrow their search and quickly win the right talent for their open positions, such as the following:

• Hire a qualified Recruitment Process Outsourcing (RPO) partner. An RPO service can save busy healthcare providers invaluable amounts of time and energy, reaching markets they might not otherwise know about or consider. A good RPO will partner with its clients to understand their pain points and challenges and will help narrow the search, so all an employer must do is interview the top candidates and make a final hiring decision.

• Entice qualified candidates with a higher salary and other monetary incentives. Employers should consider sweetening the pot with a sign-on bonus and relocation package to entice new recruits through the door and then take a hard look at the salaries they are paying their current employees.

The Vivian study found that 66% of the nurses surveyed ranked pay as the most important attribute they are seeking in a job. Nearly a third of the respondents (32%) said they are being compensated less this year than they were last year, whereas 48% claim their hours have increased in 2021. More than a third of those surveyed (36%) said they were “extremely dissatisfied” with their compensation during the COVID-19 crisis.

• Streamline the interview process to make it as swift as possible. Once top job candidates are identified and an initial phone conversation proves they are happy with the compensation being offered, it’s time to bring them in for interviews. There is no reason they should interview 4 or more times. If a decision has not been made by the end of the third interview, then they are probably not the right fit. The immediate supervisor needs to meet with them and possibly the supervisor’s boss and a team member or 2, along with corporate HR. Only the immediate supervisor should require an hour of the candidate’s time. Everyone else planning to interview the candidate should take less than half an hour. It’s also important to have a structured interview ready to go and ensure the same questions aren’t being asked by different people.

• Vet candidates thoroughly before extending an offer. In the healthcare industry in particular, employers must be careful to choose employees who will extend empathy and care to their patients and who will abide by the regulations and rules governing the profession. While there are no guarantees, this could be accomplished by:

> Asking behavioral style questions in the interview process i.e., “Tell me about the time you had a difficult patient; What made them difficult and how did you respond?”

> Requiring that candidates submit a combination of personal and professional references, and asking questions such as, “What do you consider to be their strengths? What skill are they best at? What area do you think they can improve?”

> Checking candidates’ LinkedIn accounts to see what professional associations they might be involved in and reviewing their online references if they have any.

> Reviewing state board and licensing records on the candidates.

• Once a decision has been made, communicate quickly. Hiring managers or recruiters should follow up right away with candidates as soon as a decision has been made to offer another interview, extend a job offer, or to cut them loose if they aren’t the right fit.

Today’s job market moves fast, and talent is likely to be snatched up quickly, so taking too long to make a decision could cost a company the preferred candidate. Communicate openly and encourage the candidate to be frank about what they want from the job.

Keeping employees happy

It’s important to understand that in today’s market, employers must be flexible and accommodating to win talent and retain existing employees.

Employees are stretched thin and feel overworked, under paid, and under-appreciated according to a Vivian Health survey of healthcare workers. The Vivian report showed that 83% of respondents felt their mental health was impacted after working in the healthcare field during COVID-19 over the past year, with 36% feeling “significantly impacted.” An April 2021 Washington Post-Kaiser Family Foundation poll found that roughly 3 in 10 healthcare workers have weighed leaving their profession. About 6 in 10 claimed that stress from the pandemic has harmed their mental health.

In this industry, benefits that focus on mental health and wellness should be standard. Providing schedule flexibility and offering ancillary mental-health benefits such as an Employee Assistance Program (EAP) with counseling services can make all the difference.

Eleasha Martin is the manager of recruitment process outsourcing for G&A Partners.

References available at dvm360.com
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Get a comprehensive, broad-spectrum dewormer* for dogs.

Fights nine different species of intestinal parasites. Available in easy-to-administer Taste Tabs®.

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CAUTION: Federal (U.S.A.) law restricts this drug to use by or on the order of a licensed veterinarian. DOSAGE: Not for use in puppies less than 3 weeks of age or weighing less than 2 lbs. CONTRAINDICATIONS: Do not use in pregnant animals.

*Based on label comparisons.

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How to cultivate a healthy ecosystem at your veterinary practice

Find out why motivation matters, plus how to identify common team motivational hurdles.

By Charles D. McMillan, DVM

Drontal® Plus
(praziquantel/pyrantel pamsoate/febantel)
Taste Tabs®
Broad Spectrum Chewable Anthelmintic Tablets for Dogs

CAUTION: Federal (U.S.A.) law restricts this drug to use by or on the order of a licensed veterinarian.

DESCRIPTION:

Drontal® Plus Anthelmintic Tablets are indicated for the treatment of internal parasites in dogs. The tablets may be offered to the dog by hand. Alternatively, tablets may be gently placed by hand or in the mouth. The tablets should be given at the time of the scheduled deworming. In the absence of ongoing deworming, the tablets should be given at 2 to 3 week intervals until a negative fecal examination is obtained.

ACTION:

Droncit® Plus Taste Tabs® Tablets contain three active ingredients having different modes of action and spectra of activity. Praziquantel is a cestocidal activity (pneumocystis). Praziquantel absorbed, metabolized in the liver and excreted in the bile. Upon entering the digestive tract from the bile, praziquantel is absorbed into the blood where it is distributed to the target organs (intestine). Praziquantel inhibits exocystula production, the nematode's acetylcholine receptors, which leads to spastic paralysis. Peristaltic action of the intestinal tract then eliminates the nematode. Laboratory efficacy and clinical studies conducted with Drontal Plus Anthelmintic Tablets demonstrate that each of the three active ingredients act independently without interference. The combined tablet formulation provides a wide spectrum of activity against the indicated species of intestinal helminths.

CONTRAINDICATIONS:

Drontal® Plus Taste Tabs® Tablets are contraindicated in cases of praziquantel or pyrantel toxicity. Severity of anaphylactic reactions have been observed in some species with praziquantel allergy.

TREATMENT:

Drontal® Plus Taste Tabs® Tablets should be offered to the dog by hand at the time of the scheduled deworming. The tablets should be given at 2 to 3 week intervals until a negative fecal examination is obtained.

DIRECTIONS:

Dosage is based on the weight of the dog. The tablets are offered to the dog by hand. Alternatively, tablets may be gently placed by hand or in the mouth. The tablets should be given at the time of the scheduled deworming. In the absence of ongoing deworming, the tablets should be given at 2 to 3 week intervals until a negative fecal examination is obtained.

STORAGE CONDITIONS:

Drontal® Plus Taste Tabs® Tablets should be stored at or below 77 °F (25 °C).
to high turnover. Proper guidance is required to focus the team on the hospital’s mission and goal statements and give direction on how to attain these goals while meeting daily client and patient demands.

Ineffective or obstructive policies or practices
Some policies are put in place too generally, without considering the specific needs of individual hospitals within a network. When this occurs, a chasm is created between executive leadership, middle management, and staff. When policymakers fail to consider the personal toll executing these tasks may have, workplace morale decreases and burnout occurs. An obstructive policy disregards or is unresponsive to the human capital required to deliver goals working under the guise of certain policies. Treating people or hospitals as monoliths causes issues if desired outcomes do not occur, which can lead to erroneous decisions or reprimands. The goals of executive leadership may not be readily available to staff on the ground level, creating an appearance of conflicting and even competing motivations.

Policies that are unclear to the workforce tend to get met with resistance, leading to a missed opportunity for contributing ideas on how to make achieving the company’s goals more feasible.

Poor working conditions
The quality of workplace conditions is an often-overlooked dimension of veterinary medicine. Subtle changes to these conditions can help eliminate work stress and inspire innovative thought processes. Factors that contribute to poor work conditions include, but are not limited to, shortened lunch breaks; double booking appointments; small, crammed break rooms; extended and highly stressful shifts; being understaffed; and loud, incessant noises.

Poor working conditions, which can be a result of intrinsic and extrinsic factors or a combination, can be an insidious form of stress and cause employees to carry pessimistic views about the workplace.

Negative peer relations
Negative peer relations directly lead to a toxic work environment. No matter how inspired or motivated individuals are, if they do not work well together, disengagement will ensue. Backstabbing and company gossip are early signs of an unhealthy work ecosystem. Team members who cannot stand to be around one another are less likely to see the value in their teammates and to seek help when faced with a task outside of their skill set. As a result, mistakes are made, accountability is avoided, and blame shifting becomes excessive. Negative peer relations allow healthy task-related conflicts to turn into dysfunctional relationship-based conflicts. Teams that do not work well together can negatively affect the organization’s bottom line. Moreover, clients can sense dysfunction, which causes consternation and uneasiness when interpreting how care is provided to their companion animal.

High turnover
High turnover is both a cause and effect of dwindling motivation. High turnover causes more senior and experienced workers to experience burnout. Veteran workers may also experience a “teaching tax” when burdened with having to teach a constant flow of new team members. Having historically high turnover rates may indirectly send a message to employees that this place is a stepping-stone or not a place worth investing in long term. High turnover interrupts team bonding and creates setbacks in building an apparatus designed to better serve the needs of the hospital or clinic and the client base. Turnover because of removing obvious hiring mistakes is necessary but should not be conflated with losing or driving out otherwise exceptional employees.

Identify and address these motivational obstacles
Any one or a combination of these factors will blunt motivation and must be addressed before attempting to meet individual motivational needs. If the factors go undiagnosed, they can metastasize and become a catalyst for demotivation. For your team to realize its full potential, a constant assessment of the workplace ecosystem must occur, and mechanisms must be put in place to help identify motivational obstacles.

The previous list has been tailored to address the unique aspects of veterinary medicine and pays particular attention to the added, perhaps inherent, stress that caring for animal companions creates. Now that we have gained a better understanding of possible obstacles to motivation, I implore you to implement strategies to address these hurdles at your clinic.

Charles D. McMillan, DVM, is a veterinarian with IndeVets, is based in Atlanta, Georgia, and a dvm360® editorial advisory board member. He is a 2012 graduate of Tuskegee University School of Veterinary Medicine and has a keen interest in developing the public’s understanding of veterinary medicine, fostering a healthy veterinary workplace ecosystem, and exploring solutions to make veterinary medicine more diverse and equitable. You can find him on Instagram at @yourfavoritепетдок or visit his website www.doctorthinker.com.
BluePearl Specialty and Emergency Pet Hospital is empowering employees and creating a sustainable profession with multiyear investments

The advanced veterinary care provider offers clear pathways to career advancement with a new leveling up and compensation structure as well as continuing education incentives.

BluePearl Specialty and Emergency Pet Hospital, a provider of advanced veterinary care with more than 100 hospitals across the United States, recently announced that it’s investing long term to create clear career pathways for its associates. Key aspects of these commitments are the introduction of BluePearl’s CareerTrax, which supports a first-of-its-kind leveling and compensation structure, and incentives for continuing education.

CareerTrax is the industry’s largest electronic career-pathing platform, according to a BluePearl press release. It tracks individuals’ skill set development for career advancement and gives associates full transparency into requirements for each role, level, and specialty. More than 5000 BluePearl assistants, technicians, paraprofessionals, and other support team members benefit from CareerTrax by now having a direct and organized path to advance their education and careers.

“At BluePearl, we understand it is because of the hard work, passion, and dedication of our associates that we are able to consistently provide care for pets when they are most in need,” says BluePearl President Nicholas Nelson in the release. “That is why we are not only committed to providing the highest quality of care to pets, but also to fostering a culture of innovation and growth through meeting the personal and professional needs of our associates. By contributing to our associates’ development and helping them reach their education and career goals, we hope to create a more sustainable profession and support the careers of veterinary professionals across the industry.”

BluePearl’s new tiered skill system extends career-path options for all associates, including front desk staff, providing greater transparency into available opportunities as well as the skills and knowledge needed to advance.

“Transforming the delivery of specialty and emergency veterinary medicine requires that we make working in our hospitals a sustainable career with clear paths for advancement in both skill development and compensation,” says Angela Calderone, vice president of people and organization at BluePearl, in the release. “Through CareerTrax, we remove some of the professional barriers to career growth, providing associates with organized opportunities to expand their knowledge and skills base and reach their full potential. While profession-wide change takes time, we are excited to see the impact CareerTrax has on the quality of life for our associates as well as the quality of care for our patients.”

In addition to hands-on experience gained by working in a BluePearl hospital, the company’s associates have access to continuing education materials on the electronic learning and training platform, BluePearl University, which provides access to more than 2000 medical journals, books, and abstracts. Additionally, BluePearl maintains its partnership with Penn Foster, a school accredited by the American Veterinary Medical Association Committee on Veterinary Technician Education and Activities, to offer associates an affordable pathway to becoming credentialed veterinary technicians. BluePearl offers up to 90% tuition assistance to eligible associates enrolled in the program, further demonstrating its commitment to providing sustainable career pathways and elevating the standard of care throughout the profession.

Visit BluePearl’s website for more information about the company’s career opportunities.

REFERENCE
We started with the first truly hypoallergenic dry diet for dogs with food allergies. And now, our progressive science has led to Elemental—built with 100% purified amino acids. It’s our most advanced elimination diet yet.

Explore our allergy-focused nutrition at PurinaProPlanVets.com.
Mella Pet Care has launched its latest innovation, Mella Thermometer—an accurate, clinically tested canine and feline thermometer that measures temperature noninvasively through the foreleg or hindleg and can be used by both veterinarians and pet owners.

This new product came to fruition after Anya Babbitt, CEO and cofounder of Mella, noticed there was no existing, easy, fear-free way to take the temperature of her dog, Mella. Babbitt also recognized that many owners feel uncomfortable throughout this process, and their pets also display hallmark signs of fear or distress during it.

“Before Mella [Thermometer], the veterinarian inserted an anal probe, wrote down the temperature, and entered it into a system,” says Babbitt in a company news release. “We achieved a breakthrough in hardware by creating the world’s first accurate underarm thermometer and also [a first] in software with temperature syncing with patient records.”

According to the release, the thermometer uses multiple temperature sensors, millions of patient records, and machine learning to deliver an accurate temperature reading. The thermometer is currently undergoing clinical trials at several universities that are planning to publish a peer-reviewed study comparing its accuracy level to a rectal thermometer.

Through its partnership with Vetspire, a cloud-based practice management system, Mella Pet Care also achieves the first end-to-end integrated vital signs measurement in both the veterinary and human market space. This integration is made possible with Bluetooth connectivity which, in turn, reduces human error and automates veterinary workflows.

“We look forward to introducing Mella to all of the veterinarians that we work with and transforming the future of pet care together,” says Sam Ginn, Vetspire CEO and cofounder. “By joining forces with Mella, we’re taking the first steps to empower pet care professionals and pet parents using innovative, efficient, smart technology.”

Mella has announced $1.2 million in financing led by Pet Health Innovation Labs (Phil Ventures), a pet health and wellness technology hub backed by Australian pet retailer PETstock. This financing, says Babbitt, “will allow us to expedite our first product.”

Mella Pro, for veterinary professionals, will be released first, followed by Mella Home, for parents. The company is accepting preorders for both, and a purchase includes a 30-day trial period.
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Jill Clark, DVM, CEO of IGNITE, highlights a self-paced certification that will give the front desk team the essential tools they need to create patients for life.

By Julia Burke, Assistant Editor, dvm360®

According to Jill Clark, DVM, CEO of IGNITE—a veterinarian-owned company dedicated to advancing the skills of passionate veterinary people—client experience is the differentiator in the modern veterinary practice.

“Everyone can buy a piece of equipment or have a nice facility, perhaps, but really the client experience is what is going to set us apart,” Clark says.

In an interview with dvm360®, Clark enlightened us on IGNITE’s veterinary industry certification: the Veterinary Receptionist Certificate of Excellence (VRCE). She explained the ins and outs of this certificate, her inspiration behind it, and more.

What is the VRCE?

Clark described the VRCE as a holistic front desk training program designed for customer service representatives (CSRs) to give them the essential tools to succeed at the practice.

“[The VRCE] is specifically aimed at general practices and is comprised of 32 courses that are all about an hour [to] an hour and a half apiece, [with more than] 40 hours of learning [total],” Clark says. “[The VRCE training includes] checklists, scripts on how to communicate with your clients on different topics, documents, [and] a 50-page workbook for [professionals] to fill out that really helps the CSRs—our front desk teams—[because they can] customize it into their particular practice experience.

“And then we have a final proctored exam that’s delivered at the practice level by their supervisor.”

Clark also noted that coaches are available for people completing the VRCE to allow them to ask questions and receive feedback and guidance.

“It’s just a really robust group of courses that, hopefully, will give practice managers and owners the peace of mind to be able to go and work on the things they really want to work on because their front desk is really acting in a superior, excellent way,” she says.

Inspiration behind the VRCE

Because Clark has an extensive background in hospital operations, much of the VRCE is derived from real-life practice experience and her knowledge of what clients are demanding that clinics do better.

“Probably the No. 1 thing that frustrated everybody in the practice and certainly those trying to manage [others] was the turnover in that role of the front desk CSR or receptionist and just this hamster wheel of training,” says Clark. “We [took] all of those frustrations and all of those skills and put them into 1 package and have that available for all the practices to use versus everyone trying to re-create the wheel.”

Clark said it took about 2 years to create this veterinary certificate and make it meaningful. She and her team had to pull all the components necessary for CSR success, seamlessly integrate them, and then perform beta testing.

“We started beta testing the courses in real-life hospitals with real-life front desk folks and getting their feedback of what they needed to do better or [to] get the most out of the courses,” she says.

What’s covered in the VRCE program?

Although many aspects differ among practices, many don’t—and those are the ones detailed in the VRCE program, says Clark, adding that specific courses include “things like managing wait times [and] new client acquisition. We [also] have a huge focus on the client experience [and] managing rechecks, reminders, recalls, conflict—which we know, unfortunately, our front desk teams are put in the worst of situations, sometimes with conflict, and often don’t know what to do.”

Other courses include proper prescription handling, and basic hospital finance.

How the VRCE benefits veterinary clinics

It’s no secret that practice managers and owners are busy and that training new employees often gets missed due to time constraints.

“I just really think it’s going to give the average general practice a way to enroll their folks in a program and have that program go on without them having to [set aside the time to] be the teacher and...to [construct a curriculum],” Clark says, adding that the VRCE program simplifies the process for practice managers, owners, and CSRs.

“We want to make sure we give [CSRs] a great starting point, and then they’re certainly able to customize pieces of it for their particular practice,” she adds.

Achieving the VRCE

For those interested in obtaining a VRCE, Clark advised going to IgniteVet.com, clicking on the tab “Learning Communities & Training,” and then selecting “CSR.”

“It walks you through the enrollment process, what to expect, and how long it might take—all those types of things so people can get some good awareness before they start,” Clark says.

CSRs can then enroll in the learning community. It’s self-paced, allowing them to work through the program as their schedule permits. And there will be plenty of activities for CSRs to complete at their practice to ensure their learning translates to the environment they’re working in.

“[CSRs] do have that proctored final exam, and that’s really the kicker,” Clark says, adding that they have to complete not only all of their activities but also the final exam to “achieve that VRCE certificate” and to use “those letters behind their name.”

By Julia Burke, Assistant Editor, dvm360®
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By dvm360* staff

**NOCITA®**

(bupivacaine liposome injectable suspension)

13.3 mg/mL

For local infiltration injection in dogs only

For use as a peripheral nerve block in cats only

Local Anesthetic:

Single use vial

Caution:

Federal (USA) law restricts this drug to use by or on the order of a licensed veterinarian.

Before using this product, please consult the Product Insert, a summary of which follows:

**DOG Indication:**

For single-dose infiltration into the surgical site to provide local postoperative analgesia for cranial cruciate ligament surgery in dogs.

**CAT Indication:**

For use as a peripheral nerve block to provide regional postoperative analgesia following onychectomy in cats.

**DOG Dosage and Administration:**

NOCITA is for single-dose administration only. A dose of 5.3 mg/kg (0.4 mL/kg) is administered by infiltration injection into the tissue layers at the time of incisional closure for dogs. A single dose administered during surgical closure may provide up to 72 hours of pain control.

**CAT Dosage and Administration:**

NOCITA is for administration only once prior to surgery. Administer 5.3 mg/kg per forelimb (0.4 mL/kg per forelimb) for a total dose of 10.6 mg/kg/cat as a 4-point nerve block prior to onychectomy. Administration prior to surgery may provide up to 72 hours of pain control.

**Contraindications:**

Do not administer by intravenous or intra-arterial injection. If accidental intravascular administration occurs, monitor for cardiovascular (dysrhythmias, hypotension, hypertension) and neurologic (tremors, ataxia, seizures) adverse reactions. Do not use for intravascular injection. In humans, local anesthetics administered in a joint may cause chondrolysis.

**Warnings:**

Not for use in humans. Keep out of reach of children. NOCITA is an amide local anesthetic. In case of accidental injection or accidental topical exposure, contact a physician and seek medical attention immediately. Wear gloves when handling vials to prevent accidental topical exposure.

**Precautions:**

Do not administer concurrently with bupivacaine HCl, lidocaine or other amide local anesthetics. A safe interval from time of bupivacaine HCl, lidocaine or other amide local anesthetic administration to time of NOCITA administration has not been determined. The toxic effects of these drugs are additive and their administration should be used with caution including monitoring for neurologic and cardiovascular effects related to toxicity.

The safe use of NOCITA in dogs or cats with cardiac disease has not been evaluated. The safe use of NOCITA in dogs or cats with hepatic or renal impairment has not been evaluated. NOCITA is metabolized by the liver and excreted by the kidneys.

The ability of NOCITA to achieve effective anesthesia has not been studied. Therefore, NOCITA is not indicated for pre-incisional or pre-procedural loco-regional anesthetic techniques that require deep and complete sensory block in the area of administration.

The safe use of NOCITA in dogs for surgical procedures other than cranial cruciate ligament surgery has not been evaluated.

The safe use of NOCITA in cats for surgical procedures other than onychectomy has not been evaluated.

The safe use of NOCITA has not been evaluated in dogs or cats younger than 5 months old.

The safe use of NOCITA has not been evaluated in dogs or cats that are pregnant, lactating or intended for breeding.

**DOG Adverse Reactions:**

Field safety was evaluated in 120 NOCITA treated dogs. The most common adverse reactions were complete sensory block in the area of administration.

**CAT Adverse Reactions:**

Field safety was evaluated in 123 NOCITA treated cats. The most common adverse reactions were elevated body temperature (6.7%), surgical site infection (3.3%), and chewing/licking of the surgical site (2.5%).

Field safety was evaluated in 120 NOCITA treated cats. The most common adverse reactions were:

- Field safety was evaluated in 123 NOCITA treated dogs. The most common adverse reactions were:

**CAUTION:**

The use of NOCITA is associated with increased risk of anaphylaxis. No specific signs or symptoms to anaphylaxis have been reported with NOCITA. Use NOCITA with caution including monitoring for neurologic and cardiovascular effects related to toxicity.

**How Supplied:**

13.3 mg/mL bupivacaine liposome injectable suspension in 10 mL or 20 mL single use vial. 10 mL supplied in 4-vial carton. 20 mL supplied in a single vial carton and 4-vial carton.

NADA 141-461, Approved by the FDA

US Patent: 8,182,835, 8,834,921, 9,205,052

**WARNING:**

Do not administer concurrently with bupivacaine HCl, lidocaine or other amide local anesthetics. A safe interval from time of bupivacaine HCl, lidocaine or other amide local anesthetic administration to time of NOCITA administration has not been determined. The toxic effects of these drugs are additive and their administration should be used with caution including monitoring for neurologic and cardiovascular effects related to toxicity.

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The safe use of NOCITA has not been evaluated in dogs or cats that are pregnant, lactating or intended for breeding.

**Adverse Reactions:**

Field safety was evaluated in 123 NOCITA treated dogs. The most common adverse reactions were:

**Responding to the Incident**

Field safety was evaluated in 120 NOCITA treated cats. The most common adverse reactions were:

**Caution:**

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Important Safety Information
NOCITA is for use in dogs and cats only. Do not administer concurrently with bupivacaine HCl, lidocaine or other amide local anesthetics. The safe use of NOCITA in dogs and cats with cardiac disease or with hepatic or renal impairment has not been evaluated. The safe use in dogs or cats younger than 5 months of age, that are pregnant, lactating, or intended for breeding has not been evaluated. The most common adverse reactions in dogs were discharge from incision, incisional inflammation and vomiting. The most common adverse reactions in cats were elevated body temperature and infection or chewing/licking at the surgical site. Please see accompanying brief summary for product safety information.

*In a field trial, Nocita reduced the need for post-op rescue pain treatment with opioids
**Cranial cruciate ligament

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Integrative  
> Continued from cover page

documentaries and shows like *Fantastic Fungi* on Netflix. In fact, a handful of veterinary working groups are already discussing how to destigmatize—and prepare for yet another battle for mainstream acceptance over the utility of—the ancient therapy used by Mesoamerican people throughout history.³

The big issue here besides legality is research. When cannabis became the hot topic, we were faced with the myth of “there is no research,” even though there’s plenty (e.g., literature in lab animal species, including cats and dogs and now clinical studies). When it comes to psychedelic mushrooms, on the other hand, we aren’t as fortunate. In the 1960s through the early 1970s, researchers began to investigate the compounds in psilocybin on dogs specifically.²³ However, this was halted due to the rapidly changing and more conservative approach to America’s “drug culture” at the time. Since then, we have only seen research or case studies with toxicity to shrooms, ignoring the therapeutic potential.

Although modern research is lacking because of its regulatory status, this has never stymied innovation, personal use, or in this case, the use on veterinary patients with strong client rapport.

So how are these progressive veterinarians incorporating the controversial mushies? At present, psilocybin is being used for dogs with extreme anxiety, posttraumatic stress disorder, or behavioral issues. Although no published data have yet to establish this as a proven therapy (nor is dosing even close to being understood), anecdotal evidence abounds. In other parts of the world, popular use of the psilocybin mushroom includes its potential to enhance the hunting ability of working dogs, which has some scientific support from a study published in 2015.⁴

We have also seen multiple patents being filed for the therapeutic use of various formulations that include psilocybin. For example, an excerpt from the filing for US patent 20190192498A1 reads: “Methods and compositions are disclosed for enhancing neurogenesis, resolving neuropathy, and improving neurological health and functioning using fungal extracts and their active ingredients, including species of mushrooms and mycelia containing psilocybin and psilocin, combined with erinacines and hericenones or fungal extracts containing those active ingredients, with the addition of nicotinic acid. The compositions may optionally be combined with nerve plants.” Although this product is not intended for companion animals (yet), we usually see quick enthusiasm from pet owners around therapies they are interested in (for themselves or their pets).

Where does this leave us? Well, for starters, remember psilocybin is in a different ballpark than cannabis for a few reasons:

- We don’t have gray areas seen with federal or state laws in support of its use like we do with cannabis or cannabinoids in general (excluding local municipal changes).
- We really don’t have enough research in companion animals, and we only have limited data in lab animal models.⁵⁶
- When it comes to toxicity, we have real concern. When cannabis became the hot topic and research progressed, we quickly learned things like cannabidiol (or, CBD) from the cannabis plant (hemp or marijuana) is relatively safe, even at high doses. Shrooms, on the other hand, can be quite deadly.⁷⁸

At present, psilocybin is being used for dogs with extreme anxiety, posttraumatic stress disorder, or behavioral issues.

When clients or colleagues inquire about psilocybin for pets, let us proceed with extreme caution. And when I say caution, I mean “Don’t go there.” Until we have clearer data for the species we work with regarding dosing and at least some efficacy (and the laws become more favorable), let us shy away for now, but continue to be open-minded and learn as much as we can.

Stephen Cital, RVT, RLAT, SRA, VCCS and VTS-LAM, is the academic liaison for the Society of Laboratory Animal Veterinary Technicians, executive director at the Academy of Laboratory Veterinary Technicians and Nurses, chief operating officer of the Veterinary Anesthesia Nerds and cofounder of the Veterinary Cannabis Academy.

References available at dvm360.com
Hemangiosarcoma is often the first thing that comes to mind when a splenic mass is found in a dog. Although it is the most common malignant splenic tumor, it is not the only differential. Unfortunately, obtaining a definitive diagnosis and prognosis for the patient requires histopathology, which must be obtained surgically. The decision to go forward with surgery in the face of a potentially poor prognosis can be a difficult one for clients, especially in an emergency situation when the tumor has ruptured and is actively hemorrhaging.

During a session at an American Veterinary Medical Association Virtual Convention, Sue Ettinger, DVM, DACVIM (oncology), a veterinary oncologist at the VCA Veterinary Referral and Emergency Center in Norwalk, Connecticut, discussed key facts that practitioners need to know about hemangiosarcoma to help their clients make the best decision for their pet and family.

How does hemangiosarcoma present?
Clinical signs of hemangiosarcoma vary greatly depending on tumor location and how advanced the disease is at diagnosis. Tumor location can vary from the skin to subcutaneous tissue to visceral organs. The most common primary visceral sites are the spleen, heart, and liver. Because it is a cancer of blood vessels, it metastasizes quickly, with the liver and lungs being the most common targets.

Some patients with splenic hemangiosarcoma present with nonspecific signs such as decreased appetite, lethargy, or gastrointestinal distress, and other patients present in hypovolemic shock after an acute collapse. It is also possible for patients to have no clinical signs, with the mass being found by accident.

Ettinger reminded clinicians that although large breed dogs are generally at increased risk, any dog can present with hemangiosarcoma. Golden retrievers, German shepherds, and Labrador retrievers are thought to be at highest risk, and a genetic predisposition is suspected.

The double two-thirds rule
Ettinger noted that only approximately 45% of splenic masses are hemangiosarcoma, based on what she referred to as the “double two-thirds rule.” Two-thirds of patients presenting with a splenic mass have a malignant tumor, and of these malignancies, two-thirds are hemangiosarcoma. This rule is supported by literature, which found 45% to 65% of splenic masses in dogs to be hemangiosarcoma.

Differentials for the one-third of dogs with benign masses include nonneoplastic masses like hematomas, abscesses or nodular hyperplasia, or a benign hemangioma. Differentials for the remaining malignancies include lymphoma, histiocytic sarcoma, and osteosarcoma.

In Ettinger’s experience, emergency clinicians have a higher suspicion of hemangiosarcoma when a splenic mass is identified, despite the double two-thirds rule. This is likely because patients presenting with a splenic mass in the emergency setting often have ruptured tumors and hemaabdomen, both of which increase the index of suspicion for malignancy. In one study that evaluated dogs presenting with nontraumatic hemaabdomens, 80% of the splenic masses were neoplastic, with 88% of those diagnosed as hemangiosarcoma.

Another exception to this rule is that nonruptured splenic masses found incidentally, which Ettinger nicknamed “incidentalomas,” are less likely to be malignant. In a 2016 study, only 30% of these masses were malignant.

Preoperative diagnostics
Ultimately, the definitive diagnosis of any splenic mass is through histopathology. However, several diagnostics should be performed prior to surgery to assess patient risk and stability.

Essential information for veterinary practitioners about hemangiosarcoma
During a session at an AVMA virtual convention, a veterinary cancer specialist shared key points about the disease to help clients make the best decision for their pet.

By Kate Boatright, VMD
Blood work is an essential part of the preoperative work-up and should include, at a minimum, a complete blood cell count (CBC) and a chemistry panel. CBC results may raise the suspicion of malignancy if anemia, nucleated red blood cells, abnormal red blood cell morphology, or thrombocytopenia are present. CBC results can also help assess risk of perioperative mortality. Patients with marked preoperative thrombocytopenia or anemia (hematocrit levels < 30%) have an increased risk of death.3

Coagulation status should be assessed with a prothrombin time or partial thromboplastin time blood test, in-house if available. If these tests are not available in-house, perform a buccal mucosal bleed time evaluation or toenail clip to assess clotting. Half of patients with hemangiosarcoma will present with a coagulopathy.

Chest radiographs should be performed prior to surgery to assess for gross metastatic disease. Taking 3 views of the chest is essential to maximize the chances of detecting a lung nodule if one is present. If available, abdominal ultrasound can be a helpful tool because it is less affected by effusion than radiographs. It allows the clinician to confirm the presence of any splenic tumors and assess the degree of effusion and for gross metastasis to other abdominal organs. Additionally, the architecture of the mass can be evaluated, which guides the decision to perform fine needle aspiration (FNA). FNAs are not recommended on cavitated splenic masses. Generally, cytology is low yield and inaccurate for hemangiosarcoma, and obtaining the sample has a high risk of hemorrhage due to the friable nature of the mass. If a solid splenic mass is visualized, an aspirate may be helpful to aid in the diagnosis. Although some textbooks recommend echocardiography prior to surgery to screen for right atrial masses, it is not necessary in most cases, according to Ettinger. A better use of the client’s money is an electrocardiogram, monitoring during and after surgery because arrhythmias are common in patients regardless of whether the mass is benign or malignant. The presence of intraoperative ventricular arrhythmias doubles the risk of perioperative mortality.2

Traditional treatment options
Hemangiosarcoma is a treatable cancer, and when treated, dogs do live longer. However, the 1-year survival is less than 10% no matter how aggressive treatment is. The best prognosis is seen with nonruptured, low-grade splenic tumors.

Surgery is the first-line treatment for splenic masses. During surgery, the abdomen should be fully explored. The gross appearance and size of the primary mass at the time of surgery does not correlate with malignancy. Suspected metastatic lesions on other abdominal organs, such as the liver, may actually be hematomas, extramedullary hematopoiesis, or another benign process. Thus, all suspicious lesions should be biopsied and submitted for histopathology along with the entire spleen. Surgeons must remember that hemangiosarcoma can be diagnosed definitively only by histopathology and should not make intraoperative assumptions about malignancy.

Ettinger cautioned that iatrogenic spread of neoplastic cells is possible due to the highly friable nature of the tissue. To minimize seeding of neoplastic cells during surgery, the abdomen should be thoroughly lavaged prior to closure, and fresh gloves and instruments should be used for closure.

Surgery alone is considered a palliative treatment, which controls local disease and reduces risks of acute hemorrhage in the future. Average survival time following palliative surgery is 1 to 3 months.4

Average survival time can be extended to 6 months when surgery is followed by systemic chemotherapy. Doxorubicin-based protocols are the most common, but the number of treatments that a patient can receive are limited by the accumulated cardiotoxicity. Other protocols, including the use of metronomic chemotherapy, are being investigated to maximize survival times and quality of life following surgery.

There is also new, ongoing research into therapeutic options for hemangiosarcoma, but limited data are available at this time. Ettinger said that a new drug called eBAT is being studied at the University of Minnesota as both a treatment and preventative option, but it’s not commercially available. Losartan, an angiotensin subtype II receptor blocker in dogs, is also being studied as a possible palliative option due to its antitumor effects. Ettinger expressed excitement about the possibility of new therapies but noted that more research is needed.

The role of supplements
Ettinger also discussed the use of supplements as a part of both palliative and curative-intent treatment protocols. Polysaccharopeptides are derived from Asian mushrooms and are thought to have antitumor activities through different mechanisms of action. Several blends are available, but many are proprietary, which makes comparing brands difficult. Ettinger recommended F’m-Yunity, the product used in a small study of 15 dogs that showed a slight increase in survival times beyond surgery alone, though the study lacked a placebo group.5 However, because this product can be expensive, she offered K9 Immunity Plus as an alternative, with the reminder that this blend has not been studied.

Yunnan Baiyao, a Chinese herbal mixture commonly used in patients with hemorrhage, may also be helpful for patients with hemangiosarcoma. Ettinger suggested this product as a palliative measure for patients with metastatic nodules that could rupture and bleed or for patients with a splenic tumor that has ruptured and the client declines surgery.

Key talking points
When discussing hemangiosarcoma with clients, Ettinger described it as an “aggressive and malignant cancer of blood vessels” that can occur in many locations in the body. She stresses to clients that noninvasive tests will not reveal if a splenic mass is hemangiosarcoma and that we must wait for biopsy results to give accurate diagnosis and prognosis. Treatment of hemangiosarcoma is fought on 2 battlefronts: locally and distantly. Locally is where the cancer is growing, and distantly is to control metastatic disease.

Despite the poor long-term prognosis, Ettinger noted that “a lot of my clients who treat are very happy they did, even with surgery alone, because the quality of life they get is good.”

Kate Boatzright, VMD, a 2013 graduate of the University of Pennsylvania, is an associate veterinarian and freelancing speaker and author in western Pennsylvania. She is actively involved in organized veterinary medicine at the local, state, and national levels and is a former national officer of the Veterinary Business Management Association.
Designing an award-winning animal hospital

Thoughtful design choices focused on functionality enable this veterinary hospital to stand out among the crowd.

By Amanda Carrozza
Fix the flaws

For the team at GoodVets Lee’s Summit in Missouri, top of mind when designing its new veterinary hospital was to create a practical and beautiful workspace that enhanced the team’s ability to provide optimal patient care.

“Flow is always important,” explains Antonio DeMarco, DVM, president of medical operations and medical director. “An inefficient layout can really cause frustration. Instead, we want clients to enjoy a gorgeous space and staff who want to come to work every day because of the aesthetics and practicality.”

When looking to design a hospital that combined efficiency, technology and style, the team at GoodVets—with locations in Chicago, Kansas City, and Nashville—put their trust in Midmark.

DeMarco explains. “From the color palette to the designs, our teams worked together to create amazing styles and concepts that stay true to ergonomic ideas.”

Award-winning design

GoodVets Lee’s Summit was recently presented with the merit award at dvm360’s 2021 Hospital Design Competition. The annual competition honors the most attractive, efficient, and customer-friendly veterinary hospitals in the United States. Each award recipient is decided upon by a jury of experts who evaluate the strengths and standout features of each practice.

“Anytime you win an award, it proves to you—not just internally but externally—that your ideas make sense beyond your scope and thoughts,” DeMarco says. “It proves you right!”

GoodVets began their design journey by turning to Midmark for its expertise in combining technology and style. Midmark is a clinical environmental design company that enables a better care experience in animal health.

Leveraging their expertise in the clinical space, their design technology, and a line of superior products, Midmark worked closely with GoodVets to produce a show-stopping hospital with enhanced functionality. The result is a sleek, modern facility with spacious treatment rooms that are impressing staff and clients alike.

“Midmark brings a unique perspective to animal care,” explains Ryan Whitley, Midmark Animal Health’s territory portfolio manager in the Midwest.

“We understand how teams operate within the clinical space. With that knowledge, we can help them avoid costly mistakes that put them in spaces that don’t support the way they work.”
Technology to make dreams come true
Midmark uses clinical design technology in its renderings to provide clients with a clear picture of what they can expect. The company’s proprietary software allows its designers to help hospital owners configure every area of their facility, exploring a variety of room designs all in one place.

“Visualizing in 3D helped tremendously. When looking at 2D pictures and graph paper renderings, it’s difficult to imagine how a space feels in its entirety. The 3D imagery makes everything more realistic, helping us visualize workflow and make our decisions,” DeMarco explains.

“I do believe it prevents buyers’ remorse. You do not have to wait to see a product; you get to see it prior to completion. This can save both time and money.”

The right equipment makes a difference
Midmark worked hand-in-hand with GoodVets to meet the hospital’s specific needs while highlighting common pain points and design aspects that clients face.

“We often see clinicians who do not build spaces to support their workflow,” Whitley explains. “They plan and build the space, then try to fit the equipment and workflows into the space. What happens? They are forced to adapt their workflows or the positioning of their equipment to be able to work within the space, often at the expense of staff efficiency or ergonomics.”

For GoodVets, selecting the right cabinetry was also important to creating a more efficient hospital. “The sleek design and quality of Midmark Synthesis® cabinetry allowed us to achieve better organization,” DeMarco explains.

“This may seem silly, but the soft-close feature of the cabinets is my favorite. I am a notorious ‘leave a cabinet open’ doctor. My staff always shut doors behind me—the soft-close feature never startles our patients. It’s great!”

Below is a 3D rendering (top) and the finished treatment area (bottom) at GoodVets. (Photo courtesy of Midmark)
Midmark’s attention to detail is part of its reputation. “I call Midmark the gold standard,” says Nicole Lewis, a territory manager at MWI Animal Health. “When you talk about different pieces of equipment, I always like to go to them first because of their line of service and warranties.”

Dr. DeMarco remains in awe of the creativity achieved within the space, all without sacrificing functionality. “It can be the most beautifully-designed space, but if efficiency is interrupted by it, I don’t want it. Balance is at the core of how we build and design our hospitals.”

Looking to redesign your hospital? Midmark’s Ryan Whitley offers some considerations to keep in mind before breaking ground.

• How long do you plan on staying in the space?
• What is the purpose of the space and how do you interact with your equipment?
• What is your budget?
• How much square footage do you need?
• How many people will be working in the space?
• Have you considered a separate dental space?
• Have you thought about your future pain points and not just your current ones? Are you designing a space with flexibility for the future?
• Do you have a unique brand that you want to incorporate throughout your new space? One that utilizes complimentary colors and design finishes that help create a healing environment for you and your patients?

Learn more

Scan the QR code using your phone’s camera to visit www.midmark.com.

Another exterior shot of GoodVets Lee’s Summit. (Photo courtesy of GoodVets)
Tips and tricks for performing an orthopedic exam

Incorporating this checkup into yearly wellness visits allows veterinarians to identify orthopedic problems early and take a proactive approach.

By Julia Burke, Assistant Editor, dvm360®

In a healthy animal, orthopedic exams should take less than 4 minutes, but in those with an abnormality, time should be dedicated on the specific region to correctly identify the problem.

How-to

Dycus said to approach the orthopedic examination the same way every time. He prefers having the pet stand while he completes the exam, but if the animal is more comfortable in lateral recumbency, that works too. He also recommended having the animal on the floor instead of on the examination table.

The potentially pathologic limb should be examined last to avoid causing the pet discomfort early in the exam. Dycus recommended starting at the toes and working upward to evaluate the paw pads for signs of wear and tear, wounds, foreign bodies, etc. Then extend each digit to look for crepitus, pain, or swelling, and squeeze each digit for signs of discomfort. Next, squeeze the entire paw, and then move up the limb to check the metacarpals for swelling or discomfort. If an area appears abnormal, he said to focus attention and diagnostics on that specific region.

Gait evaluation

Dogs

Dycus explained that gait evaluation is just as essential as palpation and recommended watching the dog walk and trot toward you, away from you, and from the side. To better assess a dog with abnormalities, he suggested getting in the habit of also watching seemingly normal dogs walk.

For gait analysis, you’ll need more space than an exam room. Dycus suggested using the hallway, a dedicated room, or a parking lot. He mentioned that he uses a trick—recording a video on his phone of a dog walking and trotting—to get a better look and allow him to play back the footage to analyze if an issue is present.

Cats

Dycus said he prefers to watch cats move around the room and interact with objects. He has the pet parent place the cat on the examination table or countertop. Because most cats will willingly jump off, if they do not or hesitate, this may indicate pain or discomfort in their front limbs. If the cat jumps down and immediately attempts to put their hind legs beneath them, this may mean they’re experiencing elbow pain. If the cat is hesitant to jump up, this can indicate hind limb pain, Dycus said.

Final thoughts

Dycus outlined the main takeaways for performing an orthopedic exam, the first being that gait evaluation is just as important as palpation. He also emphasized that consistency is key, so it’s important to perform the exam the same way every time. Dycus also recommended to not only look for pain but also for spasms, tensions, or resistance to hunching in on one area if something appears out of the ordinary.
Common canine spinal disease simplified

Although the spinal cord choreographs everything a dog does, it is a delicate neural pipeline and vulnerable to common issues that can be mechanical, vascular, infectious, or degenerative.

By Joan Capuzzi, VMD

When managing “spinal” disease, the first step is ruling out an imposter such as a cruciate tear, immune-mediated polyarthritis, and metabolic and vascular issues that produce weakness.

“When something can’t walk, we need to first ask whether it is truly neurological and then, No. 2, if it is like this because of a problem in the brain or in the spine or if it is neuromuscular,” explained Michelle Carnes, DVM, MS, DACVIM, medical director at Specialists in Companion Animal Neurology in Naples, Florida.

Localize and characterize the lesion

The next step is localizing the lesion into one of the 3 main anatomic districts: cervical, T3-L3, and L4-caudal. This neurologic examination also assesses motor function, proprioception, spinal reflexes, and deep pain perception.

The lesion is likely high cervical if the motor and/or proprioception is abnormal and withdrawal reflex is normal in all 4 limbs. However, if the withdrawal reflex is decreased/absent in the front limbs but normal in the hind limbs, the lesion is likely low cervical. For T3-L3 and lower lumbar lesions, the thoracic limbs are unaffected but the hind limbs have abnormal withdrawal reflexes. If withdrawal reflexes are decreased/absent in all 4 limbs, the problem is neuromuscular, Carnes explained.

The presence of spinal pain leads down a different path than its absence. For example, if pain is present, think spinal fracture, extrudal neoplasia, or acute intervertebral disc disease (IVDD). A nonpainful dog, on the other hand, could be experiencing chronic IVDD, intradural neoplasia, fibrocartilaginous embolism (FCE), or degenerative myelopathy.

Intervertebral disc herniation

IVDD is the most common cause of myelopathy and back pain in dogs. Chondrodystrophic breeds are predisposed, often presenting between 3 and 6 years of age.

Three types of IVDD exist:

- **Hansen type 1**—acute extrusion of the nucleus pulposus from the annulus fibrosus
- **Hansen type 2**—chronic bulging of the annulus fibrosus
- **Hansen type 3**—acute, high-velocity, noncompressive egression of the nucleus pulposus; secondary to sudden tear in the annulus fibrosus resulting from spinal trauma

The clinical signs—which vary with the lesion’s spinal level—are back pain, proprioceptive deficits, and paresis/paralysis. The absence of deep pain is the primary prognostic factor, and signals the need to act fast. “You’re getting secondary injury the longer that compression is there,” Carnes said.

To relieve compression and prevent spinal cord necrosis—which, in 10% of patients lacking deep pain, can culminate in myelomalacia—surgery may be necessary. Other chief indications for surgery are nonambulatory paraplegia or paresis, recurring paresis, unrelenting spinal pain, and medical treatment failure.

Most IVDD cases can be medically managed. This hinges on at least 2 weeks of strict cage rest, followed by a month or so of restricted activity. Effective drugs include diazepam, gabapentin, and nonsteroidal anti-inflammatory drugs (NSAIDs) or, alternatively, prednisone as short-course therapy.

In a 2007 study of medical management for thoracolumbar/cervical herniations in 200 ambulatory dogs, approximately 54%/49% recovered with no recurrence, 30%/33% recovered with recurrence and 14%/18% did not recover.

FCE occurrence

An FCE occurs when a fibrocartilaginous fragment breaks from the disc and injects itself into the spinal cord vasculature. The neurologic fallout from this is determined by the extent of circulation occluded. “It’s like a stroke in the spinal cord,” Carnes said.

Canines with an accelerated risk for FCE are usually miniature schnauzers and giant breed dogs. The typical presentation is sudden vocalization amidst vigorous activity, followed by an inability to walk. Deficits are asymmetrical and signs are nonprogressive. Affected dogs are usually anxious with no apparent pain.

FCE improves with supportive care and rehabilitation but not with corticosteroids. Manual bladder care and rehabilitation but not with corticosteroids. MRI can exclude IVDD but for its sparing of the withdrawal reflex and its nonresponse to corticosteroids. Most patients regain function, although some have residual deficits.

The more serious cases are signaled by several negative prognostic indicators, including symmetrical clinical signs, decreased spinal reflexes, absent/reduced deep pain sensation, spinal cord swelling (on MRI), lower/lower lumbar localization (spinal intumescences), and elevated colony-stimulating factor leukocytes.

Degenerative myelopathy

This slowly progressive decay of spinal cord white matter is considered the canine analogue for the human amyotrophic lateral sclerosis. A mutation in the SOD1 gene and, in most cases, underlies this chronic, nonpainful myelopathy that manifests as gradual weakness in the older (>8 years) dog. Usually seen in large-breed dogs, degenerative myelopathy (DM) does not spare smaller breeds.

The T3-L3 region, which corresponds to the pelvic limbs, is affected first, followed by the thoracic limbs. A diagnosis of rule-out, DM looks like IVDD on clinical presentation—wobbly gait, proprioceptive deficits, and loss of motor function, but for its sparing of the withdrawal reflex and its nonresponse to corticosteroids. MRI can exclude IVDD and neoplasia.

Though there is no established treatment for DM, intense physical therapy has been shown to slow deterioration and lengthen survival. Support may also come from adjunct treatments, including NSAIDs, thyroid supplementation, and weight loss.

Joan Capuzzi, VMD, is a small animal veterinarian and journalist based in the Philadelphia, Pennsylvania area.

Though bacteria are typically implicated in discospondylitis, Aspergillus spp. can also precipitate it, particularly in German shepherds.

Although blood or urine cultures can support treatment choices, most cases are best addressed with broad-spectrum antibiotics like Clavamox or Simplicef, presenting a response within 5 days of treatment. NSAIDs and cage rest are key to a good outcome.

X-rays that track bone healing should be obtained every 2 to 3 months. Carnes added that antibiotics should be continued for about a month past radiographic resolution.
Recognizing signs of oral pain in companion animals

A veterinarian and the president of the Foundation for Veterinary Dentistry offers advice on how to effectively educate pet owners about the hallmark signs of dental emergencies.

By Caitlin McCafferty, Assistant Editor, dvm360®

In a recent interview with dvm360®, veterinary dentistry expert Jan Bellows, DVM, DAVDC, DABVP, FAVD, offered up invaluable guidance on how to alert and educate clients on identifying potential dental emergencies.

“There are very specific signs that [occur] if there is a very painful emergency,” Bellows told dvm360® staff. “The animal will sometimes chatter—especially cats—and the [animal’s] head will tilt, and they will also paw at their mouths.”

Bellows recommends safely looking inside the patient’s mouth to see if there are any signs of a fractured tooth with a dot (especially a red dot) in the center. He explained that this is a sign of an acute emergency and is extremely painful for the animal, even if the pet is still eating.

“Pets are taught not to show pain or else they’ll be eaten,” said Bellows. “So, [even if] they don’t show pain, they’re in pain.”

To discover more about dental emergencies in pets, watch the full interview at www.dvm360.com/view/dental-emergencies-recognizing-signs-of-oral-pain-in-companion-animals

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INDICATIONS Adequan® Canine is recommended for intramuscular injection for the control of signs associated with non-infectious degenerative and/or traumatic arthritis of canine synovial joints. IMPORTANT SAFETY INFORMATION Adequan® Canine should not be used in dogs who are hypersensitive to PSGAG or who have a known or suspected bleeding disorder. It should be used with caution in dogs with renal or hepatic impairment. Adverse reactions in clinical studies (transient pain at injection site, transient diarrhea, and abnormal bleeding) were mild and self-limiting. In post approval experience, death has been reported in some cases; vomiting, anorexia, depression/lethargy and diarrhea have also been reported. The safe use of PSGAG in breeding, pregnant or lactating dogs has not been evaluated. Caution: Federal law restricts this drug to use by or on the order of a licensed veterinarian. For additional safety information, please see Full Prescribing Information at adequancanine.com.

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2 OUT OF 5 WORMS RECOMMEND SIMPARICA TRIO®
(sarolaner, moxidectin, and pyrantel chewable tablets)

That’s because their one little chew misses two big parasites, tapeworms and whipworms.
Interceptor® Plus [milbemycin oxime/praziquantel] offers broad-spectrum worm protection beyond heartworm disease. It covers all 5 major worms, including hookworms and roundworms — and most importantly, it doesn’t skip tapeworms or whipworms like Simparica TRIO® [sarolaner, moxidectin, and pyrantel chewable tablets]. With the tick and flea efficacy of Credelio® [lotilaner] or Seresto®, this is 360-degree parasite protection.

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One monthly chewable designed for defense of parasites that skips tapeworms, and whipworms (3x more common in US dog parks than roundworms)

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Ask your Elanco sales representative about 360-degree parasite protection or visit 360-degreeprotection.com.

Interceptor Plus Indications
Interceptor Plus is indicated for the prevention of heartworm disease caused by Dirofilaria immitis and for the treatment and control of adult roundworm (Toxocara canis, Toxascaris leonina), adult hookworm (Ancylostoma caninum), adult whipworm (Trichuris vulpis), and adult tapeworm (Taenia pisiformis, Echinococcus multilocularis, Echinococcus granulosus and Dipylidium caninum) infections in dogs and puppies 6 weeks of age or older and 2 pounds of body weight or greater.

Interceptor Plus Important Safety Information
Treatment with fewer than 6 monthly doses after the last exposure to mosquitoes may not provide complete heartworm prevention. Prior to administration of Interceptor Plus, dogs should be tested for existing heartworm infections. The safety of Interceptor Plus has not been evaluated in dogs used for breeding or in lactating females. The following adverse reactions have been reported in dogs after administration of milbemycin oxime or praziquantel: vomiting, diarrhea, depression/lethargy, ataxia, anorexia, convulsions, weakness, and salivation. For full prescribing information see Interceptor Plus package insert.

Credelio Indications
Credelio kills adult fleas and is indicated for the treatment and prevention of flea infestations [Ctenocephalides felis] and the treatment and control of tick infestations [Amblyomma americanum (lone star tick), Dermacentor variabilis (American dog tick), Ixodes scapularis (black-legged tick) and Rhipicephalus sanguineus (brown dog tick)] for one month in dogs and puppies 8 weeks of age and older and weighing 4.4 pounds or greater.

Credelio Important Safety Information
Lotilaner is a member of the isoxazoline class. This class has been associated with neurologic adverse reactions including tremors, ataxia, and seizures. Seizures have been reported in dogs receiving this class of drugs, even in dogs without a history of seizures. Use with caution in dogs with a history of seizures or neurologic disorders. The safe use of Credelio in breeding, pregnant or lactating dogs has not been evaluated. The most frequently reported adverse reactions are weight loss, elevated blood urea nitrogen, polyuria, and diarrhea. For full prescribing information see Credelio package insert.


*Simparica Trio protects against heartworm disease, roundworm and hookworm (A. caninum, U. stenocephala).

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Factors affecting your deworming protocols for puppies and kittens

From age and weight to each patient’s needs to type of parasite, this veterinarian outlines key considerations of this crucial step for young pets.

By Michelle Leso, VMD

A mong the happiest of pet visits are the ones with new puppies or kittens! No one can resist those cute faces and funny antics, and owners are always excited to show off their newest family members. Because deworming, along with vaccinations, is a crucial step to keep your patients and their owners happy and healthy, let’s look at the multitude of products available and factors that affect which deworming protocol you should use to get those fur babies off to their best start.

Most veterinarians will agree that pyrantel (Nemex; Zoetis) is the best medication to use in the earliest phases of puppy or kittenhood. Safe enough for 2-week-old pediatric patients, this drug is used by most breeders and shelters to begin killing parasitic roundworms and hookworms. It is not effective against whipworms or tapeworms or against the larval stages of roundworms and hookworms; thus, multiple, spaced doses are recommended to kill off all burgeoning larval infections. The drug has a large safety margin, and adverse effects are minimal. With large worm burdens, puppies and kittens can vomit or defecate abundant numbers of live worms, so warn owners to prevent accidental ingestion or overdose.

Older puppies and kittens can be given many types or classes of medications to kill these invaders, but age and weight are deciding factors in which drugs you choose for deworming. For example, and a mildly elevated potassium (6.5 mEq/L; reference range: 3.6 to 5.5 mEq/L) and phosphorous (6.4 mg/dL; reference range: 2.5 to 6.0 mg/dL). The other dog also had a mildly elevated creatinine (1.7 to 2.0 mg/dL; reference range: 0.5 to 1.6 mg/dL) and weight loss. In addition, one dog experienced intermittent head tremors within 1.5 hours of administration of vaccines, an ear cleaning performed by the owner, and its first dose of CREDELIO. The head tremors resolved within 24 hours without treatment. The owner elected to withdraw the dog from the study.

In an Australian field study, one dog with a history of seizures experienced seizure activity (frenesm and glazed eyes) six days after receiving CREDELIO. The dog recovered without treatment and completed the study. In the U.S. field study, two dogs with a history of seizures received CREDELIO and experienced no seizures throughout the study.

In three well-controlled European field studies and one U.S. laboratory study, seven dogs experienced episodes of vomiting and four dogs experienced episodes of diarrhea between 6 hours and 3 days after receiving CREDELIO.

To report suspected adverse events, for technical assistance or to obtain a copy of the Safety Data Sheet (SDS), contact Elanco US Inc. at 1-888-545-5973. For additional information about adverse drug experience reporting for animal drugs, contact FDA at 1-888-FDA-VETS or http://www.fda.gov/reportanimalae.

Effectiveness:

In well-controlled European laboratory studies, CREDELIO began to kill fleas four hours after administration or infestation, with greater than 99% of fleas killed within eight hours after administration or infestation for 35 days. In a well-controlled U.S. laboratory study, CREDELIO demonstrated 100% effectiveness against adult fleas 12 hours after administration or infestation for 35 days. In a 90-day well-controlled U.S. field study conducted in households with existing flea infestations of varying severity, the effectiveness of CREDELIO against fleas on Days 30, 60 and 90 compared to baseline was 99.5%, 100% and 100%, respectively. Dogs with signs of flea allergy dermatitis showed improvement in erythema, papules, scaling, alopecia, dermatitis/pyodermatitis and pruritus as a direct result of eliminating fleas.

In a well-controlled laboratory study, CREDELIO killed fleas before they could lay eggs, thus preventing subsequent flea infestations for 30 days after the start of treatment of existing flea infestations.

In well-controlled laboratory studies, CREDELIO demonstrated >97% effectiveness against Amblyomma americanum, Dermacentor variabilis, Ixodes scapularis and Rhipicephalus sanguineus ticks 48 hours after administration or infestation for 30 days. In a well-controlled European laboratory study, CREDELIO started killing louse ruminant ticks within four hours after administration.

Storage Information:

Store at 15-25°C (59 -77°F), excursions permitted between 5 to 40°C (41 to 104°F).

How Supplied:

CREDELIO is available in five chewable tablet sizes for use in dogs: 56.25, 112.5, 225, 450, and 900/uni00A0mg lotilaner. Each chewable tablet size is available in color-coded packages of 1, 3 or 6 chewable tablets.

Approved by FDA under NADA # 141-494

Manufactured for:
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Greenfield, IN 46140 USA

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Rev. date 05/2020
INTERCEPTOR™ PLUS
(milbemycin oxime/praziquantel)

Caution
Federal (USA) law restricts this drug to use by or on the order of a licensed veterinarian. Before using INTERCEPTOR PLUS, please consult the product insert, a summary of which follows:

Indications
INTERCEPTOR PLUS is indicated for the prevention of heartworm disease caused by Dirofilaria immitis; and for the treatment and control of adult roundworm (Toxascaris leonina), adult hookworm (Ancylostoma caninum), adult whipworm (Trichuris vulpis), and adult tapeworm (Taenia pisiformis, Echinococcus multilocularis, Echinococcus granulosus, and Dipyldium canium) infections in dogs and puppies two pounds of body weight or greater and six weeks of age and older.

Dosage and Administration
INTERCEPTOR PLUS should be administered orally, once every month, at the minimum dosage of 0.23 mg/kg (0.5 mg/kg milbemycin oxime, and 2.28 mg/kg praziquantel). For heartworm prevention, one month for at least 6 months after exposure to mosquitoes (see EFFECTIVENESS).

<table>
<thead>
<tr>
<th>Body Weight</th>
<th>Milbemycin Oxime per chewable</th>
<th>Praziquantel per chewable</th>
<th>Number of chewables</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 to 3 lbs.</td>
<td>2.75 mg</td>
<td>28 mg</td>
<td>One</td>
</tr>
<tr>
<td>4 to 6 lbs.</td>
<td>5.75 mg</td>
<td>57 mg</td>
<td>One</td>
</tr>
<tr>
<td>7.5 to 12 lbs.</td>
<td>12.5 mg</td>
<td>114 mg</td>
<td>One</td>
</tr>
<tr>
<td>12.5 to 25 lbs.</td>
<td>12.5 mg</td>
<td>114 mg</td>
<td>Twice</td>
</tr>
<tr>
<td>25 lbs. and over</td>
<td>25 mg</td>
<td>224 mg</td>
<td>Twice</td>
</tr>
</tbody>
</table>

Over 100 lbs. Administer the appropriate combination of chewables.

INTERCEPTOR PLUS may be offered to the dog by hand or to a small amount of food. The chewables should be administered in a manner that encourages the dog to chew, rather than to swallow without chewing. Chewables may be broken into pieces and fed to dogs that normally swallow treats whole. Care should be taken that the dog consumes the complete dose, and treated animals should be observed for a few minutes after administration to ensure that no part of the dose is lost or rejected. If it is suspected that any of the dose has been lost, redosing is recommended.

Heartworm Prevention:
INTERCEPTOR PLUS should be administered at monthly intervals beginning within 1 month of the dog’s first seasonal exposure to mosquitoes and continuing until at least 6 months after the dog’s last seasonal exposure (see EFFECTIVENESS). INTERCEPTOR PLUS may be used in dogs of any age.

When switching from another heartworm preventative product to INTERCEPTOR PLUS, the first dose of INTERCEPTOR PLUS should be given within a month of the last dose of the former product.

Intestinal Nematode and Cestode Treatment and Control:
Dogs may be exposed to and can become infected with roundworms, whipworms, hookworms, and tapeworms throughout the year, regardless of season or climate. Clients should be advised of appropriate measures to prevent infection of their dog with intestinal parasites. Because the prepatent period for E. multilocularis may be as short as 26 days, dogs treated at the labeled monthly intervals may become reinfected and shed eggs between treatments.

See product insert for complete dosing and administration information.

Contraindications
There are no known contraindications to the use of INTERCEPTOR PLUS.

Warnings
Not for use in humans. Keep this and all other drugs out of the reach of children.

Precautions
Treatment with fewer than 6 monthly doses after the last exposure to mosquitoes may not provide complete heartworm prevention (see EFFECTIVENESS).

Prior to administration of INTERCEPTOR PLUS, dogs should be tested for existing heartworm infection. At the discretion of the veterinarian, infected dogs should be treated to remove adult heartworms. INTERCEPTOR PLUS is not effective against adult D. immitis.

Mild transient hypersensitivity reactions, such as labeled breathing, vomiting, hypersalivation, and lethargy, have been noted in some dogs treated with milbemycin oxime carrying a high number of circulating microfilariae. These reactions are presumably caused by release of protein from dead or dying microfilariae.

Do not use in puppies less than 6 weeks of age.

Do not use in dogs or puppies less than two pounds of body weight.

The use of INTERCEPTOR PLUS has not been evaluated in dogs intended for breeding or in lactating females. Studies have been performed with milbemycin oxime alone (see ANIMAL SAFETY).
An overview of canine glaucoma

A veterinary ophthalmologist outlines the classification, diagnosis, and treatment of a leading (and painful) cause of blindness in dogs.

By Ron Ofri, DVM, PhD, DECVO

The definition of glaucoma is changing rapidly as our understanding of the pathogenesis of damage to the retina and optic nerve improves. However, the disease can still be described generally as an elevation in intraocular pressure (IOP) that is incompatible with normal ocular function. IOP is the result of a balance between production and drainage of aqueous humor. In clinical practice, glaucoma is caused by drainage disturbances, and cases of increased production are not recognized.

Production and drainage of aqueous humor

Aqueous humor is transparent fluid produced in the ciliary processes, from where it flows into the posterior chamber and through the pupil into the anterior chamber. After circulating in the anterior chamber and supplying the metabolic requirements of the lens and cornea, this fluid exits the eye through the iridocorneal angle (between the cornea and iris), which is spanned by pectinate ligaments. The drainage continues through the uveal and corneoscleral meshworks, eventually exiting the eye into the systemic venous circulation.

Aqueous humor may also exit the eye through an unconventional path, diffusing through the iris and ciliary body (or through the vitreous) into the suprachoroidal space, from there, the fluid drains into the venous circulation. The importance of this route varies among species, accounting for 15% of the total drainage in dogs and 33% in horses, but only 3% in humans.

Classifying glaucoma

Glaucoma may be classified in 1 of 2 ways:

1. Based on the cause, it can be classified as primary, when outflow problems are linked to genetic abnormalities in the drainage pathway, or secondary, when another ocular disease (eg, lens luxation, uveitis) decreases outflow.

2. Alternatively, glaucoma can be classified according to the state of the drainage angle. The angle may be open (in which case the obstruction is further downstream), narrow, or closed. These classifications are not mere semantics; rather, they have significant clinical implications. It is possible that secondary glaucoma may be cured if the primary ocular disease is treated successfully (eg, surgical removal of a luxated lens). More important, if unilateral glaucoma is deemed secondary, it means the contralateral eye is not necessarily at risk.

On the other hand, dogs with primary glaucoma will require lifelong treatment. Moreover, in patients presenting with unilateral primary glaucoma, the contralateral eye is highly likely to develop the disease (on average, within 8 months). In some breeds, examination of the angle will help determine whether the eye is at risk for developing primary glaucoma.

The 2 classification methods complement each other; in dogs, it is possible to encounter any of the possible glaucoma combinations: primary open angle, primary narrow angle, primary closed angle, secondary open angle, and secondary closed angle.

Primary glaucoma is extremely rare in cats, and for all practical purposes, feline glaucoma is invariably a secondary disease.

Primary open-angle glaucoma

Primary open-angle glaucoma (POAG) is an inherited disease that has been investigated extensively in beagles, in which it was shown to be an autosomal recessive disorder. However, POAG has also been documented in keeshonds, Norwegian elkhounds, poodles, and other breeds, although the mode of inheritance has not been established in these breeds.

As the name implies, the angle and pectinate ligaments in dogs with POAG are normal. It is assumed that the outflow obstruction, located in the uveal and corneoscleral meshworks, is the result of biochemical changes to the basement membrane in these regions. The disease is chronic in nature, with IOP increasing slowly over many months or years. Although the dog may present with buphthalmos or even with secondary lens luxation, vision frequently is retained in advanced stages of this disease.

Primary narrow- and closed-angle glaucoma (goniodysgenesis)

Primary narrow-angle glaucoma is an inherited disease in American and English cocker spaniels; flat-coated, Labrador, and golden retriever breeds; and basset hounds, Samoyeds, chow chows, Great Danes, Siberian huskies, and others.

A developmental abnormality results in the formation of dysplastic pectinate ligaments, which can be seen as sheets of tissue spanning the drainage angle. During the first years of a dog’s life, aqueous humor exits the eye through flow holes in the sheets, but eventually the flow holes fail to control aqueous fluid outflow adequately, resulting in IOP elevation. Most canine patients present with an acute attack of glaucoma, including congestion, edema, fixed dilated pupils, and loss of sight.

Although only 1 eye may be affected initially, both eyes should be evaluated, and prophylactic treatment of the unaffected eye is advisable. Individual attacks in affected eyes may be treated successfully, but progressive angle narrowing and closure may develop. In these patients, the long-term prognosis for vision is extremely guarded. >>

Figure 1. A posteriorly luxated hypermature cataract caused glaucoma in this dog.
**Indication:** For appetite stimulation in dogs.

**Important Safety Information:** For use in dogs only. Do not use in dogs that have a hypersensitivity to capromorelin. Use with caution in dogs with hepatic dysfunction or renal insufficiency. The safe use of Entyce has not been evaluated in breeding, pregnant or lactating dogs. The most common adverse reactions included diarrhea, vomiting, elevated blood urea nitrogen, polydipsia, and hypersalivation. Please see accompanying brief summary for prescribing information.

The effectiveness of Entyce has not been evaluated beyond 4 days of treatment in the clinical field study.

*Compared to 4.5/10 control dogs. Study enrolled client-owned dogs (N=244) with decreased appetite for at least 2 days, including dogs with a variety of comorbid conditions. The dogs were randomized 2:1 to receive Entyce 3 mg/kg (n=171) or vehicle control (n=73) for 4 days. 177 inappetent dogs were assessed for effectiveness. All dogs enrolled in the study were evaluated for adverse reactions throughout the study.*

**References:**

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Entyce™
(capromorelin oral solution)

30 mg/mL
For oral use in dogs only
Appetite Stimulant
Caution:
Federal (USA) law restricts this drug to use by or on the order of a licensed veterinarian. Before using Entyce, please consult the product insert, a summary of which follows:

Indication:
ENTYCE (capromorelin oral solution) is indicated for appetite stimulation in dogs.

Dosage and Administration:
Administer ENTYCE orally at a dose of 3 mg/kg (1.4 mg/lb) body weight once daily.

Precautions:
Use with caution in dogs with hepatic dysfunction. ENTYCE is metabolized by CYP3A4 enzymes (See Clinical Pharmacology).

Contraindications:
ENTYCE should not be used in dogs that have a hypersensitivity to capromorelin.

Warnings:
Not for use in humans. Keep this and all medications out of reach of children and pets. Consult a physician in case of accidental ingestion by humans. For use in dogs only

Adverse Reactions:
The following adverse reactions were observed: may have experienced more than one of the adverse reactions during the study.

Table 1: Adverse Reactions reported in dogs administered ENTYCE oral solution compared to vehicle control

<table>
<thead>
<tr>
<th>Adverse Reactions</th>
<th>ENTYCE (n = 171) n (%)</th>
<th>Vehicle Control (n = 73) n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>GASTROINTESTINAL</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diarrhea</td>
<td>12 (7.0 %)</td>
<td>5 (6.8 %)</td>
</tr>
<tr>
<td>Vomiting</td>
<td>11 (6.4 %)</td>
<td>4 (5.5 %)</td>
</tr>
<tr>
<td>Hypersecretion</td>
<td>4 (2.3 %)</td>
<td>0 (0.0 %)</td>
</tr>
<tr>
<td>Abdominal discomfort</td>
<td>2 (1.2 %)</td>
<td>0 (0.0 %)</td>
</tr>
<tr>
<td>Flatulence</td>
<td>2 (1.2 %)</td>
<td>0 (0.0 %)</td>
</tr>
<tr>
<td>Nausea</td>
<td>2 (1.2 %)</td>
<td>0 (0.0 %)</td>
</tr>
<tr>
<td><strong>CLINICAL PATHOLOGY</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elevated blood urea nitrogen</td>
<td>7 (4.1 %)</td>
<td>2 (2.7 %)</td>
</tr>
<tr>
<td>Elevated phosphorus</td>
<td>4 (2.3 %)</td>
<td>1 (1.4 %)</td>
</tr>
<tr>
<td>Elevated creatinine</td>
<td>1 (0.6 %)</td>
<td>1 (1.4 %)</td>
</tr>
<tr>
<td><strong>OTHER</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Polyuria</td>
<td>7 (4.1 %)</td>
<td>1 (1.4 %)</td>
</tr>
<tr>
<td>Lethargy/depression</td>
<td>2 (1.2 %)</td>
<td>0 (0.0 %)</td>
</tr>
</tbody>
</table>

The following adverse reactions were reported in < 1% of dogs administered ENTYCE:

- hyperactivity, increase fecal volume, increase gut sounds, and polyuria.

Effectiveness:

Laboratory Effectiveness Study: Twenty four healthy Beagle dogs (6 dogs per sex in each group) with normal appetite were randomized into two groups and dosed daily with ENTYCE (capromorelin oral solution) at 3 mg/kg/day or vehicle control (solution minus capromorelin) to compare food intake over a 4-day period. The dogs were 18 months of age and weighed between 6.5 and 12.5 kg at the time of randomization. Six dogs administered ENTYCE repeatedly exhibited salivation post dosing and two dogs administered vehicle control exhibited salivation only one time on study day 1. Emesis was observed in one dog administered ENTYCE on study day 1. Dogs administered ENTYCE at a dose of 3 mg/kg/day for 4 consecutive days had statistically significantly increased food consumption compared to the vehicle control group (p < 0.001).

Clinical Field Study: Effectiveness was evaluated in 177 dogs (121 dogs in the ENTYCE group and 56 dogs in the vehicle control group) in a double-masked, vehicle controlled field study. Dogs with a reduced appetite or no appetite, with various medical conditions, for a minimum of 2 days prior to day 0 were enrolled in the study. The dogs ranged in age from 4 months to 18 years. Doses were randomized to treatment group and dosed once daily for 4 days with ENTYCE at 3 mg/kg or vehicle control. Dogs were assessed for appetite by owners on day 0 and day 3 ± 1 using an "increased", "no change" or "decreased" scoring system. Dogs were classified as a treatment success if the owner scored their dog’s appetite as "increased" on day 3 ± 1. The success rates of the two groups were significantly different (p = 0.0078). 69.6% (n = 83) of dogs administered ENTYCE were successes, compared to 44.6% (n = 25) of the dogs in the vehicle control group.

Storage Conditions:
Store at or below 86° F (30° C)

How Supplied:
30 mg/mL flavored solution in 10 mL, 15 mL and 30 mL bottles with measuring syringe

Approved by FDA under NADA # 141-457

Manufactured for:
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Greenfield, IN 46140, USA

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PA103066X W1b
Cavalier King Charles Spaniel’s eye.

Figure 2. A large hypopyon in anterior chamber is the predominant sign of uveitis in this one of the following: ocular disease, most commonly outflow caused by another obstruction of aqueous humor glaucoma, pressure rises from

In patients with secondary glaucoma, the hypopyon is composed of inflammatory material, which also clogged the iridocorneal drainage angle and caused secondary uveitis.

Secondary glaucoma
In patients with secondary glaucoma, pressure rises from obstruction of aqueous humor outflow caused by another ocular disease, most commonly one of the following:

- **Lens luxation.** Because the lens serves as a barrier against forward movement of vitreous, any lens luxation (whether anterior or posterior) may allow vitreous humor to move into the anterior chamber and obstruct outflow (Figure 1). If the lens luxation is anterior, fluid outflow will be further impeded by the physical presence of the lens in the anterior chamber.

- **Uveitis.** In these patients, the inflammatory material in the anterior chamber (eg, cells, platelets, fibrin) can obstruct the iridocorneal angle. In addition, uveitis can lead to adhesion between the iris and the lens or cornea (posterior and anterior synchia, respectively), further disrupting aqueous humor outflow (Figure 2).

- **Intraocular tumor.** Tumors can cause glaucoma by inducing uveitis. Furthermore, neoplastic cells can obstruct the angle, or the tumor (if large enough) can physically compress the angle. Intraocular tumors should be suspected in any senior patient with unilateral uveitis or unilateral glaucoma.

Guide to diagnosing glaucoma

Tonometry (measuring IOP)
In canine patients, the normal IOP range is 15 to 25 mm Hg. Elevation in IOP is defined as glaucoma, and low IOP is usually a sign of uveitis linked to increased unconventional outflow. The IOP measurement should be similar in both eyes. Differences of more than 10 mm Hg between eyes may be indicative of glaucoma. Likewise, normal pressure in an eye with uveitis is suspicious because the hypertensive effect of uveitis may be masking elevation in pressure. IOP cannot be measured digitally with one’s fingers. It should be recorded by using a Schiotz (indentation) tonometer or, preferably, with a modern rebound or applanation tonometer.

Gonioscopy (examining the iridocorneal angle)
It is important to examine the angle to determine the risk of glaucoma in breeds with goniodysgenesis or if the glaucoma has already developed in the other eye. Gonioscopy is performed by a specialist using a special lens (ie, goniolens) that is placed on the cornea. The lens refractions outgoing light and allows visualization of the entire angle to classify its state (Figure 3). Gonioscopy allows the practitioner to view the angle between the iris (brown crescent in bottom half of the image) and the cornea (white crescent in the top portion of the image). This noninvasive examination is used to evaluate the aqueous drainage angle and determine glaucoma risk.

In dogs with unilateral glaucoma, the disease may be secondary, or it can be a primary disease because one eye is frequently affected before the other. If unilateral primary glaucoma is suspected, referral for gonioscopy is mandatory so that prophylactic treatment can be initiated in the unaffected eye.

History and clinical signs
Canine glaucoma may affect all ocular layers and structures, resulting in the following:

- **Pain.** Glaucoma is a painful disease. The pain can be expressed as blepharospasm or as general depression. Although the pain may be more insidious in dogs with chronic glaucoma, many owners report a dramatic improvement in the animal’s behavior following enucleation of a glaucomatous eye.

- **Buphthalmos.** Glaucoma may cause an increase in the size of the globe, resulting from stretching of the collagen fibers of the cornea and sclera. Buphthalmos usually occurs more frequently in patients with chronic disease and in young patients because the sclera is more elastic and stretches more easily.

- **Congestion of blood vessels.** The eye will appear red from congestion of episcleral vessels (Figure 4).

These signs include buphthalmos (enlarged globe), blue eye (from corneal edema), and red eye (from intrascleral and episcleral vessel congestion). In this patient, these vessels are also infiltrating the cornea. >>

Principles of glaucoma treatment in dogs

- The goals of glaucoma treatment are to prevent further vision loss and decrease the pain caused by intraocular pressure (IOP) elevation. Currently, it is impossible to restore vision that has been lost due to glaucoma.

- Primary glaucoma requires lifelong treatment. The owner must understand that the disease can never be fully cured so the goal of therapy is to stabilize the IOP.

- Diagnosis of primary glaucoma in one eye mandates prophylactic treatment in the other eye. If you are uncertain, consider referring to a specialist for gonioscopy.
As a result of advanced or acute stages of disease, the pupil may be dilated slightly, and its response will be sluggish. In dogs, this state of the angle (which is frequently blocked) is responsible for maintaining corneal hydration, resulting in edema (Figure 4). Stretching of the corneal fibers in patients with buphthalmos may cause rupture of the endothelial basement membrane. These ruptures, seen as white lines in the cornea, are called striate keratopathy and are pathognomonic for glaucoma.

- **Corneal pathology.** Elevated IOP damages the corneal endothelium, which is responsible for maintaining corneal hydration, resulting in edema (Figure 4). Stretching of the corneal fibers in patients with buphthalmos may cause rupture of the endothelial basement membrane. These ruptures, seen as white lines in the cornea, are called striate keratopathy and are pathognomonic for glaucoma.

- **Pupil changes.** In early stages of the disease, the pupil may be dilated slightly, and its response will be sluggish. In advanced or acute stages of the disease, the pupils are dilated and nonresponsive.

- **Luxated lens.** The lens may luxate (or subluxate) from stretching and tearing of the zonules. As noted, the reverse may also be true, as luxated lens can cause glaucoma (Figure 1).

- **Retina, optic nerve, and vision damage.** Glaucoma will cause atrophy of the ganglion cell layer and other inner retinal layers. This atrophy is a result of local ischemia caused by pressure on the retinal blood vessels (the outer retina is supplied by the choroid and is less affected by ischemia). Additional damage to the ganglion cells occurs from kinking of their axons as they exit the eye at the lamina cribrosa region. In this part of the eye, the effect of elevated IOP may be seen ophthalmoscopically as cupping of the optic disc. Because of the damage to the inner (and, eventually, outer) retina, the patient will experience progressive or acute loss of vision, which may lead to complete blindness.

- **End-stage glaucoma.** As a result of chronic IOP elevation, the ciliary body may atrophy, causing decreased aqueous production, lower pressure, and atrophy of the eye (phthisis bulbi).

**Medical therapy**

**Osmotic diuretics**

These drugs are not used for long-term treatment of glaucoma. Instead, they serve for emergency lowering of IOP in patients with acute attacks. The most commonly used drug in this category is intravenous mannitol administered slowly at 1 to 2 g/kg over 30 minutes; water is withheld for 3 to 4 hours.

**Prostaglandin analogues**

These drugs act by increasing the unconstricted state of the angle. The topical form of the drug (dorzolamide, brinzolamide) is administered twice a day and has none of the systemic adverse effects observed with the systemic inhibitors.

**Topical miotics**

These drugs increase drainage by opening the iridocorneal angle (through contraction of the iris and ciliary muscle). The most commonly used drug in this category is pilocarpine 1 to 4%, applied 2 or 3 times a day.

**β-blockers**

Sympatholytic drugs reduce aqueous production by reducing blood flow to the ciliary body. They are commonly used in humans, but their effectiveness in animals is controversial. Systemic adverse effects are common in small dogs, cats, and animals with pulmonary or cardiovascular disease. Drugs in this category include timolol, levobunolol, and betaxolol, which are administered once or twice daily. A preparation containing timolol and dorzolamide is commercially available and may be very efficacious.

**Surgical treatment**

Referral ophthalmology clinics may perform surgery to increase aqueous humor outflow (usually by implanting drainage tubes in the eye) or to decrease aqueous production through partial destruction of the ciliary body, using laser or cryotherapy. However, frequently the surgical or medical treatment fails, and the practitioner is faced with a blind and painful eye. Patient welfare requires removal of this eye through enucleation. Owners of dogs with primary (but not secondary) glaucoma may be offered evisceration (ie, implantation of a prosthesis in an empty scleral shell) to provide a more cosmetic appearance.

Ron Ofri, DVM, PhD, DECVO, is professor of veterinary ophthalmology at The Robert H. Smith Faculty of Agriculture, Food & Environment in the Koret School of Veterinary Medicine at The Hebrew University of Jerusalem in Israel. His special interest is retinal diseases, including glaucoma.
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Clinical case study: The case of the missing gallbladder

This clinical case explains how a 10-month-old dog received a diagnosis of a rare condition—gallbladder agenesis—and how it will be monitored in the future.

By Jessica Milne BVSc, GCertSAUA; subedited by Phil Tucak, BSc, BVMS

Abby, a 10-month-old female pure Maltese terrier, was referred to Queensland Veterinary Specialists in March 2021 for an investigation of her persistently elevated ALT enzyme levels, which had been detected via blood tests performed by her primary veterinarian.

Blood tests performed in November 2020, prior to her sterilization surgery, showed that Abby had an ALT level of 230 U/L. Although at birth she had been the smallest pup in her litter, she had grown well and was physically healthy. There had been no changes in her demeanor, energy levels, appetite, or water intake.

The recommendation was made to delay her sterilization surgery and continue to monitor her ALT level. When a repeat blood test was performed 5 weeks later, Abby’s ALT level had increased to 208 U/L by day 14 of the treatment trial but increased to 382 U/L 14 days after discontinuing the antibiotic therapy. Abby and her very dedicated family therefore made the 1600-km car trip from Cairns to Brisbane for further assessment and testing.

At the time of referral, Abby remained clinically well, with excellent energy levels and appetite. A physical and neurological examination performed by an internal medicine specialist at Queensland Veterinary Specialists was within normal limits. Abby underwent an abdominal CT scan with contrast because our primary concern was to investigate macrovascular or microvascular disease.

The imaging showed that Abby’s vasculature was normal, as was the liver, but surprisingly, she didn’t have a gallbladder!

Discussion

Gallbladder agenesis is an extremely rare condition in dogs. The majority of cases reported occur in young, small, purebred dogs. Gallbladder agenesis has been reported to have both a familial and genetic etiology in humans, although the condition’s pathophysiology is not well understood.

Bile is formed in the hepatocytes and stored in the gallbladder. Contraction of the gallbladder is stimulated by the entry of fats and proteins into the stomach. The bile passes through the common bile duct into the duodenum, where it helps emulsify fat, neutralize gastric acid, and facilitate cholesterol excretion. Because the gallbladder acts as storage, not production, patients without gallbladders can lead perfectly normal lives. In the absence of a gallbladder, the bile produced is consistently secreted into the duodenum instead of being stored and then released upon eating.

A review of the literature of gallbladder agenesis in dogs found that the most common biochemical change was an elevated ALT (15/17 dogs). It also found common bile duct dilation in 12 of the 17 dogs, with no evidence of bile duct obstruction. No dogs had hyperbilirubinemia.

Nine of the dogs in the review were symptomatic for hepatobiliary disease, with vomiting being the most common clinical sign (56%) and other signs including anorexia, diarrhea, ascites, lethargy, and seizures. As with Abby, the remaining 8 patients found to have gallbladder agenesis were asymptomatic and were referred for abnormalities found on routine bloodwork.

Importantly, this retrospective review also showed a strong association between gallbladder agenesis and other malformations, including liver lobe agenesis, microscopic liver abnormalities, and vascular abnormalities (most commonly, ductal plate malformation diagnosed in 16/17 dogs).

Therefore, incisional liver biopsy samples were obtained during Abby’s sterilization surgery, which was performed the day after the CT scan. During this procedure, it was confirmed that there was no gallbladder present, just a small remnant of tissue in the normal location of the gallbladder, most consistent with a thickened duct.

The liver biopsy samples were submitted to the local veterinary pathology laboratory, QML Vetnostics. Histological examination showed no evidence of microvascular or hepatic disease, the copper levels were normal, and the culture was negative for any bacterial growth, leaving the absence of the gallbladder as the most likely cause of Abby’s elevated ALT level.

In previously reported cases of gallbladder agenesis in dogs, those dogs with ductal plate malformation had a shorter survival time, so we are pleased that Abby’s liver biopsies were normal.

Because Abby was asymptomatic with no other concurrent disease evident, treatment was not required; however, we have recommended that her liver enzymes be monitored every 6 months; bile acids, every 12 months.

Since returning home to Cairns, Abby has continued to grow and put on weight, and her family says she is a very happy dog. We hope that Abby will remain asymptomatic and have many happy years ahead of her.

After graduating from Massey University in New Zealand, Jessica Milne, BVSc, GCertSAUA, completed a rotating internship with Queensland Veterinary Specialists and Pet Emergency. She has a strong passion for diagnostic imaging and is currently undertaking a specialty diagnostic imaging and internal medicine internship at Queensland Veterinary Specialists. Milne has completed additional training in abdominal ultrasound and musculoskeletal radiology and at present is working towards gaining a residency in diagnostic imaging.

REFERENCE

The International Committee on Allergic Diseases of Animals (ICADA) Guidelines recommend:  

- A multimodal approach that includes controlling inflammation
- Use of topical glucocorticoid sprays, such as GENESIS Topical Spray, to control acute flare-ups
- Long-term management in which GENESIS Topical Spray is applied intermittently (following an induction phase of daily application) until a complete and stable remission of signs is achieved

**Important Safety Information**

**GENESIS® Topical Spray (0.015% triamcinolone acetate):** For use on dogs only. Wear gloves when applying the product. The use of this product on dogs less than eight pounds, less than one year of age, breeding, pregnant, or lactating has not been evaluated. Adverse events of polyuria and polyphagia have been reported in <6% of dogs receiving treatment. For full prescribing information, contact Virbac at 1-800-338-3659 or visit us.virbac.com.

Please see full prescribing information on page 50.

References:  
GENESIS® Topical Spray contains 0.015% triamcinolone acetonide for dermatologic use. Each mL of GENESIS® Topical Spray contains 0.15 mg triamcinolone acetonide in an aqueous solution containing propylene glycol, specially denatured alcohol, and DMDM hydantoin.

PHARMACOLOGY
Triamcinolone acetonide is highly potent synthetic glucocorticoid, which is primarily effective because of its anti-inflammatory activity. Topical corticosteroids can be absorbed from normal intact skin. Studies have demonstrated that topical preparations of triamcinolone have decreased plasma cortisol levels and suppressed the response to ACTH.

INDICATIONS
GENESIS® Topical Spray is indicated for the control of pruritus associated with allergic dermatitis in dogs.

Table 1. Maximum allowable dosage

<table>
<thead>
<tr>
<th>Dog Weight</th>
<th>Maximum number of pumps per single application*</th>
<th>Total maximum volume (mL) per 28 day treatment regimen</th>
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</thead>
<tbody>
<tr>
<td>11 lb</td>
<td>5 kg</td>
<td>4 pumps</td>
</tr>
<tr>
<td>22 lb</td>
<td>10 kg</td>
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<td>33 lb</td>
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<tr>
<td>110 lb</td>
<td>50 kg</td>
<td>37 pumps</td>
</tr>
</tbody>
</table>

*Using the recommended dosing regimen, there are two applications per day for the first week, one application per day for the second week and one application every other day for the last two weeks of treatment.

STORAGE CONDITIONS
Store at room temperature, 15° - 30° C (59° - 86° F).

HOW SUPPLIED
GENESIS® Topical Spray is supplied in 8 ounce (237 mL) and 16 ounce (478 mL) bottles with spray applicators.

Approved by FDA under NADA # 141-210.

Manufactured by: Virbac AH, Inc.
Fort Worth, TX 76137 USA
Phone: 1-800-338-3659
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Canine atopic dermatitis: a roadmap to individualized, multimodal treatment

By Mary Fuller, DVM

In the last decade, new drug therapies have transformed the way veterinarians treat canine atopic dermatitis (AD). Clinicians are now able to bring dogs fast relief from pruritus and inflammation with fewer adverse effects. Still, treatment remains challenging.

In an attempt to provide veterinarians with sound guidance, treatment guidelines for canine atopic dermatitis were developed in 2010 by the International Committee on Allergic Diseases of Animals (ICADA) and have subsequently been updated in 2015.1,2

Disease overview
Atopic dermatitis is a common canine skin disorder estimated to affect about 10 to 15% of dogs.3 Affected canines are genetically predisposed to develop inflammatory and pruritic skin lesions associated with IgE antibodies targeted against environmental allergens.4

Signs typically develop early in life, between 6 months and 3 years of age. Distribution of lesions can vary, but may include the axillae, abdomen, inguinal, perineum, face, concave pinnae, as well as the dorsal and ventral paws.1 Depending on the allergens involved, clinical signs may be seasonal or non-seasonal, and the disease typically requires lifelong management.

Pathogenesis of AD
“Pathogenesis of canine atopic dermatitis is very complex and involves multiple organ systems including the skin, the immune system, and the nervous system,” according to Douglas DeBoer, DVM, DACVD, Professor at the School of Veterinary Medicine at the University of Wisconsin-Madison.

While AD was once believed to be a hypersensitivity to inhaled environmental allergens, there is now growing evidence that epidermal barrier defects may play an important role.5

Environmental allergens are thought to penetrate the epidermis, where they are captured by antigen-presenting cells. These, in turn, travel to the dermis and lymph nodes, where they activate T-helper 2 lymphocytes. These cells release cytokines or inflammatory mediators that boost allergen-specific IgE antibodies as well as pruritogenic cytokines such as interleukin-31 (IL-31) that directly stimulate nerves to promote itching.

“All of the pathways that cause inflammation and pruritus are orchestrated through the action of cytokines,” according to DeBoer in a presentation at the 2020 VMX conference.6

An individualized, multimodal approach
Traditional treatment of AD primarily relied on systemic glucocorticoids. While these medications inhibited the production of many cytokines associated with itching and inflammation, they were non-targeted in that they also inhibited other types of cytokines. This often resulted in adverse effects associated with the adrenal glands, liver, and kidneys.

To help minimize potential adverse effects, clinicians now tend to favor a multimodal approach, using a combination of products to produce synergistic effects.

The AD treatment roadmap
Once a diagnosis of canine AD has been confirmed, ICADA guidelines generally focus on treatment of acute flares or chronic AD and vary by whether signs are localized or generalized. The following is a brief summary of ICADA recommendations.1,2

Identify and avoid flare factors

ACUTE FLARES AND PREVENTION OF RECURRENCE

• Determine if there are flare factors at play, including environmental allergens (especially house dust mites and pollens), food allergens, or fleas, and remove the source, if possible.

• Treat bacterial and yeast infections of the skin and ears with appropriate and responsive antimicrobial therapy. Medicated shampoos (e.g., KETOCHLOR® Shampoo [chlorhexidine gluconate, ketoconazole]) are recommended. If using topical antimicrobials, clinicians should monitor the skin for drying or irritation, which may also cause flares.

CHRONIC AD
• Flea control: Dogs with AD can be predisposed to flea bite hypersensitivity if repeatedly exposed to flea bites.7 In regions where fleas are endemic, dogs should be on year-round flea adulticides and owners should be instructed on environmental measures.

• Frequent shampooing may impact the efficacy of topical flea control products.

• Environmental allergens: Perform allergen-specific intradermal and/or IgE serologic tests to identify possible environmental allergens or for use in allergen-specific immunotherapy.

• House dustmite control: Glycoproteins from Dermatophagoides house dust mites are the most common allergens in dogs globally.8 Reducing these in the dog’s environment may help reduce signs. This may include frequent pet bed washing and environmental vacuuming.

• Food allergy: In dogs with non-seasonal AD, perform 1 or more 8-week dietary restriction-provocation trials to determine if food allergens contribute to clinical signs.

• Bacterial and fungal infections: Staphylococcal and Malassezia skin and ear infections are common in dogs with AD. Some atopic dogs can develop an IgE hypersensitivity to Malassezia9-12 and Staphylococcus.13 Dogs should be treated with topical or systemic antimicrobials as needed.

Improve skin and coat hygiene and care

ACUTE FLARES
• Bathing: A weekly bath, including a 10-minute soak with an emollient shampoo that contains certain lipids, antiseptics, and complex sugars, or raspberry oil, can help remove allergens and reduce itching and lesions. In a randomized controlled trial, 25% of dogs given a weekly bath and 10-minute application with shampoo [ALLERMYL® shampoo (piroctone olamine), Virbac] experienced a 50% reduction in pruritus scored within 24 hours.14

CHRONIC AD
• Bathing: A weekly bath with a non-irritating shampoo and lukewarm water is advised.

• Oral essential fatty acids (EFAs): Diets or supplements, especially those rich in Omega-6 fatty acids, can help improve skin lipids and coat quality.
Reduce pruritus and inflammation with pharmacological agents

ACUTE FLARES

• Topical glucocorticoid sprays: For control of pruritus associated with AD. 0.015% triamcinolone acetone (GENESIS® Topical Spray, Virbac) has been shown to be highly effective.

• Oclacinib (Apooqel®, Zoetis). A short course of therapy can help provide quick relief for pruritus and skin lesions, and appears to be safe.

• Lokivetmab (Cytopoint®, Zoetis): Released after the publication of the 2015 guidelines, this injectable treatment can provide long-lasting relief from clinical signs.

• Oral glucocorticoids: A short course of prednisolone, prednisone, or methylprednisolone can be used for dogs with mild AD, especially if administered before a flare to prevent histamine release.

CHRONIC AD

• Topical glucocorticoid sprays: After daily induction phase, apply intermittently (2 times a week) to prevent recurrence of clinical signs.

• Oral cyclosporine: With a long history of use, cyclosporine can help induce remission, then the dose or frequency can be tapered for AD maintenance therapy.

• Oral oclacinib: These pills can be prescribed for acute or chronic control of AD.

• Lokivetmab: A single injection, administered once every 4 to 6 weeks, is also appropriate for acute or chronic management of AD.

• Oral glucocorticoids: Prednisolone, prednisone, or methylprednisolone can help induce remission of clinical signs, and should then be tapered to the lowest effective dose.

Topical and oral steroids

In most cases, broad-spectrum anti-inflammatory action is needed to get an acute flare under control before long-term maintenance therapy can be initiated.

In dogs, topical steroids are also the cornerstone for inducing remission in acute flares and localized lesions. DeBoer promoted the topical use of “steroids in spray formulation” such as 0.015% triamcinolone acetone that contain a relatively low concentration of the drug, but offer a low potential for adverse effects in relation to their anti-inflammatory potency.

If clinical signs are severe or more generalized, a short course of oral steroids such as prednisolone, prednisone, or methylprednisolone can be used with topical steroids until control has been achieved.

Cyclosporine

Oral cyclosporine is more targeted than oral glucocorticoids. It inhibits the intracellular enzyme calcineurin, which blocks the production of cytokines, such as interleukin-2 (IL-2). This, in turn, inhibits T-cell activation and proliferation to provide anti-inflammatory and immunomodulatory effects. Modified cyclosporine (Atopica®, Elanco) is available in capsule form. However, 2 randomized, controlled studies showed that a novel liquid formulation of cyclosporine [CYCLAVANCE™ (cyclosporine oral solution)] USP MODIFIED, Virbac] was better accepted by dogs than cyclosporine capsules, which may help improve compliance.

Oclacinib

Oclacinib (Apooqel®, Zoetis) has a different mechanism of action than glucocorticoids or cyclosporine. This oral medication selectively inhibits Janus kinase 1 (JAK1) enzymes within cells, blocking JAK1-dependent cytokine activity, including interleukin-31 (IL-31), a cytokine primarily responsible for sending itch signals to the brain. Since oclacinib typically relieves itch quickly (in a matter of hours), it can be a good choice for acute pruritus.

Oclacinib typically has few adverse effects, but should not be used in dogs less than one year of age. Some recent studies have shown that the use of a topical steroid in conjunction with oclacinib can reduce the time for remission of signs, and avoid “rebond” flare ups.

Lokivetmab

Lokivetmab (Cytopoint®, Zoetis): This injectable monoclonal antibody treatment is even more targeted than oclacinib, exclusively blocking the action of IL-31. After a subcutaneous injection, lokivetmab typically relieves pruritus in 1 to 3 days and lasts for 4 to 6 weeks. As a biological therapy, lokivetmab isn’t metabolized like a drug, so it’s not likely to cause organ toxicity.

Progressive therapy

“If you have a patient that’s been unresponsive or difficult to treat previously, first verify you have infection and parasite control on board,” advised DeBoer. He then promoted the concept of progressive therapy, which recognizes that different stages of AD may require different treatments over the course of a dog’s life.

Combining several products can also help manage more of the inflammatory process. For instance, it may be necessary to combine therapies, such as oclacinib and lokivetmab to provide the dog and owner with immediate itch relief in an acute flare. Other dogs may require a combination of treatments to achieve fast results and to help keep the pet in remission. For example, oclacinib can be used along with lokivetmab or a topical steroid; or, cyclosporine can be given at the same time a topical steroid is used.

REFERENCES
When it comes to pruritus, many patients and their owners shoulder a heavy burden. According to Ashley S. Bourgeois, DVM, DACVD, a dermatologist at Animal Dermatology Clinic in Portland, Oregon, and dvm360 Editorial Advisory Board member, market studies have found that most owners with pruritic dogs express concern for their pet’s overall well-being.1

At a recent Fetch dvm360® conference, Bourgeois discussed the emotional challenges many owners face when caring for pets with pruritus, including sadness (46%), frustration (44%), and helplessness (43%).1 To better navigate these conversations with clients, she highlighted a few communication pearls—from formulating a therapy plan early to demonstrating empathy.

1. Be transparent from the start
According to Bourgeois, "allergies are not cured, but managed." From the very first appointment, it's imperative that owners are made aware that in most cases, a one-time treatment isn't enough to sufficiently cure allergic dogs and cats. "Continued therapy and an ongoing veterinary relationship will be required the rest of the pet's life. It is important for owners to realize that from the first appointment," Bourgeois explained, adding that along with formulating a plan to accommodate the individual needs of both the patient and the owner, frequent check-ins and therapies will be needed to maintain the pet's comfort.

2. Address, monitor, and manage flare-ups
Flare-ups in even the most well-controlled allergic pets can occur for a variety of reasons (eg, seasons changing, dropped food, and flea control getting missed). Bourgeois urged veterinary teams to work in tandem with the owner to help educate them on what these flare-ups look like. It is also important to provide routine calls to owners so they feel supported and prioritized. She recommended investing in multiple communication methods including phone, text messaging, and communication apps to give owners an efficient communication method that works best for them.

3. Demonstrate empathy and listening skills
Skin issues like pruritus are traditionally a visual ailment, so it’s crucial to keep in mind the emotional state of many dermatologic clients when they begin to see physical changes on their pet’s skin. Bourgeois explained that because clients have different reactions, emotions, and expectations, it’s up to the veterinary team to address each client’s needs when presenting...
**What is your client’s main goal?**

When starting a diagnostic investigation for allergic disease, Bourgeois recommended finding out the client’s main goal, priority, and definition of success. Here are a few questions to ask:

- Do they want their pet to stop itching today?
- Do they care most about getting rid of the odor?
- Are they proactive owners who want to avoid chronic medications?
- Will they bathe their pet daily if it avoids systemic antibiotics?

**Brief Summary:** Before using CYCLAVANCE™ (cyclosporine oral solution) USP MODIFIED consult the product insert, a summary of which follows:

**CAUTION:** Federal (USA) law restricts this drug to use by or on the order of a licensed veterinarian.

**Indications:** CYCLAVANCE is indicated for the control of atopic dermatitis in dogs weighing at least 4 lbs (1.8 kg) body weight.

**Dosage Instructions:** Always provide the Instructions for Assembling the Dispensing System and Preparing a Dose of CYCLAVANCE and the Information for Dog Owners with the prescription (see product insert).

The initial dose of CYCLAVANCE is 5 mg/kg/day as a single daily dose for 30 days. Following this initial daily treatment period, the dose of CYCLAVANCE may be tapered by decreasing the frequency of dosing to every other day or twice weekly, until a minimum frequency is reached which will maintain the desired therapeutic effect.

CYCLAVANCE should be given at least one hour before or two hours after a meal. If a dose is missed, the next dose should be administered (without doubling) as soon as possible but dosing should be no more frequent than once daily.

The dispensing system for the 15 mL vial size includes a 1 mL oral dosing syringe graduated in 0.05 mL increments. To dose the dog, administer 0.05 mL of CYCLAVANCE per 2.2 lbs of body weight. The dispensing system for the 50 mL vial size includes both a 1 mL oral dosing syringe graduated in 0.05 mL increments, and a 3 mL oral dosing syringe graduated in 0.1 mL increments.

To dose the dog, administer 0.1 mL of CYCLAVANCE per 4.4 lbs of body weight. Do not rinse or clean the oral dosing syringe between uses. (See Instructions for Assembling the Dispensing System and Preparing a Dose of CYCLAVANCE.)

**Contraindications:** CYCLAVANCE is contraindicated for use in dogs with a history of neoplasia. Do not use in dogs with a hypersensitivity to cyclosporine.

**WARNINGS:** CYCLAVANCE is a systemic immunosuppressant that may increase the susceptibility to infection and the development of neoplasia.

**HUMAN WARNINGS:** Not for human use. Keep this and all drugs out of reach of children. For use only in dogs. Special precautions to be taken when administering CYCLAVANCE in dogs:

- Do not eat, drink, smoke, or use smokeless tobacco while handling CYCLAVANCE. Wear gloves during administration. Wash hands after administration. In case of accidental ingestion, seek medical advice immediately and provide the package insert or the label to the physician.

**PRECAUTIONS:** The safety and effectiveness of cyclosporine has not been established in dogs less than 6 months of age or less than 4 lbs body weight. CYCLAVANCE is not for use in breeding dogs, pregnant or lactating bitches. As with any immunomodulation regimen, exacerbation of sub-clinical neoplastic and infectious conditions may occur. Gastrointestinal problems and gingival hyperplasia may occur at the initial recommended dose (See Animal Safety in the product insert).

CYCLAVANCE may cause elevated levels of serum glucose, and should be used with caution in cases with diabetes mellitus. If signs of diabetes mellitus develop following the use of CYCLAVANCE, consideration should be given to tapering or discontinuing the dose.

**Effectiveness:** See full prescribing information for details on effectiveness.

**Contact Information:** To report suspected adverse drug events, for technical assistance, or to obtain a copy of the Safety Data Sheet, contact Virbac AH, Inc. at 1-800-338-3659. For additional information about adverse drug experience reporting for animal drugs, contact FDA at 1-888-FDA-VETS or visit http://www.fda.gov/reportanimalae.

**CYCLAVANCE** is a trademark of Virbac S.A.

Approved by FDA under ANADA # 200-692

Manufactured for: Virbac AH, Inc.
P.O. Box 162059
Fort Worth, TX 76161

Rev. 03/2021

**The takeaway**

Owners of pets with allergic pruritus can often encounter complex emotions such as confusion and frustration. It’s important to tackle the issue from the first appointment and curate a dependable treatment plan that keeps the needs of both patient and owner in mind.

“The impact of allergic itch on patient and owner quality of life, as well as the potential for client frustration, highlights the importance of a consistent, thorough team approach to diagnosing and treating patients with allergic pruritus,” said Bourgeois. 

**REFERENCE**


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**Table: Clinical Pathology Changes**

During the study, some dogs experienced changes in clinical chemistry parameters while receiving cyclosporine, as described in the following table:

<table>
<thead>
<tr>
<th>Clinical Chemistry</th>
<th>% Affected (n=265)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elevated Creatinine</td>
<td>7.8%</td>
</tr>
<tr>
<td>Elevated Bilirubin</td>
<td>6.4%</td>
</tr>
<tr>
<td>Hyperphosphatemia</td>
<td>5.3%</td>
</tr>
<tr>
<td>Hypocalcemia</td>
<td>3.4%</td>
</tr>
<tr>
<td>Hypochlorestenemia</td>
<td>2.5%</td>
</tr>
<tr>
<td>Hypoalbuminemia</td>
<td>2.3%</td>
</tr>
<tr>
<td>Elevated BUN</td>
<td>2.3%</td>
</tr>
</tbody>
</table>

Approved by FDA under ANADA # 200-692

Manufactured for: Virbac AH, Inc.
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Fort Worth, TX 76161
**Important Safety Information**

**CYCLAVANCE™ (cyclosporine oral solution)(USP Modified): For use in dogs only.** Wear gloves during and wash hands after administration.

Gastrointestinal problems and gingival hyperplasia may occur at the initial recommended dose of CYCLAVANCE Oral Solution for Dogs.

CYCLAVANCE Oral Solution for Dogs should be used with caution: 1) in cases with diabetes mellitus as it may cause elevated levels of serum glucose; 2) in dogs with renal insufficiency since the effect of cyclosporine use on dogs with compromised renal function has not been studied; 3) in simultaneous administration with drugs that suppress the P-450 enzyme system, such as azoles (e.g. ketoconazole), that may lead to increased plasma levels of cyclosporine. Killed vaccines are recommended for dogs receiving CYCLAVANCE Oral Solution for Dogs because the impact of cyclosporine on the immune response to modified live vaccines has not been evaluated. For full prescribing information, contact Virbac at 1-800-338-3659 or visit us.virbac.com.

See full prescribing information for CYCLAVANCE™ (cyclosporine oral solution) USP MODIFIED on the left page.

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To order, contact your distributor or Virbac representative, or call 1-844-484-7222. Learn more at vet-us.virbac.com/cyclavance.

**reliability**

The same effective cyclosporine you know and trust—IN LIQUID FORM

- Cyclosporine is recommended by the International Committee on Allergic Diseases of Animals (ICADA) for the treatment of atopic dermatitis in dogs
  - Blocks the release of inflammatory cytokines
  - Exhibits strong anti-inflammatory and antipruritic effects
- Maintains long-term beneficial effects with a dose every other day or twice weekly

**precision**

Eliminates the inefficiencies of dosing with capsules

- Liquid formulation allows for precise dosing at 5 mg/kg for all dogs
- Variance in dosing for cyclosporine capsules can range from -29% to +33% 

**confidence**

Convenient and easy dosing helps to promote compliance

- In an acceptance study, 98.3% of dogs consumed the entire dose of CYCLAVANCE™ oral solution when mixed with a small amount of dry food (vs 2.2% consumption for cyclosporine capsules)

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Tricky toes: Considerations regarding canine digit amputation

Follow these insights and tips to ensure success for this common surgical procedure.

By Kassidy Burgess, BS, and Stephanie Shaver, DVM, DACVS-SA

Digit amputation may be indicated due to neoplasia, osteomyelitis, or trauma. In many of these scenarios, amputation of the affected digit(s) can be the simplest, most effective, and most cost-efficient method to return the patient to health. Although this procedure is routinely performed, there are aspects of this straightforward surgery that can be more complicated.

What if I need to remove digit 3 or 4?
Due to digits 3 and 4 being responsible for more weight bearing, there has long been concern that amputation of either of these digits may result in long-term lameness or an unacceptable outcome. A retrospective study concluded that dogs that underwent amputation of digit 3, 4, or both did not seem to have a worse outcome than dogs that underwent amputation of other digits.1 Previous reports describing increased incidence of persistent lameness after amputation of digits 3 and 4 were often associated with resection of the digit through the mid to distal region of P1 or P2. Removal of the bone remnant was found to resolve lameness in the 3 reported cases.2 It has become many practitioners’ preference to amputate via disarticulation at the level of the metacarpal/metatarsophalangeal joint. Amputation at other sites is still acceptable, but a more proximal metacarpal/metatarsophalangeal amputation may be warranted for digits 3 and 4.

What if I need to amputate more than 1 digit?
Amputation of more than 1 digit (partial foot amputation) can result in good patient outcomes (Figure 1). In a small series of 11 dogs treated with partial foot amputation, lameness resolved in 8 dogs after a median of 37 days.3 The mild lameness that persisted in the remaining 3 dogs did not seem to affect their quality of life, and all owners were satisfied with the outcome. Another study found similar results, with both dogs in this study returning to full function after partial foot amputation.1 In fact, they also found it is possible to remove all digits and still have a functional and pain-free foot if the metacarpal/tarsal pad is preserved.

What if I don’t have enough skin to close a paw defect?
Another complication associated with surgery on the foot is a shortage of skin needed to close a defect on the paw. This is common in cases of large mass removals or shearing injuries. In these scenarios, a technique termed the phalangeal fillet is used to transpose skin from a sacrificed digit over the defect in the paw (Figure 2). Although a relatively more complex procedure, this unique flap allows for closure of defects that would otherwise be impossible.

What about routine complications?
Short-term lameness is to be expected immediately following surgery for uncomplicated digit amputation; however, other complications are common as well. One study found that nearly 40% of dogs had short-term complications, other than lameness, following digit amputation.3 These complications included dehiscence with and without infection, discharge from the wound, and delayed healing attributed to licking by the dog.

Owners should be made aware of the potential for short-term complications; however, long-term outcomes are typically excellent. Minimization of complications may be achieved with meticulous surgical technique (in particular, tension-free closure and precise apposition) and owner adherence to e-collar use or bandage management. Applying a light, soft, and padded bandage for 1 to 2 weeks postoperatively is common and may help protect the incision from environmental contaminants, licking, and splaying of the digits during early weight bearing. Discontinuation of bandaging may be necessary if pododermatitis or bandage management becomes an issue.

Conclusion
Although short-term complications are relatively common after digit amputation, this surgery is typically well tolerated by dogs, with good long-term outcomes. Nonetheless, clients should be informed of potential complications to ensure a positive experience for both the client and patient.

Kassidy Burgess is a fourth-year veterinary student at Midwestern University in Glendale, Arizona. She has a strong passion for small animal surgery and hopes to complete a surgical residency in the future. In her free time, Kassidy Burgess loves road trips and exploring the great outdoors.

Stephanie Shaver, DVM, DACVS-SA, is an ACVS board-certified veterinary surgeon and assistant professor of small animal surgery at Midwestern University. She enjoys hiking, travel, friends, family, and teaching veterinary students.

References available at dvm360.com
CONTINUING EDUCATION PROGRAM INSTRUCTIONS
Manage Osteoarthritis in Young Dogs Before Signs Develop
by David L. Dycus, dvm, ms, ccrp, dacvs-sa

Description:
This course describes the risk factors associated with canine osteoarthritis (OA), the importance of detecting the disease early, the use of OA screening tools, and the necessity of proactive multimodal management.

Learning Objectives:
Readers will be able to identify dog breeds at higher risk of OA in their practices, discuss the use of validated diagnostic and staging instruments, describe the role of early intervention in helping slow disease progression (including the use of disease-modifying osteoarthritis drug injections), and create practice protocols designed to help patients live more comfortable lives.

CE Category:
Medical

CE Method of Delivery:
Journal with Online Test available anytime

CE Hours:
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Manage osteoarthritis in young dogs before signs develop

By identifying dogs at risk of osteoarthritis (OA), primary care veterinarians and surgeons can partner to aggressively manage OA and slow its progression.

By David L. Dycus, DVM, MS, CCRP, DACVS-SA

Too many of my first-time patients are 2- to 4-year-old Labrador retrievers with end-stage developmental elbow disease and advanced osteoarthritis (OA). These dogs want to be happy and bouncy and live active lives, but they cannot, because their elbows bother them. I can often address these patients’ elbow disease with surgery, but their outcomes are hampered by OA. They have already developed such severe arthritic changes that all we can do is try to maintain some quality of life through multimodal management options.

Primary care veterinarians and orthopedic surgeons want the best outcomes for OA patients. I would like more of my patients to be referred at the first signs of developmental orthopedic disease. We know dogs with developmental elbow disease will develop OA. Our goal should be to diagnose these young dogs early in life. By identifying this risk factor of OA, we can minimize the changes and, hopefully, delay advanced OA until a later age.

Identify OA risk, not disease

I encourage primary care veterinarians to shift their focus from diagnosing OA in old dogs to identifying young dogs at risk for developing OA (Table 1). Most people think of OA as being an old dog’s disease, but that is incorrect. Age-related arthritic changes often occur in people and, sometimes, even in cats. In dogs, however, OA is typically secondary to developmental orthopedic diseases that begin early. Therefore, dogs have the potential to develop OA at any stage of life, from puppyhood to the senior years.

That is why I recommend that primary care veterinarians begin assessing dogs for OA at 13 to 16 weeks of age. Consider a puppy that visits the clinic with lameness. A veterinarian’s first instinct may be that the dog has suffered a soft tissue injury, because puppies will be puppies. However, subtle soreness and stiffness are often red flags for a bigger issue. I advise primary care veterinarians to be as aggressive as possible in reaching a diagnosis in these cases. If the issue turns out to be a soft tissue injury, the dog owner and veterinarian can rest easy. If an osteochondritis dissecans lesion or evidence of developmental elbow disease is found, the veterinarian will be glad it was detected early enough to intervene surgically or begin proactive measures that will contribute to the best quality of life and help slow OA (Table 2).

Discuss OA with owners of young dogs

Identifying young dogs at risk of OA requires a proactive conversation with dog owners. Many veterinarians hesitate to talk about OA during preventive care visits due to lack of time and the belief that OA conversations are negative. (See “The 5-minute preventive care osteoarthritis (OA) exam,” below.) I suggest positioning OA positively with other common wellness topics (eg, vaccinations, dental health). A quick mention of OA allows the veterinarian to raise awareness of the disease with every client. This is important, because most estimates show that 1 in 5 dogs are affected by canine OA.1 Even dogs without risk factors may develop OA, such as those having a secondary condition (eg, torn cranial cruciate ligament).

When an at-risk dog is identified, a more in-depth OA conversation can begin. Clients can be told that there is no way to definitively predict when arthritic changes will develop or how severe they will be. A dog may experience severe changes at a young age or mild changes at an old age. Monitoring the dog’s condition and starting proactive measures early helps ensure that clients are prepared to act if issues arise.

Unfortunately, too many dog owners, including those whose dogs are referred for surgery, have no awareness of OA. They have not been educated about the potential for OA to develop, and they are surprised that their dogs suddenly need intervention.

Bring it all together with a staging tool

To help facilitate the OA discussion with all clients and to support identification of at-risk dogs, primary care veterinarians should move beyond a simple checklist and begin using an instrument like the Canine OsteoArthritis Staging

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### Table 1. Risk Factors for Canine OA

<table>
<thead>
<tr>
<th>Breed</th>
<th>All breeds are susceptible to OA, but large- and giant-breed dogs (eg, golden retrievers, German shepherds, Labrador retrievers, mastiffs) are most affected.²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excess body weight</td>
<td>Obesity does not directly cause OA, but excess weight can alter joint-loading parameters and cause development of arthritic changes.</td>
</tr>
<tr>
<td>Genetics</td>
<td>Developmental orthopedic conditions are the best predictors of whether a dog will develop OA.³ Most conditions begin to develop early in a dog’s life. Diagnosis of the following can be a precursor to OA:</td>
</tr>
<tr>
<td>- Osteochondrosis and osteochondritis dissecans. These lesions may be found in the shoulder, elbow, stifle, or hock.</td>
<td></td>
</tr>
<tr>
<td>- Elbow and hip dysplasia. Even when dogs are puppies, palpating the elbows and hips is important. Dogs with developmental elbow disease tend to develop OA. For the hips, checking for an Ortolani sign to determine whether laxity is present is advised. If there is concern about laxity, the breed demonstrates a high prevalence of hip dysplasia, or the dog is from a known family of dogs with hip dysplasia, consider completing a PennHIP evaluation to measure the distraction index and provide stronger objectivity about the potential for arthritic changes to develop.</td>
<td></td>
</tr>
<tr>
<td>- Angular limb deformity and joint-related incongruity. These can result from genetics or injuries to the growth plate. For example, damage to the distal ulnar growth plate can cause angular limb deformity that ultimately damages the corpus or elbow, resulting in incongruity.</td>
<td></td>
</tr>
<tr>
<td>- Patellar luxation. Puppies with patellar luxation may not exhibit clinical signs, and immediate surgical correction likely is not needed. However, movement of the kneecap will create atypical cartilage wear and tear, which is a precursor for developing evidence of arthritic changes.</td>
<td></td>
</tr>
<tr>
<td>- Any abnormalities in or around the joint. These may lead to arthritic changes.</td>
<td></td>
</tr>
</tbody>
</table>

OA, osteoarthritis; PennHIP, University of Pennsylvania Hip Improvement Program.

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Tool (COAST). This tool provides a platform for creating an objective baseline to identify OA risk factors, track progression of warning signs, initiate intervention, diagnose disease, and monitor management success. COAST guides practitioners through steps that include recording a dog’s posture and gait, joint health based on pain upon manipulation, passive range of movement, and radiography, if completed.

COAST also helps practitioners involve clients in identifying pain in their pets. The COAST approach uses a validated clinical metrology instrument, such as the Liverpool Osteoarthritis in Dogs (LOAD) or the Canine Brief Pain Inventory (CBPI), that is filled out by the client. Such a questionnaire helps clients understand the subtle signs of OA so they can be identified early. Again, practitioners should begin using COAST with dogs at 13 to 16 weeks of age to help the whole care team—the primary care veterinarian, dog owner, and, possibly, an orthopedic surgeon—get ahead of OA.

**Let’s manage early OA together**

Primary care veterinarians are the first line of defense against OA. As they watch patients develop year-by-year, they can proactively manage and diagnose chronic conditions like OA. By introducing OA discussions with puppy owners and monitoring at-risk dogs, they can refer patients to an orthopedic specialist earlier in the disease process.

As an orthopedic surgeon, my role is to reinforce the work of primary care veterinarians. Surgeons can provide a second opinion and can partner in planning proactive management strategies. If a patient eventually needs surgery to address a developmental orthopedic disease, surgeons and veterinarians can work together to manage client expectations and, most importantly, create the best possible outcome for patients. After all, the shared goal is slowing the progression of OA so more dogs can enjoy more active days with the people who love them.

**The 5-minute preventive care osteoarthritis (OA) exam**

Wellness examinations are critical—and crammed. General practitioners need to cover a lot in a short time. But screening dogs with no known orthopedic issues should take less than 5 minutes. Adding this bit of time to wellness exams is well worth it, especially for young dogs at risk of developing osteoarthritis (OA). Here’s how I recommend incorporating an OA exam into wellness visits.

**Prep: Stock the right tools**

Keep a soft tape measure in every exam room. Use it to measure the muscle circumference of every dog’s limbs as a quick, quantitative way to track muscle mass in the medical record. Also, keep a goniometer in every exam room to objectively quantify range of motion.

**Minute 0: Ask clients to complete the Canine Brief Pain Inventory (CBPI) questionnaire**

Technicians can jumpstart the OA exam by asking clients to complete a clinical metrology questionnaire, such as the CBPI, while waiting on the veterinarian to enter the examination room. The easy-to-read and -understand CBPI questionnaire takes just a few minutes to complete and allows clients to rate their dog on items such as being able to walk, rising to standing from lying down, and climbing stairs.

**Minute 1: Start the OA conversation**

When you enter the exam room, take a quick look at the clients’ completed CBPI form. If the scores indicate little to no pain, let them know their dog doesn’t appear to be showing any early signs of OA. Alternatively, if the form indicates the dog is experiencing some pain, ask the clients a few open-ended questions to unearth some of the early-OA indicators they might not think to mention. For example, ask what their dog’s first steps look like in the morning. Does the dog seem stiff and then warms up, or does the dog act like it may have slept on its leg wrong? Use the opportunity to explain that these behaviors could be signs of early OA.

**Minutes 2 to 5: Examine each leg from toe to shoulder/hip**

Perform the wellness OA screening examination the same way every time. The examination can occur with the dog in lateral recumbency or standing. I prefer to examine dogs as they are standing, and I get down on the floor rather than using an examination table. The overall goal of the examination is to evaluate all joints of the front and hind limbs, beginning at the toes and working proximally. When evaluating the joints, look for a smooth range of motion through slow trotting and walking downhill and down steps.

**TABLE 2. Proactive OA Management**

| Ongoing COAST use | Monitoring muscle mass and range of motion using COAST throughout the dog’s life ensures that practitioners can measure the success of proactive measures and determine if and when referral to an orthopedic surgeon is warranted. |
| Weight management | Maintenance of a lean body weight is imperative. Managing obesity in puppies is difficult, because they grow so rapidly. However, excess weight in fully grown dogs at risk for OA or with early OA must be addressed. For these dogs, speak to clients about weight loss measures (eg, diet change, restricted caloric intake). |
| Daily exercise (walking) | Low-impact physical activity helps maintain muscle mass and range of motion. Ensure that dog owners understand that daily walking promotes joint health and does not exacerbate problems—a common misperception among many clients. Create a simple exercise plan appropriate for the dog’s underlying condition and affected joints. Here are 2 examples: Hip dysplasia, Promote hip extension and maintenance of muscle mass by walking up small inclines and stairs. Stretching, dancing, and performing sit-to-stand exercises help maintain range of motion. | Stifle issue. Improve stifle range of motion through slow trotting and walking downhill and down steps. |
| DMOAD injections | Protecting dogs’ cartilage and mobility is preferable to trying to regain it. DMOADs are designed to prevent further joint damage as they relieve inflammation. The only FDA-approved DMOAD, polysulfated glycosaminoglycan, is proven to inhibit the loss of proteoglycan, collagen, and hyaluronic acid. Practitioners will see the most success when they use DMOADs early in the disease process, before dogs experience advanced signs of OA. The ideal candidate for DMOAD use is a 7- to 8-month-old puppy that exhibits some laxity and discomfort in the hips, which can be an early indicator of OA. In this situation, the DMOAD mechanism of action can help reduce the loss of articular cartilage in the synovial joints, slow the progression of joint structural damage, and promote healthy joint component maintenance. |

**COAST, Canine Osteoarthritis Staging Tool; DMOAD, disease-modifying osteoarthritis drug; FDA, United States Food and Drug Administration; OA, osteoarthritis.**

**TABLE 3. Proactive OA Management**

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**COAST, Canine Osteoarthritis Staging Tool; DMOAD, disease-modifying osteoarthritis drug; FDA, United States Food and Drug Administration; OA, osteoarthritis.**
Multimodal canine OA management

Osteoarthritis (OA) products used to treat canine OA

Nonsteroidal anti-inflammatory drugs (NSAIDs): NSAIDs are approved by the United States Food and Drug Administration (FDA) to help manage the pain and inflammation associated with canine OA. Early use of an NSAID can help a general practitioner determine whether a painful incident is an OA flare-up or a longer-lasting effect that could require surgical referral. Although NSAIDs help control the signs of OA, they do not treat the disease of OA.

Disease-modifying osteoarthritis drugs (DMOADs): DMOADs act on the tissues involved in OA to prevent the progression of structural changes. Currently, polysulfated glycosaminoglycan is the only FDA-approved DMOAD approved for use in veterinary medicine. Like NSAIDs, this DMOAD is available only by prescription from a veterinarian. Although the veterinary DMOAD is proven to help restore joint lubrication and renew the building blocks of healthy cartilage, it is less effective on advanced OA disease, once cartilage wears away completely, it cannot be restored.

Nutraceuticals or supplements: Several nutraceuticals and supplements are available. However, it can be a “buyer beware” market, because these products are not approved by the FDA. In the absence of FDA regulation, there are no processes to ensure the safety or efficacy of a nutraceutical or supplement. There also are no legal ramifications if a nutraceutical or supplement does not meet the label claims or ingredient makeup included on the product label. In fact, a study of glucosamine levels in commercial equine oral supplements for joints showed that some had no levels of the “active” ingredient, whereas others actually contained 221% of levels listed on the product labeling.

Differences between products used to treat canine osteoarthritis (OA)

Nonsteroidal anti-inflammatory drugs (NSAIDs): NSAIDs are approved by the United States Food and Drug Administration (FDA) to help manage the pain and inflammation associated with canine OA. Early use of an NSAID can help a general practitioner determine whether a painful incident is an OA flare-up or a longer-lasting effect that could require surgical referral. Although NSAIDs help control the signs of OA, they do not treat the disease of OA.

Disease-modifying osteoarthritis drugs (DMOADs): DMOADs act on the tissues involved in OA to prevent the progression of structural changes. Currently, polysulfated glycosaminoglycan is the only FDA-approved DMOAD approved for use in veterinary medicine. Like NSAIDs, this DMOAD is available only by prescription from a veterinarian. Although the veterinary DMOAD is proven to help restore joint lubrication and renew the building blocks of healthy cartilage, it is less effective on advanced OA disease, once cartilage wears away completely, it cannot be restored.

Nutraceuticals or supplements: Several nutraceuticals and supplements are available. However, it can be a “buyer beware” market, because these products are not approved by the FDA. In the absence of FDA regulation, there are no processes to ensure the safety or efficacy of a nutraceutical or supplement. There also are no legal ramifications if a nutraceutical or supplement does not meet the label claims or ingredient makeup included on the product label. In fact, a study of glucosamine levels in commercial equine oral supplements for joints showed that some had no levels of the “active” ingredient, whereas others actually contained 221% of levels listed on the product labeling.

Radiographs: Now or later?

If a canine patient presents to you with an orthopedic issue, taking radiographs of the affected limb and the contralateral limb are essential. During wellness visits, radiographs are not necessary unless you identify an issue or are evaluating a skeletalally immature at-risk breed. If an issue is discovered, the radiographs can be completed at the wellness examination if time permits or can be taken at the follow-up appointment.

Regardless of whether the wellness screening shows signs of potential OA, ensure that clients are aware of the importance of identifying the disease early. Explain that early diagnosis allows for proactive intervention and management, which provides the opportunity to have a greater impact on delaying the effects of OA.

REFERENCES


David Dycus, DVM, MS, CCRP, DACVS-SA, is the chief of orthopedics and director of the Nexus Veterinary Bone & Joint Center and the medical director of Nexus Veterinary Specialists, both located in Baltimore, Maryland. Dr Dycus was named one of the 10 veterinarians to watch in 2018 by dvm360.com, and he has been featured on the “Pet Health and Orthopedics” segment on Sirius XM Doctor Radio. Dr Dycus has a passion for teaching. He frequently writes and lectures for veterinarians and veterinary teams, and he is co-founder and co-director of the Veterinary Sports Medicine and Rehabilitation Institute.

Free COAST resources

Some pharmaceutical companies have developed convenient, interactive digital versions of COAST and the related client questionnaire, which you can find by searching online for “interactive COAST form.”
1. Osteoarthritis (OA) is typically secondary to developmental orthopedic diseases that begin when?
   a. Early in life
   b. After spaying or neutering
   c. In adulthood
   d. Late in life

2. What is the ideal age to begin assessing dogs for OA?
   a. 1 to 2 years of age
   b. 16 to 20 weeks of age
   c. 13 to 16 weeks of age
   d. After age 2

3. Which of the following is NOT included in the article as a reason that practitioners hesitate to discuss OA during preventive care visits?
   a. Lack of time
   b. Belief that OA conversations are negative
   c. Perception that OA is an old dog disease
   d. Impression that other wellness concerns are more important

4. How many dogs are affected by canine OA?
   a. 1 in 4
   b. 1 in 5
   c. 1 in 6
   d. 1 in 8

5. What does COAST stand for?
   a. Canine OsteoArthritis Staging Tool
   b. Canine Osteoarthritis Ambulatory and Sensory Test
   c. Canine Osteoarthritis Standardized Test
   d. Canine Osteoarthritis Adverse Sign Trial

6. Which of the following is NOT part of the COAST assessment process?
   a. Posture and gait
   b. Joint health based on pain upon manipulation
   c. Force plate findings
   d. Passive range of movement

7. All the following are tools that can be used to involve clients and identify pain in their pets EXCEPT:
   a. Liverpool Osteoarthritis in Dogs (LOAD)
   b. Translational Research in Pain (TRIP)
   c. Validated clinical metrology instrument
   d. Canine Brief Pain Inventory (CBPI)

8. Which breeds are most affected by OA?
   a. Large- and giant-breed dogs, including golden retrievers, German shepherds, Labrador retrievers and mastiffs
   b. Small and medium-breed dogs, including Yorkshire terriers, beagles, Corgis, and bull terriers
   c. Brachycephalic breeds, including Cavalier King Charles spaniels, bulldogs, Boston terriers, and pugs
   d. None of the above

9. Which of the following is NOT a risk factor for canine osteoarthritis?
   a. Breed
   b. Excess bodyweight
   c. Genetics
   d. Geographical area

10. Which of the following is NOT a component of multimodal, proactive OA management and treatment?
    a. Ongoing COAST use
    b. Weight management
    c. Disease-modifying osteoarthritis drug injections
    d. All the above
In the veterinary sector, it is becoming more and more apparent that training—clinical and human skills—are no longer optional. According to Caitlin Keat, MS, BS, and Alyssa Mages, BS, CVT, presenters at the Fetch dvm360® Conference in Kansas City, training is integral to a practice’s success.

Keat and Mages are co-owners of Empowering Veterinary Teams (EVT), longtime friends, and experts in helping hospitals and veterinary companies fine-tune aspects of their workplace standards to maintain status at the forefront of the industry.

Since launching in October 2019, EVT has provided webinars, leadership seminars, hands-on workshops, training programs, and training materials designed for a hospital’s specific needs. “Our [adage] ‘inspire, instruct, impact—together’ is what we do for each other and what our ultimate goal is in the work that we do,” Mages previously told dvm360®.

During their Fetch dvm360® presentation, Keat and Mages said training is essential to standardize and create a comprehensive program that supports the team and enacts the positive changes critical for the growth and development of its members, and they detailed the steps to take your team H.I.G.H.E.R.—hire, instruct, goals, hold, empower, and rely.

6 steps proven to take teams H.I.G.H.E.R.

**Hire:** “The first step in creating your impactful team is to fill roles with the right candidates,” the pair recommended. Most often, this takes the form of a traditional interview process to hire a new team member. However, EVT also suggests reaching out within your existing organization to identify experts or find individuals ready for a growth opportunity. In either case, they said it is important to talk with these candidates first to understand their skills, personality, and career goals. It’s also helpful to reach out to their coworkers and leaders to understand their performance in other situations. Always be on the lookout for teammates who bring knowledge and match the social dynamic of the team, they added.

**Instruct:** Part of being a leader is being a teacher and mentor to your staff, even if your veterinary team is brimming with experts. “There are always aspects that are unique to your team, and ensuring you teach and communicate this to new members is fundamental to your success,” they said.

If you have novice staff members on your team, “instruct” takes on an elemental meaning. You will need to teach them the fundamentals of their roles more than you would the experts. Most importantly, they added, leverage your network and your larger team to help. If you connect a junior team member with the right expert, they can help and enhance this training.

**Goals:** Once you have established the ideal team and they are on the path to superior learning, it is time to create team goals.

“Teams will fall apart if they don’t know what they’re working toward achieving,” Keats and Mages advised.

Without a shared purpose, team members will be running in different directions and completing actions that oppose each other. “Imagine a soccer team that doesn’t know which goal is theirs, and players are stealing the ball from each other,” they illustrated. “Well-defined goals help to avoid this and keep your team moving in the same direction.”

A good way to check that your goals are functioning is to check if they are SMART: specific, measurable, achievable, relevant, and time based.
Hold (accountable): Both you and your team need to take accountability and be held accountable. According to Keat and Mages, this means adhering to deadlines, completing actions, and communicating obstacles that may impact either. “This does not mean yelling and screaming over every missed deadline or every mistake,” the pair clarified.

When a mistake arises—and you can guarantee it will—identify the root cause rather than looking for someone to blame. As a leader, you must help team members understand their mistakes and involve them in finding a resolution. Try to move forward, Keat and Mages told their audience: “Dwelling on the mistake or searching for someone to blame does not erase the mistake; it just makes your team scared of making mistakes. This fear can stop their progress altogether.”

Empower: By following the preceding steps, your veterinary staff is now composed of experts, you have set the direction, and you are all accountable. Now comes the most important part: Make sure the staff is empowered.

“You are not an expert in every field. That is why you’ve surrounded yourself with them. You cannot possibly understand every detail or make every decision,” they explained.

This is another great example of when you need to rely on your people. Give them the power to make decisions and take actions within their area of responsibility. Support their decisions and actions to exemplify your trust. Come to terms with the fact that not every decision will be perfect. Remember, this is why you hold each other accountable.

“This is where the power of your team to get things done, to impact, and inspire begins to take shape,” Keats and Mages said. Unfortunately, this is also where many leaders fall apart. Too often, practice owners feel it is their responsibility to question every decision and approve every action. However, this is ineffective and grinds productivity to a halt. Remember the steps you took to get your team here and believe in the process.

Rely: This is another area that presents a roadblock for leaders. “Just as they believe they need to make every decision, they believe they need to answer every question,” the duo explained.

Instead, Keat and Mages encouraged attendees to accept that they are not the experts in everything, and it is impossible to be. “The team you have built is your council of trusted advisors. Use them,” they said.

As your veterinary practice faces tough challenges or decisions, turn to your council. Consider their thoughts and concerns, and ask questions to understand the implications, the consequences, and the benefits of their advice. Then collect all these pieces of advice and make a more informed, intelligent decision. Do not be afraid to turn an answer over to your teammate if you are unsure.

“Answering a question incorrectly undermines your credibility way more than letting someone else answer or even saying ‘I don’t know, but I will find out,’” they said.

Putting it into practice
Many of these leadership behaviors are mastered over time. They do not always come naturally. If you find your team struggling, come back to this article and reset. Keats and Mages recommended even selecting a single step from the H.I.G.H.E.R. process that you can focus on. Keep practicing these skills and motivating your staff. In time, you will find that every team you create is an empowered veterinary team that reaches HIGHER.

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Nutritional management of urolithiasis in dogs and cats

Explore the crucial role nutrition plays in treating this frustrating condition and how to determine which diet is best for your patients.

By Julie Byron DVM, MS, DACVIM

But doc, he was on that diet you prescribed. How did he get stones again?” Does that sound familiar? Like many of you, I have heard this question countless times from owners of dogs and cats prone to stone formation. It’s frustrating for owners who have already put their pet through surgery and think that the prescribed diet will prevent future urolithiasis to discover that those pesky rocks have returned. It is equally frustrating for us to see dogs that have had 3 or more cystotomies for recurrent calcium oxalate stones or to have to manage a male bulldog with a scrotal urethrostomy. This situation highlights the importance of understanding the role of diet in a variety of urolith types, what it can and cannot do, and managing client expectations.

Exploring the role of nutrition

For many years it has been known that diet plays a role in causing—and managing—urolithiasis in people and in small animals. The relationship between urease-positive bacterial urinary tract infections and struvite uroliths in dogs was noted more than 70 years ago.¹ In the 1980s, studies by Carl Osborne and his team highlighted the significance for dissolving these uroliths of maintaining urine acidity through dietary modification in addition to antimicrobial treatment.² New discoveries about the role of urine pH and dietary magnesium levels in the risk of feline struvite urolithiasis led to changes in commercial cat food formulations in the 1980s and drastically altered the prevalence of these uroliths. However, after years of decline in cats, a recent study indicated a rise in their prevalence at a major urolith center.³ Although there is a clear role for diet in the dissolution and prevention of struvite urolithiasis in both dogs and cats, prevention of lower urinary tract infection with urease-positive bacteria is also crucial in dogs.

There are several veterinary therapeutic formulations available for the dissolution and prevention of struvite urolithiasis, and they typically work because of their low pH and high calcium concentration. The majority of patients that form calcium oxalate uroliths, and even struvite uroliths, do not require additional prevention measures. However, the majority of patients that get urolithiasis, those patients that get uroliths, their presence does not indicate a need to place a male sex, neutering, breed, and obesity have been identified as predisposing to their development. Although dogs can be tested for urinary tract infections and struvite urolithiasis in the dog and cat. Previously, a protein-restricted diet was used for dissolution but not advised as complete maintenance for long-term prevention. In the past 10 to 15 years, the veterinary therapeutic food industry has explored healthier, more balanced diets and their impact on the dissolution of struvite uroliths.⁴ Several studies, like the one published using BLUE Natural Veterinary Diet W+U, demonstrated dissolution of naturally occurring feline struvite uroliths in less than a month.⁵ Our study also demonstrated the importance of feeding the diet exclusively to achieve the best results. Dietary management of struvite urolithiasis is extremely successful in cats and dogs if risk factors for UTI are also addressed.

Unfortunately, diet has been shown to be less effective in prevention of calcium oxalate uroliths in dogs and cats. As a greater understanding of struvite urolithiasis reduced its prevalence, the frequency of calcium oxalate grew in both cats and dogs, according to several prominent urolithiasis laboratories. In fact, an unfortunate consequence of the trend toward urinary acidification of cat foods may have led to an increase in calciuresis and risk of nephro- and cystolithiasis.⁶ The predisposition to calcium oxalate urolithiasis is complex, multifactorial, and incompletely understood. Factors such as male sex, neutering, breed, and obesity have been identified as predisposing to their development. They are frequently recurrent, and management strategies usually revolve around increased water intake, reduction of urinary calcium excretion, an increase of inhibitors, and surveillance with minimally invasive removal of small uroliths.⁷

Currently, the available diets and research in calcium oxalate prevention focus on reduction of relative supersaturation (RSS) by reduction of calciuresis, oxalate, and other promoters in the urine, increased urinary citrate and volume, and subsequent dilution of lithogenic elements. Two ways to accomplish this may be to add sodium chloride or potassium chloride to the diet.⁸,⁹

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A closer look at calcium oxalate uroliths

At this time, there is no commercial diet available that will dissolve calcium oxalate uroliths, and even with the reduction in RSS and induction of isosthenuria, dietary prevention of these uroliths has been disappointing. The majority of dogs, and many cats, who develop calcium oxalate uroliths will have a recurrence. Therefore, it is important to educate owners on the role a veterinary therapeutic diet plays in this disease. No calcium oxalate diet has been shown to prevent recurrence, but delayed recurrence is more likely with its use. Surveillance and removal of very small stones using voiding urohydropulsion and other minimally invasive techniques are likely the best approach to avoid surgery.

Urate urolithiasis is most commonly seen in dog breeds with the SLC2A9 transporter mutation or with congenital portosystemic vascular shunts. There is a block to the complete metabolism of dietary purines in the liver and an increase in urinary excretion of uric acid. Historically, dogs were placed on very low protein diets to reduce the purine content; however, there other diets are now available that use egg whites or vegetarian sources of protein to reduce the purine content while maintaining an adequate protein level.1

Cats can also develop urate uroliths secondary to liver dysfunction, but more commonly they are idiopathic, with no identified genetic or metabolic cause. As with dogs, a low purine diet would be ideal, but there are no commercial veterinary therapeutic diets specifically formulated for cats. Purina HA and Royal Canin HP are lower in purine without a significant protein restriction. Low-protein diets like those for treatment of kidney disease are often used instead, and efforts at maintaining a more neutral to basic urine pH can be made since urate is less soluble in acidic urine.

A rise in cystine urolithiasis cases

During the past 10 to 15 years, we’ve observed a significant increase in the number of cystine urolithiasis cases. It is suspected that this is caused by the emergence of an androgen-dependent mutation in some large breed intact males that leads to increased cystinuria. Although dogs can be tested for this mutation, neutering of all intact males is recommended to prevent passage of any abnormalities to offspring. 2 Cystine is an essential amino acid, so a diet containing cystine and its precursor methionine near AAFCO minimum levels is advised.3 Alkalization of the urine is also recommended due to the high solubility of cystine in basic urine. Limiting high sodium diets is recommended since some studies have shown that increased sodium intake increases cystine excretion in the urine. If nutritional management is unsuccessful, oral 2-mercaptopropionylglycine (2-MPG) may be tried. This drug complexes with cystine and has been used to dissolve and prevent uroliths. Although cystine urolithiasis in cats is very rare, avoidance of these amino acids and a low protein diet may also be advised.4

The most important nutritional aspect of managing urolithiasis of any type is water intake and dilution of the urine. Several urine-specific gravity targets have been suggested, with the most recent being less than 1.020 in dogs and less than 1.030 in cats. A diet of canned food, watering down of dry diets, and placement of fountains or other hydration devices in the animal’s environment are important ways to achieve this goal.

Understanding crystalluria

Although urate and cystine crystals may indicate a dog or cat is prone to develop those types of uroliths, the same is not true for struvite or calcium oxalate crystals. These can be found in concentrated urine of varying pH levels in animals that will never form uroliths. Unless the patient is already known to form uroliths, their presence does not indicate a need to place the patient on a special diet. In those patients that get urolithiasis, their presence indicates a need for additional prevention measures.

The bottom line

Nutrition plays a crucial role in managing urolithiasis in dogs and cats. Veterinary therapeutic diets have been specifically formulated for the management of several types of urolithiasis. If a patient will not consume the recommended diet, consider a consultation with a board-certified veterinary nutritionist for additional measures.

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Ripping off the bandage: Mastering bad news delivery in veterinary medicine

Make a challenging conversation more manageable with a little structure and a vote of confidence—plus why we really need to master this skill.

By Carla Johnson, DVM

Communication training is now a required component of veterinary curricula. This is a change that has taken place under the directive of the American Veterinary Medical Association Council on Education over the past 2 decades. Previously, most veterinarians received no training in delivering bad news; they learned the hard way, through trial and error. Although this skill comes more naturally to some of us than others, the reality is that “on-the-job training” potentiates stress during what is already a challenging make-it-or-break-it transitional period for new graduates. Many of us have coped by postponing or sugarcoating these dreaded “bad news” conversations.

We are often reluctant to upset clients with a terminal or scary diagnosis until we are confident about the likely outcome of the patient’s condition. This is understandable, but rarely are we absolutely sure of a terminal diagnosis or of how long the patient may have to live. Because of high costs and/or the invasiveness of some treatments, we seldom have the benefit of the advanced diagnostics afforded in human medicine and frequently must narrow down the diagnosis or make an educated guess. The good news is that in these cases, we usually have a good idea of what is wrong with the patient. So why do we sometimes hold our tongue? Why might we send patients home without having key conversations with clients about anticipated diagnosis, prognosis, expectations for disease progression, or anticipated outcome? Why might we avoid engaging in honest, open dialogue with clients when those conversations might lead them down the road of anticipatory grief? Why might we be reluctant to prepare clients for the truth of what might come?

“Having to be the bad guy can be very draining,” according to Ryane Englar, DVM, DABVP (canine and feline practice), who delivered the presentation, “Bad News Delivery: Why Are We So Bad at It?” at the dvm360® Fetch conference in Kansas City. Bad news conversations include discussions about medical errors, the unexpected death of a patient, financial constraints, a terminal diagnosis in an apparently healthy pet, or euthanizing animals with behavioral issues. How can we improve our skills to facilitate these crucial conversations?

First, as Englar points out, we must realize that we’re not alone in terms of the mixed bag of emotions that these conversations are likely to elicit. We may experience frustration, guilt, doubt, uncertainty, and fear. We often anticipate how clients might react. We may worry they will hate us, blame us, cry, become angry with us, even retaliate. We may fear saying the wrong thing and making the situation worse. We may fear that we’re wrong, and also that we’re right. If we’ve made a mistake, we may experience shame. We may question if we truly belong in this profession. The impostor syndrome may resurface.

We are in good company, not just among veterinarians, but also among all medical specialists. In human medicine, end-of-life discussions are even more critical, as the client is also the patient. But even MDs may skirt around uncomfortable topics when dealing with terminal illness and medical errors, and formal training in this area is a relatively recent development. The problem is multifactorial, but essentially doctors “worry more about being overtly pessimistic than overly optimistic” and rely on hope as a plan. The results are that the patient and family are not prepared for the loss or for what death will be like. In a study called Coping With Cancer, one-third of patients were given a palliative care specialist—essentially, someone to talk with. These patients experienced less suffering, less cardiopulmonary resuscitation, and fewer visits to the emergency room (ER), and were dramatically less costly to treat at the end of their lives. Their relatives were better prepared for the loss and for the decisions that had to be made. It wasn’t the details that made a difference; it was the conversation. As Atul Gawande puts it, “If end-of-life discussions were an experimental drug, the FDA would approve it.” It also helps to recognize the way bad news is delivered and received impacts both sender and receiver. Thus, it affects us as veterinarians. But structure can be our friend in scary situations. Englar recommends setting up a structured approach to have the most impact. Check in with yourself first, she points out, breathe (it’s easy to forget that), and pause. Ask yourself whether you’re in the right frame of mind, can focus on the client’s needs, and put them before your own. If not, take some time to center yourself.

Next, check in with the client. To accomplish this, we can adopt the mnemonic SPIKES model used in human medicine.

**Setting:** Pick a place that is private and quiet for a face-to-face delivery of bad news, or find a telephone away from noise and interruptions (but only if a phone call cannot be avoided). Set aside time and ask the client for permission: “Is this a good time to talk about Fluffy’s results?” Tell them you have important news to share. Consider scheduling a time when an in-person conversation is possible. Make eye contact appropriately rather than avoiding their gaze, if you’re meeting in person. If you are having to interact over the phone, it may take longer to relay news than in person because neither of you can see or interpret the other’s body language. It also takes longer to share information when the client is distracted because you may have to repeat information.

**Perspective:** Think about how the client views the situation. If they are at home, how do they think their pet is doing? Clients may not hear what we’re saying unless we first address what’s on their minds. Ask “What are you most concerned about?” “How do you think Fluffy is feeling?” “How has Fluffy been since we last spoke?” Let them share their thoughts. This way, before giving them the news, you open a line of communication that can lead to a more focused, in-depth conversation or a shorter explanation later. If it is a surprise diagnosis, you can shorten this part to avoid undue client anxiety, but don’t just “dump the bad news.”

**Information sharing:** Giving the diagnosis is the next step. Begin by delivering a “warning shot.” We each have our own way of saying the same thing. Some sample warning shots include:

- “I’m afraid that I don’t have good news to report.”
- “What I’m about to share with you is really important.”
- “I need to talk to you about something serious.”
- “I share your concerns; I am really worried about Fluffy, too.”
- “This isn’t the news we were hoping for.”

Relay the news, then pause to let clients absorb it. It is important to pause for as long as they need.
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Knowledge: At this point, you can discuss what you know about the condition. In the 1990s, medical ethicists Ezekiel and Linda Emanuel described 4 different ways of talking about a diagnosis or medical choice in human medicine: paternal, informative, deliberative, and interpretive. The paternal approach directs people to do what you want them to do while providing little information; the informative gives them all the details of the diagnosis and the medications and allows them to choose what to do; in deliberative mode, the doctor acts as a friend and makes specific recommendations; and interpretive combines information and direction, with the doctor acting as an advisor (not a friend) and the client making the choices. Far too often we use the informative method, overwhelming clients with facts and options but offering no direction. The better strategy is likely the interpretive: alternately informing and listening so that you can best guide clients by answering their questions. Let people know that you are worried, then “ask, tell, ask” as you deliver bad news. Ask what the client wants to know, answer the question, then ask whether they understood. This approach is now known as “shared decision-making” and seems to be the best way to assist people at times like these, but it requires a conversation. What does this mean for the pet? How much will it cost? What are the treatment options? How much time is this going to take? Is the condition curable? What is the goal of treatment? If not curative, is it palliative? Will it be painful? Will it significantly affect the animal’s life span? Is the testing complete? Also specify what you don’t yet know.

Empathize: How we handle the situation depends on our personal style and on how the client is responding to the news. Many of us struggle here. However, there are 2 main ways of empathizing. Cognitive empathy involves understanding where the client is coming from. You may or may not agree, but you don’t have to feel what the client feels. You’re simply acknowledging it. Emotional empathy, on the other hand, means that you are putting yourself in the client’s shoes and trying to appreciate in every way what it is like to be them. Cognitive empathy is genuine, but it’s not as draining as emotional empathy and so is easier to display. You may verbalize it to the client by saying, “I’m not you and I do not know what you are feeling, but I can understand how or why you might feel this way,” said Dr Englar.

Emotional empathy, on the other hand, is raw and more difficult to sustain. If experienced regularly, it can drain you and eventually contribute to compassion fatigue. If you do go there—and there are some clients who may draw emotional empathy out of us more than others, such as the long-term client whose dog we’ve cared for since puppyhood—know how to get yourself back from the brink of emotional exhaustion. Know your limits.

Empathy can be displayed in words: “What can I do to help?” “This must be really hard; help me to better understand your situation.” “I care; what do you need right now?” Don’t give advice, and don’t change the subject. Never interrupt the speaker. Try not to invalidate the speaker’s feelings. Don’t end the conversation. Let them share. Empathy is deeper than sympathy, and it is interactive. Those who struggle to display empathy verbally may choose to show it through actions and gestures, like simply sitting beside the person who is grieving.

Summarize and strategize: This is the final step. Ask “Where do we go from here? Do you need to call someone, or get back to me? What do you need that will help you with the next step?” Clients may not even be ready to talk about the next steps, but you should at least leave the door open for them to discuss the plan at their convenience. You may make an offer of next steps as a gesture of goodwill; it can be something as simple as a phone call to check back with them in the near future.

Takeaways: Being up front with clients
How do you communicate with clients without making them feel bad? Well, the goal is to make bad news survivable, not pain-free. It is going to hurt. Clients need us to hold their hands during the patient’s life, and this includes the end. They expect it. Working in the ER, I am delivering bad news multiple times a day, and, in some cases, all day long. Much of the bad news I relay has already been diagnosed at the pet’s regular hospital, but either it has not gotten through, was diluted and minimized, or wasn’t addressed at all.

Guidance at the end of a pet’s life may actually be more crucial for clients than in the middle, and I think that’s why we receive most gifts and cards after euthanasias. We rarely get them after a difficult diagnosis followed by a successful treatment plan, right?

Whether or not it makes sense, clients need to know that you are on their side at the end, and that includes being straight with them. You don’t need to lie and say that Fluffy has cancer, if you’re unsure. Instead, you can say, “I am really worried that this is cancer, and not the treatable kind. I cannot be sure right now, but if I were to take a nonscientific guess, I would say that there is a 90 [or any number] percent chance that this is a terminal cancer. I do not know how long she has, but it could be as little as 2 weeks.” This part is important. People do not know that cancer progresses faster in cats and dogs than in humans, and we tend to catch it at an already advanced state. You can add, “We can send you to a specialist and have a biopsy done to find out. Are you interested in that?” Then, you can estimate the cost and possible risks if you know.

It is also acceptable to say that you think it is an untreatable disease and that doing further testing might not help with treatment. You are allowed to say what you think, as long as you offer a workup to confirm or refute your suspicions. You are also allowed to guess at how long the patient might have, as long as you say it is a guess. Sometimes I will say “days rather than weeks,” “weeks rather than months,” or “months rather than years.”

If you use the informative approach, what the client hears is that there is a list of equally likely possibilities, that we don’t have any idea what disease the pet has, and that there is hope that “whatever it is” is totally curable or most likely easily fixable.

We might think that the clients cannot handle it. Believe me, they can. I am tearfully thanked by pet parents many times a day for “giving it to them straight” or “not sugar-coating it.” The bond between doctor and client does not have to break at the end of a pet’s life or period of good health, or in the face of mistakes, accidents, grief, or anxiety. With just a conversation and an open line of communication, we can make a difference for clients, even in situations in which we can no longer make a difference for the patient. What if it just takes a conversation?

Ryane Englar, DVM, DABVP (Canine and Feline Practice), is founding faculty, associate professor, and director of veterinary skills development at the University of Arizona College of Veterinary Medicine in Oro Valley where she designs and implements the professional and clinical skills curriculum for first and second-year veterinary students. Englar is the sole author of various books including. Performing the Small Animal Physical Examination, Common Clinical Presentations in Dogs and Cats, and Writing Skills for Veterinarians, and is a proponent of teaching interpersonal skills in the veterinary curriculum. She has also developed a state-of-the-art, simulation-based communication curriculum for the University of Arizona and continues to research client communication to help facilitate interpersonal skills training sessions with students around the globe.

References available at dvm360.com
Are your patients getting the canine osteoarthritis (OA) pain and inflammation relief they need?

Recommend Galliprant as first-line treatment

- **FIRST-IN-CLASS** non-COX inhibiting NSAID1
- **MODE OF ACTION TARGETS** canine OA pain and inflammation while reducing the impact on GI, kidney, and liver homeostasis1,2
- **FOR ALL STAGES** of OA from the earliest clinical signs*

*Approved for use in dogs older than 9 months of age and greater than 8 pounds. Monitoring is recommended if used long-term.

**INDICATION**

Galliprant is an NSAID that controls pain and inflammation associated with osteoarthritis in dogs.

**IMPORTANT SAFETY INFORMATION**

Not for use in humans. For use in dogs only. Keep this and all medications out of reach of children and pets. Store out of reach of dogs and other pets in a secured location in order to prevent accidental ingestion or overdose. Do not use in dogs that have a hypersensitivity to grapiprant. If Galliprant is used long term, appropriate monitoring is recommended. Concomitant use of Galliprant with other anti-inflammatory drugs, such as COX-inhibiting NSAIDs or corticosteroids, should be avoided. Concurrent use with other anti-inflammatory drugs or protein-bound drugs has not been studied. The safe use of Galliprant has not been evaluated in dogs younger than 9 months of age and less than 8 lbs (3.6 kg), dogs used for breeding, pregnant or lactating dogs, or dogs with cardiac disease. The most common adverse reactions were vomiting, diarrhea, decreased appetite, and lethargy. For full prescribing information see Galliprant package insert.


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GALLIPRANT® (grapiprant tablets)

For oral use in dogs only
20 mg, 60 mg and 100 mg flavored tablets
A prostaglandin E2 (PGE2) EP4 receptor antagonist; a non-cyclooxygenase inhibiting, non-steroidal anti-inflammatory drug

Caution:
Federal (USA) law restricts this drug to use by or on the order of a licensed veterinarian.

Before using Galliprant, please consult the product insert, a summary of which follows:

Indication:
GALLIPRANT (grapiprant tablets) is indicated for the control of pain and inflammation associated with osteoarthritis in dogs.

Dosage and Administration:
Always provide “Information for Dog Owners” Sheet with prescription.

Use the lowest effective dose for the shortest duration consistent with individual response.

The dose of GALLIPRANT (grapiprant tablets) is 0.9 mg/lb (2 mg/kg) once daily.

Only the 20 mg and 60 mg tablets of GALLIPRANT are scored. The dosage should be calculated in half tablet increments.

Dogs less than 8 lbs. (3.6 kgs) cannot be accurately dosed.

The 100 mg tablet is not scored and should not be broken in half.

See product insert for complete dosing and administration information.

Contraindications:
GALLIPRANT should not be used in dogs that have a hypersensitivity to grapiprant.

Warnings:
Not for use in humans. Keep this and all medications out of reach of children and pets. Consult a physician in case of accidental ingestion by humans.

For use in dogs only. Store GALLIPRANT out of reach of dogs and other pets in a secured location in order to prevent accidental ingestion or overdose.

Precautions:
The safe use of GALLIPRANT has not been evaluated in dogs younger than 9 months of age and less than 8 lbs (3.6 kg), dogs used for breeding, or in pregnant or lactating dogs.

Adverse reactions in dogs receiving GALLIPRANT may include vomiting, diarrhea, decreased appetite, mucoid, watery or bloody stools, and decreases in serum albumin and total protein.

If GALLIPRANT is used long term appropriate monitoring is recommended.

Concurrent use with other anti-inflammatory drugs has not been studied. Commonly used protein-bound drugs include cardiac, anticonvulsant and behavioral medications.

Drug compatibility should be monitored in patients requiring adjunctive therapy. Consider appropriate washout times when switching from one anti-inflammatory to another or when switching from corticosteroids or COX-inhibiting NSAIDs to GALLIPRANT use.

The use of GALLIPRANT in dogs with cardiac disease has not been studied.

It is not known whether dogs with a history of hypersensitivity to sulfonamide drugs will exhibit hypersensitivity to GALLIPRANT. GALLIPRANT is a methylbenzenesulfonamide.

Adverse Reactions:
In a controlled field study, 285 dogs were evaluated for safety when given either GALLIPRANT or a vehicle control (tablet minus grapiprant) at a dose of 2 mg/kg (0.9 mg/lb) once daily for 28 days. GALLIPRANT-treated dogs ranged in age from 2 yrs to 16.75 years. The following adverse reactions were observed:

Table 1. Adverse reactions reported in the field study.

<table>
<thead>
<tr>
<th>Adverse reaction*</th>
<th>GALLIPRANT (grapiprant tablets)</th>
<th>Vehicle control (tablets minus grapiprant)</th>
</tr>
</thead>
<tbody>
<tr>
<td>N = 141</td>
<td>N = 144</td>
<td></td>
</tr>
<tr>
<td>Vomiting</td>
<td>24</td>
<td>9</td>
</tr>
<tr>
<td>Diarrhea, soft stool</td>
<td>17</td>
<td>13</td>
</tr>
<tr>
<td>Anorexia, inappetence</td>
<td>9</td>
<td>7</td>
</tr>
<tr>
<td>Lethargy</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>Buccal ulcer</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Immune mediated hemolytic anemia</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

*Dogs may have experienced more than one type or occurrence during the study.

GALLIPRANT was used safely during the field studies with other concurrent therapies, including antibiotics, parasiticides and vaccinations.

To report suspected adverse drug events and/or to obtain a copy of the Safety Data Sheet (SDS) or for technical assistance, call 1-888-545-5973.

For additional information about adverse drug experience reporting for animal drugs, contact FDA at 1-888-FDA-VETS or online at http://www.fda.gov/AnimalVeterinary/SafetyHealth

Information for Dog Owners:
Owners should be advised of the potential for adverse reactions and be informed of the clinical signs associated with drug intolerance. Adverse reactions may include vomiting, diarrhea, decreased appetite, and decreasing albumin and total protein. Appetite and stools should be monitored and owners should be advised to consult with their veterinarian if appetite decreases or stools become abnormal.

Effectiveness:
Two hundred and eighty five (285) client-owned dogs were enrolled in the study and evaluated for field safety. GALLIPRANT-treated dogs ranging in age from 2 to 16.75 years and weighing between 4.1 and 59.6 kgs (9 – 131 lbs) with radiographic and clinical signs of osteoarthritis were enrolled in a placebo-controlled, masked field study. Dogs had a 7-day washout from NSAID or other current OA therapy. Two hundred and sixty two (262) of the 285 dogs were included in the effectiveness evaluation. Dogs were assessed for improvements in pain and function by the owners using the Canine Brief Pain Inventory (CBPI) scoring system.¹ A statistically significant difference in the proportion of treatment successes in the GALLIPRANT group (63/131 or 48.1%) was observed compared to the vehicle control group (41/131 or 31.3%). GALLIPRANT demonstrated statistically significant differences in owner assessed pain and function. The results of the field study demonstrate that GALLIPRANT, administered at 2 mg/kg (0.9 mg/pound) once daily for 28 days, was effective for the control of pain and inflammation associated with osteoarthritis.

Storage Conditions:
Store at or below 86° F (30° C)

How Supplied:
20 mg, 60 mg and 100 mg flavored tablets in 7, 30 and 90 count bottles

Manufactured:
Elanco US Inc.
Greenfield, IN 46140

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November 2018

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How would Walt Disney run a veterinary practice?

“First, think. Second, dream. Third, believe. And finally, dare.” —Walt Disney

By Robert Sanchez

I was 5 years old when I first experienced the magic of Disneyland. I was always intrigued by Mickey Mouse and his costars. I loved Pinocchio, Peter Pan, Beauty and the Beast, and Aladdin, among countless other Disney characters. Although I can’t fully recall my first visit, I know that it made me unbelievably excited to return to this enchanted place. My family and I went to Disneyland every year for vacation, and there was always a crescendo of emotions throughout the entire trip. Walking through the gates, seeing Mickey, adventuring down Splash Mountain, rooting for Indiana Jones to make it under the giant rolling rock of terror, whipping through the stars on Space Mountain, and being with the people I loved most the entire time—it was truly magical.

It was no accident that I felt that way. Walt Disney was a savant at creating memorable experiences. He knew how to delight guests, return adults to their childhood, and imbue the entire experience with a sense of importance and meaning. He could do this because he understood our basic desires and needs as humans. In this article, I share my thoughts on how Walt Disney would run a veterinary practice, one that would elevate the client experience and build the strongest and most meaningful relationships imaginable.

The power of storytelling

When you walk into Disneyland, you are instantly submerged into a sprawling, captivating story with heroes and villains, love and loss, and magic and mystery. The story we tell ourselves about our own life is what gives events and experiences meaning and thus creates our sense of self, confidence, and values. In fact, the most successful businesses are avid storytellers.

So what kind of story should your veterinary practice tell? More importantly, how do you want to tell it? Remember, your practice should be in the love story business. The connection that humans and animals share is sacred, and it’s your duty to protect this special bond. I believe that Walt Disney would turn the design of your animal hospital into a shrine for this love story, one that constantly reminds people what this love means, the vital role it plays in our lives, and how it affects our well-being and happiness. He would do it through carefully curated artwork in every practice room, designed to evoke the right emotion; vinyl quotes throughout the facility; and parking lot placards. In a thousand different ways, he would remind pet owners how precious their love story with their pet is and that this is the place that will protect it.

Be meticulous about creating an unforgettable experience at your veterinary practice, then design everything in a way that promotes this mission.

The 3 basic needs that Walt Disney riffs on are the same ones he would want you to emphasize at your veterinary practice.

1. Safety. We are constantly, and unconsciously, evaluating the safety of our environment. If it feels unsafe, we feel uneasy and look for ways to leave it or make it feel safe again. The quickest way to lose a client is by making them feel uncomfortable and unsafe. You should rigorously train your team to promote emotional safety during every kind of interaction with clients and their pets.

2. Status. We all want to be appreciated and feel as if we matter. That’s why you must make clients feel like they are important to you. From the way your front desk greets them to the way your technicians empathize with them to the way you speak with them, how them how much you value them and their animal companions.

3. Connection. We long to connect with our environment and the people in it. Many veterinary teams are already great at connecting with their clients—those are usually the most successful practices—but if you want to take it up a notch, strategize how to form stronger connections with clientele at your practice.

A simple way to do this is by creating a “discovery” document for each of your clients, in which you meticulously map out what matters to them, their fears, their concerns, notable life events, and more. Before every visit, you can quickly scan the document to reacquaint yourself with their life.

Think like an imagineer

Imagineers design the experience that guests have at Disney parks. If Walt Disney were running a veterinary practice, he would think of himself as an experience designer more than anything. Think about the human needs that you want to address and the story that you want to tell, then imagine the best possible experience that you want your clients to have, for all types of visits. How should it start? How should they wait? What should they see on their way to the exam room? What should they feel once they get to their room? How should they feel when they are talking with you, your technicians, and your support staff? What should they see and feel when they are leaving?

Be meticulous about creating an unforgettable experience in veterinary practice, then design everything about your practice in a way that promotes this mission. It is a backward methodology, but when applied correctly, it is incredibly powerful. 😍

Robert Sanchez is the founder and chief executive officer of Digital Empathy, an award-winning web design and marketing firm for veterinary practices. He lectures at national conferences, leads a team of wonderful employees, sits on the board of VetPartners, and shares his home with 2 very spoiled dogs—Cole and Lula.
When the going gets tough: 4 ways to persevere in veterinary medicine

These useful strategies build resiliency so that you can thrive during adversity.

By Julia Burke, Assistant Editor, dvm360

It’s no secret that veterinary professionals are resilient. During the COVID-19 pandemic, the profession was confronted with significant challenges, yet adjusted to the sudden, drastic changes to successfully meet the new and growing demands.

“Our profession is resilient, and if our profession is resilient, that means the professionals within the profession are resilient,” said Kara Burns, MS, MEd, LVT, VTS (Nutrition). “If we’re resilient it means we [have] recovered from [things] and learned to change course and move forward.”

When facing adversity—from a pandemic to a challenging situation in the clinic—having the right tools to help you maintain resiliency is crucial. Burns shared 4 strategies for persevering in veterinary medicine during difficult times.

1. **Prioritize self-care**
   Maintaining a healthy lifestyle (ie, getting adequate sleep, eating well, and exercising) is key for maintaining resiliency. Additionally, Burns emphasized that veterinary team members have experienced enormous amounts of stress during the pandemic, so practicing these healthy habits is vital for overall mental and physical health.

2. **Nurture close relationships**
   Fostering close relationships with immediate and extended family, team members, and organizations is crucial when trouble arises. Along with having a solid support system, it’s essential to practice effective communication. Let people know when you’re on the brink of burning out and lean on the people you love and trust during challenging times.

3. **View failure as a learning opportunity**
   Failure is inevitable. Although it can be frustrating and even discouraging, it can help you grow personally and professionally. A crucial element of being resilient is accepting that it’s OK to make mistakes.

   “Failure is not fatal. We learn so much when we fail. As long as we are failing forward—taking that failure, taking that feedback from our failures, learning from it, and then applying and moving forward—then we truly aren’t failing,” said Burns.

4. **Maintain a positive outlook**
   When things aren’t going your way, staying hopeful can promote resiliency, Burns said, adding that optimism empowers you to expect good things to occur even when there’s a storm around you. Burns also suggested visualizing what you want. “Studies have looked at visualization, and it really does make a difference. It changes your mind-set, maybe even on the subconscious level,” she said, adding that the first step to altering your reality is seeing the outcome you want and not letting fear of failure hold you back.

**Why resiliency matters**

Burns told attendees that resiliency is a significant trait to possess in veterinary medicine because it:

- provides you with the emotional strength needed to cope with trauma, adversity, and hardship;
- allows you to work beyond setbacks and not let them deter you;
- makes you less likely to feel overwhelmed or helpless; and
- helps you avoid unhealthy coping strategies (eg, avoidance, isolation, and self-medication).
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Revolt® (selamectin)
Topical Parasiticide for Dogs and Cats

**CAUTION:**
US Federal law restricts this drug to use by or on the order of a licensed veterinarian.

**DESCRIPTION:**
Revolt (selamectin) Topical Parasiticide is available as a colorless to yellowish, ready-to-use solution in single dose tubes for topical (cutaneous) treatment of dogs six weeks of age and older and cats eight weeks of age and older. The content of each tube is formulated to provide a minimum of 2 mg/kg (±0.6 mg/kg) of body weight of selamectin. The chemical composition of selamectin is (S,S,S,S)-25-30 (40S,40R)-25-carboxy-40-(4-hydroxyethyl)-14-hydroxyimino-22,23-dihydro-5-hydroxyavermectin A1a.

**INDICATIONS:**
This product is recommended for use in dogs six weeks of age and older and cats eight weeks of age and older for the following parasitic infestations:

- **Dogs:** Revolt kills adult fleas and prevents flea eggs from hatching for one month and is indicated for the prevention and control of flea infestations (Solenopsetriches felis), prevention of heartworm disease caused by Dirofilaria immitis, and the treatment and control of ear mite (Otodectes cynotis) infestations. Revolt is also indicated for the treatment and control of sarcoptic mange (Sarcoptes scabiei) and for the control of tick infestations due to *Dermacentor variabilis*.

- **Cats:** Revolt kills adult fleas and prevents flea eggs from hatching for one month and is indicated for the prevention and control of flea infestations (Solenopsetriches felis), prevention of heartworm disease caused by Dirofilaria immitis, and the treatment and control of ear mite (Otodectes cynotis) infestations. Revolt is also indicated for the treatment and control of mangeuroid mites (Acarapis woodi) infestations in cats.

**WARNINGS:**
Not for human use. Keep out of the reach of children.

In humans, Revolt may be irritating to skin and eyes.

Reactions such as itching and skin redness have been reported in human instances. Individuals with known hypersensitivity to Revolt should be advised to use this product cautiously or consult a health care professional. Revolt contains isopropyl alcohol and the preservative benzyl alcohol hydroxypropyl (BHT). Wash hands after use and wash off any product in contact with the skin immediately with soap and water. If contact with eyes occurs, flush eyes copiously with water. In case of ingestion by human, contact a physician immediately.

The safety data sheet (SDS) provides more detailed occupational safety information. To report suspected adverse drug events, for technical questions, or for the safety data sheet (SDS), contact Aurora Pharmaceutical, Inc. at 1-888-FOA-VETS or on our website at www.aurorapharmaceutical.com. For additional information about adverse drug experience reporting for animals, contact FDA at 1-888-FOA-VETS or at www.fda.gov/animalamy. Flammable: Keep away from heat, sparks, open flames or other sources of ignition.

Do not use in sick, debilitated or underweight animals (see SAFETY).

**PRECAUTIONS:**
- Prior to administration of Revolt, dogs should be tested for existing heartworm infestations. At the discretion of the veterinarian, infected dogs should be treated to remove adult heartworms. Revolt is not effective against adult D. immitis and, while the number of circulating microfilariae may decrease following treatment, Revolt is not effective for microfilariae clearance.
- Hypersensitivity reactions have not been observed in dogs with patent heartworm infestations administered three times the recommended dose of selamectin. Higher doses were not tested.

**ADVERSE REACTIONS:**
Prior to the treatment of ticks (cutaneous) infestations in dogs and cats, Revolt should be administered once as a single topical dose. A second monthly dose may be required in some cases. Monthly use of Revolt will control most concomitant mite infestations. In the clinical field trials, ears were not cleansed, and many animals still had debris in their ears after the second monthly dose. The cleansing of the ears recommended is intended for the removal of debris.

**DOGS:**
In safety studies, selamectin was administered at 1, 3, 5, and 10 times the recommended dose to patent heartworm infected cats, and no adverse reactions were observed. The safety of selamectin administered orally was also tested in case of accidental oral ingestion. Oral administration of selamectin at the recommended topical dose in 5- to 8-month-old beagles did not induce any adverse reactions. In a pre-clinical study selamectin was dosed orally to immature-mature collies. Oral administration of 2.5, 10, and 15 mg/kg in this model for 12 hours did not cause any adverse reactions, however, eight hours after receiving 1 mg/kg orally, one avermectin-sensitive collie became ataxic for several hours, but did not show any other adverse reactions after receiving subsequent doses of 10 and 15 mg/kg orally. In a topically safety study conducted with avermectin-sensitive collies at 1, 3, 5 and 10 times the recommended dose of selamectin, salivation was observed in all treatment groups, including the vehicle control. Selamectin also was administered at 1 times the recommended dose to patent heartworm infected cats, and no adverse reactions were observed.

**CATS:**
In safety studies, selamectin was applied at 1, 3, 5, and 10 times the recommended dose to patent heartworm infected cats, and no adverse reactions were observed.

**STORAGE CONDITIONS:**
Store below 10°C (50°F).

**HOW SUPPLIED:**
Available in eight separate dose strengths for dogs and cats of different weights (see DOSAGE). Revolt for puppies and kittens contains 3 single dose tubes. Revolt for cats and dogs is available in cartons containing 3 or 6 single dose tubes.

Approved by FDA under AUR 200-673 volunteers.

**Revolt® (selamectin)**
Manufatured By: Aurora Pharmaceutical, Inc.
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Aurora Pharmaceuticals, Inc.
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Vanguard® CIV H3N2/H3N8
Bivalent canine flu vaccine

This bivalent canine flu vaccine by Zoetis effectively protects canines against both highly contagious H3N2 and H3N8 strains of canine influenza virus (CIV). This vaccine is approved for use in healthy dogs 8 weeks and older. An efficacy study revealed that the vaccine not only protected dogs from disease but also appeared to assist in decreasing the number of days for shedding the CIV H3N2 virus. This convenient vaccine protects dogs from both known CIV strains, thus increasing herd immunity. Dogs should initially receive 2 doses administered 3 weeks apart. The need for an annual booster vaccination has not yet been established; consultation with a veterinarian is recommended. This vaccine is currently available in 25 x 1-dose packages.

For more information, visit zoetisus.com/products/dogs/vanguard-civ-h3n2-h3n8.

If your area is in the midst of a CIV outbreak, visit CIVOutbreak.com for clinic and client resources.

Vetster
Online veterinary scheduling platform

Vetster helps practices save time, enhance service, and grow by providing pet owners with the ability to book appointments conveniently from their clinic’s website. These appointments are then synced directly into the practice management system calendar in real time. Including a user-friendly dashboard that enables you to set your preferences, this platform helps to control availability and replicate your existing booking workflow. You can embed Vetster on your website or share booking links in email campaigns, text messages, social profiles, and much more. Plus, accept payments at the time of booking and easily send automated appointment reminders. Key Vetster features include the following:

- Simple website widgets
- Real-time sync with your existing calendar
- Custom scheduling rules
- Secure online payments
- Telemedicine
- Reporting and analytics

For more information, visit vetster.com.

Vetstoria
Online appointment scheduling platform

Vetstoria helps practices save time, enhance service, and grow by providing pet owners with the ability to book appointments conveniently from their clinic’s website. These appointments are then synced directly into the practice management system calendar in real time. Including a user-friendly dashboard that enables you to set your preferences, this platform helps to control availability and replicate your existing booking workflow. You can embed Vetstoria on your website or share booking links in email campaigns, text messages, social profiles, and much more. Plus, accept payments at the time of booking and easily send automated appointment reminders. Key Vetstoria features include the following:

- Simple website widgets
- Real-time sync with your existing calendar
- Custom scheduling rules
- Secure online payments
- Telemedicine
- Reporting and analytics

For more information, visit vetstoria.com.

Mella Pro
Noninvasive pet thermometer

This clinically tested smart axillary thermometer is the first to measure feline and canine temperature under the foreleg or hindleg while immediately sending results to practice management software. In partnership with Vetspire, a cloud-based veterinary practice management system, Mella Pro uses Bluetooth connectivity to provide the first end-to-end integrated vital signs measurement on both the veterinary and human market. It uses various temperature sensors, millions of patient records, and machine learning to calculate an accurate reading. Mella Pro displays the result within 10 to 15 seconds and can be used at home and in the clinic.

For more information, visit mella.ai/vets.

Vetster
Online veterinary scheduling platform

Vetster connects pet owners to thousands of licensed veterinarians prepared to offer the best online services through video chat appointments 24/7. This unique platform allows users to search for available veterinarians in their area and find a match within seconds—no downloads required. From initial concern to diagnosis to product delivery, receive prescriptions delivered to your door in 2 days or less. Veterinary professionals interested in working for the platform can set their hours and are quickly compensated for all completed appointments through the convenient payout processing. You can access Vetster on your computer, tablet, or mobile device.

For more information, visit vetster.com.
Canine Tooth Gel with eco-friendly bamboo toothbrush

Dog oral kit
This cruelty- and toxic-free dental kit is Leaping Bunny certified and features an eco-friendly bamboo toothbrush coated in soybean wax and USDA-certified organic canine gel. The tooth gel contains natural ingredients such as coconut oil, olive leaf extract, fennel extract, sweet potato, cinnamon powder, and kelp extract to tackle plaque and tartar. The product is available in sizes small and large.

For more information, visit pureandnaturalpet.com/products/organic-dental-solutions.

Antinol
Natural canine and feline joint health supplement
Antinol is a joint supplement that helps to maintain healthy joints and mobility in cats and dogs. This product works quickly and is safe for long-term use. This concentrated formula contains a natural blend of 6 marine lipid groups including Omega-3 fatty acids, ETA, EPA, DHA, DPA OTA, and it contains over 90 essential fatty acids and has no serious side effects. Antinol’s organic blend is designed to support a canine or feline’s natural inflammatory response and aid in their joint, skin, and cardiovascular function while reducing joint discomfort linked to pet aging and activity. Antinol is easy to swallow as it comes in a 0.4-in long softgel. It can be tableted or used in conjunction with a pill pocket or wrap. For best results, store this product at 75°F or below. In hotter climates, keep it refrigerated and remove it from the container before use.

For more information, visit vetzpetz.com.

VETCBD Hemp Tincture for Equines
Equine hemp oil
This veterinarian-formulated, triple-tested CBD oil is extracted from premium American-grown hemp and made with extra virgin olive oil. Specially developed for equines, VETCBD Hemp Tincture helps support normal brain function and joint mobility and promotes calmness. This product contains 3000 mg of CBD oil and comes in a 2-fl oz bottle. It also includes a pet-safe syringe for accurate dosing. Though available on VETCBD’s website, laws in Idaho, Kansas, Nebraska, and South Dakota prohibit the shipment of this product to these locations. Additionally, because of state regulations, it’s currently not for sale in California.

For more information, visit VETCBDHemp.com.

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Simparica Trio (sarolaner, moxidectin, and pyrantel) is the first monthly chewable tablet in the United States to provide all-in-one protection against heartworm disease, ticks, fleas, roundworms, and hookworms. This FDA-approved medication prevents flea infestation by killing fleas before they can lay eggs within 4 hours of administration. Additionally, it has been demonstrated to achieve 100% effectiveness in 8 hours. One clinical study revealed that 1 monthly tablet provided 100% protection. Simparica Trio is proven safe for puppies as young as 8 weeks old, weighing at least 2.8 pounds. Each package contains 6 liver-flavored tablets.

For more information, visit zoetispetcare.com/products/simparica-trio.
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Unlike other ventilators that demand both the space in your operating room and the attention of your technicians, EZB becomes just one more part of your routine surgical procedure. It fits comfortably into any operating room size / protocol and is designed to be permanently attached to your anesthesia machine ready to be used at the push of a button.

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- Auto-Tune circuitry
- Maintenance free
- "On-Demand" compressor
- H-Frame mobile stand
- Automatic H.P. actuators
- Built-in water reservoir
- Switching power supply
- Handpiece operation
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The COVID-10 pet adoption boom: Did it really happen?

There's more to the “pandemic puppy” narrative.

By Matt Salois, PhD, and Gail Golab, DVM, PhD, MANZCVS, DACAW

Stories of skyrocketing pet adoptions during COVID-19 have become a staple both in the news and on our social media feeds. Our practices, too, are busier than ever. For many of us, it certainly feels like we're dealing with the puppy (and kitty) boom that we've been hearing about. But is this really the case?

When we look at transactional data from the primary source of pet adoptions, animal shelters, the pandemic adoption “boom” may not be as great as media coverage suggests. In fact, the total number of pets adopted from shelters in 2020 was the lowest number in 5 years, according to data from the nation’s 4,000 plus shelters.

A glance at the data

According to shelter data from Best Friends Animal Society and 24PetWatch, approximately 20% fewer pets were adopted in 2020 than in 2019. (See table)

The reason for this decrease is that a smaller pool of animals was available. Shelters saw 32% fewer dog intakes and 23% fewer cat intakes. Fewer people relinquished their pets, and animal control was less active in picking up strays. At the same time, successful spay/neuter programs helped keep populations down. Additionally, the share of shelter animals moved into foster care more than doubled—from 22% in April 2019 to more than 46% in April 2020.

It also took longer to adopt a pet during the pandemic. Shifting first to virtual adoption appointments and later to a limited schedule of physical visits meant shelters could handle fewer potential adopters. The result: Nearly 450,000 fewer animals were adopted in 2020 compared with 2019. The adoption rate—or percentage of available animals adopted—was up, but the actual number was down significantly.

Although shelters aren't the only source of new pet adoptions, they're the primary source. Data on pet acquisition from nonshelter sources are difficult to obtain and, in some cases, nonexistent. Still, the data that are available indicate there may not have been as dramatic a surge in pets adopted from shelters during the pandemic as some thought.

Getting the facts straight

When looking at reports explaining the pandemic surge in pet adoptions, the sources are mainly surveys and anecdotes—both of which rely on personal accounts. Transactional data hint at a different story. Although some shelters may have observed individual adoption numbers increase and veterinary practices did see an uptick in visits from new pet owners in 2020, on a national level, there doesn't appear to have been a dramatic increase in pet adoptions.

An underlying issue is the different types of data available. Surveys—though an extremely useful tool to collect data and understand trends—aren't exhaustive. They can be used as one puzzle piece when trying to understand the big picture of pet owners' and our veterinary teams' experiences. But taken alone, they rarely tell the whole story because they rely on individuals to answer without error or bias. Other informational sources—including hard data based on actual transactions—help provide a clearer and more complete picture.

Business versus busyness

Even though there may not have been a boom in pet adoptions, our teams are feeling overwhelmed and overworked. The truth is, veterinary practices are busier than ever. Nationally, the average number of appointments booked with veterinary practices increased 4.5% from 2019 to 2020, according to data from VetSuccess. Appointments increased 6.5% for the 6-month period from January to June 2021 versus the same period in 2020.

These numbers demonstrate healthy and encouraging growth, but they aren't the only reason for the feelings of busyness we're experiencing. Although more business does create more business, other factors related to the pandemic and the economy appear to be contributing significantly to our current reality.

One major factor is decreased productivity. According to data from the American Veterinary Medical Association Census of Veterinarians and Veterinary Practice Owners, veterinarians saw fewer patients per hour in 2020 than in 2019 and average productivity declined by almost 25%.

COVID-19 created myriad challenges for practices, and many clinics are still wrestling with the resulting changes. At the start of the pandemic, we saw a significant backlog in wellness visits because practices were prioritizing urgent cases. At the same time, clients were spending more time at home with their pets, allowing them to quickly spot potential health issues and ponder about veterinary care in general. Some clients also had more disposable income available for pet care—from stimulus payments and reduced spending in other areas.

Meanwhile, practices were implementing new safety protocols. These helped ensure the continued provision of quality patient care but also limited team efficiency and productivity.
When we look at this productivity decrease, along with the increase in appointments, we can better understand the source of our teams’ current busyness. Many practices are still playing catch up with patients who haven’t been seen in more than a year, and our teams still aren’t working at peak productivity because of lingering effects of COVID-19. Increased workload and lower efficiency create backlogs and intensify the stress and busyness many are experiencing.

**Growth in 2021: Temporary or permanent?**

Although there have been more veterinary visits in 2021 year to date versus last year, we don’t yet know if the increases are permanent. Temporary, cyclical economic factors may still be influencing demand. The backlog created by the pandemic, for example, will take time to work through.

Postpandemic economic recovery isn’t going to be a smooth process. Markets and consumer reactions are expected to remain volatile for at least the next several months. This means we can’t expect business conditions today to remain next year or even later this year.

Hiring more people might seem like a quick fix, but doing so could be shortsighted. Because we don’t know if demand will remain at current levels, it makes sense to focus first on other solutions; improving team productivity, employee engagement, and employee retention are far more effective approaches.

**Planning for the future**

There’s a cautionary lesson here as we plan for the future and consider how to grow our businesses: Business strategy should be based on data, not stories alone. Whenever possible, leverage data from multiple sources that reflect what people actually do and what your practice is experiencing.

Reports of increased pet adoption numbers, coupled with the stress we might be feeling right now, could lead us to make reactive business decisions that aren’t in our best interest. We don’t yet know if there’s a long-term increase in veterinary demand. What we do know is that productivity has suffered during COVID-19. Let’s look for ways to enhance productivity and optimize the resources we have on hand.

Here’s an example: Before hiring new staff, let’s first make sure we’re using our existing team members, especially veterinary technicians, to full capacity. This means familiarizing ourselves with the duties veterinary technicians are legally allowed to perform in our state and identifying opportunities to use more of their skills. When we make full use of our technicians’ abilities, we free up veterinarians for more of the work that uses their advanced veterinary medical education—and the whole practice operates more efficiently.

Matthew Salois, PhD, is director of the American Veterinary Medical Association (AVMA) Economics Division.

Gail Golab, DVM, PhD, MANZCVS, DACAW is the assistant director of communications for the AVMA.

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Famously, Tony Buffington, DVM, PhD, MS, DACVN, and many others have demonstrated the need for indoor cats to live in an enriched environment to benefit mental and physical well-being. However, what has not been clear is how to appropriately feed domestic indoor cats.

Contrafreeloading—the willingness to work for food or even preferring to work for food when equivalent food is freely available—has been observed in some captive animal species in zoos and laboratory rodents. Mikel Delgado, PhD, CAAB, CCBC, with the University of California, and colleagues sought to work for food when equivalent food is freely available—has been observed in some captive animal species in zoos and laboratory rodents. Delgado and colleagues sought to learn more and recently published the paper “Domestic Cats (Felis catus) Prefer Freely Available Food Over Food That Requires Effort” in Animal Cognition. Only 1 previous study has been published about cats and contrafreeloading, dating back to 1971. In that report, 6 laboratory cats all failed to contrafreeload.

Various captive animal species have been shown to contrafreeload, ranging from maned wolves to giraffes to grizzly bears.

The authors hypothesized that in a home environment, domestic cats would readily contrafreeload when given a choice between a food puzzle and a tray of similar size and shape that contained identical food. They also hypothesized that more active cats would more likely contrafreeload.

“I’ve long recommended food puzzles to clients with positive results,” Delgado says. “In nature, cats hunt, so I was certain that tapping into what cats are hardwired to do would be no problem and [that] we’d easily prove the previous study wrong—at least for cats who live in homes. However, science can be funny that way, and yes we were surprised [by the results].”

In all, 17 cats participated in the study, using 1 consistent food puzzle (Trixie Cat Tunnel Feeder) with a food dish next to it. Overall, cats did little contrafreeloading and instead chose the easy meal from the bowl. Most cats ate some food from both sources; however, the amount of food eaten from the easy meal on the tray was significantly higher than the amount of food eaten from the puzzle. Nearly half the cats consumed less than 10% of food from the puzzle, and two-thirds expressed no interest in the puzzle. Zero cats were considered strong contrafreeloaders.

“Though surprising, our findings were statistically relevant,” says Delgado. “There wasn’t a lot of variability.”

Although the study made a solid case, Liz Bales, VMD, founder of Doc & Phoebe’s Cat Company, says, “In my experiences, cats being cats, the acclimation period in the study [4-12 days] of a novel way [with] which to feed wasn’t nearly long enough. So what should that acclimation period be? We don’t know, but I would think months and not days.”

Indeed, Bales does have an acclimation experience because she also invented “hunting products” for cats, notably the Indoor Hunting Feeder. Theresa DePorter DVM, ECABWM, DACVB, a behavioral medicine specialist at Oakland Veterinary Referral Services in Bloomfield Hills, Michigan, agrees: “Cats being cats may be timid, cautious, or at least circumspect about anything novel. Yes, they may require more acclimation time, particularly since these cats may have had no prior experience with food puzzles. They’re accustomed to feeding one way and are only given days to adjust to a new way.”

DePorter, who has authored feline studies, is aware of practical limitations set by finances and by what cat parents are willing to do in homes. In this case, the study was cut short a bit by the pandemic. Neither Bales nor DePorter deny that this study was well thought out and important, but both consider it only a start—and Delgado doesn’t disagree.

Bales notes another factor. “The seeking circuit was missing in this study,” she says. “Cats need to go through seeking and finding their prey. The pounce and eat is only a fraction of the process, which was represented by the food puzzle [that] just sits on the ground next to a food bowl and may not be stimulating enough for many cats who naturally are hardwired to seek. Also, there’s no movement involved with this particular food puzzle, and movement is stimulating for cats.”

The authors hypothesize that, in general, more active cats would be more into contrafreeloading also was unproven.

“Perhaps it means lives are so enriched of the cats in the study that their drives to use puzzle feeders was reduced,” Delgado says. “Perhaps we could have better acclimated by using treats at first in the feeders. Also, individual cats may have individual preferences to different food puzzles.”

DePorter points out that we have known for a very long time that domestic cats do appear to contrafreed. After all, some well-fed indoor and outdoor cats that clearly do not require a meal still apparently enjoy the chase and catch—and then deliver rodents or birds as live “gifts” to human family members. DePorter, who lives in a rural setting, notes that one of her cats—who happens to be very well fed—catches mice.

Despite the study results, Delgado, who co-owns a website that sells puzzle feeders (foodpuzzlesforcats.com), is in no way suggesting that pet parents diminish use of puzzle feeders: “For starters, do understand most of the cats in our study did eat something from the puzzle feeder. Of course, I’m not a proponent of dumping too much food in a bowl and watching the cat eat it.”

According to Bales, she has witnessed her puzzle feeders contribute “countless times” to solving behavior problems, which in some cases has kept cats in homes.

DePorter will also continue to recommend puzzle feeders to clients. “I absolutely don’t interpret this study as suggesting not to use puzzle feeders—that would be a mistake. We know puzzle feedings are enriching, help to control food intake, provide physical and mental exercise, and may reduce obesity, which is so common among cats. And, of course, obesity leads to a laundry list of issues.”

Delgado adds, “Certainly, there’s more to learn, more to do—understanding cats has never been easy.”

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At 6:30 in the morning, Dr Kay received a phone call that she first thought was from a client whose dog had been having significant issues. However, the message was from an early arriving staff member who had just discovered that the clinic had been robbed!

Upon the team member’s arrival, they noticed one of the front glass doors had been shattered. Further investigation showed petty cash was missing as well as some cell phones (which became a safety measure during the COVID-19 pandemic). The total loss was an estimated $1500.

The police responded quickly and checked out the clinic’s internal surveillance cameras, which revealed a couple of men in sweatshirts who were essentially unidentifiable. The police were attentive but recommended immediately reporting the incident to the insurance carrier as the stolen items were not going to be recovered. Fortunately, the controlled substances were locked up, and the pharmacy drugs were untouched.

As expected, some staff members were upset and feared for their safety when walking to their cars after work. The management team scheduled a meeting to evaluate the incident and to plan precautions that can help prevent a future robbery, and everyone’s suggestions were dutifully heard.

At the meeting, the management team agreed they should be concerned about the clinic’s lax approach to security. Although they had surveillance and a secure safe for controlled substances, there was no burglar alarm system, petty cash was not securely locked up overnight, and exterior lighting and theft protection signage were not adequate.

The management team also advised that the staff had to be reassured that they were working in a safe environment in addition to improving the security measures. It was noted that unless there is substantial monetary or equipment loss, the insurance company advised against making a claim for fear of significantly increased post theft premiums.

It was decided that the clinic would hire a security consultant to recommend a comprehensive security protection plan, placing protection of the clinic in the care of professionals. The next step was scheduling a staff meeting at which the team would be reassured that the significant steps were being taken to prevent an intrusion of this nature in the future.

Overall, the general staff meeting was well received. The team was informed of the event that occurred; how a future incursion would be prevented; and finally, that staff safety was the primary concern. One team member summed it up by saying, “I love my workplace and respect my coworkers, but an ounce of prevention is worth a pound of cure.”

Marc Rosenberg, VMD, is director of the Voorhees Veterinary Center in Voorhees, New Jersey. Although many of the scenarios in Rosenberg’s columns are based on real-life events, the veterinary practices, doctors, and employees described are fictional.

Rosenberg’s response

Most veterinary professionals worry about difficult clients, staff shortages, and missed appointments. Incidents involving robberies and vandalism barely warrant any thought at all—that is until you are the victim. Unfortunately, many clinics learn the hard way. This is a perfect example where being proactive rather than reactive is the answer. First, abandon any thoughts of, “it can’t happen to me.” Second, don’t get lulled into being casual when it comes to securing your clinic’s pharmacy drugs and money. Finally, invest in a professional security evaluation and listen to their recommendations. Following these steps can help you avoid that early morning call from your local gendarmes.
Equine skin graft goes rogue

Find out what happened when this veterinarian performed a skin graft procedure on a horse and took healthy skin tissue a bit too close to the mane.

Horses are strange creatures that often come with many caveats. Since they don’t have muscle tissue below their knee or hock, when an injury that removes the skin is present, horses develop a horrible condition veterinarians call proud flesh, which is another term for granulation tissue.

Don’t get me wrong, proud flesh has its benefits. For example, it can protect horses by providing them with a way to heal while maintaining movement and appetite. However, if the skin damage is extensive, then proud flesh becomes excessive and horses are at risk of developing terrible scars and a potentially deadly infection.

In this case, the male horse I was working with had a bad injury. The skin located on the front of the knee and ankle was practically effaced and the owners were eager to have this rectified. When I assessed the situation, I discovered that the only foreseeable way of repairing the massive tissue loss was by potentially utilizing skin grafting.

Finessing the punch graft
Veterinarians often use a technique on horses called a punch graft. In this technique, instead of taking a giant piece of skin from somewhere on the horse and transplanting it onto the wound, we simply take 4-mm punches of skin and fuse them into the flesh, 1 little piece at a time. This promotes healing in the locations where the grafts are present, and the punches in the proud flesh will start to spread similarly to Bermuda grass.

The horse I was working with had a large wound that would typically require 100 to 150 punches of normal epidermis that would then be transferred to the wound bed. At the time, I had not performed this procedure enough and was more reliant on what the book said, which stated that you can take the healthy skin tissue from the belly or underneath the mane.

The owners weren’t too keen on spending an abundant amount of money, so I reckoned I could perform the graft with the horse standing, using local anesthetic—so the horse feels no pain—and harvesting the healthy skin tissue from under the mane without having to use the added expense of general anesthesia.

I went to work and began clipping the hair from the side of the mane and the skin adjoining it, then I scrubbed the area perfectly and began transferring healthy skin tissue from under the mane to the front of the leg. The procedure went smoothly. All grafts were placed, and I worked hard for the next 2 weeks to ensure those tiny pieces of healthy skin tissue were happy in their new environment on the leg.

On to greener pastures
At the end of the 2-week mark, the owners came back to pick their horse up. I sent them home with a long to-do list to ensure the grafts had the best chance of survival. The owners digested every bit of information I provided them with, which gave me confidence that they could make this procedure successful.

When the horse left, the areas where we had taken the grafts from were completely healed. In fact, you couldn’t even tell anything had happened. The graft bed looked healthy, and I was hopeful that the terrible injury would be a distant memory within just a few months.

The case of luscious leg locks
Roughly 6 months after I performed the procedure, a green pick-up truck pulled into the parking lot at the clinic. Out of it stepped the owners of the horse, and I could tell from a mile away they were laughing. I asked them how the horse had turned out, since they never gave me a call like I had advised them to. They just stood there and chuckled a bit, to the point where it was becoming uncomfortable.

“Out of any veterinarian in the world, you did the best job of fixing a giant injury,” one of them said, “The wound is completely healed, and if it weren’t for a few minor details, no one would ever know there was a problem.”

They proceeded to laugh a bit more and explained that they were headed to a rodeo and wanted to stop by and thank me for getting their horse healed up. They also mentioned that they had stopped by to “razz” me a bit. If the wound is healed and they were ropping off of the horse, why was there a need to razz me a bit?

I stood there with a perplexed look on my face as one of them went and unloaded the horse. I was approximately 30 yd from the trailer when I realized what all the fuss was about. It seems that when I was taking the skin from under the mane to use as the grafts, I was a little too close to the mane. (Mane hair tends to be large in diameter and can grow to around a foot long, whereas body hair is fine in diameter and grows to nearly an inch long.)

Across the parking lot stood a wonderfully healthy horse that had 12 in of long hair growing from the front of his leg. Yes. The luscious leg locks were blowing in the breeze like a Sports Illustrated model strolling on the beach. I was utterly flabbergasted.

The owners assured me not to worry and explained that they usually shave it down so it’s not noticeable. They let it grow this time to give me a hard time and stopped by to see if they could use my clippers before heading to the rodeo. At the end of the day, they were relieved that the horse lived and told me they weren’t upset about the horse having 2 manes.

Ever since, I always use the stomach for punch grafts. Live and learn.

Bo Brock, DVM, owns Brock Veterinary Clinic in Lamesa, Texas.

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