Synovetin OA

1 simple treatment relieves pain up to 1 year.

For easy, enduring relief of chronic OA pain, use Synovetin OA.

• Long-lasting relief: Up to 1 full year of OA pain relief
• Consistent effectiveness: 92% (12/13) in mild to moderate elbow OA\(^1\), 71% (10/14) in severe\(^2\)
• Non-systemic: No systemic adverse effects\(^3\)
• Convenient: 1 simple, targeted procedure


This procedure can only be performed by licensed veterinarians at veterinary hospitals permitted to use internal radiation therapy. On rare occasions, discomfort in the treated elbow has been seen in dogs that can last up to 72 hours after treatment. Short-term home-care instructions must be followed after treatment to minimize extended close contact such as co-sleeping. To review the full veterinary prescribing information, visit synovetin.com/cpinfo.
Homogeneous Tin ($^{117m}$Sn) Colloid] Veterinary Device for Use in Dogs

**NAME:** Synovetin OA®

Tin ($^{117m}$Sn) stannic colloid in ammonium salt.

It is supplied as a 2–4 mCi (74–148 MBq)/mL suspension for intra-articular (IA) injection.

**NET QUANTITY**

Vials contain a prescribed dose up to 6.0 mCi (222 MBq) at the date and time to treat one dog. 1 mL of suspension contains 2–4 mCi (74–148 MBq) of tin ($^{117m}$Sn) stannic colloid in ammonium salt at the date and time of end use.

**PRODUCT DESCRIPTION**

Synovetin OA® is a conversion electron therapeutic veterinary device comprising a colloidal, sterile suspension with a pH between 6.5 and 9.0 where at least 90% of the particles have a size between 1.5 μm and 20 μm (HORIBA light scatter instrument). The $^{117m}$Sn emits monoenergetic conversion electrons (significant energies 127–158 keV; emission probability 113%) and imageable gamma radiation ($^{117m}$Sn; 159 keV, 86% abundant). Accompanying low-energy emissions are Auger electrons (<22 keV) and X-rays (<30 keV). The half-life of $^{117m}$Sn is 14 days. $^{117m}$Sn decays by isomeric transition to stable $^{117}$Sn.

Excipients include ammonium carbonate (NH$_4$)$_2$CO$_3$, ammonium chloride (NH$_4$Cl), ammonium iodide (NH$_4$I), iodine (I$_2$) and trace tin (Sn) salts.

**MECHANISM OF ACTION**

Synovetin OA® is a veterinary device consisting of a homogeneous tin colloid which emits discrete (<300 μm) low-energy conversion electrons confined to the joint space. The colloid is composed of microparticles (1.5 μm to 20 μm) that are retained in the joint space of the dog. The particles are absorbed and retained by synoviocytes and macrophages in the synovium, resulting in apoptosis and reduction of inflammatory cells. Elimination of the pro-inflammatory cells reduces inflammation of the joint synovium, thereby reducing pain associated with synovitis. The data, including radiographic evidence, supports use in Grade 1, 2, and 3 osteoarthritis (OA) of the elbow joint.

**CAUTION**

Federal law restricts this device to sale by or on the order of a licensed veterinarian trained in the use of radioactive veterinary medical products. Use of this product is restricted to facilities with a compatible Radioactive Materials (RAM) license.

**INTENDED USE**

Synovetin OA® is intended to reduce synovitis and associated pain of canine elbow joints afflicted with osteoarthritis.

**WARNINGS**

Do not exceed 6.0 mCi (222 MBq) of radiation activity per dog per treatment. Not for use in humans. Keep this and all medications out of reach of children. Consult a physician in case of accidental injection or ingestion by humans.

**PRECAUTIONS**

Injection should be performed only by a licensed veterinarian skilled in the delivery of intra-articular (IA) injections who is located at a facility that has a RAM license.

Rigorous aseptic technique must be ensured during injection.

**ROUTE OF ADMINISTRATION**

Intra-articular injection. The product must NOT be administered by any other route. Confirmation of needle placement is recommended, whether by anatomical landmarks, fluoroscope, C-arm, ultrasound, or radiography.

**DIRECTIONS FOR ADMINISTRATION**

Dogs should be appropriately anesthetized or deeply sedated prior to administration to prevent vocalization and resistance to dosing. A 22-ga. needle can be used to inject Synovetin OA® directly into the elbow joint. Pain during and after treatment may occur. Administration of non-steroidal anti-inflammatory agents at the labeled dose may help any post-treatment pain.

**FREQUENCY OF ADMINISTRATION**

If needed, Synovetin OA® can be readministered to a previously treated elbow at least 12 months after the last treatment.

**DURATION OF EFFECT FROM ADMINISTRATION**

Effectiveness has been shown to last up to 12 months following a single treatment of dogs with naturally occurring OA of the elbow.

**MAXIMUM ANNUAL DOSE**

Total radiation dose per joint should not exceed 3.0 mCi/joint, with the total body dose not exceeding 6.0 mCi (i.e., two elbow joints during a 12-month period).

**ADVERSE REACTIONS**

Dogs participating in clinical studies to evaluate safety and effectiveness (n=74 dogs, 97 elbow joints) exhibited no significant adverse reactions when administered Synovetin OA®. Discomfort in the treated elbow has been rarely reported in some dogs up to 72 hours after treatment. If adverse events are observed or suspected, please report them by calling Exubrion Therapeutics® Customer Service at 1-833-942-1247.

**POST-INJECTION CARE**

Following administration of Synovetin OA®, the dog can recover with other post-operation animals in the general clinic population. Once the dog has fully recovered from anesthesia, it can be discharged to go home with the approval of the facility radiation safety officer or authorized user. All treatment site policies and license requirements should be observed.

**OWNER INSTRUCTIONS FOR POST-TREATMENT CARE**

When the level of radiation is determined to be below the established levels for release, the dog can be discharged. The dog will, however, retain a low level of radioactivity in the treated joint(s) for a short period of time. Specific written instructions based on the post-treatment radiation dosimetry for care and proximity to the treated dog will be provided by the radiation safety officer (RSO) or authorized user (AU) of a radioactive materials (RAM)-licensed veterinary hospital to the dog owner. These instructions include information on limiting proximity to the dog in the post-treatment period. If in the judgement of the veterinarian, the dog owners are not likely to comply with the release instructions, the product should not be administered. A RAM-licensed veterinary hospital RSO or AU should contact Exubrion Therapeutics® if there are specific questions. Apart from the proximity requirements to protect people there is no requirement for restraint of the dog itself, and it can resume its normal level of activity subject to the distance requirements.

**MANUFACTURED BY** Theragenics Corporation for Exubrion Therapeutics®

Manufacturer’s contact information:
Theragenics Corporation
5203 Bristol Industrial Way
Buford, GA 30518
Customer Service Phone: 833-942-1247
info@exubrion.com

**STORAGE INSTRUCTIONS**

Store in the shipping container at controlled room temperature (10°–30°C or 50°–86°F) until ready to use.
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It’s FDA-approved to prevent Borrelia burgdorferi infections by killing Black-legged ticks.

Now, pair knowledge with protection. Boehringer Ingelheim is offering a Continuing Education course on Black-legged ticks and Lyme disease.

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The new Boehringer Ingelheim Continuing Education course, “The big impact of a small tick: Lyme disease and the Black-legged tick,” is now live on BI-CONNECT™.

This free, 1-hour CE course will cover:
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- Distribution, activity, and habitat
- Lyme disease transmission, control, and prevention

How to Access:
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3. Click on “View All On-Demand Trainings” to visit the BI Learning Center
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Note that many of this year's industry events are now being held online or via a combination of live and virtual learning. Please visit individual event websites for details.

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From the cover

30 A closer look at hydrotherapy for rehabilitation

By using the properties of water, patients with certain conditions can benefit from muscle relaxation, improved joint range of motion, muscle tone, strength, and endurance

Kirsty Oliver, VN, DipAVN (surgical), RVT, VTS (Physical Rehabilitation), CCRP, CVPP, CCMT

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May is National Physical Fitness and Sports Month—a great time to get outside and encourage your clients and their pets to do the same.

After a 2-year hiatus from many group sports and activities, we now have a chance to jump back into playing baseball and soccer, dancing, going to the beach and swimming, and more. The same goes for pets.

With more than half of dogs and cats in the United States considered overweight or obese, and humans plagued by this issue as well, the American Veterinary Medical Association (AVMA) encourages pets and their owners to get regular exercise—together. This not only improves cardiovascular health, helps maintain a healthy weight, and supports good mental health for both owner and pet, but also strengthens the human-animal bond.

AVMA offers tips at avma.org/walking for pet parents, including discussing an exercise program with your vet, leash training, starting with shorter, more frequent walks and rests as needed, including “sniff breaks,” then building to one or more 15-minute periods of brisk walking, then allowing for cooldown time as needed. Finally, the site recommends avoiding walks during the hottest part of the day during the dog days of summer.

Don’t forget to take care of your own physical needs, too: Refresh that gym membership and walk around the building between seeing patients.

One other thing to add to your May to-do list: Register for our upcoming Directions in Veterinary Medicine (DIVM), a dvm360® Regional Conference, scheduled to be held in person June 24-25, 2022, at the Indianapolis Marriott Downtown in Indianapolis, Indiana, in collaboration with the International Veterinary Academy of Pain Management.

This 2-day conference of educational content focuses on select therapeutic specialties in a module series, along with complementary courses, focusing on one of our 5 tracks: anesthesiology, integrative medicine, pain management, sports medicine, and virtual care. Participants will gain a comprehensive and deeper understanding by engaging in hands-on, interactive learning while earning up to 13 RACE-approved continuing education credit hours. For full details and to register, visit dvm360.com/divm-indianapolis.
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How can 1 podcast make a difference? I have got to be honest. I had never listened to a single podcast before the pandemic. Yes, I had heard of them and knew how interesting it was to listen to perspective, share stories, and learn insightful information on just about anything. But if you told me 16 months ago that I would be the host of dvm360®’s The Vet Blast Podcast, I would have said, “You have cats to be kitten me!”

Fast forward to the present day, when we are heading to our 100th incredible episode of the podcast! Those of you in the business know it takes a lot of work dropping a podcast. From content creation, booking guests, postproduction editing, and marketing, it takes quite a bit of work to make the episodes wonderful. I must give a huge shout-out to our editorial team for writing up the wonderful article that marries to each episode. I especially want to shout out Robert Alaburda, senior editor at dvm360®, who has the awful pleasure of listening to my voice and editing out any errors.

I absolutely enjoy interviewing guests. I find it incredibly fascinating, with all the exceptional work our veterinary colleagues do in and around the profession. I genuinely am intrigued, inspired, and moved by each guest whom I have the privilege of getting to learn more about. Some conversations are personal and their stories needed to be heard, while other chats are incredibly educational and full of empowered knowledge. It makes me so proud to be a part of a profession that actively seeks out knowledge and ways to advance the profession while preserving and protecting the special human-animal bond.

Being the chief veterinary officer for the largest privately held health care media companies in the is truly a gift. I have the privilege of advancing change, providing voices to the voiceless, and making sure our fellow veterinary professionals are truly seen, heard, and understood. And just like I always say in practice: Teamwork makes the dream work. This role involves all of you out there listening, following, attending, reading, and engaging with us.

We want to thank all our guests and sponsors who have been on the show—veterinarians, veterinary technicians and assistants, veterinary students, practice managers, client service representatives, industry leaders, practice owners, and pet parents. We couldn’t have made 100 episodes without you.

We are honored to have our 100th episode with the Cynthia Otto, DVM, PhD. Otto is a professor of Working Dog Sciences & Sports Medicine at the University of Pennsylvania School of Veterinary Medicine. I can’t wait for you to listen to all the great work she has done, including training working dogs to sniff out COVID-19. She has done incredible work in our profession, and we know having Otto for our 100th podcast will bless us with success in future shows.

So to circle back to my initial question, how can 1 podcast make a difference? I know the answer: because we are the difference—all of you who have been a guest on the show and all of you who have listened to our podcast make the difference. We learn and grow together in helping us better ourselves as veterinary professionals and human beings. Thank you for making our podcast one of the top veterinary recommended podcasts. It’s been said that “the ears are better listeners than the tongue.” Here’s to making us become better listeners and empowered professionals. And here’s to another 100 episodes of The Vet Blast Podcast.

—Adam Christman, DVM, MBA
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Next steps for transgender, nonbinary, and gender nonconforming belonging in veterinary medicine.

The Gender Identity Bill of Rights (GIBOR) for the veterinary profession was released by Pride Veterinary Medical Community (PrideVMC) in June 2021. This document was written and reviewed by a team of gender-diverse voices and allies with different perspectives and backgrounds. The purpose of the document is to provide the core rights needed for the existence of transgender, nonbinary, and gender-nonconforming individuals in the veterinary profession. The following standard concerns are highlighted: correct name and pronoun use, bathroom access, and protection from discrimination and harassment. Additionally, important concepts such as freedom from explanation, right to advocacy, and freedom from gender affirmation timelines are included.

In the months since GIBOR was publicized, there has been mounting commitment for implementation from individuals, affinity groups, professional organizations, industry, and educational institutions. A follow-up PrideVMC effort called the Gender Diversity Guide is in the works to discuss background, implementation, and compliance for these rights to help the gender-diverse community thrive in the veterinary profession. While we wait for this guide to be produced, this article will provide insights beyond the basic rights included in GIBOR.

A repeated question from the gender-diverse community and allies is “What comes next?” As with other underrepresented groups, defining specific paths to belonging is complex. The Trans Agenda for Liberation (Transgender Law Center) states the necessity of providing a home for individuals in all groups including, but not limited to, those who are Black, Native American, Alaska Native, Native Hawaiian, Indigenous, Asian Americans and Pacific Islanders (AAPI), and migrant peoples with the goal of “the freedom of movement to seek out our own belonging.” This article highlights areas in which we can represent, support, and sustain gender diversity in the veterinary profession while honoring intersectionality as a core focus.

**Decision-making representation**

To achieve changes within the veterinary field that benefit equity, inclusion, and belonging for transgender, nonbinary, and gender-nonconforming individuals, there must be members of this community involved in decision-making. This includes leadership teams, committees, task forces, working groups, and all other bodies that gather to consider and make decisions that impact our profession. It is important to note that this direction does not come at the exclusion of other underrepresented communities. We must include this as a consideration when filling decision-making positions in organizations and associations in which gender-diverse individuals, especially those within the Black, Native American, Alaska Native, Native Hawaiian, Indigenous, Latinx, AAPI, and migrant communities as well as those with neurodiversity and diverse abilities, are underrepresented.

**Representation and consideration in recruitment**

Nondiscrimination in hiring does not always mean active effort for inclusion of candidates. Requiring recruitment and admissions committees to undergo training related to diversity, equity, and inclusion with specific information about bias, intersectionality, and the transgender, nonbinary, and gender-nonconforming community is essential for reducing both conscious and implicit bias. Although GIBOR provides foundational information, in-depth understanding comes through training programs, exposure, and engagement.

If individuals involved in recruitment have the opportunity to listen to gender-diverse voices, it will help expand perspective on candidates’ backgrounds. Although it is not legal to ask about gender identity and sexual orientation, for some this is highly visible when pronouns first enter a conversation. Also, when possible, involving transgender, nonbinary, or gender-nonconforming (they/them) individuals, particularly those from underrepresented minority populations, in admissions and recruiting should have a positive long-term impact on inclusion in the field.

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- Nicole Jefferson

This article highlights areas in which we can represent, support, and sustain gender diversity in the veterinary profession while honoring intersectionality as a core focus.
Pathways to leadership

For members of many underrepresented minority communities, the road to leadership may be difficult or only partial, with many hitting a glass ceiling. If the profession is committed to the livelihood of transgender, nonbinary, and gender-nonconforming veterinary professionals, then there must be intention around development of leadership from this community that results in tangible upward advancement rather than lateral moves. Such efforts are already being made for other underrepresented communities. Including gender diversity as a priority when building mentorship and leadership advancement programs will lead to optimized outcomes that result from identity diversity and the subsequent cognitive diversity bonus.¹

Transgender, nonbinary, and gender-nonconforming individuals have a resilient and valuable perspective for leadership. This outlook encompasses unique lived experiences of gender discrimination, navigating the health care system, and raising children as a professional. The community deserves equal pay and opportunities regardless of racial, ethnic, socioeconomic, neurodiversity, diverse ability, religious, or immigration status. Additionally, gender diversity should be seen through the lens of gender equality (which often does not happen) as defined by more than cisgender White individuals.

Inclusion in marketing to clients and/or business partners

Transgender, nonbinary, and gender-nonconforming individuals rely on and inhabit the veterinary field as clients and business partners. In addition to efforts within the veterinary field that are described in other points, it is important to have outward-facing gender-diverse visibility. This is an important message to millions of individuals in the country who may not feel traditionally welcomed in business settings. Marketing and commercial campaigns for veterinary products can include transgender, nonbinary, and gender-nonconforming individuals and be met with success and approval. Additionally, mindfulness around the business supply chain to include distributors that engage with diversity, equity, inclusion, and belonging (DEIB) should be a priority.

Access to education

Transgender, nonbinary, and gender-nonconforming individuals often have some combination of socioeconomic disadvantages that may be compounded by being unsheltered while bearing the costs of transition, other health care expenses, counseling, and referrals for care. This is in addition to the impact that socioeconomic status can have on educational performance. Acknowledging these financial disadvantages and working to improve access to both veterinary and veterinary technical/nursing education is a priority that benefits from a growth mindset and may require innovative thinking on scholarships and preveterinary education. Efforts should also focus on pathways to specialization, including internships, residencies, and veterinary technician specialization.

Inclusion in STEAM educational efforts

STEAM (science, technology, engineering, the arts, and mathematics) educational efforts have been a significant step forward in developing the future of veterinary medicine in younger generations. Representation of traditionally underrepresented groups has been a successful and important emphasis of programs introducing individuals to the veterinary field. Outreach that includes examples of transgender, nonbinary, and gender-nonconforming individuals with diverse racial/ethnic and other identities (eg, ability, nationality, etc) in veterinary medicine is a vital component of inclusion in the field. This honors another portion of the Trans Agenda, which demands “the freedom to define ourselves and our futures, free of nonconsensual...gatekeeping.” ²

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DEVELOPING SUPPORT WITHIN THE PROFESSION

Support in the profession requires a broad degree of understanding that does not necessarily exist everywhere. The following are several ideas to help deepen understanding.

Equity in DEIB discussions

Transgender, nonbinary, and gender-nonconforming individuals are not homogenous and come from many backgrounds and inhabit multiple facets of intersectional identities. As the veterinary field moves forward with trying to include and listen to the needs of underrepresented communities, it is important that gender diversity receive equity in these discussions. The transgender, nonbinary, and gender-nonconforming community has battled a lack of existence in multiple spaces, giving no ability to pursue meaningful changes particularly within the Black and Indigenous People of Color (BIPOC) and Latinx communities. Now that legal protections and support exist, we as a community should have a voice in the conversation about DEIB in the profession.

Coalition building as a 2-way street

Many in the transgender, nonbinary, and gender-nonconforming community experience bias and discrimination across their social identities (eg, race/ethnicity, class, sexual orientation, nationality, ability, neurodiversity, etc); therefore, support for gender diversity should be met with equal support as would be given for other underrepresented and marginalized communities. In this work, we do nothing in a vacuum or alone. We are all working together to make the profession more inclusive and just. As a place is built for transgendernonbinary, and gender-nonconforming individuals who rightfully demand the freedom to thrive with “active community support in building lives for ourselves” (Trans Agenda).2 Following are ideas for sustaining those needs.

SUSTAINING THE COMMUNITY

Sustaining the community is not easy. Attempts are under way to shore up support for transgender, nonbinary, and gender-nonconforming individuals who rightfully demand the freedom to thrive with “active community support in building lives for ourselves” (Trans Agenda).2 Following are ideas for sustaining those needs.

Sustainable benefits for gender affirmation

Transition takes many different forms and may require the assistance of therapists, endocrinologists, surgeons, and other specialties. Medical therapy, if elected, may be lifelong. To move forward with integrity, we need to ensure that hormone therapy and endocrine monitoring are affordable, and that the benefits for transition are treated similarly to other medical benefits including deductibles and maximum out-of-pocket benefits. Setting low limits on coverage precludes many from surgical transition, which leads to mental health strain, suicide risk, and potential dropout from the profession. Following on the Trans Agenda, Black trans individuals should have “equitable access to health care,” as should other Black and Indigenous People of Color (BIPOC) and Latinx individuals who have been historically denied this right. Provision of mental health services is a vital benefit for all veterinary professionals, including transgender, nonbinary, or gender-nonconforming individuals as they encounter societal prejudices that disproportionately impact mental health.

Sustainable benefits for leave

Transition takes many different forms dependent upon the medical needs of the transgender, nonbinary, or gender-nonconforming individual. Some aspects of transition require significant leave to allow for healing prior to returning to physically active duty, such as for mastectomy, breast reconstruction, pelvic and prostatic surgery, and necessary facial reconstruction. If the profession wants to have transgender, nonbinary, and gender-nonconforming individuals survive and thrive, then treating these events in transition with care and sensitivity is essential. Precedents exist for care of cisgender individuals in the profession who have undergone similar procedures. This same support should be equitable for all individuals in the profession regardless of intersectional identity.

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Development of educational initiatives

The Purdue University Human-Centered Veterinary Medicine and American Veterinary Medical Association Brave Space programs are examples of existing DEIB education that helps to educate around the needs, issues, and interaction with underrepresented communities in the veterinary profession. The development of additional educational resources (eg, web modules, articles, the Gender Diversity Guide, and podcasts) is essential to providing opportunities for self-education. Programs like these also provide a baseline understanding of what information individuals have been exposed to regarding issues around DEIB.

SUSTAINING THE COMMUNITY

Sustaining the community is not easy. Attempts are under way to shore up support for transgender, nonbinary, and gender-nonconforming individuals who rightfully demand the freedom to thrive with “active community support in building lives for ourselves” (Trans Agenda).2 Following are ideas for sustaining those needs.

Sustainable benefits for gender affirmation

Transition takes many different forms and may require the assistance of therapists, endocrinologists, surgeons, and other specialties. Medical therapy, if elected, may be lifelong. To move forward with integrity, we need to ensure that hormone therapy and endocrine monitoring are affordable, and that the benefits for transition are treated similarly to other medical benefits including deductibles and maximum out-of-pocket benefits. Setting low limits on coverage precludes many from surgical transition, which leads to mental health strain, suicide risk, and potential dropout from the profession. Following on the Trans Agenda, Black trans individuals should have “equitable access to health care,” as should other Black and Indigenous People of Color (BIPOC) and Latinx individuals who have been historically denied this right. Provision of mental health services is a vital benefit for all veterinary professionals, including transgender, nonbinary, or gender-nonconforming individuals as they encounter societal prejudices that disproportionately impact mental health.

Sustainable benefits for leave

Transition takes many different forms dependent upon the medical needs of the transgender, nonbinary, or gender-nonconforming individual. Some aspects of transition require significant leave to allow for healing prior to returning to physically active duty, such as for mastectomy, breast reconstruction, pelvic and prostatic surgery, and necessary facial reconstruction. If the profession wants to have transgender, nonbinary, and gender-nonconforming individuals survive and thrive, then treating these events in transition with care and sensitivity is essential. Precedents exist for care of cisgender individuals in the profession who have undergone similar procedures. This same support should be equitable for all individuals in the profession regardless of intersectional identity.

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Blood smear evaluations, in concert with automated cell counts, play a vital role in confirming results and potentially guiding diagnosis and treatment.

Hematology is the study of numbers and morphology of blood cells and encompasses some of the most important and commonly performed tests in veterinary diagnostics. The complete blood count (CBC) is the main diagnostic test for hematology and defines the number of red blood cells (RBC), white blood cells (WBC), and platelets (PLT) in a sample. The CBC also provides information about some specific physical parameters of the RBC population. These are known as RBC indices.

Each of these types of blood cellular elements performs vital physiologic functions, so determining their numbers and physical characteristics can provide important and meaningful health information on the patient being evaluated. Hematology testing consists of 2 main components: a quantitative and a qualitative evaluation of the blood.

The quantitative evaluation of the blood includes a CBC, which is generally performed on an automated hematology analyzer or using manual techniques. However, it is typically and preferably performed on an automated cell analyzer. The complete blood count classifies, enumerates, and differentiates the types of cells present in the peripheral blood. This quantitative evaluation provides the different cell population counts and associated indices as well as graphical representations of the different results when performed on an automated analyzer. Typical CBC parameters provided in a report are shown in Table 1.

Table 1. CBC Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>RBC</td>
<td>Red blood cells (count)</td>
</tr>
<tr>
<td>WBC</td>
<td>White blood cells (count)</td>
</tr>
<tr>
<td>PLT</td>
<td>Platelets (count)</td>
</tr>
<tr>
<td>Hct</td>
<td>Hematocrit</td>
</tr>
<tr>
<td>Hgb</td>
<td>Hemoglobin</td>
</tr>
<tr>
<td>MCV</td>
<td>Mean corpuscular volume</td>
</tr>
<tr>
<td>MCH</td>
<td>Mean corpuscular hemoglobin</td>
</tr>
<tr>
<td>MCHC</td>
<td>Mean corpuscular hemoglobin concentration</td>
</tr>
</tbody>
</table>

Why a blood smear evaluation should be performed with every CBC

Blood smear evaluations complement the results of automated CBCs and are a critical tool in veterinary medicine. They are used to confirm results and potentially guide diagnosis and treatment. Blood smear evaluations are especially important in cases of anemia, neutrophilia, or thrombocytosis. They can also be used to identify other disorders such as stress, excitement, or inflammation.

Blood smear evaluations are performed by a veterinarian or a veterinary technician who prepares a thin film of whole blood on a glass slide. The blood is then dried and stained with a Romanowsky-type stain, such as Wright’s or Diff-Quik. The slide is then examined under a microscope to count and evaluate the number of cells, differentiate cell types, and examine any abnormal cells or inclusions.

It is important to note that blood smear evaluations can provide additional diagnostic information not reported by automated analyzers, such as toxic changes in cellular morphology, the presence of atypical cells, or viral inclusions. Therefore, they should be performed in conjunction with automated CBCs and provide a second opinion for the clinician.

In conclusion, blood smear evaluations remain an essential component of the diagnostic workup in veterinary medicine. They are a critical tool for confirming results and guiding diagnosis and treatment. It is important for veterinary professionals to understand the value of blood smear evaluations and incorporate them into their diagnostic repertoire.
The CBC can be complemented with the manual measurement of the packed red blood cell volume, (PCV) which is the percentage of blood volume that is made up of erythrocytes and is comparable to the hematocrit calculated from the automated CBC results. Ideally, a CBC should be part of a minimum database, along with a serum/plasma chemistry analysis and a complete urinalysis, so that results can be interpreted together to deliver a comprehensive laboratory diagnosis.

The qualitative evaluation of the blood, also known as a blood smear or blood film evaluation, is the other component of a complete hematological evaluation. Blood smears are made using the EDTA-anticoagulated blood and stained using water-based Romanowsky-type stains, following the stain manufacturer’s protocol. The stained blood smear is then examined for estimated counts and morphological characteristics of the blood cells.

### Table 1. CBC Parameters

<table>
<thead>
<tr>
<th>RBC PARAMETERS</th>
<th>WBC PARAMETERS</th>
<th>PLATELET PARAMETERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red blood cell count</td>
<td>White blood cell count</td>
<td>Platelet count</td>
</tr>
<tr>
<td>Mean cell volume</td>
<td>Lymphocyte count and %</td>
<td>Plateletrit</td>
</tr>
<tr>
<td>Hematocrit</td>
<td>Monocyte count and %</td>
<td>Mean platelet volume</td>
</tr>
<tr>
<td>Hemoglobin</td>
<td>Granulocyte count and %</td>
<td>Platelet distribution width</td>
</tr>
<tr>
<td>Mean corpuscular hemoglobin concentration</td>
<td>Neutrophil count and %</td>
<td>Platelet distribution width</td>
</tr>
<tr>
<td>Red blood cell distribution width</td>
<td>Eosinophil count and %</td>
<td></td>
</tr>
<tr>
<td>Reticulocytes*</td>
<td>Basophil count and %</td>
<td></td>
</tr>
</tbody>
</table>

*Not reported on all automated analyzers
†Reported on a 3-part WBC differential
‡Reported on a 5-part WBC differential

### Table 2. Examples of Morphological Changes

<table>
<thead>
<tr>
<th>Red blood cells</th>
<th>White blood cells</th>
<th>Platelets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polychromasia</td>
<td>Leukocytosis</td>
<td>Macrophage</td>
</tr>
<tr>
<td>Anisocytosis</td>
<td>Toxic changes</td>
<td>Macrophage</td>
</tr>
<tr>
<td>Spherocytes</td>
<td>Reactive lymphocytes</td>
<td></td>
</tr>
<tr>
<td>Heinz bodies</td>
<td>Blast cells</td>
<td></td>
</tr>
<tr>
<td>Poikilocytosis</td>
<td>WBC inclusions and parasites</td>
<td>Platelet clumping</td>
</tr>
<tr>
<td>Nucleated red blood cells</td>
<td>Mast cells</td>
<td></td>
</tr>
<tr>
<td>RBC inclusions and parasites</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The qualitative evaluation of the blood smear can complement each and every CBC. It is especially important for sick animals and those with hematologic abnormalities. A blood smear enables the veterinarian to confirm results and ensure quality and may provide additional insights to guide diagnosis and treatment. It provides the ability to confirm automated CBC results by verifying RBC, WBC, and platelet counts. In addition, a blood smear evaluation evaluates cell morphology that is not reported by automated CBC analyzers.

Ideally, a blood smear evaluation should always be performed as part of every CBC, but it is vital in the following clinical situations:
- anemia (low red blood cell count);
- thrombocytopenia (low platelet count);
- neutrophilia or neutropenia (verify count and examine cells);
- lymphocytosis;
- severe illness;
- suspicion of hemoparasites; and
- when certain warning flags are present on the automated CBC report.

#### Why Perform a Blood Smear Evaluation?

Microscopic evaluation of a well-prepared blood film is a vital diagnostic procedure that is used to verify the automated analyzer’s results, such as total and differential white blood cell count and platelet count. It is also used to identify very important diagnostic information that automated analyzers cannot evaluate, such as diagnostically essential changes in cellular morphology, the presence of abnormal cells, or cellular inclusions. These morphologic abnormalities and cellular inclusions can be present even in patients with quantitatively normal results for all hematologic parameters.

Ideally, a blood film should be examined every time a CBC is performed. A blood smear evaluation complements both point-of-care and reference laboratory automated hematology counts and should be performed regularly with every CBC. It is especially important for sick animals and those with hematologic abnormalities. A blood smear enables the veterinarian to confirm results and ensure quality and may provide additional insights to guide diagnosis and treatment. It provides the ability to confirm automated CBC results by verifying RBC, WBC, and platelet counts. In addition, a blood smear evaluation evaluates cell morphology that is not reported by automated CBC analyzers.

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- when certain warning flags are present on the automated CBC report.

In 2 surveys at Michigan State University, the frequency (%) of anemia was shown to be 23% to 29% in dogs and 10% to 20% in cats. In the same surveys, 5% to 15% of dogs and 7% to 60% of cats were thrombocytopenic. These are examples of conditions in which a blood smear should always be performed to confirm anemia and/or low platelet counts. In addition, for anemic patients, cell morphology can be equally important for patient diagnosis as confirming the number and presence of reticulocytes.

Alternatively, a blood smear evaluation should never be utilized as a replacement for an automated cell count, as automated analyzers, if properly maintained, are more precise and accurate than manual counting of cells. Automatic analyzers will count several thousand cells in the liquid phase of blood, whereas only a few hundred cells are analyzed on the slide for blood smear evaluation. Some examples of the morphological changes that can be appreciated on a blood smear evaluation are shown in Table 2.

The practice of a blood smear evaluation is routinely performed in reference laboratories to supplement high-quality, “gold-standard” automated CBC analyzers. In general veterinary practices, gold-standard CBC analyzers are impractical because of cost, challenge of operation, maintenance, and footprint. Therefore, the blood smear evaluation is even more critical in these situations. Failure to perform a blood smear evaluation can result in potential incomplete and potentially misleading diagnostic information, complicating clinical decisions.

In some instances, blood smears are not performed in veterinary practices because of the technical challenges of making and reliably interpreting the blood smear and the general lack of easily available, timely expert evaluation. Blood smear evaluation success is dependent on a number of components, including the following:
- quality of the blood smear preparation;
- staining solution quality maintenance;
- ability to evaluate correct areas of a blood smear;
- ability to differentiate artifacts from legitimate morphologic abnormalities; and
- user experience with preparing and interpreting blood smears.

#### CLOSING THOUGHTS

Evaluations of blood smears will continue to play a critical role in confirming the presence of abnormal cell populations that automated CBC analysis has identified as suspect and flagged for the operator’s attention. When there is a lack of confidence in dealing with these challenges, blood smears should be referred to an expert veterinary clinical pathologist.

Using the VETS CAN IMAG YST AI Blood Smear application, challenges regarding workflow, time, and interpretation can be alleviated for veterinary practitioners. Additionally, there is easy and timely access to clinical pathologists for add-on expert review of the blood smear by digital image transfer when there is a potential need to evaluate cellular information not reported by the AI, such as toxic changes to WBC and morphology changes to RBCs. With the VETS CAN IMAG YST, a blood smear evaluation can complement each and every CBC easily and efficiently at the point of care.

References available online at dvm360.com
Veterinarian travels to Ukraine border to help provide animal care

As a volunteer with World Vets, Marty Becker, DVM, worked with local organizations in Romania and Moldova to assess the unmet needs of pets affected by war, and help facilitate free veterinary services to care for them.

By Kristen Coppock, MA, Associate Editorial Director

A mother and her 2 young daughters—refugees from war-torn Ukraine—arrived at a shelter in Romania, each with a pet: a muzzled dog, a cat carried in a backpack, and a hamster in a small cage. Marty Becker, DVM, a volunteer with the nonprofit, international veterinary aid organization World Vets, watched as the trio reunited with the girls’ father, from whom they had been separated for about a month. Along with the humans’ excitement, the dog greeted the man by jumping up on its hind legs and furiously licking him.

“He was happy to see the dog. The dog was happy to see him,” said Becker.

One of the girls had told Becker the hamster was her “best friend.” Upon seeing her father, she held the cage up to proudly show her pet as the man knelt to look.

“That human animal bond, to her, I think, was a lifeline,” Becker said in an interview with dvm360.

Many people are leaving Ukraine as refugees, seeking safety from the violence that has come with Russia’s ongoing invasion. The humanitarian crisis has also displaced countless pets, according to World Vets. Many of these animals need food, shelter, and veterinary care for their survival.¹

Volunteers like Becker, founder of Fear Free and a dvm360 advisory board member, and his World Vets peers are helping displaced dogs, cats and other pets at Ukraine borders. Becker recently traveled to Romania and Moldova—the 91st country he has visited—to help assess unmet needs and facilitate free veterinary services for animals arriving from Ukraine.

“Moldova, Romania, and Ukraine come together in this one spot, right by the Danube River,” said Becker.

According to World Vets, Becker’s mission was to coordinate efforts with the organization’s existing partners in Romania and Moldova.² Cathy King, DVM, PhD, World Vets founder and CEO, said Becker spent time in clinic and on the border’s front lines. “His first hand accounts helped to guide our strategy for prioritizing aid in the region. He has also done a tremendous amount to bring awareness to the situation and to direct funding to local groups aiding refugees and their pets, especially in Romania,” said King, in an email to dvm360.

Becker also met with the head of Romania’s veterinary medical association to discuss what local veterinarians were seeing and where help was needed. “The 1 thing you don’t have to worry about is the animals in need finding love and attention,” said Becker. “I met people over there who walked 20 miles carrying a dog to safety.”

WORKING WITH LOCAL RELIEF ORGANIZATIONS

Sava’s Safe Haven in Galati, Romania is one partner Becker worked with during his trip. The family-run, nonprofit shelter is dedicated to caring for homeless and stray animals in the region’s poor, rural areas.² World Vets knew it had a capable, dedicated partner through an established working relationship with Sava’s Safe Haven, and is providing free veterinary services to pets of Ukrainian refugees as well as veterinary supplies at the shelter, noted King.

“We are helping to financially support their aid station that is located at the entry point where refugees are crossing the Ukraine border into Romania with their pets. It is anticipated that the need for veterinary services will continue long term in the region and, therefore, we are also making longer term plans to recruit a veterinary team in the coming months to go there to provide additional medical, surgical, and preventive health campaigns for pets of refugees as well as abandoned pets that are brought to the shelter,” said King.

Sava’s Safe Haven is also working to find new homes for displaced pets in need, and sending food and other supplies across the border to Ukraine. According to social media statements made by the organization, these critical supplies are being shared with people who chose to remain in Ukraine, many of whom are elderly and include individuals who are feeding street animals.

In a social media post, Becker said he witnessed Sava’s Safe Haven sending 2.5 tons of dog food to a ferry crossing between Romania and Ukraine to feed pets that are owned and living in shelters—even though the organization was starting to run short on dog food. A similar run is made “at least every other day,” he wrote on Facebook.

At a partner clinic in Chișinău, Moldova, World Vets previously funded the costs of veterinary services for pet owners who were struggling during the COVID-19 pandemic, according to King. “We are now offering free veterinary services for any pets from Ukraine at that same clinic,” she said.

PEOPLE AND PETS STAY CONNECTED

Becker, a World Vets advisory board member, said one the biggest takeaways from his experience near Ukraine are the strength of the human-animal bond and the resilience of people and pets. “If you’re tested, you’ll really see what you can do,” he said.

> continued on page 21
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.


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PM-US-21-1049
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.
To administer ENTYCE, gently shake the bottle, and then withdraw the appropriate amount of
solution using the provided syringe.
Rinse syringe between treatment doses.

The effectiveness of ENTYCE has not been evaluated beyond 4 days of treatment in the clinical
field study (See Effectiveness).
See product insert for complete dosing and administration information.

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

Precautions:
Use with caution in dogs with hepatic dysfunction. ENTYCE is metabolized by CYP3A4 and
CYP3A5 enzymes (See Clinical Pharmacology).
Use with caution in dogs with renal insufficiency. ENTYCE is excreted approximately 37% in
urine and 62% in feces (See Adverse Reactions and Clinical Pharmacology).
The safe use of ENTYCE has not been evaluated in dogs used for breeding or pregnant or
lactating bitches.

Adverse Reactions:
In a controlled field study, 244 dogs were evaluated for safety when administered either
ENTYCE or a vehicle control (solution minus capromorelin) at a dose of 3 mg/kg once daily for
4 days. Enrolled dogs had a reduced or absent appetite for a minimum of 2 days prior to day 0
and had various medical conditions: arthritis (40); gastrointestinal disease (24); allergy (22);
dental disease (22); cardiovascular disease (16); renal disease (13); and others. Some dogs
may have experienced more than one of the adverse reactions during the study.
The following adverse reactions were observed:

| Table 1: Adverse Reactions reported in dogs administered ENTYCE oral solution compared to vehicle control |
|--------------------------------------------------------------|------------------------|------------------------|
| Adverse Reactions                                           | ENTYCE (n = 171) n (%) | Vehicle Control (n = 73) n (%) |
| **GASTROINTESTINAL**                                         |                        |                        |
| Diarrhea                                                    | 12 (7.0 %)             | 5 (6.8 %)              |
| Vomiting                                                    | 11 (6.4 %)             | 4 (5.5 %)              |
| Hypersalivation                                             | 4 (2.3 %)              | 0 (0.0 %)              |
| Abdominal discomfort                                        | 2 (1.2 %)              | 0 (0.0 %)              |
| Flatulence                                                  | 2 (1.2 %)              | 0 (0.0 %)              |
| Nausea                                                      | 2 (1.2 %)              | 0 (0.0 %)              |
| **CLINICAL PATHOLOGY**                                      |                        |                        |
| Elevated blood urea nitrogen                                | 7 (4.1 %)              | 2 (2.7 %)              |
| Elevated phosphorus                                         | 4 (2.3 %)              | 1 (1.4 %)              |
| Elevated creatinine                                         | 1 (0.6 %)              | 1 (1.4 %)              |
| **OTHER**                                                   |                        |                        |
| Polydipsia                                                  | 7 (4.1 %)              | 1 (1.4 %)              |
| Lethargy/depression                                         | 2 (1.2 %)              | 0 (0.0 %)              |

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
to compare food intake over a 4-day period. The dogs were 13 months of age and weighed
between 6.5 and 12.5 kg at the time of randomization. Six dogs administered ENTYCE
were enrolled in the study. The dogs ranged in age from 4 months to 18 years. Dogs 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 < 0.001).

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. Dogs 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); 68.6% (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:
Elanco US Inc.
Greenfield, IN 46140, USA
Revised: September 2020

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PA103066X
He recalled a Ukrainian woman who had lost her husband and her home because of the war. She arrived at the border aid station in Moldova with a young girl and a dog that had been injured. Although the dog had been limping, it began running after smelling the shelter. “It’s got a fight or flight response,” Becker said.

Grieving the death of her husband, the woman said the dog would now be her constant companion, according to Becker. “Beyond that affection connection, and the healing power of pets, I don’t know what else she would do. There’s nothing [for her] to go back to. Her house is gone,” said Becker.

Another woman, he said, crossed a border from Ukraine with 10 leashed dogs. She had walked in freezing temperatures, pulling a wagon with food and supplies to care for her pets but nothing for herself.

CONCLUSION

Becker noticed during his trip that veterinary technology in the region he visited is generally lacking compared with modern US facilities, although not as primitive as he’s seen in other countries. One clinic in Moldova had a single radiology machine, for example. Becker said the staff was using oven mitts rather than the safer, lead-lined gloves US veterinary professionals typically use to operate it.

Overall, he said, there is need for more modern veterinary technology and equipment as well as food and basic supplies to care for displaced pets.

He brought with him to the Ukraine border region 3 large suitcases filled with toys for the animals he would be serving.

“There are things we can do to help,” said Becker. According to World Vets, many in the organization’s community want to help the pets and people of Ukraine. To that end, World Vets is requesting financial contributions in support of its efforts to assist in the veterinary care of Ukrainian pets. Donors may visit worldvets.org to direct a monetary gift to World Vets’ international disaster response fund for helping pets from Ukraine.

REFERENCES

Sustainable pet products that help wildlife as well
Phil Tucak, BSc, BVMS

Having seen more than enough wildlife with preventable morbidities caused by plastics and pollution, veterinarian Stephanie Stubbe, DVM, decided to help put an end to it and founded Anipal, a company that recycles post-consumer plastic bottles into pet products and supports threatened species in the process.

Stubbe grew up on a farm in rural New South Wales and worked for an AgTech accelerator during her veterinary studies. After graduating, she worked for RSPCA Victoria, and in addition to clinical work she set up Anipal to help the veterinary industry drive sustainable change.

“Anipal...rethink[s] and redesign[s] the everyday things we use in the vet and pet industry from a sustainable, functional, and scientific perspective, so we have a light environmental footprint,” said Stubbe. “Proceeds from our sales go to coordinating and supporting threatened species projects, ensuring we are helping on the ground also.”

Stubbe’s time working at the RSPCA, where she treated animals suffering from auto accidents, littering, and a myriad of pollutants, reinforced her drive to make a positive difference for wildlife.

“This experience led me to consider how the vet and pet industry could help drive sustainable and preventative change... Without a doubt, the skills...we practice daily as clinical vets parallel [with] what is required in business,” explained Stubbe.

“In the clinic, we make treatment decisions by piecing together history and clinical signs. In business, the same problem-solving approach is required. Through asking questions, researching, and developing an action plan, business ideas can be trialed and tested. Additionally, as a vet you need to keep an open mind and keep learning and developing; the same traits are required in growing an evolving business.”

Anipal recently launched a range of carbon-positive, functional treats that target particular pet conditions, including allergies, anxiety, and arthritis. The company is also supporting various projects to help threatened species.

“We incorporate unique complete proteins [into the treats] and have created the only dental chews that provide additional functional and health support. We have also just launched our recycled feline tethering range, the only sustainable offering on the market, which supports and celebrates our threatened species and boosts awareness about gold-standard feline husbandry and wildlife management,” said Stubbe.

Survey finds striking misconceptions surrounding veterinary technicians

A survey conducted by the North American Veterinary Community (NAVC) asked pet owners nationwide if they knew who cared for their pets at the veterinary clinic. The results revealed that pet owners trust and have positive feelings toward credentialed veterinary nurses/technicians. However, significant misconceptions surrounding their role, responsibilities, education, and skills remain.

“Like their counterparts in human healthcare, credentialed veterinary nurses and technicians are also highly skilled professionals, providing life-saving and life-enhancing care for pets as well as emotional support,” Harold Davis, BA, RVT, VTS (emergency and critical care) (anesthesia and analgesia), NAVC board president, said in a news release.

“Respondents indicated they value veterinary nurses/technicians; now it’s up to us to do a better job by educating pet owners how vital they are to the veterinary healthcare team, so their skills can be better leveraged for the benefit of animals everywhere,” he continued.

The results demonstrated the following:

• 47% of pet parents were unaware that the role of the credentialed veterinary nurse/technician consists of performing medical tasks and procedures;
• 73% understood the veterinary technician role involved cleaning cages, removing animal waste, feeding or grooming pets (responsibilities typically performed by less experienced and noncredentialed staff);
• 63% percent of pet owners did not know credentialed veterinary nurses and technicians are the animal health care equivalent of registered nurses; and
• 20% of respondents mistakenly thought that veterinary nurses/technicians have less than 2 years of higher education.

Plus, they are unaware of the national exam needed to achieve a license or the requirements for continued education to maintain that license.

“The vast majority of credentialed veterinary nurses/technicians hold an associate degree in veterinary technology with many obtaining and now seeking out their bachelor’s to further their career goals. They have passed a national exam, are licensed, certified, or registered by an external governing body in their state.” Ashli Selke RVT, CVT, president of the National Association of Veterinary Technicians in America (NAVTA), said in the release.

“We are educated healthcare professionals who understand the whys behind the science and can advocate wholly for our patients,” she added.

Additionally, the survey discovered that when respondents were more educated regarding credentialed veterinary nurses/technicians, their views changed. This included the following:

• 69% of pet parents would feel more confident and comfortable with the level of care veterinary nurses/technicians can offer; and
• 84% would trust them as much as they do a veterinarian.

The survey was completed as part of a national awareness and education campaign spearheaded by the NAVC and VCA Animal Hospitals, with support from NAVTA. This campaign is associated with the Veterinary Nurse/Technician Empowerment Initiative, a recently launched program designed to elevate and accelerate credentialed veterinary nurses/technicians.

REFERENCE

Many respondents reported misbeliefs regarding technicians’ roles, responsibilities, education, and skills.
Elura helps cats with CKD maintain or gain weight to keep them feline fabulous.

It can be hard to watch cats with chronic kidney disease (CKD) waste away. Prescribe Elura at the first sign of weight loss in your feline CKD patients.

**INDICATION**
For the management of weight loss in cats with chronic kidney disease.

**IMPORTANT SAFETY INFORMATION**
For oral use in cats only. Do not use in cats that have a hypersensitivity to capromorelin, or in cats with hypsomatomatropism (acromegaly). Elura may increase serum glucose for several hours after dosing; use in cats with current or historical diabetes mellitus has not been evaluated and may not be appropriate. Use with caution in cats that may have cardiac disease, severe dehydration, or hepatic dysfunction. Elura has not been evaluated in cats younger than 5 months of age, or in breeding, pregnant or lactating cats. The most common adverse reactions included vomiting, hypersalivation, inappetence, behavior change and lethargy. Please see accompanying brief summary for product safety information.

*Compared to 4/10 control cats. A multi-center, placebo-controlled, randomized and masked field study including 176 cats with CKD and at least 5% unintended loss of body weight (as compared to the highest weight in the medical records for the 3 years preceding enrollment). Study period was 56 days (Day 0 – Day 55). Primary endpoint was percent change in weight from Day 0 to Day 55.

CKD, chronic kidney disease.


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Ross University adds Fear Free certification to its curriculum

Ross University School of Veterinary Medicine (Ross Vet) in Saint Kitts and Nevis has added Fear Free certification requirements to its curriculum, making it the first international American Veterinary Medical Association–accredited university to adopt the Fear Free initiative.

“Ross University School of Veterinary Medicine has always strived to develop a deep understanding of veterinary science and a passion for keeping our patients’ well-being front and center,” Sean Callanan, PhD, MVB, CertVR, MRCVS, FRCPath, DipECVP, dean of Ross Vet, said in an organizational release.1 “Fear Free’s rigorous standards and empathetic approach to animal handling and care is a natural fit for our curriculum and will help the next generation of veterinary professionals reach a deeper understanding and level of care for animals than ever before.”

Starting in the summer of 2022, Fear Free companion animal and equine certifications will be included in the curriculum for all Ross Vet students. There will also be an avian certification offered as an elective for individuals in the avian medicine program.

“Veterinarians of my generation were taught and remember the harsh physical restraint we utilized to immobilize animals. It was designed to protect people with little regard for the animal’s emotional well-being. Most of these animals were terrified and felt they were going to be harmed or even killed,” said Marty Becker, DVM, founder of Fear Free, in the organizational release.1 “Now Ross University School of Veterinary Medicine students will learn Fear Free techniques, which still achieve positional compliance to take x-rays, vaccinate, place a catheter, or examine a wound but are designed to protect the animal’s emotional and physical state.”

REFERENCE

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Elura™ (capromoren oral solution)

20 mg/ml
For oral use in cats only

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

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

INDICATION:
For management of weight loss in cats with chronic kidney disease.

DOSAGE AND ADMINISTRATION:
Administer ELURa orally at a dose of 2 mg/kg (0.9 mg/lb) or 0.1 ml/kg (0.045 ml/lb) body weight once daily.

CONTRAINdications:
ELURa should not be used in cats that have a hypersensitivity to capromoren.

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 oral use in cats only.

Do not use in cats with hyperadrenocorticism (adrenocorticism). ELURa may increase serum glucose for several hours after dosing. Use in cats with current or historical diabetes mellitus has not been evaluated and may not be appropriate.

PRECAUTIONS:
Use with caution in cats that may have cardiac disease or severe dehydration. ELURa causes transient decreases in heart rate and blood pressure up to 4 hours following dosing administration. Some cats may exhibit clinical signs of bradycardia or hypotension following administration of ELURa, use with caution in cats with hepatic dysfunction. Capromoren is metabolized in the liver in humans and dogs and similar metabolism is expected in the cat. The safe use of ELURa has not been evaluated in cats younger than 5 months old. The safe use of ELURa has not been evaluated in pregnant, lactating, or intend for breeding.

ADVERSE REACTIONS:
Safety was evaluated in a 56-day field effectiveness study in 176 client-owned cats (118 administered ELURa, 58 administered vehicle control) that received at least one dose. Cats enrolled had ≥55% of intended weight loss and a history of chronic kidney disease (CKD). Cats had a mean age of 15 years at enrollment 11.4% of the cats were in Stage 1 CKD, 66.5% were in Stage 2, 21.0% were in Stage 3, and 1.1% were in Stage 4. Cats enrolled in the study had a variety of concomitant conditions: dental disease (82.1%), moderate or severe muscle mass loss (42.5%), heart murmur (28.4%), history of vomiting or underlying gastrointestinal disease (28.4%), hyperthyroidism (13.5%), and hypertension (7.5%).

Table 1: Adverse Reactions in the Field Effectiveness Study

<table>
<thead>
<tr>
<th>Adverse Reaction</th>
<th>ELURA (n=118)</th>
<th>Vehicle Control (n=58)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yorimining</td>
<td>35 (29.6%)</td>
<td>13 (22.4%)</td>
</tr>
<tr>
<td>Hypertension</td>
<td>25 (21.2%)</td>
<td>4 (7.0%)</td>
</tr>
<tr>
<td>Impotence</td>
<td>22 (18.8%)</td>
<td>2 (12.0%)</td>
</tr>
<tr>
<td>Behavior Change</td>
<td>17 (14.4%)</td>
<td>3 (5.2%)</td>
</tr>
<tr>
<td>Lethargy</td>
<td>16 (13.6%)</td>
<td>6 (10.3%)</td>
</tr>
<tr>
<td>Anemia</td>
<td>11 (9.3%)</td>
<td>7 (12.1%)</td>
</tr>
<tr>
<td>Dehydration</td>
<td>11 (9.3%)</td>
<td>2 (3.4%)</td>
</tr>
<tr>
<td>Stage of CKD increased</td>
<td>10 (8.5%)</td>
<td>3 (5.2%)</td>
</tr>
<tr>
<td>Diarrhea</td>
<td>9 (7.6%)</td>
<td>2 (3.4%)</td>
</tr>
<tr>
<td>Urinary Tract Infection</td>
<td>8 (6.8%)</td>
<td>2 (3.4%)</td>
</tr>
<tr>
<td>Hyperpyrexia</td>
<td>6 (5.1%)</td>
<td>2 (3.4%)</td>
</tr>
<tr>
<td>Upper Respiratory Infection</td>
<td>7 (5.9%)</td>
<td>1 (1.7%)</td>
</tr>
<tr>
<td>Hypertension</td>
<td>5 (4.3%)</td>
<td>0 (0.0%)</td>
</tr>
</tbody>
</table>

Note: If an animal experienced the same event more than once, only the first occurrence was tabulated.

- Behavior change included hiding from the owner (ELURA, 1 vehicle control), owner reported difficulty administering medication (7 ELURA, 1 vehicle control); and redirected aggression to another household cat (2 ELURA, 1 vehicle control).
- Two ELURA and 1 vehicle control cats increased their CKD stages. A ELURA and 2 vehicle control cats increased their CKD stage. It could not be determined if the progressive renal disease was the natural course of the pre-existing disease or treatment related.
- Hypersalivation was generally associated with dosing and resolved within a few minutes.
- Nine cats (8 ELURA and 1 vehicle control) either died or were euthanized during or shortly after the study. Six ELURA cats were euthanized due to inadequate control of CKD. One ELURA cat was euthanized after study withdrawal on Day 33 for declining quality of life and recent identification of a new mass. One ELURA cat acutely declined and was euthanized for findings of multiple in both kidneys and diagnosis of acoma. The vehicle control cat was euthanized for acute onset of right hindlimb paresis and suspected embolic event. Two additional cats were diagnosed with neoplasia during the study (one ELURA cat with unspecified soft tissue sarcoma and one control cat with maxillary adenocarcinoma), but completed the study. In-voluntary post-mortem reporting for extra-label use of a capromoren product for dogs, the following adverse events have been reported in cats (listed in decreasing order of reporting frequency): bradycardia, lethargy, hyperventilation, hypotension, body change, and vomiting.
- To report suspected adverse events, for technical assistance or to obtain a copy of the Safety Data Sheet (SDS), contact Elanco US Inc., at 1-888-545-5873.

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

EFFICACY:
Effectiveness was demonstrated in a multicenter, prospective, masked, randomized, vehicle-controlled field study. The study enrolled 177 client-owned cats with ≥55% of intended weight loss and a history of chronic kidney disease. The cats enrolled included 96 females and 50 males of various breeds, 4.4 - 22.1 years old with a mean age of 15 years and weighing 3.1 - 7.0 kg. CKD stage was determined based on creatinine screening according to the International Renal Interest Society (IRIS) 2015 guidelines. All stages were enrolled. Cats were administered ELURa at 2 mg/kg or a matched volume of control once daily by mouth for 56 days. The control was the solution without capromoren (vehicle control). The primary effectiveness variable was the percent change in body weight from Day 0 to Day 55. Effectiveness was evaluated in 172 cats; 71 cats administered ELURa and 41 cats administered vehicle control. There was a statistically significant difference between the percent change in weight for the ELURa group (4.5% ± 2%) compared to the vehicle control group (1.6%) at Day 55 (p<0.0001). Secondary analysis for percent change in weight at Day 15 and Day 27 demonstrated cats in the ELURa group gained weight throughout the study.

STORAGE CONDITIONS:
Store at or below 68°F (20°C)

HINT AVAILABLE:
20 mg/ml flavored oral solution in a 15 ml bottle with an oral dosing syringe. Approved by FDA under NADA # 141-336.

Manufactured for Elanco US Inc., Greenfield, IN 46140 USA

REV DATE: 10/2020

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REFERENCES
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Nutrition credentials and their role in pet food formulation

Two experts in veterinary nutrition share their differing perspective as a result of their distinct paths through the industry.

Pet food development and manufacturing require a team of highly trained nutrition professionals for a successful offering to consumers. Veterinarians often ask what the differences and similarities are between Board Certified Veterinary Nutritionists and MS and PhD animal nutritionists. The World Small Animal Veterinary Association (WSAVA) has provided guidelines for pet owners to assist in the selection of pet foods, and it emphasizes the role that both pet food formulators (animal nutritionists MS- or PhD-trained) and veterinary nutritionists (DACVIM [Nutrition] or ECVCN) have in development of pet foods. Laura Gaylord, DVM, DACVIM (Nutrition), and Matt Panasevich, PhD (Nutritional Science), provide their perspectives on their training, how their roles are involved in feeding pets, and how these roles work together.

Q1 What are your credentials and education, and what made you decide to take this route?

Gaylord: Nutrition has always been a passion of mine both personally and in veterinary practice, and so after completing my doctorate in veterinary medicine degree and working 14 years as a general practice veterinarian, I decided to pursue an alternative tract clinical nutrition residency program through my DVM alma mater, North Carolina State University College of Veterinary Medicine. This training was intensely focused on the clinical aspects of nutrition, but it also laid the foundation with educational requirements in nutritional biochemistry, physiology, and metabolism. As nutrition residents, we manage nutrition plans for intensive care inpatients, referral patients in the different specialties at the teaching hospital (internal medicine, cardiology, oncology, dermatology, etc), participate in nutrition-focused research projects, review and seek to publish peer-reviewed studies, and assist with educating students enrolled in the veterinary medicine doctoral program. I still currently work directly with pet owners, veterinarians, and veterinary specialists through my business, Whole Pet Provisions, PLLC, to design optimal nutrition plans for our patients that will support wellness and/or managing disease conditions. I also am involved with several ongoing research projects in collaboration with colleagues and enjoy working as an independent consultant with pet food and pet supplement companies.

Panasevich: I received my bachelor’s degree in animal sciences with a minor in nutritional sciences from Cornell University. I received my MS in animal sciences and PhD in nutritional sciences from the University of Illinois at Urbana-Champaign. My research emphasis during graduate school was on dietary fiber’s effects on the gut microbiome and gastrointestinal health in companion animals. After graduate school, I did a postdoctoral research assistantship at the University of Missouri in the Department of Nutrition and Exercise Physiology and School of Medicine, where I investigated the links between nutrition, the gut microbiome, and metabolic syndrome. Currently, at the Blue Buffalo Co, I am in R&D Pet Nutrition Technologies as a senior nutrition scientist. I investigate nutritional technologies and concepts for new product formulations and renovations for both OTC and veterinary prescribed diets.

I’ve always been intrigued by companion animal and human health and how nutrition plays a pivotal role in health. As an animal sciences major at Cornell University, I was involved with nutrition research under a Board Certified Veterinary Nutritionist. This was an eye-opening experience that emphasized the important contributions one can have from the angles of both a researcher and clinician. This overall helped guide my decision to pursue a PhD.

Q2 What is the primary focus of the role of animal nutritionist and veterinary nutritionist?

Gaylord: The veterinary clinical nutrition specialty focuses on how nutritional interventions can support wellness as well as modify disease states in our pets at every life stage. After completion of a residency training program, veterinary nutritionists may work in academia, in research, in clinical practice, for individual pet food companies, or balance a combination of these roles. Veterinary nutritionists working in clinical practice will apply these skills to design the best nutrition plans for their patients. They may assist with critical care management, design assisted feeding plans for patients in the hospital (enteral or parenteral methods), or design longer-term plans for at home feeding with commercial foods, homemade foods, or a combination. Veterinary nutritionists are uniquely positioned to draw from both their education and experience in clinical practice to assist with the inspiration and development of pet foods and pet food formulations. Veterinary nutritionists can also be valuable in assisting with the education, marketing, and distribution of pet food products to pet owners as well as veterinarians and pet food company sales teams.

written by

LAURA GAYLORD, DVM, DACVIM (NUTRITION)

Gaylord is a Board-Certified Veterinary Nutritionist, completing residency and graduating with a Doctor of Veterinary Medicine from NC State University College of Veterinary Medicine. She has more than 24 years of experience as a general practice/nutrition veterinarian in North Carolina and currently works as a veterinary nutrition consultant to pet owners and veterinary professionals.

written by

MATT PANASEVICH, PhD

Matt Panasevich, PhD (Nutritional Science), serves as R&D Senior Nutrition Scientist in Innovation, Technology, and Quality at the Blue Buffalo Company. He has an extensive background in nutrition research and qualification of novel ingredients for pet food manufacturing.
Panasevich: From an animal nutritionist perspective, diet formulation, evaluation of finished product nutritional data, and incoming raw material should be of utmost importance to pet food manufacturers for safety. Furthermore, delving into the scientific literature and evaluating new concepts to make pet food better and remain safe is equally important. Exploring novel concepts and asking different questions are what help drive research and innovation, which sparked my interest to continue down the research path. Graduate school training brought a focused approach on nutrition, health, and disease. Indeed, there is a comprehensive nutritional science curriculum, including courses in advanced companion animal nutrition, micro- and macronutrient metabolism, requirements and regulation of metabolism, and policy and regulatory factors. These courses prepare us to formulate diets, understand nutrient deficiencies and nutrient toxicities, consider life stage nutrition, design regulatory and feeding studies, focus on therapeutic/disease state nutrition, and evaluate ingredients. In addition, nutritionists complete thesis requirements by conducting experiments, analyzing and interpreting results, and presenting the findings at scientific conferences. Both the curriculum and extensive laboratory and experimental design training gained from graduate work provide a foundation for a career in pet food formulation and manufacturing.

Panasevich: For the first 3 WSAVA questions, it is no surprise that providing nutritionally adequate and safe food should be of primary importance to both a pet food company and consumer. Furthermore, with the unique nutrient requirements of dogs and cats, it is vital that each meal is complete and balanced. The unique hard skills gained from graduate training in nutrition are directly relevant to these needs of a pet food manufacturer. Nutritionists are continually evaluating incoming ingredient data to deliver the intended nutrients in formulation, and subsequently confirming this with the result in the final formula. These checks, plus shelf-life stability, toxicological assessments, and microbiological safety before, during, and after the product is made, are a necessity. Nutrient toxicities and deficiencies are directly linked to formulations and ingredient quality. Animal nutritionists provide guidance by formulating and overseeing the formulations of commercial and veterinary-prescribed diets being fed to the general pet population. Understanding the complexities of ingredient-processing interactions and their impacts on feeding outcomes such as palatability, digestibility, and stool quality are vital to product safety and must not be overlooked by trained nutritionists.

The fourth and fifth questions raised by WSAVA in guidelines in selecting pet foods are: What kind of product research or nutrition studies have been conducted? Is it published in peer-reviewed journals? These are arguably the most rewarding part of research and development. Similar to assessing product safety through formulations and raw material assessments, advancing animal health and well-being should be equally important to pet food manufacturers. When enrolled in a graduate program, one is continually challenged to think critically and ask questions on how to improve and further the knowledge in their respective field. Delving into the scientific literature on novel concepts related to human, production animal, and preclinical models stimulate innovation in companion animal nutrition. Consumers will always have a demand for nutrition above and beyond their basic requirements and will often assume what is healthy for them is also good for their pets. Scientists should continually be evaluating novel ingredients or nutritional strategies that are hypothesized to support health or are beneficial in a disease state. Furthermore, research and development programs at pet food manufacturers should go through the process of publishing their findings to showcase the validity of these concepts and advance the field of companion animal nutrition.

Q3 WSAVA’s Global Nutrition Committee has guidelines on selecting pet foods. How do they pertain to your expertise?

Gaylord: Question 1: “Do they employ a nutritionist?” Can refer to either a Board Certified Veterinary Nutritionist or a PhD animal nutritionist. Ideally both should play an integral role in a pet food’s development from start to finish. Question 2: “Who formulates the diet?” May refer to the individual who selects ingredients and balances the recipe for that product. The veterinary clinical nutrition residency training program emphasizes the clinical aspects of nutrition as it relates to wellness and management of disease conditions, but it may not specifically emphasize the intricacies of pet food formulation nor the food science knowledge required for production, especially on a large scale. While the training programs typically incorporate an overview of the industry, most veterinary nutritionists interested in focusing on pet food formulation will seek additional training and education beyond their clinical residency program or work in collaboration with a PhD animal nutritionist. Questions 3 and 4 refer to quality control for ingredients and finished products and nutrition research, and this aspect also is best served with collaboration and input from both types of nutritionists. Veterinary nutritionists contribute to the body of nutrition knowledge via research and publications through their work in clinical practice, academia, and industry. Lastly, product labeling will also be overseen and reviewed by both veterinary nutritionists and PhD animal nutritionists.

Q4 How do you feel animal nutritionists and veterinary nutritionists can work together? Also, what other careers can these roles serve in the pet food and veterinary fields?

Gaylord: I like to say “it takes a village” to develop, produce, and market a high-quality and successful pet food. Each type of nutritionist brings to the table advanced nutrition training and research skills however the approach of each is somewhat different and the best pet foods are made when there is a successful collaboration of both working as a team. Veterinary nutritionists will utilize their clinical knowledge of prevention and best management of health and disease conditions, while animal nutritionists will overlay their expertise in ingredient quality, formulation, processing impacts, and food science. In addition to developing pet foods, veterinary nutritionists (but also animal nutritionists) can serve as educators for veterinarians, pet owners, and others within the pet food industry. Both may also serve at the state and federal levels in government and regulatory functions. We also find them working in pharmaceutical, biomedical, toxicological, and environmental research.

Panasevich: Although PhD animal nutritionists have extensive backgrounds in experimental design, diet formulation, evaluating ingredient quality, and understanding processing impacts on nutritional outcomes, their clinical nutrition experience is limited. Their approach is often more focused on the general healthy population and less focused on individual needs or disease-state nutrition. Veterinarians in clinical practice provide valuable perspectives, understand client needs, and see firsthand common health conditions. Formulating diets to address disease states such as urinary stones, kidney disease, obesity, food allergies, cardiac disease, and more requires special consideration of macro- and micronutrients levels or inclusions. A veterinarian with advanced nutrition training can help identify the impacts of nutrition on preserving health as well as management of disease states. Veterinary nutritionists in clinical practice also understand the client demand and can help provide a nutrition solution that can meet expectations. The clinical efficacy of diets is also critical to communicate to practicing veterinarians and further demonstrate a pet food company’s credibility. Both animal and veterinary nutritionists can collaborate on formula design, evaluate the clinical efficacy, and communicate the diet’s benefits. As the approach toward nutrition from a graduate research perspective vs veterinary medical training is different, drawing from each of these perspectives can certainly help deliver the best outcomes for pets.

In summary, nutrition is a highly collaborative science and it must be a team effort within the pet food industry. Both animal and veterinary nutritionists play pivotal roles in the areas of ingredient/raw material qualification, regulatory, quality, food safety, academia, and government. Together they have a direct impact on feeding the pet population. The demand by consumers for nutrition above and beyond the basic nutrient requirements is growing. Pet owners seek to align their pet’s food with their own personal values. It is truly an exciting time for all nutritionists to be involved in pet food and help guide these demands into innovative products.
The Conservation Medicine Program will work in close collaboration with the international veterinary aid organization, World Vets. The new World Vets Galápagos Conservation Medicine Program will work to help protect the vast biodiversity of the Galápagos Islands, especially as it relates to the unique challenges brought about by the interface of wildlife populations, domestic animals, and humans, according to an organizational press release from Lakefield.

In recent years, the need for year-round access to veterinary care has become an urgent priority in the Galápagos, particularly on San Cristóbal Island, which lacks consistent access to veterinary services, according to Lakefield. To keep the local dog and cat populations healthy and manageable, year-round veterinary services will be provided free of charge to the local community. Lakefield is the primary donor and sponsor for the new hospital, which aims to bring aid to an underserved community and provide training and mentorship for new veterinary graduates.

Tom Parker, DVM, of World Vets, and a team of 5 doctors, 3 licensed technicians, and 7 assistants from Lakefield visited the Galápagos in November 2021. In a week, the team achieved 271 spay and neuters, distributed over 300 leashes and collars, and administered general wellness care for more than 60 pets in the community.

For members of the team, the trip made a lasting impression. “Coming down here, you don’t know what you’re going to see. In the United States, people’s pets are taken care of, loved, and have access to regular medical care. Here, you have the same love and passion from the owners, but they don’t have access to that treatment. In San Cristóbal, this will be the place for owners that want to do best by their pets,” said Madeleine Desmarais, owner of Lakefield, in the organizational release.

In recent years, Lakefield and World Vets have worked together on several successful veterinary outreach trips to South America. In February 2022, three Lakefield team members packed their bags full of leashes, collars, and supplies for a second trip to the new hospital, accomplishing another 150 spay and neuters over 3 days.

The Conservation Medicine Program will work in close cooperation with local agencies and organizations, including the Galápagos Conservancy, Galapagos National Park, Animal Balance, Galapagos Biosecurity Agency, and the Municipality of San Cristóbal. The program’s efforts will include work on marine animals and other native and endangered wildlife species, as well as domestic animals at a separate location.

According to Lakefield, the program also will include the following:
• Veterinary response and support for sick, injured, and entangled marine animals, as well as native terrestrial wildlife, primarily in instances related to human interaction–caused conditions
• Invasive species monitoring and control
• Building capacity forstranding response and veterinary support for marine animals throughout the National Park.
• Research related to understanding and protecting marine species and other native wildlife, including health and disease monitoring
• Education and training programs for new veterinary graduates and local assistants
• Working to maintain healthy and manageable local populations of domestic cats and dogs through sterilization programs and year-round veterinary services.

“EVE has collaborated with LX to design, build and deploy a solar-charged GPS tracking device called the K-Tracker. This tracker sits around the koala’s neck on a breakable collar which sends updates to the cloud at regular intervals, reporting the location of koalas and their activity,” said EVE veterinarian Julien Grosmaire, BVB/BVS.

“This informs us of the individual koala’s exact position, including whether they are in danger zones, as determined through geofencing, and records a history of their past locations. It also informs us on individuals interacting as well as low activity periods, prompting our field team to check the individual for problems, such as ill health or [even] death.”

The K-Tracker won an Australian Good Design Award (product design) in 2021, in recognition of its accurate reporting, robust design, and ultra-low power use.

Julien Grosmaire, BVB/BVS, Endeavour Veterinary Ecology (EVE) veterinarian

New veterinary hospital on the Galápagos Islands offers services at no cost to clients

Lakefield Veterinary Group has launched its first free-of-charge veterinary hospital on the Galápagos Islands in collaboration with the international veterinary aid organization, World Vets. The new World Vets Galápagos Conservation Medicine Program will work to help protect the vast biodiversity of the Galápagos Islands, especially as it relates to the unique challenges brought about by the interface of wildlife populations, domestic animals, and humans, according to an organizational press release from Lakefield.

In recent years, the need for year-round access to veterinary care has become an urgent priority in the Galápagos, particularly on San Cristóbal Island, which lacks consistent access to veterinary services, according to Lakefield. To keep the local dog and cat populations healthy and manageable, year-round veterinary services will be provided free of charge to the local community. Lakefield is the primary donor and sponsor for the new hospital, which aims to bring aid to an underserved community and provide training and mentorship for new veterinary graduates.

Tom Parker, DVM, of World Vets, and a team of 5 doctors, 3 licensed technicians, and 7 assistants from Lakefield visited the Galápagos in November 2021. In a week, the team achieved 271 spay and neuters, distributed over 300 leashes and collars, and administered general wellness care for more than 60 pets in the community.

For members of the team, the trip made a lasting impression. “Coming down here, you don’t know what you’re going to see. In the United States, people’s pets are taken care of, loved, and have access to regular medical care. Here, you have the same love and passion from the owners, but they don’t have access to that treatment. In San Cristóbal, this will be the place for owners that want to do best by their pets,” said Madeleine Desmarais, owner of Lakefield, in the organizational release.

In recent years, Lakefield and World Vets have worked together on several successful veterinary outreach trips to South America. In February 2022, three Lakefield team members packed their bags full of leashes, collars, and supplies for a second trip to the new hospital, accomplishing another 150 spay and neuters over 3 days.

The Conservation Medicine Program will work in close cooperation with local agencies and organizations, including the Galápagos Conservancy, Galapagos National Park, Animal Balance, Galapagos Biosecurity Agency, and the Municipality of San Cristóbal. The program’s efforts will include work on marine animals and other native and endangered wildlife species, as well as domestic animals at a separate location.

According to Lakefield, the program also will include the following:
• Veterinary response and support for sick, injured, and entangled marine animals, as well as native terrestrial wildlife, primarily in instances related to human interaction–caused conditions
• Invasive species monitoring and control
• Building capacity forstranding response and veterinary support for marine animals throughout the National Park.
• Research related to understanding and protecting marine species and other native wildlife, including health and disease monitoring
• Education and training programs for new veterinary graduates and local assistants
• Working to maintain healthy and manageable local populations of domestic cats and dogs through sterilization programs and year-round veterinary services.

“EVE has collaborated with LX to design, build and deploy a solar-charged GPS tracking device called the K-Tracker. This tracker sits around the koala’s neck on a breakable collar which sends updates to the cloud at regular intervals, reporting the location of koalas and their activity,” said EVE veterinarian Julien Grosmaire, BVB/BVS.

“This informs us of the individual koala’s exact position, including whether they are in danger zones, as determined through geofencing, and records a history of their past locations. It also informs us on individuals interacting as well as low activity periods, prompting our field team to check the individual for problems, such as ill health or [even] death.”

The K-Tracker won an Australian Good Design Award (product design) in 2021, in recognition of its accurate reporting, robust design, and ultra-low power use.

Julien Grosmaire, BVB/BVS, Endeavour Veterinary Ecology (EVE) veterinarian

New veterinary hospital on the Galápagos Islands offers services at no cost to clients

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Julien Grosmaire, BVB/BVS, Endeavour Veterinary Ecology (EVE) veterinarian
DRS. TERRENCE FERGUSON & VERNARD L. HODGES
TOGETHER FOR PETS AWARD

Congratulations to the barrier-breaking founders of Critter Fixers Veterinary Hospitals. These inspirational veterinarians will receive a $20,000 grant from Blue Buffalo.

WHERE DO YOU WORK?
We own Critter Fixer Veterinary Hospital, a full-service clinic with two locations in Central Georgia.

WHY DID YOU BECOME VETERINARIANS?
VH: I grew up around all different kinds of animals in rural Georgia, and knew I wanted to be a veterinarian very early.
TF: Around the age of 8, I helped tend to a dog that had been hit by a car, and from there, I knew that was it for me.

WHAT’S YOUR PASSION?
VH: Treating exotics can really make for an exciting practice. Seeing a skink, python and axolotl all in one day is so rewarding.
TF: Orthopedic surgery. The process of mending broken bones fascinates me.

HOW DO YOU MAKE A DIFFERENCE?
We want to make the profession as inclusive as possible. We’ve started a program called Vet for a Day where we tour the country and introduce veterinary medicine to students of all ages. The students join a network that can connect them to local vets.

WHAT EXCITES YOU ABOUT THE FUTURE?
We’re excited to usher in the new generation of veterinarians. Seeing the steady flow of people who have seen us on TV or heard about us and now want to be veterinarians is very fulfilling.

Blue Buffalo salutes the veterinarians who go above and beyond to advance the profession and improve the lives of our pets.
The power of the human-animal bond

In tough times, the connection between humans and their pets can make a big difference.

2020 was a difficult year for everyone. With human-to-human interaction limited by COVID-19 safety concerns, a lot of people turned to their pets for companionship—and their pets gave back in a big way.

Support when it matters most

A recent study found that pets were a major source of emotional support¹ during the darkest days of the pandemic.

95% Said they couldn’t imagine being without their pet in 2020
94% Said their animal had a positive impact on the family
87% Said their pet helped them cope
73% Said their pet helped them stay active and fit

The human-animal bond

Human Animal Bond Research Institute (HABRI) produces detailed scientific research on what most pet owners know to be true—that humans and their pets share a unique, mutually beneficial bond. This research has supported claims that people are happier and healthier in the presence of animals with scientific documentation on health factors like blood pressure, anxiety, and feelings of well-being.

HABRI and the North American Veterinary Community (NAVC) recently certified Nationwide as a Human-Animal Bond Certified Company, a designation that celebrates a commitment to strengthening the human-animal bond through research, education, professional development and support for its members.

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²HABRI 2016 pet owner survey.
The veterinarian’s role in the human-animal bond

Talking with clients about the relationship between pets and human health can improve pet care.

If pets make our lives happier and healthier, should veterinarians participate in human health conversations, too?

Research suggests that veterinarians who contribute to conversations about the human-animal bond can improve their patients’ care. They also tend to create a stronger bond with their clients, who see the vet as a caregiver for the whole family.

Conversations that improve care

Pet owners are more likely to seek out veterinary and wellness care for pets when they understand how their bond with their pets impacts their own health.²

Be an advocate for the human-animal bond

Here are some helpful entry points to discussing this fascinating topic:

- Did you know that the American Heart Association believes that pet ownership improves heart health in humans?³
- Did you know that owning a cat can improve the odds of recovery following a heart attack?³
- Did you know that your pets can help lower your systolic blood pressure?³
- Did you know that dog owners tend to live longer than people who don’t have a dog?⁴

Want to start having this conversation? Nationwide, a Human-Animal Bond Certified Company, created a complimentary client education video to help spread the word to clients.

Contact clarson@nationwide.com to request your free copy.

A closer look at hydrotherapy for rehabilitation

By using the properties of water, patients with certain conditions can benefit from muscle relaxation, improved joint range of motion, muscle tone, strength, and endurance.

The use of water as a therapeutic modality in veterinary practice is becoming commonplace, but the therapeutic properties of water have been used in the human and animal worlds for hundreds of years. The Greeks were using public baths in 500 BC and the Romans had heated bathhouses in 350 AD. Arctic monkeys realized that during the winter, the hot springs kept them warm.

Hydrotherapy, a term used when water is a therapeutic modality,1 covers the use of exercises, such as swimming, and walking on an underwater treadmill.2 By using the properties of water, for conditions identified as pre- and postsurgical, neurologic, and orthopedic, as well as conditioning, patients can benefit from muscle relaxation, improved joint range of motion, muscle tone, strength, and endurance.3

PROPERTIES OF WATER

It is important to understand the properties of water and what water does to a body placed in it. The temperature, hydrostatic pressure, viscosity, and buoyancy will all influence the patient4 and must be taken into consideration when planning therapeutic exercises in water. Forces exerted on a solid body in water include gravity, drag, thrust, buoyancy, and movement (Figure 1).

TEMPERATURE

The temperature of the water is important, as are the thermal properties of water. The thermal conductivity of water is 0.6 m.K, which is the

Figure 1. Forces Exerted on a Solid Body in Water4

1, gravity; 2, drag; 3, thrust; 4, buoyancy; 5, direction of movement.
EXCHANGE OF THERMAL ENERGY

When a body comes into contact with water, thermal energy is exchanged between the body and the water. Certain temperatures of the water can aid in soft tissue relaxation, decrease pain, and aid in circulation and tissue perfusion, while also increasing tissue extensibility. The temperature of the water typically used in veterinary hydrotherapy ranges from 83 to 88 °F. Care must be taken to monitor patients participating in hydrotherapy for signs of exhaustion and/or overheating, such as increased respiratory rate, lagging at the back of the underwater treadmill, and visual signs of an increase in stress.

HYDROSTATIC PRESSURE

Pascal’s law states that fluid pressure is exerted equally on all surfaces of an immersed object. The pressure increases with the depth of the fluid and density of the object. For example, a 1-liter (l) object placed at the bottom of a 1-m deep pool experiences a pressure of 1 kilopascal (kPa), while an object placed at the bottom of a 2-m deep pool experiences a pressure of 2 kPa. Further, the pressure is proportional to the depth of the fluid and the density of the fluid. For example, a 1-liter (l) object placed at the bottom of a 1-m deep pool of water experiences a pressure of 10 kPa, while an object placed at the bottom of a 1-m deep pool of oil experiences a pressure of 0.9 kPa.

RESISTANCE AND VISCOSITY

Frictional resistance is created by the stickiness or viscosity of the fluid molecules. Water is 15 times stickier than air, therefore, water resists the motion within it. There is a decrease in resistance to flow and resistance is dependent on speed, the velocity of the fluid, and the shape of the body within the fluid. Aquatic exercises can be fatiguing so it is important to monitor patients for signs of fatigue, pain, lameness, and distress.

BUOYANCY

Buoyancy is the force exerted on an immersed object that is opposite gravity. Archimedes’ principle states that when a body is partially or wholly immersed in fluid, it experiences upward thrust equal to the weight of displaced fluid. Therefore, as the water depth increases, weight bearing decreases. (Figure 2) When working with buoyancy, it is also important to understand specific gravity (SG), which is the ratio of the density of a substance to the density of a standard, usually water for a liquid or solid. The SG of water is 1.0. How well a pet “floats” depends on SG. Pets with lean body structure and lower amounts of body fat have an average SG of 1.10, whereas pets with a higher amount of body fat have an average SG of 0.93. Therefore, patients with a lower SG can float a little better than others.

FLUID DYNAMICS

Fluid dynamics is a description and study of liquids and gases and in part involves the study of the motion of a given fluid. Laminar flow is the smooth flow or straight flow of water particles moving in 1 direction and speed where all molecules are parallel. Turbulent flow has a more chaotic, non-linear motion where the water particles flow in all directions, creating more dynamic pressure differentials, so the resistance increases with velocity. Drag is anything that increases resistance. In the case of hydrotherapy in veterinary practice, the drag relates specifically to hair coat, type, and length, as all of these create drag and increase resistance.

SPEED

A general rule is that the taller and longer the dog, the higher the speed of the treadmill belt is required to reach a normal walking gait. Increased turbulence, resistance, and friction can cause increased exertion. Movement, hair coat, weight, and speed all influence overall exercise exertion.

POOL VS UNDERWATER TREADMILL (UWTM)

Swimming allows for non-weight-bearing exercise, is relatively low impact, is an excellent upper body workout with active range of motion (AROM) of all joints, especially the front limbs, which are affected more with increased workload, and improves core and trunk strength. Davis et al indicated that hip range of motion was not affected significantly by swimming compared with walking.

Patients beginning swimming should not be left unsupervised and a flotation device should be utilized to aid in buoyancy. Care should be taken to ensure the patient acclimates gently to decrease stress and anxiety, as not all patients inherently know how to swim. Excessive forelimb motion due to stress or anxiety will increase turbulent flow and make moving through the water more difficult, which will likely increase the stress level further.

UWTM

Walking on an underwater treadmill can be a relatively more controlled form of aquatic exercise. Less stress is placed on the joints and spine, making it a more appropriate form of hydrotherapy for early rehabilitation of patients. It can provide variable and adjustable weight-bearing exercise, improved AROM, proprioceptive gait training, and improved balance when walking, can build lean muscle mass, and is a starter for swimming. Patients also have the benefit of proprioception—the ability to identify the place and position of one’s own body part, which involves balance. It is also allows for engagement of the triceps brachii and quadriceps femoris, which are essential for weight bearing and ambulation.

CONCLUSION

Hydrotherapy is growing in the veterinary field and is an important tool for the rehabilitation professional. Hydrotherapy proves to be an integral part of a multimodal approach to canine and feline physical rehabilitation. It can be used to introduce early weight-bearing exercise in postoperative patients, improve proprioception and balance in the neurologic patient, and aid in the improvement of joint range of motion in the osteoarthritic patient, while aiding in the development of muscle mass, strength, and endurance. Understanding the properties of water and the effects on the patient while undergoing hydrotherapy will assist the rehabilitation team in providing the right type of hydrotherapy based on these factors.

References available online at dvm360.com
Lyme disease risk forecast to increase

The expanding range of the tick vector may contribute to potential cases of infection

The Companion Animal Parasite Council (CAPC) is warning that vector-borne diseases including Lyme will pose higher-than-average risks across much of the United States this year.1,2 In its 2022 Pet Parasite Forecast, the CAPC reported that tick-borne diseases such as Lyme are further spreading throughout the nation. The CAPC is publishing 30-day Pet Parasite Forecast Maps to alert pet owners of forthcoming outbreaks every month in each US county.1

GROWING RANGE FOR POTENTIAL DISEASE

Transmitted by ticks, Lyme disease (Borrelia burgdorferi) is spreading because of the expansion of the tick vector (Ixodes scapularis) host habitat range, primarily deer and rodents, and migratory birds carrying ticks to new areas. Warmer weather and longer seasons for tick reproduction are also factors.2

As the tick vector of Lyme disease continues to expand its range, the 2022 Pet Parasite Forecast noted the following geographic trends1,2:

- The geographic prevalence of Lyme disease continues to expand southward and westward.
- CAPC expects increases beyond last year’s forecasts in eastern Kentucky, northeastern Tennessee, western Michigan, and Ohio.
- High-risk “hot spots” are again predicted in northern and western lower Michigan and southern and northeastern Ohio.
- High risks of Lyme disease persist in all portions of the Northeast, the upper Midwestern states of Wisconsin and Minnesota, and the upper peninsula of Michigan. Additionally, a higher-than-normal risk continues in North Dakota, northeastern South Dakota, Iowa, Illinois, and eastern Kentucky.

The southward movement of Lyme disease is also evident in the increasing risk in the Carolinas and Tennessee. Higher risk areas in east central South Carolina and most of coastal North Carolina appear for the first time in the 2022 forecast.1,2 According to CAPC, these emerging threats validate and emphasize CAPC reminders that pets and pet owners do not have to travel to the traditional endemic areas of the Northeast to encounter substantial Lyme disease risks.1

PREVENTION AND TREATMENT

“Because of the zoonotic potential of parasites, we started providing our annual forecasts to alert communities to the risk they pose to people and pets locally. Over the years, we’ve seen the risk for parasitic diseases increase and expand into areas that have had historically lower prevalence,” Christopher Carpenter, DVM, and chief executive officer of CAPC, said in an organizational news release.1

The 2022 forecast also spotlights areas where more action should be taken to reduce the risk of companion animals’ exposure to disease vectors. The core of these prevention strategies includes veterinarians suggesting that pet parents annually test their pets for disease and protect them with products that kill or repel mosquitoes and ticks, plus receive year-round heartworm prevention.1 According to CAPC, veterinarians and pet owners should also test pets annually and use tick preventives year-round. A vaccination for Lyme disease should always be considered for pets in high-risk areas.2

“CAPC’s 2022 Pet Parasite Forecast is critical to alerting pet owners to the risks this year and reinforcing CAPC’s recommendation that all pets need to be annually tested and protected year-round,” Carpenter said in the release.1 >>
Stop Lyme Before it Starts

This May, support National Lyme Disease Awareness Month by staying one step ahead with tick control + Lyme prevention.

One Step Ahead Protection

Ask your Elanco rep how to protect your patients from Lyme disease

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® INDICATIONS:
Credelio 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.

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.

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For brief summary of safety information, see Credelio brief summary on adjacent page.
**NOVEL THERAPEUTIC OPTIONS**

Pharmacological treatments can also help to prevent and control tick infestations in dogs and cats that can lead to Lyme disease. Recent FDA approvals have allowed promising new therapies to arrive on the market.

In January 2022, the FDA approved a label expansion for sarolaner, moxidectin, and pyrantel chewable tablets (Simpatica Trio; Zoetis) to include indication for the prevention of *Borrelia burgdorferi* infections in dogs aged 8 weeks and older weighing at least 2.8 lb. According to Zoetis, the medication is the first combination product demonstrated to prevent infections that may cause Lyme disease. This treatment works by killing *Ixodes scapularis* vector ticks, including black-legged or deer ticks, which can transmit the infection.3

“Once dogs are infected with *Borrelia burgdorferi*, the bacteria’s unique mode of motility allows it to rapidly disseminate throughout the body. This can make the infection difficult to treat,” Richard T. Marconi, an expert in mycobacteriology and immunology at Virginia Commonwealth University Medical Center and a consultant for Zoetis, said in an organizational news release.3

For cats aged 6 months and older and weighing 2 lb or greater, lotilainer (Credelio Cat; Elanco Animal Health) is indicated for treatment and control against *Ixodes scapularis* infestation. The FDA-approved prescription oral tick treatment is administered monthly. Designed specifically for cats, the therapy offers a vanilla and yeast scent and flavor that appeals to many feline patients, according to Elanco. In a field study, these lotilainer chewables were successfully administered by 99.5% of participating cat owners.4

Elanco Animal Health also offers a lotilainer chewable product for dogs, Credelio, for treatment and control of tick infestations including *Ixodes scapularis*. This drug treatment is indicated for all dogs aged 8 weeks and older and weighing 4.4 lb or greater.4

**CONCLUSION**

In regions of historically high prevalence and in forecast regions of increased risk, the CAPC suggests that veterinarians reinforce recommendations of aggressive tick control and advise pet owners about the importance of year-round prevent. Lyme disease has the potential to spread anywhere the tick vector is present and vaccination should be considered for high-risk patients.1

**REFERENCES**


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**Credelio**

**Chewable Tablets**

**For oral use in dogs**

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

**Description:** Credelio (lotilainer) is a beef-flavored, chewable tablet for oral administration to dogs and puppies according to their weight. All chewing tablet formulations are manufactured to provide a minimum lotilainer dosage of 9 mg/20 mg (lotilainer).

Lotilainer has the chemical composition of C_5(CF)I_3-4 ethyl-5,1,3-4 trifluorophenyl-5-(trifluoromethyl) -3-isoxazolyl-3 methyl-N-2-oxo-2-[(2,2,2 trifluoroethyl) amino]ethyl]-2-[(2,2,2 trifluoroethyl) amino]ethylamine.

**Indications:** Credelio kills adult fleas and is indicated for the treatment and prevention of flea infestations (*Chortopsylla jessoensis*) and the treatment and control of *Lytice spinipalpis* infestations (*Arthropodam americanum* [one star tick], *Deinocerantus variabilis* [American dog tick], *Loxosceles rufescens* 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.

**Dosage and Administration:** Credelio is given orally once a month, at the minimum dosage of 9 mg/20 mg (lotilainer).

**Dosage Schedule:**

<table>
<thead>
<tr>
<th>Body Weight</th>
<th>Lotilainer Per Chewable Tablet (mg)</th>
<th>Chewable Tablets Administered</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.4 to 6 lbs</td>
<td>56.25</td>
<td>One</td>
</tr>
<tr>
<td>6.1 to 12 lbs</td>
<td>112.5</td>
<td>One</td>
</tr>
<tr>
<td>12.1 to 25 lbs</td>
<td>225</td>
<td>One</td>
</tr>
<tr>
<td>25.1 to 50 lbs</td>
<td>450</td>
<td>One</td>
</tr>
<tr>
<td>50.1 to 100 lbs</td>
<td>900</td>
<td>One</td>
</tr>
<tr>
<td>Over 100 lbs</td>
<td>Administer the appropriate combination of chewable tablets</td>
<td></td>
</tr>
</tbody>
</table>

Credelio must be administered with food (see Dosage and Administration:)

**Dosage:** In a well-controlled laboratory study, CREDELIO demonstrated 100% effectiveness against adult fleas 12 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 was 99.5%, 100%, and 100%, respectively. Dogs with signs of flea allergy dermatitis showed improvement in pruritus, papules, scaling, alopecia, dermatitis/systemic pruritus, and pruritus as a result of elimination in Fleas. In a well-controlled laboratory study, CREDELIO killed fleas before they could emerge, thus preventing subsequent flea infestations for 30 days after the start of the field study. In well-controlled laboratory studies, CREDELIO demonstrated >97% effectiveness against *Dermatopicide spinipalpis* infestations. In a well-controlled laboratory study, CREDELIO killed fleas before they could emerge, thus preventing subsequent flea infestations for 30 days after the start of the field study. In well-controlled laboratory studies, CREDELIO demonstrated >97% effectiveness against *Amblyomma americanum* [one star tick], *Deinocerantus variabilis* [American dog tick], *Loxosceles rufescens* black-legged tick, and *Rhipicephalus sanguineus* brown dog tick infestations.

**Effectiveness:**

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**REFERENCES**


Oncology

Novel veterinary cancer treatments and diagnostics

Craig A. Clifford, DVM, MS, DACVIM (Oncology), offered an overview of the latest treatments and diagnostic tools accelerating veterinary oncology.

By Julia Burke, Assistant Editor

Cancer is one of the leading causes of death in dogs aged 10 years old, with 50% of cultivates developing the disease.1 At the Fetch dvm360 conference held in Charlotte, North Carolina, Craig A. Clifford, DVM, MS, DACVIM (Oncology), detailed innovative products and technology to provide the best care and quality of life for oncologic patients.

Imprimed Chemotherapy Sensitivity Assay

According to Clifford, ImpriMed offers a precision medicine service to predict a patient’s response to a drug by using artificial intelligence (AI) algorithms that combine immunophenotyping data, live cell-based chemosensitivity results and a patient’s clinical data.2 Veterinarians submit patients’ samples by using a fine needle aspiration biopsy and the test kit provided. Within 7 days, they receive AI driven, personalized, anti-cancer drug response predictions. ImpriMed analyzes the live cells, indicates the chance a patient will respond to a specific drug and compares your case to the average dog. It also tells veterinarians the time line of when the patient will likely respond to treatment and can predict how a patient will do overall regarding B cells vs T cells, which is also used in human medicine. Clifford explained that during a study analyzing quality of life when taking the drug, most owners felt their pets maintained a good quality of life even when the disease progressed, a significant number of patients remained on the drug because they felt content.2

“I feel more likely [Laverdia CA-1] is going to be a primary care drug. I think oncologists, we’re going to try and figure out where we put it in the protocols, but I really do see it as a bridge to getting treatment or in the cases where the owner doesn’t want to go further,” Clifford said.

“That means more cases are going to be treated and there are maybe some cases that have a greater response, and the owner then elects to go for treatment and that’s wonderful too because then you know that dog is going to likely live longer and that wouldn’t have happened if we didn’t have that bridge,” he continued.

Some adverse effects of Laverdia CA-1 include anorexia, weight loss, vomiting, and diarrhea, so it is important to do weight assessments during follow-up visits. It is to be given at 1.25/mg/kg twice weekly to a minimum dose of 1 mg/kg twice per week with at least 72 hours between doses.2 It is available in 3 doses: 2.5 mg per tablet, 10 mg per tablet, and 50 mg per tablet.

Clifford noted that there are limited data currently available surrounding Laverdia CA-1, so it is difficult to draw too many conclusions. Thus, there will be a learning curve with it and investigator driven trials must be completed to determine which cases to use it for, how to adjust the dose, which chemotherapy drugs it is best combined with, and more.

OncoK9 Liquid Biopsy Test

OncoK9 is a noninvasive liquid biopsy test using a simple blood draw designed for early screening of canine cancer. Using cutting-edge technology, it is highly accurate in finding certain genetic sequences associated with 30 types of cancer to indicate if a patient has a risk developing it.

“Young generation sequencing, [OncoK9 is considered high end]. What they have been able to find is certain genetic sequences that are common to many cancers so you can imagine if it’s positive, there’s a high probability the patient has cancer,” Clifford shared. “It’s not affected by inflammation; it’s not affected by if the patient ate or anything like that; those don’t play a role in it.”

Clifford added that it is ideal as an annual screening test for dogs at higher risk of cancer (ie, those over aged 8 years old and predisposed breeds). Breeds predisposed to cancer include golden retrievers, German shepherds, boxers, and Bernese mountain dogs. OncoK9 also aids as a diagnostic test for canines in which cancer is suspected.

“All of these groups have come out and said what we already know: Wouldn’t it be nice if we could diagnose [cancer] earlier? Meaning, we can find the cancer before it’s metastasized if its osteosarcoma or angiosarcoma, wouldn’t it be great to catch it when it’s at its lowest point? That’s our greatest chance to impact overall survival,” said Clifford.

Takeaways

Summarizing his points to conclude the lecture, Clifford said ImpriMed is a novel tool for select cases and may change how atypical lymphoma is treated. Additionally, Laverdia CA-1 is a convenient and effective oral treatment option and post-market research will determine its niche, and the OncoK9 liquid biopsy test is best for older or predisposed breeds and in circumstances where cancer is a concern.

References

Maximizing adherence to minimize heartworm resistance

Prevention strategies can help protect dogs from infection with resistant strains

Heartworm disease is a threat to canines and felines in all 50 states. Although the disease can be fatal, preventives are widely available and highly effective. Resistant strains of heartworm are present in the United States. Protecting patients from infection with resistant strains and minimizing the continued development of resistance requires veterinarians to evaluate current prevention strategies and work to maximize adherence with both prevention and treatment protocols.

HEARTWORM LIFE CYCLE

Dirofilaria immitis is the nematode parasite that causes heartworm disease. Microfilaria are ingested by mosquitoes during a blood meal from an infected dog. They undergo several molts into the infective third-stage larvae (L3) within the intermediate host. Within days of entering the host, L3 molt to fourth-stage larvae (L4), which migrate through the host’s body toward the circulatory system. Within 45 to 65 days, the L4 begin their final molt to the juvenile or immature adult stage.

Within 90 to 120 days following infection, all immature adult worms reach the pulmonary vasculature, where they will continue to develop into mature adult worms that will reproduce. Between 6 and 9 months following infection, the dog will develop patent infection with circulating microfilaria, which creates a reservoir for infection.

HEARTWORM PREVENTION AND THE ROLE OF ADHERENCE

The American Heartworm Society (AHS) recommends that dogs receive year-round heartworm prevention regardless of where they reside.1 All available FDA-approved heartworm prevention products are members of the macrocyclic lactone (ML) drug class. MLs are safe for all breeds, even those with MDR mutations, at prescribed doses.1 These drugs are highly efficacious against L3 and early L4 stages (<30 days old).

Most FDA-approved preventive products are available in topical or oral forms for dogs and cats. These products rely on pulse administration of a low dose of ML once every 30 days, which works to kill larval heartworms that have been transmitted to the patient in the preceding month. The drug is eliminated from the body within a few days of administration, making timely dosing essential. Because L4s can molt into the juvenile stage in 45 days and late-stage L4, juvenile, and adult heartworms are less susceptible to MLs, a single missed dose of these preventive may result in infection.1

Adherence is the largest barrier to effective heartworm prevention. When evaluating adherence with monthly preventive products, several factors need to be evaluated. These include the following:

- Were the appropriate number of doses purchased by the client for a given period?
- Was the product purchased/administered appropriate for the weight of the patient at the time of administration?
- Was the product administered at appropriate intervals?
- For oral products, did the patient ingest the full dose?
- For topical products, was it applied to the skin in an effective manner?

Many of these factors are difficult to evaluate on a wide-scale basis to assess adherence, but several studies have evaluated purchase adherence. Data show that approximately two-thirds of US dogs do not receive any heartworm prevention.2 On average, only 8.6 doses are purchased per patient annually, falling short of the recommended 12 doses per year.2 In a study evaluating lack of efficacy claims, where a patient said to be on heartworm prevention tested antigen positive, 80.7% of cases were found to have insufficient heartworm prevention purchased.2

An alternative prevention strategy for dogs is the use of injectable products administered in the veterinary clinic. Two long-acting injectable products are available, providing protection for either 6 or 12 months with a single injection. These products rely on the continuous release of moxidectin to eliminate larval heartworms. Purchase adherence with injectable heartworm preventives has been found to be superior to monthly products.4 Additionally, administration of the product in the veterinary office removes concerns that the patient was dosed appropriately.

IDENTIFYING ML RESISTANCE IN THE CLINIC

Suspicion of heartworm resistance to MLs has yet to be evaluated and ongoing research is needed to further identify resistance.3 Identification of ML-resistant D immitis is difficult and requires experimentally infecting a naïve dog with a suspected resistant strain following administration of an ML and monitoring for development of infection.5,6 Genetic analysis of resistant strains is ongoing to better understand mechanisms of resistance.1,4 Despite the identification of single nucleotide polymorphisms (SNPs) in some strains of ML-resistant D immitis, genotyping is not practical to use in the clinic to identify cases of resistant disease.2

When a patient on preventives develops a heartworm infection, resistance should not be immediately assumed. Adherence in purchasing and administering appropriate preventives should be evaluated closely. An algorithm that can be used in the clinic to investigate potential resistance was developed by investigators.6 The algorithm relies on use of a microfilarial suppression test. A reduction in microfilaria by more than 90% indicates that resistance is unlikely.7

COMBATING RESISTANCE

Although resistant strains exist, it is important to note that in most cases, MLs are still reliable preventives.7
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.

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 brief summary of safety information see Interceptor Plus brief summary on adjacent page.

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Combating resistance will require maximizing the dosage and formulation of available MILs into highly effective preventives as well as maximizing adherence in administering existing preventives. Variability in the efficacy of MILs exists and is related to the inherent properties of each drug. For instance, moxidectin is more lipophilic, has a longer potency, and has a longer half-life than other MILs.4,5

Recent literature has demonstrated that moxidectin has higher efficacy than other MILs against resistant strains of *D. immitis*, especially in sustained-release, pet-parent-administered products.6 Thus, especially in areas with higher concerns for resistance, moxidectin-containing products may offer superior protection. In practice, veterinarians can combat resistance by educating clients on the importance of year-round prevention, annual testing, and appropriate treatment for infected dogs. Recommendations for combating resistance in practice include the following:

- **Begin heartworm prevention in puppies by 8 weeks of age and continue year-round.**
- **Consider the use of long-acting injectable preventives to improve adherence.**7 An added advantage of these products is that all available injectable preventives for *D immitis* contain moxidectin.
- **Include mosquito repellent products and environmental control of mosquitoes in your prevention strategy, especially in endemic areas, to minimize transmission.**
- **Doxycycline can be administered to patients with resistant *D immitis* strains to help minimize transmission.**8 At 10 mg/kg twice daily, doxycycline kills the symbiotic bacteria *Wolbachia pipientis*. In the absence of *W pipiens*, *D immitis* is unable to produce viable microfilaria. Additionally, microfilaria exposed to doxycycline are unable to develop into infective larval stages when ingested by mosquitoes.
- **Follow AHS guidelines for adjuvant therapy using melarsomine. The use of “slow-kill” methods for heartworm disease that rely on MILs is not recommended.** Prolonged use of MILs in adult worms may select for resistant subpopulations and create a reservoir for resistant infection.9

### TAKE-HOME MESSAGE

Macromyclic lactone drug resistance has been observed in some strains of *D immitis*, but the mechanisms of resistance, prevalence of resistant strains, and their distribution are still being investigated. As all available FDA-approved heartworm preventives rely on MILs, it is imperative that veterinarians work with clients to combat resistance through improving adherence in preventive administration and follow AHS guidelines when presented with a heartworm-positi-

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### References available online at dvm360.com

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**INTERCEPTOR PLUS**

**Milibemycin oxime/praziquantel**

- **EFFECTIVENESS**
- **Dosage Schedule**

<table>
<thead>
<tr>
<th>Weight (lb)</th>
<th>Milbemycin Oxime per chewable</th>
<th>Praziquantel per chewable</th>
<th>Number of chewables</th>
</tr>
</thead>
<tbody>
<tr>
<td>8 to 11 lbs</td>
<td>0.75 mg 7.5 mg</td>
<td>72 mg</td>
<td>One</td>
</tr>
<tr>
<td>12.1 to 20 lbs</td>
<td>2.5 mg 25 mg</td>
<td>252 mg</td>
<td>Two</td>
</tr>
<tr>
<td>20.1 to 50 lbs</td>
<td>0.23 mg/lb (0.5 mg/kg)</td>
<td>2.28 mg/lb (5 mg/kg)</td>
<td>One</td>
</tr>
<tr>
<td>50.1 to 100 lbs</td>
<td>0.23 mg/lb (0.5 mg/kg)</td>
<td>2.28 mg/lb (5 mg/kg)</td>
<td>One</td>
</tr>
</tbody>
</table>

**INTERCEPTOR PLUS** may be offered to the dog by hand or added to a small amount of food. The chewables should be administered in a manner that encourages the dog to chew, rather than to swallow whole. Chewing may be broken into pieces and fed to dogs that normally swallow treatments 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, it is recommended that the animal be retreated.

**INTERCEPTOR PLUS** should be administered at monthly intervals beginning within 1 month of the dog’s first heartworm exposure and continuing until at least 6 months after the dog’s last seasonal exposure. (See EFFECTIVENESS.) INTERCEPTOR PLUS may be administered year-round without interruption. When switching from another heartworm preventive product to INTERCEPTOR PLUS, the first dose of INTERCEPTOR PLUS should be given within a month of the last dose of the previous product.

**INTERCEPTOR PLUS** is available in four strengths, formulated according to the weight of the dog. Each chewable flavored tablet is formulated to provide a minimum of 0.23 mg/pound (0.5 mg/kg) milbemycin oxime and 2.28 mg/pound (5 mg/kg) praziquantel. Milbemycin oxime consists of the oxime derivatives of 5-didehydromilbemycins in the ratio of approximately 80% A, C16 (H4), AM 55735, and 20% A, C15 (H5), AM 541,689. Milbemycin oxime is classified as a macrocyclic anthelmintic.

**Praziquantel** is an isoquinolone anthelmintic with the chemical name 3-[2-(2-hydroxyethylamino)ethyl]-10,11-dehydro-4-quinolone. It is effective against a wide variety of cestodes, nematodes, and trematodes.

**Caution**

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

**Description**

INTERCEPTOR PLUS is available in four strengths in color-coded packages for oral administration to dogs and puppies according to their weight. Each chewable flavored tablet is formulated to provide a minimum of 0.23 mg/pound (0.5 mg/kg) milbemycin oxime and 2.28 mg/pound (5 mg/kg) praziquantel. Interceptors Plus is a chewable tablet formulation of milbemycin oxime and praziquantel. There are no known contraindications to the use of INTERCEPTOR PLUS. However, INTERCEPTOR PLUS is not effective against adult heartworms. INTERCEPTOR PLUS is available in four strengths, formulated according to the weight of the dog. Each strength is available in color-coded packages of one, six or twelve chewable tablets each.

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How to stay calm during emergencies
Preparation and mindset are critical in performing under stress

It’s the middle of a busy day when an owner bursts through the doors of your clinic, limp pet in hand, begging for someone to do something for little Fluffy. Their pet may have been hit by a car, may be having trouble breathing, or may have even arrested. What do you do?

For many of us, emergency cases activate our sympathetic nervous system, setting off internal alarm bells and clouding our judgment. But don’t worry—you’re not alone. Even the most seasoned professional can get tripped up by an urgent case. While we may not be able to stop our natural instincts altogether, we can condition ourselves to become more comfortable with those times when seconds and minutes count.

TAKE A BREATH

As in our veterinary patients, humans don’t do well when our brains aren’t exchanging gases appropriately; we either hold our breath or begin hyperventilating when we’re stressed or anxious. These behaviors can lead to worsening anxiety, confusion, and altered decision-making. While it may not seem as if we have a few seconds to take a deep breath to slow the flow of stress hormones, the alternative is panicking, which could compromise patient care. Take a moment to ground yourself and breathe to prepare yourself for the task at hand.

KNOW YOUR ABCS

Airway, breathing, and circulation are primary considerations in any emergency, as these are the processes we must triage first and correct rapidly to avoid additional morbidity and mortality. The polytrauma patient isn’t going to die from his road rash, but he’ll decline quickly because of his pulmonary contusions. Successful initial stabilization relies on not being sidelined by lesser, though visually more dramatic, problems. Once our ABCs are stabilized, we can move on to the fracture, proptosis, or laceration.

YOU DON’T NEED ALL THE ANSWERS RIGHT AWAY

Many veterinarians become overwhelmed when an unstable patient crosses their path if there is not an obvious etiology of the pet’s signs. Remember that maintaining an airway, ensuring appropriate oxygenation, and establishing adequate perfusion are our primary goals in the initial stabilization of these critical cases. It may take time, monitoring, and a number of tests before we get to the bottom of the extent of disease. Preparing owners for this process unburdens us from feeling as if we need have all the answers the moment the pet arrives.

WELL CAN WAIT

In most emergency situations, we end up dealing with secondary stressors: Appointments are pushed back, normal workflow is disrupted, and patients need referral. Regardless of these other pressures, our focus should be on treatment of the emergency in front of us. Using support staff and hospital signage is key to signal to clients that the sickest pets are seen first and those that are well will have to wait.

BE PREPARED

While we all hope that emergencies don’t become routine occurrences, we can at least become familiar with what we tend to see the most. Make sure your team understands how to set up for common procedures like urinary catheterization and keep those supplies in a labeled cabinet; have a fluid pump primed and ready; and keep your crash cart updated and stocked, confirming that every staff member knows the basics of resuscitation. Emergency preparation is a great way to educate and empower your team and will ensure that there is minimal confusion when the real thing arrives on your doorstep.

The next time you encounter a true emergency, don’t panic. With a little preparation, an understanding of triage, and a deep breath, you’ll be well on your way to saving your critical patient.

References available online at dvm360.com

But wait, there’s more!
Scan the QR code to see our in-depth interview with Jessica Nord, VMD, and learn more about handling emergencies like a pro.

written by
Jessica Nord, VMD
Nord is a 2015 University of Pennsylvania School of Veterinary Medicine graduate and a practicing small-animal veterinarian in Charleston, South Carolina. She has extensive experience in emergency and critical care and is passionate about empowering primary care clinicians to feel confident in managing emergencies as first-line veterinary practitioners. When she’s not in the clinic, you can find her writing blogs for IndeVets, working on DIY projects with her husband, or wrangling their 4 troublemaking felines.
Pain

If you are building or retooling your operating room, then you need to consider your anesthetic equipment. Proper tools and training are essential because poor anesthetic monitoring has consequences, such as worsening of chronic renal and cardiac diseases, gastrointestinal issues, the development of chronic pain, or even death. Minimum standards for anesthetic safety include continuous monitoring of respiratory function, circulation, heart rate, pulse, perfusion quality, oxygenation, ventilation, and temperature, which carry all the way through to recovery.

What follows are some of the most basic pieces of equipment a veterinary practice might have, along with their uses and limitations.

**ELECTROCARDIOGRAM**

**Uses**

One of the most important pieces of monitoring equipment is the electrocardiogram (ECG). The function of the ECG is to provide real-time assessment of cardiac rate and rhythm and to signal changes in cardiac electrical patterns. General anesthesia may uncover underlying issues in patients that are not known beforehand. The ECG is also essential to screen patients for extracardiac issues such as electrolyte abnormalities and hypoxemia. Most ECGs are now combined into multiparameter monitors with several different systems conveniently in the same unit.

**Limitations**

Artifacts may be caused by electrical interference from cautery, nerve stimulators, other heating devices, and more. Your team must be skilled enough to determine whether something is an artifact or a real issue. For example, pulseless electrical activity—characterized by a complete dissociation between the cardiac electrical activity and its contractility—is one of the most severe issues and can manifest as a slightly abnormal ECG, despite the fact that the animal has actually gone into cardiac arrest.

**DOPPLER FLOW DETECTOR**

**Uses**

Another means of monitoring circulation and pulse is a Doppler flow detector, a unit that converts blood flow into an audible signal. The portable unit can travel with your patient from pre-op to recovery and is a noninvasive and reliable way to monitor continuous pulse and heart rate. It provides an opportunity to detect any infrequent or subtle arrhythmias.

**Limitations**

— Certain classes of drugs may affect the sound quality of the pulse.
— Attaching a probe to the patient is an art form because it must be securely attached—not too loose, not too tight.
— The patient needs to remain reasonably motionless.
— The unit may pick up radiofrequency interference that distorts the sound.
— Any damage to the crystals will also affect sound quality.
— You cannot determine whether an arrhythmia you hear audibly is sinus or ventricular in origin.

**CAPNOGRAPHY**

**Uses**

Capnography is one of the most important tools in anesthesiology. Ventilation monitoring is primarily through measurement of end-tidal carbon dioxide (CO₂), done through a noninvasive attachment placed onto the patient’s endotracheal tube that provides confirmation of correct placement in the trachea and adequacy of patient ventilation. End-tidal CO₂ is also used as a marker for cardio-pulmonary resuscitation effectiveness. The waveform produced by a capnogram also detects any disconnection or obstruction and warns of impending cardiac arrest.

Two types of CO₂ sensors are available: mainstream and side stream. Mainstream units measure directly at the sample site, which may be bulky for small patients but has no delay in measurement. A side-stream sensor draws gas from the patient and measures it at a distant site, usually at the base of the monitor.

**Limitations**

— Lines can become kinked or obstructed by water or secretions, causing issues with the waveform.
— Humidification, tiny cracks or gaps in the connections, and loose connections can cause artifacts.

**CLOSING WORDS**

There are many factors to weigh regarding anesthetic equipment in the operating room. Careful consideration on the uses and limitations of each item can play a major role in maintaining a high level of quality and care in anesthetic monitoring.
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Earlier dermatology referral rewards primary care practice (part 1): easing client expenses and enhancing patient care

A new survey from the American College of Veterinary Dermatology shows why patients with dermatologic conditions should be a higher priority for referral.

Pets with dermatologic problems provide a substantial caseload in primary care veterinary practice. It’s often difficult to identify the underlying and contributing causes of dermatologic conditions, so it can be challenging to effectively and efficiently treat these patients while satisfying clients’ expectations. Such challenges may arise in part because of clients’ financial, emotional, physical, or time constraints that delay or prohibit diagnostic testing and treatment or prevent clients from completing their pets’ prescribed therapies.

New client survey data from the American College of Veterinary Dermatology (ACVD) indicates that referral to board-certified veterinary dermatologists earlier in the patient evaluation process may alleviate some of these client constraints and benefit primary care practices, their clients, and dermatology patients.

SURVEY PURPOSE AND DESIGN

Dermatology referrals may not be top of mind for primary care practitioners because unlike pets presented with orthopedic, neurologic, or cardiac issues that require immediate referral to a specialist, pets with dermatologic disease less frequently present with problems that seem urgent or life-threatening. In fact, veterinary dermatology has the second-lowest referral rate among several veterinary specialty groups (Figure 1).

In 2019, I partnered with the ACVD to survey clients’ perceptions of primary vs specialty veterinary care related to their dogs’ signs of dermatologic problems. Clients were recruited to participate from veterinary dermatology specialty practices in the United States (95% of participants) and Canada, and clients must have visited a primary care veterinarian for their dog’s preliminary examination and diagnosis.

Clients answered online retrospective survey questions about their dogs’ exams, diagnoses, and treatments delivered by their primary care veterinarian and by a board-certified veterinary dermatologist. The dogs presented for evaluation of a variety of dermatologic issues such as pruritus, ear problems, coat changes, and skin lesions including masses.

Of the 283 clients who were included in the survey, 77% had first noted their dog’s dermatologic problem within the 2 years preceding the survey.

RECURRENT PATIENT VISITS

Twenty-seven percent of clients reported that their dogs were successfully treated after their first visit with the primary care veterinarian. However, these clients had visited a veterinary dermatologist because their pet’s condition had resolved and then recurred or because the condition was the first episode of a chronic problem.

Most clients (73%) reported that they visited their primary care veterinarian more than 3 times for evaluation of their pet’s dermatologic condition before they were offered a referral to a board-certified veterinary dermatologist. Of these clients, 42% had visited their primary care veterinarian an average of 5 times before referral and 31% had sought a second opinion from another primary care veterinarian.

DIAGNOSIS DISAGREEMENTS

Primary care veterinarians may delay referring their patients for specialty care because they have confidence in their treatment selection and efficacy. Yet while therapeutic options for dermatologic conditions abound, having the knowledge and experience required to use them optimally is paramount. The presenting clinical signs for many skin conditions overlap substantially and complicate diagnosis, so correctly identifying a patient’s clinical signs and subtle cytologic features is needed to institute efficient and effective treatment.

Along these lines, the ACVD survey revealed that across all the dermatologic diagnoses made by primary care veterinarians, 46% did not match the veterinary dermatologists’ diagnoses. The top 3 diagnosis mismatches were food allergy, breed-associated genetic skin condition, and skin allergy (Figure 2). Incomplete or inaccurate diagnoses can contribute to the treatment failure and disease recurrence rates of dermatologic problems and result in repeat patient visits.
The good news is that across all the dermatologic diagnoses made by primary care veterinarians, 54% matched the veterinary dermatologists’ diagnoses. However, repeat patient visits may still occur if the prescribed treatments are ineffective or if clients do not use them properly. Clients reported that 16% to 28% of the treatments prescribed by their primary care veterinarians were ineffective and that 4% of the treatments prescribed by veterinary dermatologists were ineffective. These observations suggest earlier referral is beneficial because veterinary dermatologists consistently prescribe more effective treatment.

COSTS AND CONSEQUENCES OF CLIENT FRUSTRATION

The 73% of clients who visited their primary care veterinarian more than 3 times for evaluation of their pets’ dermatologic problems reached a “tipping point of frustration.” This tipping point was defined as when the primary care veterinarian couldn’t control, diagnose, or resolve the pet’s dermatologic problem after 3 visits or after the client had spent $925. Of these clients, 15% stopped visiting their primary care veterinarian for their pets’ routine veterinary care and 38% said they would not return to their primary care veterinarian for their pets’ pressing medical issues. This illustrates that primary care veterinarians risk losing future practice revenue generated by those pets (as well as revenue potentially generated by other pets in those households) by not referring clients to a veterinary dermatologist by the third visit for evaluation of patients’ dermatologic problems.

REDUCING CLIENTS’ COSTS AND ENHANCING PATIENT CARE

Referral to veterinary specialists can be considered 1 component of offering clients a spectrum of care. Spectrum of care encompasses a wide variety of evidence-based diagnostic and treatment options—ranging from basic, lower-cost, and low-tech care options to those that are advanced, higher-cost, and state-of-the-art.1 Spectrum of care should mesh with each client’s resources, values, and goals of their pet’s care, as well as with a practice’s resources and veterinarian’s knowledge and skills.1 Primary care veterinarians may hesitate to refer patients for specialty care because they anticipate that clients will incur higher costs, or clients may decline referral because of perceived higher costs. However, the ACVD survey revealed that veterinary dermatologists addressed dogs’ issues in an average of 3.8 visits at an overall lower cost. The data showed that the 42% of clients who averaged 5 visits to their primary care veterinarian before referral to a dermatologist would have saved 25% in costs if they had been referred by the tipping point of 3 visits. Furthermore, the 31% of clients that obtained a second who averaged 5 visits to their primary care veterinarian before referral to veterinary dermatologists addressed dogs’ issues in an average of 3.8 visits at an overall lower cost. The data showed that the 42% of clients who averaged 5 visits to their primary care veterinarian before referral to a dermatologist would have saved 25% in costs if they had been referred by the tipping point of 3 visits. Furthermore, the 31% of clients that obtained a second visit for evaluation of patients’ dermatologic problems.

FURTHER DISCUSSION

In a future issue of dvm360®, part 2 of this article series will discuss the boost to client satisfaction that earlier dermatology referrals can have. In addition, it will cover the benefits to the patient of collaborative care between primary care veterinarians and specialists.

References available online at dvm360.com

Acknowledgments
The author thanks Theresa En triek, DVM, and David Senter, DVM, DACVD, for their writing and editorial assistance with this article.

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It is generally agreed that dental diseases including tooth resorption, periodontal disease, and the signs of halitosis affect many of the adult cats we see daily in practice. It has also been shown that if left untreated, dental diseases can spread to other organ systems including the heart and kidneys. 

Dentistry can be challenging, involving diagnostics, performing treatment and postoperative evaluation, and assessing prevention compliance. Looking forward, examining the oral microbiome in states of oral health and disease may hold the key to unlock the ability to predict halitosis, periodontal diseases, and tooth resorption as well evaluate posttreatment return to health and the positive effect of prevention protocols.

Daily plaque composed mostly of gram-positive bacteria and oral debris attached to the teeth and gingiva. In time, if not disturbed through chemicals or mechanical means, a bacterial biofilm colonizes over the teeth, tongue, cheeks, gingival sulcus, tonsils, and hard and soft palates. The community of microbial residents that reside in the oral cavity is called the microbiome. After the gut, it is the second-largest microbial community.2

The genome is the complete set of DNA in our patient’s bodies. The oral microbiome is an exciting and expanding field of research. Oral microbiome differs in states of health and disease. Differences in the makeup of the oral microbiome may be the cause of oral diseases or show up at the same time but not be causative. Identifying the microbiome in health is the first step of microbiome research, after which it is necessary to understand the role of the microbiome in the alteration of functional and metabolic pathways associated with the diseased states.

Basepaws Dental Health testing has gathered oral samples from thousands of cats and will soon be exploring dogs to study the link between the oral microbiome and halitosis, periodontal diseases, and tooth resorption.

How might dental health testing be adopted in our offices?
Because the current exam room assessment of oral health is primarily visual, the microbiome may prove predictive for present or future tooth resorption, halitosis, or periodontal disease. The exam room test is noninvasive, with a simple collection method. The main potential benefits include early detection and/or predictive risk, evaluation of disease prevention recommendations and intervention, and ongoing management of dental diseases. It can potentially increase client compliance with higher acceptance of our recommendations. It provides education to the pet parent about hidden oral disease signs and symptoms. There are potential long-term health care cost savings from early detection, treatment, and control of disease. It offers potential peace of mind for the client that, at the time of the test, their pet’s mouth was healthy. Pet parents can take a more involved, active role with at-home care (ie, changes in normal daily behaviors) to keep the semiannual microbiome testing normal.

I feel the potential to improve prediction and early detection of underlying dental diseases would be a win for practicing veterinarians, patients, and pet parents. With earlier intervention and preventive measures, our pets can receive better-quality care that can be more cost-effective for the client in the long run. While research in this field is ongoing, the findings so far have been promising. I look forward to seeing what is on the horizon and will keep you posted as the oral microbiome research develops.

Further reading


REFERENCES


#1 dog preferred with a delicious beef flavor.

Safe for puppies as young as 8 weeks, weighing as little as 4 pounds.
In times of sadness, we need someone we can rely on to carry us through. During a euthanasia appointment, various personnel commonly interact with the client and patient, but rarely is there a consistent person who will be there for the duration. Yet a trusted, reliable friend can help navigate the appointment and make the experience feel safer. In modern veterinary practices, this “friend” can be a devoted euthanasia attendant, whom clients can rely on to help them through one of the hardest days of their life.

In servitude to protect the human-animal bond, a euthanasia attendant is an appointed member of the team who will chaperone the appointment from start to finish. This person can be a nurse, assistant, social worker, or even the veterinarian. They are the client’s point person, there to answer questions and provide emotional support as the appointment progresses. The attendant also is the liaison among all other team members, making sure everything runs smoothly. Ideally, this person comprehends the magnitude of pet loss and naturally conveys love and compassion. Without an attendant, the appointment will be managed by many members of the team. In this author’s experience, it is common for front-desk personnel to lead the client and patient to the room. While the client completes paperwork, a nurse enters and takes the patient to the treatment area for intravenous (IV) catheter placement. The patient returns to the room with the nurse or with the veterinarian who will perform the euthanasia procedure. After the patient’s passing, any one of these—front-desk personnel, nurse, or veterinarian—may return to check on the family and help them exit the building.

Meanwhile, behind the scenes, numerous conversations are happening among staff about what the client and patient need, which can lead to miscommunication and missed opportunities to meet expectations. Having 1 person, an attendant, hearing all details increases efficiency while reducing mistakes.

This procedure offers no do-overs, so getting things correct the first time is a game changer. Modern euthanasia includes providing pre-euthanasia sedation or anesthesia drugs to patients and keeping the client and pet together without separation. Medical personnel can administer sedatives, place IV catheters, and in some states, facilitate euthanasia. Nurses are often tasked with acquiring the necessary drugs and preparing bodies for aftercare services, such as cremation or aquamation. For these reasons, nurses may be the best suited for the attendant position. In hospitals employing veterinary social workers, they are perfect for the role, too.

Euthanasia attendants need not be experts in euthanasia, although understanding the complexities is beneficial. They do, however, need to be strong communicators, empathetic, and organized. Of course, if the veterinarian is the euthanasia attendant, as is often the case in small practices with only a few team members, then they need to be highly skilled in the procedure itself.

The goal is to leverage the team as it is without adding more personnel to an already stretched labor force.

An attendant’s direct tasks may include the following:
• ready the room and supplies;
• review client and patient notes, such as emotional record and preplanned requests;
• greet client and patient at the entrance and direct to the room;
• provide water and similar comforts;
• listen to needs and requests and relay them to necessary personnel;
• remain present during the procedure;
• offer privacy before and after;
• ensure all requests are carried out; and
• prepare the pet’s body for aftercare.

An attendant’s indirect tasks may include the following:
• create a sympathy card and memorial items, if applicable;
• update medical records;
• notify veterinarians and paraprofessionals of the death;
• answer phone calls pertaining to end of life;
• include euthanasia topics in meetings/rounds; and
• advocate for self-care.

Attendants are not expected to be with the client/patient during every moment of the procedure. Privacy and alone time are still highly encouraged to provide space for clients to reflect on the loss of a dear friend. This means that in between appointments and during client privacy time, the attendant is afforded time to handle more indirect tasks. If end-of-life phone calls can be triaged to the attendant, the burden of switching between life-and-death calls at the front desk is greatly reduced.

Regardless of one’s professional position in a hospital or practice, not everyone is well suited to the role of euthanasia attendant. Those whom this work appeals to already gravitate toward euthanasia. They are often the first to sign the sympathy cards or make memorialization items. They may talk about end-of-life cases more than others and want to handle aftercare arrangements. On the other hand, those who avoid euthanasia or prefer not to be part of the appointments any more than necessary should not be forced, although proper euthanasia training may improve moral around the procedure.

It is advised to have a staff meeting to discuss the attendant position and ask who is interested in helping. From there, management will need to monitor attendants for euthanasia-related stress, as they should for all personnel involved in death care. It has been shown that veterinarians benefit from having colleagues at work who discuss cases and provide mutual support during and after euthanasia.1

The goal is to leverage the team as it is without adding more personnel to an already stretched labor force. Some hospitals have a high euthanasia volume and may need more than 1 designated attendant per day.

Euthanasia attendants can also facilitate self-care for themselves and for the team on their designated day, ordering comfort foods and snacks for the team, playing soothing afternoon music, making sure everyone takes their breaks, providing calming scents, and more.

Euthanasia attendants, first advocated for by the Companion Animal Euthanasia Training Academy, can fill a vital team role to support grieving clients, manage appointment logistics, and make sure the busy workday still puts emphasis on caring and compassion—where it belongs. Just as important, they are masterful listeners.

A euthanasia attendant can improve client, patient, and team support. Discussion about euthanasia services can also stimulate dialogue within the team about boundaries and preferences toward death—who wants to do more, who wants to do less—and find balance for the team. This includes identifying strengths and gaps in emotional intelligence and resilience, which are both so important in end-of-life work.  

REFERENCE

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**Understanding the clients at your practice**

A veterinary expert shares strategies to maximize communication effectiveness and improve compliance.

By Caitlin McCafferty, Associate Editor

Veterinary professionals have a unique relationship with clients: They must get through to pet owners to get proper care for their patients. This communication is crucial because without client adherence, pets could be at risk of not receiving the care they need or falling victim to Dr Google.

How can veterinary professionals increase adherence? They must understand their client and tailor their communication accordingly.

In his recent lecture at the 2022 Midwest Veterinary Conference,1 Courtney Campbell, DVM, DACVS-SA, a veterinary surgeon at VetSurg in California, explained a key point of getting through to pet owners—understanding what kind of client they are—and suggested using anecdotes from other cases to illustrate why adherence is important.

### TYPES OF CLIENTS

People have different perspectives on their pet’s care. Campbell noted 3 types of clients: health literate, collaborative, and directive. It is important to know these different styles and which a particular client is to improve adherence.

Health-literate clients typically appear to have a deeper understanding of health care. These clients tend to ask more questions about what is happening with their pets, and according to Campbell, they may have also done research on whatever issue is affecting their pet. The questions they ask often stem from whatever prior knowledge or reading they have done.

The directive client’s goal is to do whatever it takes to get their pet the help they need. They do not ask as many questions as the health-literate client.

“There are some [clients] who [ask] less questions,” Campbell said. “[They] do not want to look under the hood. They just want to drive the car. So [they say], Please tell me what I should do. This is what the doctor said, and this is exactly what I am going to do.”

The remaining clients you see at your practice will most likely fall somewhere in the middle of health literate and directive, which Campbell describes as collaborative. Collaborative clients view the treatment as a team effort. They will listen to the veterinarian, but Campbell noted that will not stop them from putting their own spin on the treatment plan.

For example, Campbell explained that collaborative clients might think something like: “I’ll listen to the expert, but I also want to do my own thing,” or “[The doctor] recommends I [go] home [with] trazodone and acepromazine, but I’m just going to sprinkle a little cannabis oil on it.”

### ACHIEVING ADHERENCE THROUGH STORYTELLING

After identifying which kind of client you’re working with, you can adapt how you communicate to more effectively connect with them. One strategy that Campbell uses with certain clients is relating what the pet owner is going through with their animal to other clients’ experiences.

If you tell a pet owner that a different client at the clinic did not follow their pet’s treatment plan and the pet ended up reinfected or sicker than before, it can help achieve adherence. Campbell said that although some might consider this a scare tactic, he views it as the staff doing what’s best for the patient. If telling the owner about a real-life scenario achieves adherence, the pet gets the care it needs.

“If we want to make sure that we increase compliance for the best care of that animal [and the] best care of that family, increase revenues for the hospital while saving unnecessary pain and suffering, and [avoid] high medical bills for those around us in our community, then we have to get serious about [how we communicate],” Campbell said.

### REFERENCE

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steps to build up your team

Learn how to conquer burnout by creating an environment that supports well-being and positivity.

1. HAVING A VISION AND PLAN

Success of a business grows from the seeds of the owner’s vision and plan. It is unfortunately common for practice owners to get so caught up working in the business that they forget to work on the business. Practice owners who regularly take themselves out for coffee, meaning leaving the practice and sitting down to think and strategize, end up being more effective leaders.

2. ESTABLISHING MISSION, VALUES, AND CULTURE

As the size of a veterinary practice increases, so does the complexity. Management responsibilities must flow from the owner to leaders within the various departments. This is where it becomes critical to ensure that leaders within the organization are well aligned with the mission, values, and philosophies of the owner. Management processes including the cadence of meetings; meeting agendas; departmental strength, weakness, opportunity, and threat (SWOT) analysis; and systematic methods for managing projects become critical to reducing stress and achieving goals.

3. ESTABLISHING POLICIES AND PROCEDURES

Once the ownership, leadership, and team have identified and aligned themselves with the aspirational virtues of the stated mission, values, and culture, it is imperative that the policies and procedures for the practice also reflect these traits. These become the measuring stick by which so many aspects of planning and performance are judged.

4. ALLOWING STAFF TO TAKE MORE OWNERSHIP

One of the most effective ways to get better performance out of a person is to ensure they feel ownership over their tasks. Still, far too many DVMs are doing things that their staff could handle. This comes down to leadership structure; developing standard operating procedures that reflect the agreed-upon mission, values, and culture of the practice; training; and identifying key performance indicators that each department can use to monitor performance.

5. WELCOMING TEAM FEEDBACK

This is often recognized as important yet is seldom implemented and encouraged in a way that consistently elicits genuine, constructive feedback. Something magic happens when a staff member brings up a good point for improvement and sees management implement it. This can let people know that their voice is heard and taken seriously and can create a powerful sense of connection to the business on top of the improvements staff may suggest.

6. REINFORCING CULTURE AND POLICIES

The mission, values, and culture of the practice can come to fruition only if everyone knows them, can repeat them, and believes that aligning with them is a requirement for employment. These become tools that are constantly referred to in training, working through challenges, and identifying wins.

7. LETTING GO OF TOXIC EMPLOYEES

Many practice owners feel they are being nice by keeping on an employee who is underperforming or is not a good fit. In reality, it is unfair to other team members and is destructive to the culture you are hoping to build. If an employee isn’t behaving in a way that aligns with the agreed-upon mission, values, and culture of the company, letting them go will both remove a toxic force and demonstrate to the team that the ideals of the organization are to be taken seriously.

8. CELEBRATING ACCOMPLISHMENTS

Everyone enjoys and needs recognition and reward on some level, but the type of recognition and reward that excites them can significantly vary. By getting to know the personal, professional, and financial goals of each team member, you can better structure rewards to incentivize optimal performance.

9. ENJOYING THE BENEFITS OF A HIGHLY ENGAGED AND ENTHUSIASTIC TEAM

These 9 steps are a well-proven framework for improving workplace satisfaction and achieving significant company-wide performance improvements. The bottom-line improvements enjoyed by practices that get this right are easy to point toward as reason enough to put in the work. However, seeing how much better your team works together, handles difficult situations, and feels so much happier at the end of the day will be the greatest reward of all.

REFERENCE

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Hospital design for treating cancer patients: USP regulations

Learn key hospital design protocols to help protect patients and staff

Over the course of the COVID-19 pandemic, veterinary professionals have had a lot to worry about. How to keep ourselves and our loved ones safe was at the top of the list. We were forced to take a closer look at how disease can be transmitted and what it’s like to do everything we can to keep each other safe. This included our pets. Many people adopted pets during the pandemic and others just spent much more time with them at home than they had before. Consequently, our veterinary teams were busier than ever on the front lines diagnosing, treating, and caring for our 4-legged family members.

Before the pandemic for non–health care workers, I probably would have needed to define what PPE stood for. Now, it’s common terminology. We now think about how we touch things and how we can potentially pass disease, unknowingly, to someone else. We even think about how long we wash our hands.

When thinking about designing safer spaces for our veterinary teams, we have learned that they need more space; touchless faucets where operationally functional; nonporous, easily cleanable surfaces; and well-planned spaces for proper storage and proper placement of equipment to facilitate a safe working environment. Many of the best practices for safety in hospital design that we all instinctually knew about prepandemic have come flooding back.

Right as the pandemic was getting started, I was patiently waiting for the appeal process for the United States Pharmacopeial Convention’s (USP) revised 2019 General Chapters, <795> Pharmaceutical Compounding – Nonsterile Preparations and <797> Pharmaceutical Compounding – Sterile Preparations, to be complete so we could better understand their implications for designing the safest veterinary oncology area that we could for our clients. Early in January 2020, I published an article in dvm360® titled “Handle hazardous drugs? Read this” that provided the general background and importance of these 2 chapters along with their counterpart, General Chapter <800> Hazardous Drugs – Handling in Healthcare Settings. For over a year before that, we had begun implementing the new standards in our designs. Then, on March 12, 2020, as we were all rightfully concentrating on this new thing called COVID-19, USP issued a decision on appeal of the revised General Chapters <795> and <797>.

The decision was to grant appeals for these 2 General Chapters and to remand the chapters to the Compounding Expert Committee (CMP EC) with the recommendation for further engagement on the issues raised concerning the beyond-use date provisions. The CMP EC is still in review and, as such, the last revised chapters remain official. The kicker here is that until the 2019 versions of these

Figure 1. USP 800 Process Flow

- Identify all HDS
- Identify types of exposure
- Develop SOPs
- Determine configurations
- Train staff
- Execute (update HD/SOP as needed)

Locate four areas

- Designate area for receipt and unpacking
- Designate area for storage
- Designate area for nonsterile compounding
- Designate area for sterile HD compounding

But wait, there’s more!

Scan the QR code to see our in-depth interview with Vicki Pollard, CVT, AIA, and learn more about best practices in hospital design.

Written by
Vicki J. Pollard, AIA, NCARB, AAA, CVT

As a partner at Animal Arts, Pollard brings unique experience to the animal care design world as both an architect and certified veterinary technician. She is also the coauthor of Practical Guide to Veterinary Hospital Design published by AAHA Press and a frequent speaker at national veterinary conferences.
General Chapters are adopted, USP <800> is not compendially applicable. One reason for this is that a General Chapter numbered below 1000 becomes compendially applicable, and a required standard, when the chapter is referenced in another General Chapter below 1000.

Without the revised <795> and <797> chapters, General Chapter <800> holds no regulatory weight. This chapter was devised to create a public standard aimed at minimizing the potential risk of exposure and the information in it is crucial for the safety of both the people administering the drugs and the patients that receive them.³

It has been 2 years since the start of the pandemic and since the CMP EC began its review. The comment period officially closed March 17, 2022, and it is expected that as early as the beginning of next year, we will see the revisions become effective. We need to continue to focus on using this time to begin implementation of the standards.

Tracing the path of hazardous drugs (HDs) from the moment they arrive at the hospital into your receiving area, to your oncology department, and then to a client or administered to a pet is critical. Breaking this down a little further to help you understand the flow, we have illustrated the process in Figure 1. The boxes in orange are the areas your architects should design with your input. The gray boxes are the areas that the veterinary team members handling these drugs will be responsible for.

Let’s take a quick look at some highlights of these 3 General Chapters:
• All antineoplastic drugs requiring manipulation must follow all containment requirements.
• Engineering controls are required. These controls are containment primary engineering control (C-PEC an example being the hood itself), containment secondary engineering control (C-SEC) such as the room in which the C-PEC/hood is located), and supplementary levels of control.
• Sterile and nonsterile hazardous drugs (HDs) must be compounded within a C-PEC located in a C-SEC.
• For sterile preparations, the C-PEC must be in a C-SEC, which may either be an unclassified containment segregated compounding area (C-SCA) (Figure 2) or an ISO Class 7 buffer room with an ISO Class 7 anteroom (Figure 3). These setups are illustrated in the following plan examples.

³ If the C-PEC is placed in a C-SCA, the beyond-use date (BUD) of all compounded sterile preparations must be limited as described in <797> for CSPs prepared in segregated compounding areas. (In <797>, depending upon which version you are referencing, you will need to confirm that you will be able to operationally comply with the low- or medium-risk level or Category 1.)
Volatile drugs can be compounded in a Type 2, Class II BSC. If you plan to use a CAGI, you will need to verify with the hood manufacturer for compliance.

Keep in mind that oncology departments require much more than spaces to handle chemotherapy drugs. They need functional exam space, sufficient nursing, charting spaces, and sufficient additional treatment areas for nonchemotherapy administration. Each full-time–equivalent doctor, if space allows, should have 2 exam rooms, a treatment table, and 2 nurse charting stations dedicated to their service. Additionally, there should be animal housing to accommodate the larger physical size of most oncology patients, as well as varying housing types and locations to support the needs of the patients and procedures that are carried out.

In the floor plan example (Figure 4) there is a run ward nearby as well as cages within the treatment room. Surrounding services should also help support oncology by providing a flex space for additional treatment tables and animal housing. Because many of the animals in this area of the hospital are immunocompromised, you also want to minimize cross traffic of other patients and people and keep the service close to the exam rooms and front-desk team for easier support and transport of animals.

**Final Thoughts**

As veterinary medicine continues to advance and provide more oncology services to more patients, it’s essential that we design to incorporate the goals of these 3 significant USP General Chapters as part of our recognition and support of the safety and facility needs of the people who work and pets that are cared for in these spaces.

References available online at dvm360.com
STRETCH THEIR PROTECTION
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BRAVECTO Chews for Dogs kills fleas, prevents flea infestations, and kills ticks (black-legged tick, American dog tick, and brown dog tick) for 12 weeks. BRAVECTO Chews also kills lone star ticks for 8 weeks.

IMPORTANT SAFETY INFORMATION: The most commonly reported adverse reactions include vomiting, decreased appetite, diarrhea, lethargy, polydipsia, and flatulence. BRAVECTO Chews for Dogs have not been shown to be effective for 12-weeks’ duration in puppies less than 6 months of age. BRAVECTO Chews are not effective against lone star ticks beyond 8 weeks of dosing. Fluralaner 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. Please see full product information on page 56.


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Description:
Each chew is formulated to provide a minimum dose of 11.4 mg/lb (25 mg/kg) body weight. The chemical name of fluralaner is (S)-3-(2,2,2-trifluoroethylamino)-5-(3-fluoromethyl)-4,5,6,7-tetrahydroisoazol-3-yl)-2-methyl-N2-couo-2,2,2-trifluoroethylamidae.

Indications:
Bravecto kills adult fleas and is indicated for the treatment and prevention of flea infestations (Ctenocephalides felis), and the treatment and control of tick infestations (Ixodes scapularis (black-legged tick), Dermacentor variabilis (American dog tick), and Rhipicephalus sanguineus (brown dog tick)) for 12 weeks in dogs and puppies 6 months of age and older, and weighing 4.4 pounds or greater. Bravecto is also indicated for the treatment and control of Amblyomma americanum (lone star tick) infestations for 8 weeks in dogs and puppies 6 months of age and older, and weighing 4.4 pounds or greater.

Dosage and Administration:
Bravecto should be administered orally as a single dose every 12 weeks according to the Dosage Schedule below to provide a minimum dose of 11.4 mg/lb (25 mg/kg) body weight. Bravecto may be administered every 8 weeks in case of potential exposure to Amblyomma americanum ticks (see Effectiveness). Bravecto should be administered with food.

Dosage Schedule

<table>
<thead>
<tr>
<th>Body Weight Ranges (lb)</th>
<th>Fluralaner Content (mg)</th>
<th>Chews Administered</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.4 – 9.9</td>
<td>112.5</td>
<td>One</td>
</tr>
<tr>
<td>&gt;9.9 – 22.0</td>
<td>250</td>
<td>One</td>
</tr>
<tr>
<td>&gt;22.0 – 44.0</td>
<td>500</td>
<td>One</td>
</tr>
<tr>
<td>&gt;44.0 – 88.0</td>
<td>1000</td>
<td>One</td>
</tr>
<tr>
<td>&gt;88.0 – 123.0*</td>
<td>1400</td>
<td>One</td>
</tr>
</tbody>
</table>

* Dogs over 123.0 lb should be administered the appropriate combination of chews.

Treatment with Bravecto may begin at any time of the year and can continue year round without interruption.

Contraindications:
There are no known contraindications for the use of the product.

Warnings:
Not for human use. Keep this and all drugs out of the reach of children. Keep the product in the original packaging until it is used. Do not eat, drink or smoke while handling the product. Wash hands thoroughly with soap and water immediately after use of the product. Keep Bravecto in a secure location out of reach of dogs, cats, and other animals to prevent accidental ingestion or overdose.

Precautions:
Fluralaner 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. Bravecto has not been shown to be effective for 12-weeks duration in puppies less than 6 months of age. Bravecto is not effective against Amblyomma reamani ticks beyond 8 weeks after dosing (see Effectiveness).

Adverse Reactions:
In a well-controlled U.S. field study, which included 294 dogs (224 dogs were administered Bravecto every 12 weeks and 70 dogs were administered an oral active control every 4 weeks and were provided with a tick collar), there were no serious adverse reactions. All potential adverse reactions were recorded in dogs treated with Bravecto over an 84-day period. The most frequently reported adverse reactions in dogs in the Bravecto and active control groups was vomiting.

Percentage of Dogs with Adverse Reactions in the Field Study

<table>
<thead>
<tr>
<th>Adverse Reaction (AR)</th>
<th>Bravecto Group: Percentage of Dogs with the AR During the 182-Day Study (n=224 dogs)</th>
<th>Active Control Group: Percentage of Dogs with the AR During the 84-Day Study (n=70 dogs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vomiting</td>
<td>7.1</td>
<td>14.3</td>
</tr>
<tr>
<td>Decreased Appetite</td>
<td>6.7</td>
<td>0.0</td>
</tr>
<tr>
<td>Diarrhea</td>
<td>4.9</td>
<td>2.9</td>
</tr>
<tr>
<td>Lethargy</td>
<td>5.4</td>
<td>7.1</td>
</tr>
<tr>
<td>Polydipsia</td>
<td>1.8</td>
<td>4.3</td>
</tr>
<tr>
<td>Flatulence</td>
<td>1.3</td>
<td>0.0</td>
</tr>
</tbody>
</table>

In a well-controlled laboratory dose confirmation study, one dog developed edema and hyperventilation of the upper lips within one hour of receiving Bravecto. The edema improved progressively through the day and had resolved without medical intervention by the next day.

Post Approval Experience (2019):
The following adverse events are based on post-approval adverse drug experience reporting. Not all adverse events are reported to FDA/CDRH. It is not always possible to reliably estimate the adverse event frequency or establish a causal relationship to product exposure using postapproval data.

The following adverse events reported for dogs are listed in decreasing order of reporting frequency for fluralaner:

Vomiting, lethargy, diarrhea, (with and without blood), anorexia, pruritis, polydipsia, seizure, allergic reactions (including hives, swelling, erythema), dermatitis (including crusts, pustules, rash), tremors and ataxia.

Contraindication:
For a copy of the Safety Data Sheet (SDS) or to report suspected adverse drug events, contact Merck Animal Health at 1-800-224-5318. Additional information can be found at www.bravecto.com.

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

Clinical Pharmacology:
Peak fluralaner concentrations are achieved between 2 hours and 3 days following oral administration, and the elimination half-life ranges from 9.3 to 16.2 days. Quantifiable drug concentrations can be measured (lower than necessary for effectiveness) through 112 days. Due to reduced drug bioavailability in the fasted state, fluralaner should be administered with food.

Mode of Action:
Fluralaner is a systemic use and belongs to the class of isoxazoline-substituted benzamide derivatives. Fluralaner is an inhibitor of the arachidonic acid system. The mode of action of fluralaner is the antagonism of the ligand-gated chloride channels (gamma-aminobutyric acid (GABA)-receptor and glutamate-receptor).

Effectiveness:
Bravecto began to kill fleas within two hours after administration in a well-controlled laboratorystudy. In a European laboratory study, Bravecto killed fleas and reduced the numbers of live fleas and flea eggs in dogs by 89% within 12 hours of 12 weeks. In a well-controlled laboratory study, Bravecto demonstrated 100% effectiveness against adult fleas 48 hours post-infestation for 12 weeks. In well-controlled laboratory studies, Bravecto demonstrated 93% effectiveness against Demodexvariolatus, Ixodes scapularis and Rhipicephalus sanguineus ticks 48 hours post-infestation for 12 weeks. Bravecto demonstrated 90% effectiveness against Amblyomma americanum 72 hours post-infestation for 8 weeks, but failed to demonstrate 90% effectiveness beyond 8 weeks.

In a well-controlled U.S. field study, a single dose of Bravecto reduced fleas by < 0.0% for 12 weeks. Dogs with signs of flea allergy dermatitis showed improvement in erythema, alopecia, pruritis, scales, crusts, and excoriation as a direct result of eliminating flea infestations.

Potentially in a well-controlled U.S. field study, which included 559 dogs administered to 224 dogs. 87.8% of dogs voluntarily consumed Bravecto within 3 minutes, an additional 12.1% voluntarily consumed Bravecto within 5 minutes when offered with food, and 0.8% refused the dose or required forced administration.

Animal Safety:
Margin of Safety Study: In a margin of safety study, Bravecto was administered orally to 8- to 9-week-old puppies at 1, 3, and 5X the maximum label dose of 56 mg/kg, at three, 8-week intervals. The dogs in the control group (0X) were untreated.

There were no clinically-relevant, treatment-related effects on physical examinations, body weights, food consumption, clinical pathology (hematology, clinical chemistry, coagulation tests, and urinalysis), gross pathology, histopathology, or organ weights. Diarrhea, mucoid and bloody feces were the most common observations in this study, occurring at a similar incidence in the treated and control groups. Five of the twelve treated dogs that experienced one or more of these signs did so within 6 hours of the first dosing. One dog in the 3X treatment group was observed to be dull, inappetant, with evidence of bloody diarrhea, vomiting, and weight loss beginning five days after the first treatment. One dog in the 11X treatment group vomited food 4 hours following the first treatment.

Reproductive Safety Study: Bravecto was administered orally to intact, reportedly-breed-specific male and female Beagles at a dose of up to 168 mg/kg (equivalent to 3X the maximum label dose) on three to four occasions at 8-week intervals. The dogs in the control group (0X) were untreated.

There were no clinically-relevant, treatment-related effects on the body weights, food consumption, reproductive performance, semen analysis, litter data, gross necropsy (adult dogs) or histopathology findings (adult dogs and puppies). One adult 3X treated dog suffered a seizure during the course of the study (46 days after the third treatment). Abnormal salivation was observed on 17 occasions in six treated dogs (11 occasions after dosing and four control dogs (6 occasions). The following abnormalities were noted in 7 pups from 2 of the 10 dams in only the treated group during gross necropsy examination: limit deformity (4 pups), enlarged heart (2 pups), enlarged spleen (3 pups), and deformed palate (2 pups). During veterinary examination at Week 7, 2 pups from the control group had inguinal testicles, and two and four pups from the treated group had inguinal and cryptorchid testicles, respectively. No undescended testicles were observed at the time of necropsy (days 50 to 71). In an well-controlled field study Bravecto was used concurrently with other medications, such as vaccines, anthelmintics, antibiotics, and steroids. No adverse reactions were observed from the concurrent use of Bravecto with other medications.

Storage Information:
Do not store above 86°F (30°C).

How Supplied:
Bravecto is available in five strengths (112.5, 250, 500, 1000, and 1400 mg fluralaner per chew). Each chew is packaged individually into aluminum foil blister packs sealed with a peelable paper backed foil lid stock. Product may be packaged in 1, 2, or 4 chews per package.

Approved by FDA under NADA # 1-414-426
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Madison, NJ 07940
Fluralaner (active ingredient) is made in Japan.
Formulated in Austria
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Rev. 04/19
HappyVetProject

The HappyVetProject website offers a variety of customized content for veterinary professionals that promotes self-care to help alleviate them from their stressful profession. It focuses on physical balance, emotional health, and proper nutrition. There are a host of veterinary interviews and articles, simple cooking recipes, a yoga video and podcast series, and more.

happyvetproject.org

Perio Care Rx gel

Perio Care Rx gel helps promote normal gum recovery and improve gum health. It includes small-molecule lactoferrin, which is a multifunctional protein with antimicrobial and antiviral properties. The formula is highly absorbable and effective because of its unique enzyme processing. This gel is alcohol free, with no irritation.

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WSAVA Veterinary Oncology Glossary

The World Small Animal Veterinary Association Oncology Working Group’s Veterinary Oncology Glossary defines terms surrounding presentations, diagnoses, and treatments, with accompanying images to illustrate key terms. Using straightforward language, the resource simplifies the complexities of cancer so pet parents are better informed when discussing their pet’s condition with their veterinarian.

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DEEP DIVE: MEDICAL MUSHROOMS IN VETERINARY MEDICINE

Robert Silver, DVM, MS, explores the history of mushrooms and discusses how research must be done to see the potential they have in treating patients with cancer, chronic pain, and more.

To watch the video, scan the QR code or visit www.medicalworldnews.com/view/into-medical-mushrooms-in-veterinary-medicine

AFTER HOURS: ROCK & ROLL VET TECH

Longtime Fetch faculty member Alyssa Mages, BS, CVT, cofounder of Empowering Veterinary Teams, shared with Medical World News® her experience as a vocalist in Hypnotic Eye Band, The Tom Petty Experience, a tribute group. When Mages was around age 8 years old, she discovered a love of music through singing and performing musical instruments such as the piano and flute. Now she and the band travel around southeast Pennsylvania, near Philadelphia, performing music from the late Tom Petty as well as Stevie Nicks. To Mages, being a performer connects her to strangers in a unique, special way.

To watch the video, scan the QR code or visit www.medicalworldnews.com/view/after-hours-rock-roll-vet-tech

DEEP DIVE: VETERINARY CBD RESEARCH

Stephen Cital, RVT, RLAT, SRA, VCCS, VTS-LAM, gives a closer look at the use of CBD products in veterinary medicine. He also discusses what began his passion for CBD use and research and how veterinary professionals can talk to clients who are interested in using CBD to treat their pet.

To watch the video, scan the QR code or visit www.medicalworldnews.com/view/deep-dive-into-veterinary-cbd-research

AFTER HOURS: VET TECH BY DAY, COMEDIAN BY NIGHT

Veterinary medicine is a passion for Walter Brown, RVTg, VTS (ECC). However, along with his career as a veterinary technician, Brown is a comedian. Through his comedy career, Brown hopes to shed different perspectives on clinics by creating a sense of humor around things that might appear frustrating but, through laughter, can be seen through a new lens. By pulling from everyday events in his life in and out of the clinic, he hopes to make individuals laugh at the relatable content they all experience daily. He believes that through laughter and appropriate humor, he can put clients at ease about their pets’ treatments or diagnoses.

To watch the video, scan the QR code or visit www.medicalworldnews.com/view/after-hours-vet-tech-by-day-comedian-by-night
Bo advising me to just “get in there and take it out” is why I appreciate his insight. Not because that wasn’t what was best for the horse, or because I wasn’t qualified to do it, but mainly because it instilled confidence in a young veterinarian eager to help a horse in need.

Once off the phone with Bo, I discussed different scenarios with the client. “What if we do nothing?” Jennifer asked.

It’s an easy surgery, I told myself. Find the fracture, take it out, sew it up.”  
— Jeff Ledford, DVM  

Unfortunately, his lameness is so bad that we may have to put him down.” I responded.

“I suspect it will continue to get worse. Bo thinks we need to surgically remove the fragment from the patella. He thinks I can do it, but he said he would do it if you wanted to take a trip down to Lamesa.”

“No, you got it,” the owner said.

I appreciated the confidence she had in me, but I wasn’t so sure about this one. So many things could go wrong. I may not be able to get the chip fracture out. I may cut too much soft tissue, and the horse may not be able to use that leg anymore. I could inadvertently enter the stifle joint and cause it to become septic. The poor outcomes were running through my brain. “OK, well, let’s give it a go,” I said.

When the day of surgery arrived, I was feeling confident. I had a good plan: Cut it open and take it out. Easy. I sedated the horse with xylazine and while he was sedated, I started clipping the hair over the surgery site. All my instruments were in order and we were ready to get started. I placed an intravenous (IV) catheter in the left jugular vein, and when it was sutured in place, I administered ketamine to induce anesthesia. My goal in that moment was to get Play-A to lie down on his right side. You can flap a horse over to the other side if you have enough people, but it was not going to be a good omen if he lay down on the incorrect side. He started wobbling and tried his hardest to lie down on the left, but I gave him a last-minute nudge that pushed him over to the right. I moved the IV pole next to his neck and hooked up the triple-drip anesthesia that would keep him down while we operated. We finished our final surgical scrub, I donned my sterile gloves, opened my pack, and clamped the drape—we were ready for business.

I made an incision through the skin directly over the patella. I dissected to the hypothetical region of the chip fracture. I could palpate a piece of bone that was embedded within soft tissue that felt like the golden ticket. I grasped it with forceps, dug it out, and we were ready to take a follow-up x-ray to ensure full removal. We snapped the picture, and there was still a large piece in there. I went back to work.

I felt around with my fingers, but I couldn’t feel anything broken. Everything felt firmly attached and smooth. What was I going to do? I extended the skin incision and opened the soft tissue to provide me a wider window, and I felt around again—still nothing. We lined up the x-ray generator and I pointed an instrument in the hypothetical location. We snapped the picture again, and I looked. The instrument was just above where I needed to be. I dissected and opened more tissue below where I was looking.

“Ledford!” my technician, Kiersten, yelled. As she pronounced the final syllable of my name, Play-A woke up and his neck started rising from the ground. I leaped on top of his chest, and I was lying belly down on his shoulder. He started trying to sit up, and I was flopping on top of him like a flounder. For whatever reason, I was still holding my hands in the air, trying to stay sterile. Sterility was long gone, but it was an instinct.
"Get the xylazine and ketamine," I yelled while Play-A flopped into the water bucket and splashed mud all over me. Kiersten drew up the ketamine and ran over to give him a bolus. He started settling down and I looked over at the situation behind me. In the hubbub, I hadn’t paid attention to the surgery site. The drape clamps were still attached, and the drape was lying in the mud. The horse had flopped onto the x-ray plate, but my instruments were still where I left them. I pulled off my gloves, helped raise him up, pulled out the x-ray plate, and assessed the surgery site. Kiersten pulled up some saline flush and we started to lavage the incision with it. I donned a new set of gloves, pulled the instruments over to where our new surgery location was, and got back after it. I felt a sense of urgency after the rodeo we had just experienced. Kiersten was ready with ketamine, just in case.

It’s an easy surgery, I told myself. Find the fracture, take it out, and sew it up. I probed around with my forceps hoping to find a divot or crack in the bone’s surface—nothing. I kept searching, but I was losing confidence at this point. What was I going to tell the owner? “Sorry, I suck. I couldn’t find it. I filleted his leg open for no reason.” Or, “Sorry, we are going to have to put him down.”

No. I reminded myself: It’s an easy surgery. Just get it out and sew it up. We took another x-ray. I was looking in the right place. My feet were falling asleep kneeling next to the horse. I was hunched over, arms up, knees on the ground, head half-cocked to the side, and my pants were stained with blood and mud. My brow was dripping with sweat. My hemostat dragged across a lip. I went back over it. It was progress. I stuck the hemostat in a crevice and leveraged up. An oval piece of bone creaked and lifted underneath the periosteum, sucking it down to the bone. It was what I had been looking for. I leveraged with my left hand and cut the periosteum with my right. I worked it up, leveraging the bone fragment away with the hemostat like it was a crowbar. It snapped up, and I clipped the last remaining piece of connective tissue loose and held the piece of bone in my hand. My golden ticket. We snapped the x-ray and the screen hovered in limbo as the software processed the image. The image popped up in view. It was out. We got it.

Kiersten opened the bone rasp and I smoothed out the rough edges. We had to lavage it with saline again and squirt some antibiotic in there for safe measure. I closed it as quickly as I could. I threw the last stitch and breathed a sigh of relief. We had done our part. Now we just had to hope Play-A healed.

I was covered in blood, mud, and sweat. My feet were asleep. My head was pounding from my acute hypertension, and my belly felt like I was Mike Tyson’s punching bag from flopping around on a horse’s chest while he tried to wake up with his leg cut open. But hey—I was in the wilderness, operating on horses, trying to make them better. A smile flashed across my face. No wonder Bo encouraged me to take a stab at this one. I couldn’t wait to call him.

Epicur Pharma is proud to support the ACVO’s philanthropic program as its official namesake sponsor; an event that showcases the heart of the veterinary medicine community!
Client satisfaction and loyalty can go a long way toward ensuring adherence and optimal patient care—not to mention repeat business. Client satisfaction is about meeting expectations, whereas loyalty is about relationship building. Both contribute to the likelihood of a client returning to—and even recommending—your practice, or switching practices altogether.

The news from the American Veterinary Medical Association (AVMA) 2021 Pet Ownership Survey is encouraging in this regard. Despite the challenges to health care delivery posed by COVID-19, 90% of pet owners who responded were somewhat to extremely satisfied with their last veterinary visit, and half were very likely to recommend the practice to friends or family. Even so, 2% were extremely dissatisfied, and 9% said they were extremely likely to switch practices.

Although low in number, dissatisfied clients can disrupt our days, harm the well-being of our teams, and jeopardize the hard-earned reputations of our practices. Indeed, we’ve seen this all too often recently.

So what can we target to improve client satisfaction and loyalty? The answer may surprise you.

**IT’S ABOUT VALUE**

AVMA’s survey found that the most influential factor in client satisfaction is perceived value. Forty percent of clients who were dissatisfied with the overall value of services provided by their veterinarian said they would be likely to switch practices. By contrast, only 18% of clients dissatisfied with the practice’s convenience (hours, location, etc) were likely to switch. Convenience, it turns out, is the least influential factor.

Perceived value isn’t just important to maintaining clients, it also affects an owner’s decision whether to visit the veterinarian in the first place. The survey asked specifically about primary reasons owners did not visit the veterinarian, and respondents told us the following:

- Seventy-eight percent chose responses suggesting low perceived value.
- Convenience ranked much lower, at less than 10%.

**WHAT’S THE PROBLEM?**

The truth is that although many people consider their pets as part of the family, many of these pet owners don’t understand the value of the recommendations their veterinarians make. This is particularly true when it comes to routine examinations and preventive care. Some of the reasons owners gave for their pet not seeing a veterinarian in the past 2 years are as follows:

- Pet didn’t get sick or injured—28%.
- Pet didn’t need vaccines—26%.
- Veterinary care costs more than it’s worth—6%.

This lack of understanding is not surprising if we consider findings from the Bayer veterinary care usage study, which found that communication during veterinary appointments can be unclear. The responses included the following:

- Forty-three percent of pet owners didn’t completely agree that their veterinarian communicates with them in language they understand.
- Fifty-six percent didn’t completely agree that their veterinarian clearly explains when they should bring their pet in to be seen.

**WHAT’S THE SOLUTION?**

The disconnect between what clients perceive as valuable and what veterinary professionals know is important for patient health limits our ability to provide the care our patients need. How can we address, and perhaps eliminate, this disconnect? It all comes down to communication.

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TN NEW ENGLAND Area - Grossing $800K, AAHA Accredited, Owner Willing to Stay On.
TX AUSTIN Area - Grossing $800K, Owner Willing to Stay On.
TX DALLAS Area – Grossing Over $1.0M, Owner Willing to Stay On.
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veterinary care can significantly influence pet owners’ perceptions about the value and importance of regular care. The AVMA’s Language of Veterinary Care findings indicate that pet owners value 3 main things when it comes to their veterinarian:
- expertise;
- a strong relationship; and
- personalized recommendations.

It also uncovered strategies we can use to meet these expectations, as follows:
- Emphasize our experience, not training, to convey expertise.
- Leverage the relationship owners have with their pets: Acknowledge them as their pet’s advocate.
- Provide individualized care, as personalized recommendations can differentiate the veterinary team from other information sources such as groomers, trainers, or the internet.

RESOURCES YOU CAN DRAW ON

The AVMA’s e-book, *Language That Works*, explores the results of this research in further detail, with words and phrases that veterinary teams can use—or should avoid—to help build client relationships and loyalty. We’ve also developed a robust training module that helps veterinary team members connect meaningfully with pet owners to improve adherence, enhance patient care, and drive your business forward. Both resources are available online at avma.org/LanguageOfCare.

COMMUNICATION STYLE MATTERS, TOO

Other tips to help clients appreciate the value of the services you provide, building trust and loyalty, are as follows:
- Use a relationship-centered approach to communication involving back-and-forth with clients to create a partnership rather than a 1-sided delivery of information.¹
- At the start of the appointment, partner with the client in setting an agenda. Ask about any concerns they have, listen, probe for additional concerns, and confirm the list.²
- Talk through what you’re looking for while conducting a physical exam. Conclude with a clear, customized recommendation.¹
- Explain, in client-friendly terms, the benefits and efficacy of the treatments, diagnostic tests, or other services you’re recommending.
- In situations involving choice, such as recommending one vaccine over another, explain the rationale in terms of the patient’s needs.
- Be transparent about costs and explain the value of related services in relation to the pet’s current and long-term health.¹,³
- Conclude the appointment with a personalized follow-up plan.

Partners for Healthy Pets offers a free preventive health care certificate program that provides more detail on communication styles that promote relationship building and perceived value. It can be found online at avma.org/Axon. An added bonus: veterinarians, veterinary technicians, and practice managers can earn 9 continuing education (CE) credits by participating.

WHAT ABOUT ANGRY CLIENTS?

Despite our best efforts, we’re bound to encounter disgruntled or angry clients. When this happens, how can we build a bridge to reestablish friendly and trusting relationships?
- Let the client vent and listen to understand. Appreciating the concern can help you decide whether and how to address it.⁴
- Acknowledge the problem and apologize. Let the client know you hear them.
- Be willing to solve the problem. Compassion is an effective antidote to anger.
- Remain calm. Consider your body language and aim for a relaxed posture with good eye contact.
- Consider difficult feedback a gift. You can’t fix what you don’t know about, and talking things out in person may prevent complaints on social media.

If you’re attending AVMA Convention 2022, you’ll find specific CE sessions that can help deal with these situations, including “Difficult Clients: Turning Snappy Into Happy,” led by Amy Newfield, MS, CVT, VTS.

THE BOTTOM LINE

Pet owners appreciate convenience, but understanding the value of veterinary services will keep them coming back. Simply changing how we talk can help owners better understand this value, ultimately leading to healthier pets and stronger, more rewarding relationships. ☚

REFERENCES

Making Rash Decisions When Choosing a Treatment Plan for YOUR CANINE DERMATOLOGY PATIENTS?

Don’t Forget Your Dermatopical!
It’s Monday morning. You just arrived at your desk after finishing your coffee, putting on your lab coat and stethoscope, and sitting down at the computer to open your schedule for the day. You see multiple dermatology cases in your schedule, including second or third opinion consultations for a pruritic dog with over 30 pages of history from multiple primary care practices, with some scribbled handwritten notes. Does this sound familiar? This common scenario can stir up a variety of emotions. Most veterinarians can be divided into 1 of 2 groups; those who love dermatology cases with all their complexity, multimodal, and individualized approaches, or those who absolutely dread to see them in their appointment schedule, knowing the lengthy conversations that are about to ensue and the stack of records that must be reviewed. Dermatology cases can have a negative impact on the human-animal bond between our patients and their pet parents. The skin and fur are one of the first parts we touch, feel, and see whenever we interact with our pets, and most of us would be quick to say that we enjoy a good snuggle with our pets. When pets develop an odor, poor coat quality, are awake at night with pruritus, or have visible dermatologic lesions, pet owners are also very distressed. Dermatology can be incredibly frustrating for everyone involved. Successful management of dermatology patients requires consistent, thorough, and repeated communication from all veterinary team members and patience from the owner and the involved veterinarians. There is a lack of tangible diagnostic tests for atopic dermatitis (AD). Optimal treatment of AD requires a flexible patient-specific therapeutic plan including multimodal anchor therapy and flare-up therapy, extended or lifelong treatment, exceptional client adherence, and necessitates setting realistic expectations. Even with all of the above, flare-ups and secondary infections may still occur, making clear understanding and reasonable expectations of pet owners the key to successful long-term management of dermatology cases. Dermatology patients are here to stay. The estimated prevalence of patients with canine AD is 10% to 15%. While our understanding of the pathogenesis of AD is always evolving, a lot remains to be elucidated. To complicate things further, the nomenclature of AD is also transforming, now including canine atopic-like dermatitis as well as the traditional AD. Most veterinarians typically have go-to medications and diets for AD patients, but many shy away from the use of dermatopicals due to concerns with client compliance or the convenience of the newer generations of anti-pruritic therapy. Unfortunately, foregoing dermatopicals means that many treatment plans are missing the part of multimodal therapy that addresses the largest organ of the body involved in the pathogenesis of AD—the skin.

A BRIEF REVIEW OF AD

**Definition and Etiology**

The International Task Force on Canine Atopic Dermatitis, now the International Committee on Allergic Diseases of Animals (ICADA), defines canine AD as “a genetically predisposed inflammatory and pruritic allergic skin disease with characteristic clinical features associated with immunoglobulin E (IgE) antibodies most commonly directed against environmental allergens.” Patients with canine atopic-like dermatitis have inflammatory and pruritic skin disease, present with clinical features identical to canine AD, but an IgE response to environmental or other allergens cannot be documented.

Canine AD is a multifactorial, noncurable disease. The pathogenesis is not fully understood, but the disease is currently agreed to be caused by a combination of genetic abnormalities, skin barrier defects, and an altered immune system leading to skin inflammation. Antigen exposure occurs through various routes, mainly oral, inhaled, or through a permeable or defective skin barrier. Commonly affected breeds include but are not limited to West Highland white terriers, boxers, French bulldogs, Chinese Shar-pees, American cocker spaniels, English Springer spaniels, and poodles.

**Clinical Signs and Secondary Infections**

Patients with canine AD typically present with a history of pruritus that may or may not be accompanied with recurrent skin and/or ear infections. These clinical signs can be seasonal or nonseasonal, particularly if the patient also has cutaneous adverse food reactions. During flare-ups, veterinarians may see patients presenting with erythematous lesions, papules, crusts, excoriations, and in chronic cases of lichenification with hypo- or hyperpigmentation. In many cases, they may present with secondary bacterial or yeast infections, further exacerbating the pruritus and defective epidermal barrier.

**Diagnosis**

Diagnosis of AD is not straightforward and typically relies on being a diagnosis of exclusion, in addition to signalment, history, clinical signs, and response to treatment. While this may seem like a challenging endeavor, the process of obtaining this diagnosis may benefit the patient in determining an appropriate treatment plan. A quick summary of diagnostic tests commonly used in AD patients is presented in Table 1 (on the next page). Many clinicians use checklists to aid in objectively diagnosing AD. But as with any checklist, some patients do not exhibit every clinical sign, and some of these clinical signs can occur with other pathologies. “Favrot 2009 criteria” is a commonly used checklist.
# Table 1. Summary of Diagnostic Tests and Justification in Canine Atopic Dermatitis

<table>
<thead>
<tr>
<th>Diagnostic tests</th>
<th>Justification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diet trial for 8 to 10 weeks using either a novel or hydrolyzed protein followed</td>
<td>Rule out concurrent cutaneous adverse food reaction</td>
</tr>
<tr>
<td>by provocation trial. May require more than 1 diet trial</td>
<td></td>
</tr>
<tr>
<td>Parasite prevention program</td>
<td>Rule out flea-bite hypersensitivity and other potential ectoparasites with similar presentation</td>
</tr>
<tr>
<td>Fungal culture</td>
<td>Rule out dermatophytosis</td>
</tr>
<tr>
<td>Cytology (deep skin scraping, hair plucks, superficial skin scrapings)</td>
<td>Rule out parasitic etiologies of pruritus and dermatologic lesions such as demodicosis,</td>
</tr>
<tr>
<td></td>
<td>Cheyletiella sp, Sarcoptes scabiei sp</td>
</tr>
<tr>
<td></td>
<td>Guide treatment of secondary infections</td>
</tr>
<tr>
<td>Biopsy</td>
<td>Can be used to rule out other differential diagnoses such as cutaneous T-cell lymphoma, but</td>
</tr>
<tr>
<td></td>
<td>histology changes of atopic dermatitis are not pathognomonic</td>
</tr>
<tr>
<td>Blood work</td>
<td>Rule out endocrine diseases (hypothyroidism, hyperadrenocorticism, diabetes mellitus) that can</td>
</tr>
<tr>
<td></td>
<td>affect a patient’s immune response</td>
</tr>
</tbody>
</table>

# Table 2. Summary of Treatment for Acute and Chronic Canine Atopic Dermatitis per ICADA

<table>
<thead>
<tr>
<th>Treatment for acute canine AD flare-ups</th>
<th>Treatment for chronic canine AD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identify and avoid/eliminate factors involved in flare-up such as food, fleas,</td>
<td>Identify and avoid/eliminate factors involved in flare-up, such as food, fleas, environmental</td>
</tr>
<tr>
<td>environmental allergens or secondary infections with bacteria or yeast</td>
<td>allergens or secondary infections with bacteria or yeast</td>
</tr>
<tr>
<td>Improve skin and coat hygiene by bathing patient with mild shampoos</td>
<td>Improve skin and coat hygiene with regular bathing and possibly increasing fatty acid intake</td>
</tr>
<tr>
<td>Control pruritus and skin lesions using either topical and/or oral glucocorticoids</td>
<td>Use medications such as topical and oral glucocorticoids, oral ciclosporin, or oral</td>
</tr>
<tr>
<td>or oral oclacitinib*</td>
<td>oclacitinib to reduce chronic pruritus and skin lesions *</td>
</tr>
</tbody>
</table>

Targeted therapy using ASIT

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**AD, atopic dermatitis; ASIT, allergen-specific immunotherapy; ICADA, International Committee on Allergic Diseases of Animals.**

*These guidelines were published before the approval of loktevetab, therefore it was not mentioned in the guidelines.

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1. Onset of signs before 3 years of age
2. Indoor living environment
3. Glucocorticoid-responsive pruritus
4. Pruritus sine materia (without other clinical signs) at onset (ie, alesional pruritus)
5. Affected front feet
6. Affected ear pinnae
7. Nonaffected ear margins
8. Nonaffected dorsolumbar area

A patient exhibiting 5 of the above criteria has a diagnostic sensitivity of 85%, and specificity of 79% in identifying and differentiating canine patients with AD from those with chronic/recurrent pruritus due to unrelated etiologies.\(^8\)

Unfortunately, the use of intradermal allergy tests (IDTs) and serologic allergy tests (SATs) should be reserved for selecting allergens in allergen-specific immunotherapy (ASIT) and not as a diagnostic tool. It is well documented that both healthy patients as well as patients with canine AD may have false positive results leading to misdiagnosis.\(^5,10\) Furthermore, patients with atopic-like dermatitis typically have negative SATs.\(^3,9\)

**Treatment**

ICADA has issued clinical practice guidelines, last updated in 2015, which summarize the treatment suggestions for both acute and chronic flare-ups of AD.\(^5,11\) **Table 2** outlines a brief summary of the treatment recommendations in acute flare-ups, in addition to chronic canine AD.\(^12\)

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**THE SKIN AS AN ORGAN**

Before discussing the barriers of the skin and their involvement in the pathogenesis of AD, we should quickly review the skin as an organ. The skin and its importance are often overlooked by busy clinicians. It’s the largest organ by weight and covers nearly all of the body. Depending on the breed/s of dog, it can comprise up to 24% of the weight of a newborn puppy and 12% of the weight of an adult dog.\(^13\) The skin is a complex, multifunctional organ and performs a seemingly endless variety of functions, some subtle and some more obvious. The skin maintains our body’s form or shape, helps with thermoregulation, prevents water and electrolyte loss, and secretes and excretes life-sustaining substances such as milk. The skin also stores fat, can serve as an indicator of internal diseases, plays a role in the synthesis of vitamin D, and protects us from trauma, microbes, and irritants. And besides, we would look really strange without it!

The skin is comprised of 3 major layers and multiple appendages (such as hair and claws). The thickness of the skin varies based on its location on the body. From superficial to deep, these layers are (Figure 1):

---

**Figure 1. Anatomy of the Layers of Dog Skin**

- **Epidermis**
- **Dermis**
- **Subcutaneous tissue**
- **Hair follicle**
- **Sebaceous gland**
- **Arrector pili muscle**
- **Lymph vessel**
- **Nerve**
- **Vein**
- **Artery**
- **Fat**
- **Sweat gland**

The skin layers.
**Epidermis:** The outermost layer of the skin, providing protection and always being renewed through the process of keratinization. It is comprised of multiple cell types such as keratinocytes, corneocytes and Langerhans cells. The epidermis itself is also comprised of layers (covered below).

**Dermis:** The second outermost layer of the skin, which supports the epidermis. The dermis is comprised of a rich network of connective tissue fibers, hair follicles, glands, blood vessels, nerves, and lymphatic vessels.

**Subcutis:** The deepest layer of the skin is comprised of connective tissue and fat and attaches the dermis and epidermis to underlying muscles and bones.

The epidermis is the skin layer of greatest importance when discussing dermatopicals for clinical use. It’s the layer that provides barrier function and its dysfunction plays a role in the pathogenesis of AD, and therefore is the target of topical treatments. The epidermis itself is comprised of 5 sublayers, as seen in **Figure 2**.

**Stratum corneum:** The most external layer of the epidermis plays the major role in the skin’s barrier functions. It is comprised of multiple layers of flattened dead cells called corneocytes. The corneocytes are surrounded by a lipid matrix, or lamellae, made of a combination of cholesterol, free fatty acids, and ceramides. The corneocytes are held together by corneodesmosomes, which are intercellular adhesive structures.

**Stratum lucidum:** This thin layer of nonnucleated keratinizing cells is only present in certain areas, such as the canine foot pad.

**Stratum granulosum:** The cells in this layer start to have degenerating nuclei. It is comprised of a thin layer of keratinocytes containing keratohyalin granules, which contribute to the keratinization process.

**Stratum spinosum:** This layer is directly superficial to the stratum basale. The thickness of this layer varies based on the anatomic location. The cells in this layer have lamellar bodies, which eventually extrude their contents to provide the extracellular lipid lamellae. This layer also contains Langerhans cells.

**Stratum basale:** This is the most proximal layer before the dermis. This layer contains dividing live cells called keratinocytes. It is also the only layer with melanocytes. It attaches the epidermis, to the dermis.

The epidermis is in constant transition due to normal maturation. Live keratinocytes from the stratum basale are dividing and moving up through the layers to eventually become corneocytes surrounded by the cement-like lipid matrix in the stratum corneum. The corneocytes are eventually shed into the environment, giving place to new cells. This process, called keratinization, typically takes approximately 21 days in dogs, and is why topical therapy can take a few weeks before seeing improvement in certain cases. Any disruption in this cell life cycle due to changes in nutrition, hormones, disease or inflammation can lead to seborrheic changes.

### SKIN BARRIERS IN HEALTHY SKIN

A lot has been said so far about the skin acting as a barrier between the body and the environment. However, there are multiple components to the barrier that work together like an ecosystem. A defect in one barrier will affect the others and can lead to progression of pathology. When all barriers are healthy, they support each other and maintain skin health.

The first component of the skin barrier would be the physical or mechanical skin barrier, which is in large part provided by the stratum corneum. The best way to think about the physical barrier of the stratum corneum would be to use a brick and mortar analogy. The stratum corneum serves as an interface between the outside environment and the body and relies on the structural integrity of this brick and mortar sublayer to do so. The “bricks” are the terminally differentiated corneocytes, while the “mortar” is the intercellular lipid lamellae that holds everything together and is further strengthened by corneodesmosomes. When this physical barrier is healthy, it maintains hydration by preventing water loss, promotes normal cell turnover (keratinization), and most importantly in the role of AD, it prevents allergens and pathogens from penetrating the stratum corneum.

A healthy physical barrier prevents the immune system from constant bombardment by pathogens and allergens while keeping the microbiome right where it should be—on the surface of the skin.

Our knowledge and understanding of the second component of the skin barrier is constantly evolving. For years we have understood the importance of the microbiome in the gastrointestinal tract. We are now...

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**Figure 2. Epidermis of the Dog**

![Canine epidermis layers.](image)
realizing that the resident microbiome of the skin plays a very important role in its barrier function, and likely contributes to the pathogenesis of AD. The skin microbiome is rich and diverse, and comprised of a complex ecosystem of various organisms including bacteria, fungi, and viruses. Multiple studies in recent years have sequenced the resident microbiome in the skin. In dogs, the bacterial population varies based on the body site sampled, the individual, and even the gender. The predominant resident bacteria appear to be Firmicutes (such as *Staphylococcus* [staph] and *Streptococcus*), or Proteobacteria (such as *Enterobacteriaceae*).

See Figure 3 for a visualization of the variability in the microbiome of different body locations in a healthy dog. With advances in technology, mainly next-generation sequencing, we are now beginning to understand how to identify the resident fungal population. Typically, the factors that appear to influence the mycobiome include cohabitation with other pets, skin health, and environmental exposures. In many cases, *Malassezia pachydermatis* was identified in healthy dogs of various breeds in interdigital skin and the perioral and lip regions. The most commonly identified fungi on canine skin appear to be common fungal human allergens and filamentous environmental contaminants, mainly *Alternaria*, *Cladosporium*, and *Epicoccum* spp.

Second, the microbiome plays multiple crucial roles in the skin barrier function. First, the commensal flora helps inhibit the growth of pathogenic organisms by providing competition for space and nutrition, by maintaining a specific pH, and by producing substances that inhibit the growth of pathogenic organisms. TLR pathways play a role in the innate immune system by recognizing pathogen-associated molecular patterns of microbes. Finally, the immune system makes up an important component of the skin barrier. It involves various cells, molecules, in addition to an intertwined innate and adaptive immune responses. The innate immune

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**Figure 3. Anatomy and Related Microbiome of a Healthy Dog**

![Microbiome diagram]

The skin microbiome is rich and diverse, and comprised of a complex ecosystem of various organisms including bacteria, fungi, and viruses.”

—*Karren Prost, DVM, MPH, DACVPM*
response is rapid and poorly discriminating with very little memory, whereas the adaptive immune response is highly specific with memory, however it is slower in onset. The innate immune response includes nonspecific strategies to block and attack pathogens. These include physical barriers such as the epidermal barrier, natural killer cells, neutrophils and macrophages, eosinophils, antibodies, and keratinocytes that produce chemokines, cytokines, and peptides with antimicrobial functions. The adaptive immune system involves antigens being presented to Langerhans cells or dendritic cells, followed by lymphocyte activation and specific antibody production. A normal immune system contributes to the skin barrier by reacting in an appropriate manner to pathogens presented to it. A healthy mechanical barrier prevents most pathogens from reaching the immune system while rich and diverse microbiome help in educating and reinforcing the immune system.

We now understand the various components of the skin barriers, and how they work in conjunction in healthy patients. The question is, what happens in AD? Where does it all go wrong? Unfortunately, in some cases it is difficult to pinpoint where the problem starts. Skin barrier dysfunction is now a very well documented phenomenon in both canine and human AD. There are defects identified in multiple facets of the skin barrier, and each defect negative affects the other components of the skin barrier. It’s all part of a vicious cycle.

**SKIN BARRIERS IN AD**

Canine patients with AD are subjected to multiple changes or defects to the skin barrier that contribute to the pathogenesis of this disease. The stratum corneum is the first mechanical line of defense, protecting the skin from the environment. Once the physical barrier is disrupted and the brick and mortar structure is no longer impermeable, allergens, irritants, and pathogens can penetrate the epidermis. The epidermis’ Langerhans cells then become exposed to the allergens and pathogens initiating an inflammatory response. Multiple studies highlight these findings. A study looking at the skin of atopic beagles using electron microscopy identified wider intercellular spaces in the stratum corneum, even in clinically normal skin. 

Transmission electron microscopy has also found that even clinically normal skin in atopic dogs has changes in the “mortar,” with disorganized lipid lamellae and widening of the intercellular space that worsen when AD lesions develop. It is also well documented that atopic dogs have increased transepidermal water loss due to increased permeability, even in nonlesional skin.

Multiple studies have also described changes in composition and a decreased amount of ceramide in AD patients with lesions, with particular decreases in ceramides 1, 3, and 9. Finally, dust mites and their allergens alter the function of corneodesmosomes, furthering the permeability of the stratum corneum of AD patients.

In addition to increased permeability of the stratum corneum, patients with AD are found to have both bacterial and fungal dysbiosis even in nonlesional skin. Some of these bacteria also develop biofilms, providing them additional protection from the host’s immune system. Some of this is fairly common knowledge. We understand secondary bacterial and fungal infections are commonplace with AD due to reduced immunity associated with altered and more permeable skin barriers. These commonplace infections are often caused by commensal organisms that are a component of a healthy microbiome. These typically include *Staphylococcus pseudintermedius* or *Malassezia pachydermatis,* which serve as a reservoir and act as opportunistic pathogens by proliferating in the right environment. A relative increase in *Staph spp* often precedes a flare-up of AD, and these secondary infections lead to additional inflammation, can modulate the immune system, and can act as allergens (*Malassezia spp*), promoting pruritus and dermatitis.

The pruritus causes further damage to the mechanical barrier, causing additional pathogen penetration, and the vicious cycle persists. Patients with canine AD no longer have a diverse microbiome helping to prevent pathogen colonization and contributing to the immune system.

Besides a permeable stratum corneum and dysbiosis, canine patients with AD have dysregulation of their immune system. Canine patients with AD present with an overstimulation of T helper (Th) cells and triggers a Th2 response. This Th2 response occurs due to the increased penetration of allergens through atopic skin, increasing the production of important cytokines such as interleukin (IL)-4, IL-5, IL-6, IL-13, and IL-31. There is also an increased expression of thymic stromal lymphopoietin (another cytokine). Some of the cytokines are proinflammatory, some of them (IL-4 and IL-13) stimulate B-lymphocytes to produce an increasing amount of IgE, and some contribute to the pruritogenic pathway.

In summary, a defective mechanical barrier allows allergens, pathogens, and irritants to penetrate and contact epidermal immune cells while allowing increased water loss. These epidermal immune cells trigger an overstimulation of T helper cells, which serve as a reservoir for allergens and pathogens. The pruritus causes further damage to the mechanical barrier, causing additional pathogen penetration, and the vicious cycle persists. Patients with canine AD no longer have a diverse microbiome helping to prevent pathogen colonization and contributing to the immune system.

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**MAIN BENEFITS OF ADDING A DERMATOPICAL**

Now that we’ve done a deep dive into how skin barrier defects present in patients with AD and how such defects contribute to the pathogenesis of this incurable condition, it is easier to recognize that addressing the skin itself is an important component of multimodal therapy.
Dermatology is one area of veterinary medicine where responsible antimicrobial usage can make a big impact.”

— Karren Prost, DVM, MPH, DACVPM

Dermatopicals, mainly shampoos, remain the best way to do this. While it can sometimes be difficult to get owners on board, sharing the specific benefits of dermatopical therapy can help convince them. These benefits include as follows:

**Repairing the Defective Skin Barrier**

Using dermatopicals allows the ingredients to have immediate and direct contact with the target organ that is defective to potentially reduce flare-ups. Many shampoos and other dermatopical formulations such as mousses and wipes contain ingredients that can help repair the skin barriers. Important ingredients for repairing the skin barriers include phytosphingosine (a major component of ceramides) and Ophytrium. Ophytrium has been found to increase total ceramide levels, decrease transepidermal water loss, and reduce biofilm formation in *in vitro* studies.\(^\text{30,31}\)

**Promoting Responsible Antimicrobial Use**

Veterinarians are very familiar with the dilemma of antimicrobial resistance. Antimicrobial resistance is on the World Health Organization’s list “Ten Threats to Global Health in 2019.” Driven by the overuse of antimicrobials in both people and animals, veterinarians are at the forefront of ensuring judicious use of these lifesaving treatments. Dermatology is one area of veterinary medicine where responsible antimicrobial usage can make a big impact. In canine patients, superficial bacterial folliculitis (SBF) is the most common form of pyoderma seen in clinical practice. SBF is usually caused by *Staph pseudintermedius*, a resident organism that takes advantage of a defective skin barrier and is the principal reason for antimicrobial use in small animal practice.\(^\text{7}\) Patients with SBF will often present with recurrent infections due to underlying AD, necessitating the need for judicious antimicrobial use. Using topical antiseptics greatly reduces exposure of systemic antimicrobials to other organ systems driving the development and emergence of resistant strains. In addition, resistance to the high concentrations of antimicrobials typically found in dermatopicals is uncommon.\(^\text{37,32}\) The Antimicrobial Guidelines Working Group of the International Society for Companion Animal Infectious Diseases encourages topical therapy as the recommended approach to SBF, particularly in early stages and localized lesions, or in conjunction with systemic antimicrobials to decrease their duration of administration while providing faster resolution of lesions.\(^\text{37,32}\) Common antiseptics found in dermatopicals include chlorhexidine, benzoyl peroxide, ethyl lactate, and povidone iodine, and their use is recommended 2 to 3 times weekly until 7 days past clinical resolution, then weekly for prophylaxis.\(^\text{37}\) Dermatopicals are also of benefit in *Malassezia* overgrowth. The current clinical consensus guidelines by the World Association for Veterinary Dermatology recommend that the treatment of *Malassezia* dermatitis includes appropriate topical and/or systemic antifungals, and a combination of the two is optimal in dogs with generalized or severe lesions.\(^\text{37}\) Current recommendations for topical treatment of *Malassezia* dermatitis include dermatopicals containing 3% chlorhexidine or 2% chlorhexidine with 2% miconazole.\(^\text{17}\)

In both of these clinical situations, dermatopicals provide multiple added benefits in addition to typically being very well tolerated with minimal adverse effects, unlike some systemic medications.

**Removal of Allergens, Debris, and Irritants and May Reduce Flare-ups While Providing Relief**

While there are many amazing alternatives to shampoos nowadays, shampoos will always be needed. It is well understood that the most important route of allergen absorption is the percutaneous route. A shampoo is typically recommended before using alternative formulations such as mousses, wipes, sprays in order to remove the allergens, debris, and irritants that accumulate on the skin surface. Many dermatologists will advise weekly bathing even between flare-ups in order to reduce cutaneous contact with allergens. In certain cases, regular bathing with antiseptic shampoos may help prevent further recurrence of SBF or *Malassezia* dermatitis, by preventing potentially pathogenic organism overgrowth.\(^\text{33}\) Using cool or lukewarm water when bathing hot and inflamed skin can provide immediate relief for our patients. Certain dermatopicals containing emollients can have an antipruritic effect.\(^\text{12}\) There are promising human studies using a topical product containing *Ophiopogon japonicus* (the purified natural ingredient that is Ophytrium) demonstrating clinical efficacy in reducing AD flare-ups.\(^\text{11}\)

**HOW TO BEGIN INCORPORATING DERMATOPICALS INTO YOUR PRACTICE**

Now that we realize the importance of dermatopicals, it’s time to put our understanding into action. It can be daunting to change how we practice. By taking small steps and slowly incorporating these medications into your routine, the use of dermatopicals can become a regular component of your treatment for patients with canine AD. The following steps are a great way to get started in your practice of incorporating dermatopicals:

1. Know and understand what dermatopicals are in your practice. What are their ingredients? What are their claims? What other formulations or alternatives are available to the shampoos? Reach out to your sales reps and technical services veterinarians. They are great resources to help you in this endeavor. Technical services veterinarians can provide you with tools to help in client communication, and can help optimize your treatment plans using their products.

2. If you’re doing cytology for a patient—which should take place in every dermatology case—you’ll need a dermatopical. It might be a little difficult to convince clients who haven’t recently dealt with an AD flare-up to start shampooing. But when patients present with active lesions, they need a dermatopical. Start by...
CONCLUSION

Patients with atopic dermatitis is an everyday part of veterinary practice, and they are likely to be seen in any practice. Healthy skin typically has an impermeable barrier to prevent the penetration of allergens and pathogens while also keeping in moisture. Healthy skin should also contain a rich and diverse microbiota in addition to a balanced immunological response. We now know that patients with AD have defective skin barriers. 1-3

3. Be prepared with ways to handle client objections to dermatological use. These suggestions may be helpful:
   a. Use a lick mat and Fear Free practices for dogs that are difficult to bathe. Fear Free Happy Homes (https://www.fearfreehappyhomes.com) is a website designed specifically for clients with anxious patients with great advice on bathing and grooming.
   b. If you don’t have a tub at home, self-serve dog washes are available in many shopping malls, pet food stores, and dog parks, and certain car washes have enclosed dog bath stations available.
   c. Take advantage of all the alternative formulations to shampoo! While an initial bath to remove the dirt, oils, and hair follicles may be required, antiseptics and topical applications of active ingredients that can repair wounded skin barriers can be applied in other manners, such as using mousses, lotions, sprays, or wipes. The alternative formulations can help drive up patient compliance, and most do not require a rinse.

The impact of Fear Free

Since its founding in 2016, Fear Free, LLC, has had an everlasting effect on the veterinary community. Here is a deeper dive into Fear Free and what it does to help veterinary professionals, pet parents, and most importantly, the pets.

I have been involved with veterinary medicine for over 25 years. I learned a long time ago that if you have a new idea, the hope is that you also have patience, because veterinary medicine doesn’t instantly embrace new ideas. However, I suppose many veterinary professionals are very familiar with Fear Free, LLC, which was launched in 2016 by Marty Becker, DVM, and the public is becoming increasingly familiar with it, as well.

Only 6 years later, a relatively short time in veterinary medicine. Fear Free came along at the right time, exceeding expectations, even of its founder. Today, the standard line ought never to be “just get the job done,” even if the pet is petrified. Veterinary professionals of a certain era were once taught just to get it done, and worrying about emotional fallout wasn’t even a consideration. In fact, no one knew or cared about such things.

Karen Overall, MA, VMD, PhD, DACVB, CAAB, has said for years, “Fear is the worst thing a social species could experience, and it causes permanent damage to the brain.”

In my personal experience, I imagine many animals believe they are going to die when they arrive at the veterinary clinic, and that terror may occur at the mere sight of the carrier for some. I have no data to back it up, but veterinary professionals have most likely seen the sheer terror in patients. I assume these individuals believe they’re fighting for their lives. It does not need to be this way, and today’s pet parents, who are more attuned to their “fur baby’s” feelings than ever before, aren’t going to allow for this.

It’s all about perception. If that client (particularly millennials) believes your team has “manhandled” their cat or if a practice calls in the National Guard to wrestle a dog, it’s over. Worse than losing a client, the description of the epic battle could be all over the Internet in an hour.

Of course, the quality of an exam is skewed when a patient is terrorized and there is a potential that the patient may be injured, not to mention an increased risk of injury to a member of the veterinary team. Again, as Becker repeatedly says, “It’s simple: Today, we know better. We can take the ‘pet’ out of ‘petrified.’”

To be transparent, I’ve been a Fear Free speaker from the beginning, and here is what I know: Fear Free is a resounding success because it works. Today, there are over 84,000 Fear Free Certified Professionals in the US and Canada and many more in over 50 other nations, with over 150 practices Fear Free Certified. What’s more, many veterinary schools encourage or even require Fear Free as a part of their curriculum.

Watching the impact of Fear Free, dog trainers, animal behavior consultants, and groomers approached Dr Becker asking his team to create certifications for their professions, which has since happened. Additionally, the Fear Free Shelter program was launched in 2019.

A 2021 study demonstrates that using Fear Free tools and techniques makes a difference in patient visits. When seeing a Fear Free veterinarian, vet visits increased overall 2%, and 3.5% among cats. In a study made up of 41 Fear Free Certified Practices, several key performance indicators were identified and measured. Fear Free Certified Practices continually improved their own performance after 3 years of implementing Fear Free, as follows:

- 14% increase in the number of patients per practice;
- 23% increase in revenue per practice;
- 8% increase in drugs and medications;
- 22% increase in vaccines;
- 37% increase in booking forward feline patients; and
- 44% increase in booking forward for canine patients.

In 2017, Fear Free launched Fear Free Happy Homes, a website for pet parents. With so much misinformation online, this site offers a dependable source of companion animal information, with content authored by experts and reviewed by experts, such as boarded veterinary behaviorists or technicians boarded in behavior, often presented in an entertaining manner.

Indeed, emotional well-being matters, as scientists and even the courts now acknowledge our pets are sentient beings, but consider emotional well-being on both sides of the exam table. I know of 0 veterinary professionals who went into this industry to wrangle pets and support them being downright terrified. Of course, it makes veterinary professionals feel better about their jobs, and one thing the profession can use—especially right now—is job satisfaction.

What is Fear Free?

- Previsit pharmacology—whether pharmaceuticals, nutraceuticals, pheromones, or a combination—and likely pairing it with behavior modification to provide pets with the ability to enter the clinic calmly.
- Making the visit as pet friendly as possible, using distractions such as high-value treats like peanut butter or tuna, soft music, and willingness to meet the pet emotionally without force, such as examining a cat in the carrier.
- Using touch gradient (predictability of what’s next), gentle handling, and more. Even the architecture of the clinic itself may be adjusted to be more Fear Free.
- Creating a pet parent–conscious environment. Understanding the stress level of clients coincides with the escalating stress level of their pet (and vice versa). Also, today’s pet parents want explanations for everything and, as 1 example, don’t want you disappearing with the pet in the “dreaded back” without a reasonable explanation.

REFERENCES


Steve Dale, CABC, writes for veterinary professionals and pet owners, hosts 2 national radio programs, and has appeared on TV shows, including Good Morning America and The Oprah Winfrey Show. He is on the dvm360® Editorial Advisory Board as well as the boards of the Human Animal Bond Association and EveryCat Foundation. He appears at conferences around the world. Visit stevedale.tv.
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