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Veterinary Medicine is a peer-reviewed journal dedicated to providing concise, credible, and essential information on the most common and crucial clinical problems seen in companion-animal practice.

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Do you see cats? Then you need these *environmental guidelines*

Ilona Rodan, DVM, DABVP (feline practice)
Cat Care Clinic
Behavior Consultations for Cats
322 Junction Road
Madison, WI 53717

Do you enjoy working with inappropriate elimination? What about difficult-to-control feline idiopathic or interstitial cystitis (lower urinary tract disease)? How about the challenges of introducing a new cat into a multicat household?

If you answered "No" to any of the above questions, the 2013 AAFP and ISFM Feline Environmental Needs Guidelines, produced by the American Association of Feline Practitioners and the International Society of Feline Medicine, are for you. (*Download a PDF at* **catvets.com/professionals/guidelines/publications/?Id=487**.)

Get it now
You can also download the guidelines by scanning the QR code below.

What you'll find

Although cats are beloved family members to most people, we inadvertently do not provide for cats' needs because of a lack of understanding of these needs, which differ vastly from our own. Meeting the environmental needs of cats is not optional, but rather essential to the physical and emotional health of our feline patients.

The guidelines address the benefits to meeting cats' environmental needs and understanding cats and their species-specific needs. It also addresses the five pillars of a healthy feline environment. It is essential to meet cats' needs and allow them to express their natural behaviors, to prevent stress and undesirable behavior, and to improve feline health and welfare. The recommendations in the guidelines apply to all pet cats, regardless of lifestyle (indoor vs. indoor/outdoor) and location (home, veterinary practice, or shelter).

My view

As a veterinary practitioner, I find these guidelines to be the support that many of us practitioners need to help prevent and even resolve many behavior problems. If we understand cats and their needs and educate our veterinary teams and clients about how to live with these beloved pets, we can keep cats healthier and happier—and ensure cat owners enjoy their beloved cats.

Incorporating these guidelines into your practice and client education can help prevent or reduce behavior problems and stress-associated illness

>>> Dr. Rodan examines Cheetos in a basket in a chair to help the cat feel more comfortable.

>>> Dr. Rodan examines another cat while it rests comfortably in the bottom half of its carrier.

and enhance the relationship that cat lovers have with their cats and with your practice. VM

About the panel members

The guidelines were developed by panelists from the United States and the United Kingdom, including two companion-animal practitioners, two feline-only practitioners, two board-certified behaviorists, an internist, and a research scientist with expertise in feline environmental needs. The American Animal Hospital Association approved the guidelines shortly after development.

Special thanks go to Dr. Sarah Ellis, who co-chaired the guidelines with me. Thanks also go to all the other panelists—Drs. Hazel Carney, Sarah Heath, Irene Rochlitz, Lorinda Shearburn, Eliza Sundahl, and Jodi Westropp—for all the time and effort to make these important guidelines practical to all veterinarians who see cats.

Why routine health screening is a must for older cats

Why they did it

An ongoing concern in feline health is getting owners to bring their cats for yearly wellness checks. Clients may think if their cats are behaving normally, nothing is wrong. This study took a look at what's going on when you take a closer look.

What they did

Researchers evaluated 100 cats more than (or equal to) 6 years of age that were all in apparent good health, according to their owners. Cats receiving anything other than preventive medications were excluded, and the owners completed a detailed questionnaire about their cats' health, medical history, and living conditions. Cats were divided into two groups: middle-aged cats between 6 and 10 years (Group 1) and cats more than 10 years old (Group 2). All cats underwent a complete physical examination, blood pressure measurement, blood and urine analysis, indirect fundic examination, and Schirmer tear test.

What they found

The following abnormalities were found in the total study population (100 cats):

- Gingivitis: 72 cats
- Crystalluria: 41 cats
- Submandibular lymphadenopathy: 32 cats
- Elevated creatinine concentration: 29 cats
- Hyperglycemia: 25 cats
- Thyroid goiter: 20 cats
- Feline immunodeficiency virus infection: 14 cats
- Heart murmur: 11 cats
- Elevated systolic blood pressure (> 160 mm Hg): 8 cats
- Elevated total thyroxine concentration (> 3.5 µg/dl): 3 cats
- Overt proteinuria (urine protein:creatinine ratio > 0.4): 2 cats

Many of the cats in the study had elevations in creatinine, phosphorus, protein, and sodium concentrations. While some of these changes may have been truly reflective of an underlying disease process, the researchers note that these changes were likely not clinically relevant when evaluated in conjunction with other parameters. Rather, they felt these changes may be associated with inaccuracies in the reference intervals (RIs) and note, "[t]o avoid misinterpretation of clinical data, RIs need to reflect the population for which they are used."

Less than half of the cats in the study had an ideal body condition, indicating that changes in weight are not routinely perceived by the owners as indicative of a problem.

When parameters were compared by age group, elevated systolic blood pressure, heart rate, and murmur frequency were noted more often in the older cats. There was moderate to substantial overlap between both groups for all other parameters.

Take-home message

Despite being apparently healthy, middle-aged and older cats can often have physical examination or laboratory abnormalities that would benefit from veterinary intervention and monitoring. These findings underscore the need for routine health examinations in this population as well as the development of age-specific laboratory parameters.

Paepe D, Verjans G, Duchateau L, et al. Routine health screening: Findings in apparently healthy middle-aged and old cats. *J Feline Med Surg* 2013;15(1):8-19.

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Does pimobendan prevent CHF or sudden death in Dobermans with preclinical DCM?

Why they did it

About 25% to 50% of purebred Doberman pinschers eventually develop dilated cardiomyopathy (DCM).[1,2] Can this positive inotrope help delay the progression and extend lives?

What they did

As part of a multicenter, blinded, placebo-controlled trial, researchers enrolled 76 Doberman pinschers with echocardiographic evidence of preclinical DCM based on weight-adjusted values of left ventricular internal dimension in systole. Dogs were recruited between July 2006 and December 2010. A Holter recording was also performed on all dogs to ensure no dog had sustained ventricular tachycardia.

Dogs were randomized to receive either pimobendan (median dose 0.453 mg/kg/day) or placebo in a 1:1 ratio. A Holter recording was repeated after initiation of the test medication. The primary endpoint evaluated was either the onset of congestive heart failure (CHF) or sudden death. Cardiac death was assumed if no other apparent cause of death was found.

What they found

Dogs in the pimobendan group reached the primary endpoint much later than those receiving placebo (718 days vs. 441 days, respectively), although the proportion of dogs reaching each component of the primary endpoint was similar between the two groups. Median survival time was also significantly longer ($P = 0.034$) among those in the pimobendan group (623 days) compared with those in the placebo group (466 days). Dogs with higher heart rates on physical examination as well as those with evidence of ≥ 4 ventricular premature complexes on a three-minute ECG were seven times more likely to reach the primary endpoint first after adjusting for the effect of treatment.

Take-home message

Pimobendan given to Dobermans with preclinical DCM delays onset of clinical signs and extends survival.

These "Journal Scan" summaries were contributed by Jennifer L. Garcia, DVM, DACVIM, a veterinary internal medicine specialist at Sugarland Veterinary Specialists in Houston, Texas.

Read more at **dvm360/JournalScan**.

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Summerfield NJ, Boswood A, O'Grady MR, et al. Efficacy of pimobendan in the prevention of congestive heart failure or sudden death in Doberman Pinschers with preclinical dilated cardiomyopathy (The PROTECT study). *J Vet Intern Med* 2012;26(6):1337-1349.

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Collies and chemotherapy: A cautionary note

In our article "Intracavitary and intralesional chemotherapy in dogs and cats" (March 2013), we presented literature reports of using preparations containing doxorubicin and mitoxantrone for control of cavity-based cancers (*see the full text of this article at* **dvm360.com/ChemoAlternatives**). These drugs are substrates of the P-glycoprotein pumps of the MDR1 gene.

In the hard-copy version of the article, photographs of collies were included for artistic reasons by the editors. The authors would like to point out to readers that these dogs, and certain other breeds, frequently have mutated MDR1 genes that cause them to handle some chemotherapy drugs, including doxorubicin and probably mitoxantrone, differently than dogs without the MDR1 mutation. For these breeds, standard dosages of these drugs could prove fatal. Veterinarians should consult with an oncologist before using chemotherapy drugs in a breed with high potential for these mutations.

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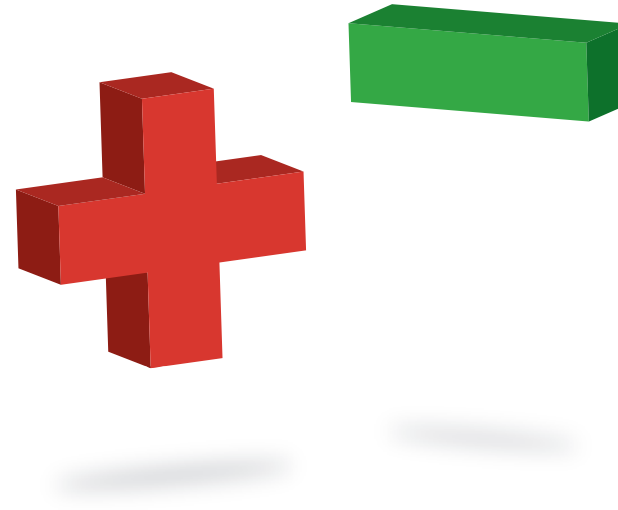
Veterinary medicine

RETHINK heartworm test results REPORTING

Do you tell clients that their dogs' heartworm test results are negative? If so, Michael Dryden, DVM, MS, PhD, DACVM, says veterinarians should reconsider how these results are reported to clients.

In his session "Canine heartworm challenges and opportunities" at the Western Veterinary Conference in Las Vegas, Dr. Dryden stressed that because most antigen tests detect antigen from mature female *Dirofilaria immitis* species, a negative antigen test result does not necessarily mean that a dog does not have heartworm infection. Furthermore, he says that in many dogs, heartworm antigen may not be detectable until seven months postinfection.



Dr. Dryden encourages veterinarians to educate pet owners and instead report the results as "below detectable limits." He says that reporting the results as "negative" may lead to incorrect client expectations regarding their dogs' heartworm infection status or misperceptions about the efficacy of the heartworm preventive.

A negative antigen test result does not necessarily mean that a dog does not have heartworm infection.

Dr. Dryden recommends performing antigen and microfilaria tests together, performing another antigen test four to six months after a heartworm preventive is initiated, and then retesting at one year. For more information, Dr. Dryden recommends the American Heartworm Society guidelines and additional resources at **heartwormsociety.org**.

THE TOXICITY OF *plastic explosives*

Reports of dogs ingesting C-4 have come from nine states and, as described here, from as far away as Kandahar, Afghanistan. *By Irina Meadows, DVM, DABT*

Composition C-4 is a high-velocity military plastic explosive. The explosive material in C-4 is cyclotrimethylenetrinitramine ($C_3H_6N_6O_6$), commonly called *cyclonite* or *RDX* (royal demolition explosive). It exists as white crystalline powder or crystals. The additive materials are binder, motor oil, and plasticizer. It also contains 2,3-dimethyl-2,3-dinitrobutane (DMDNB), which functions as a chemical marker for security forces.

Cyclonite explosive has more explosive power than trinitrotoluene (TNT) does and can be mixed with TNT for aerial bombs, mines, and torpedoes. Cyclonite is also used in the manufacture of smokeless powders and occasionally as a rodenticide, particularly rat poison.[1] Cases of recreational abuse of C-4 in people have been reported.[2]

PHARMACOKINETICS AND TOXICITY

When ingested, cyclonite explosive may cause adverse

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Cyclonite explosive may cause adverse central nervous system, renal, and gastrointestinal effects.

central nervous system, renal, and gastrointestinal effects.[3] Proposed mechanisms of neurologic effects involve alterations of brain cholinesterase activity, decreased monoamine oxidase activity, antagonism of GABA receptors, and down regulation of glutamate signaling pathways.[3]

A single oral dose of 14 mg/kg of C-4 in an experimental situation was lethal to a dog. The dog developed signs 7.5 hours after exposure and died 18 hours after exposure. Clinical signs included congested mucous membranes, hyperthermia, tachycardia, hyperventilation, intermittent tremors, rigidity, and convulsions. No treatment was provided. It was concluded that the clinical signs of C-4 toxicosis closely resembled those of strychnine poisoning.[4]

The oral LD_{50} of cyclonite in rats and mice is highly variable and ranges from 59 to 500 mg/kg. The LD_{50} of a coarse granular cyclonite is three times higher than that of a fine powder at 100 mg/kg mixed in a solution or slurry.[1]

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For product label, including complete safety information, visit comfortis.com or see page 276.

[1]D.N. Carlotti, D.E. Jacobs, 2000. Therapy, control and prevention of flea allergy dermatitis in dogs and cats. Vet. Derm. 11, 83-98

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C-4 ingestion in a military working dog

A military veterinarian based in Kandahar, Afghanistan, contacted the ASPCA APCC regarding C-4 ingestion by a military working dog.[1] A 2-year-old 48.1-lb (21.8-kg) female Labrador cross was left alone in a room in which a C-4 training aid was sitting on an accessible shelf. The dog's handler estimated that he was away for 15 minutes and that the dog ingested about 56 to 85 g of C-4.

Within 20 minutes, the dog vomited, collapsed, and began seizing. According to the handler, the dog lost consciousness and "appeared to be dead." Medics were called for help. Diazepam (4 mg) was administered intravenously, and activated charcoal (180 ml) was given through a stomach tube. At that point, the decision was made to medevac the dog.

The flight was about an hour later at which point the dog was somewhat responsive with stable vital signs. The dog received 1,300 ml of fluids and vomited a chunk of C-4 on its way to the base.

At the medical facility, lung crackles and mild dyspnea were noted. Oxygen saturation was 89%. Aspiration was suspected. Mildly elevated liver enzyme activities were reported as well. No further seizures were noted. Mild twitching was treated with additional intravenous diazepam. Gastrointestinal protectants, sucralfate and ranitidine, and enrofloxacin for suspected aspiration were started. Dosages were not provided.

Six days after the exposure, the dog was considered clinically normal, and return to duty was recommended.

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1. AnTox Database. Urbana, Ill: ASPCA Animal Poison Control Center, 2001-2011.

orally but slowly. Based on limited human exposure data, serum cyclonite concentrations appear to correlate with clinical presentation.[1]

Cyclonite was detected in the serum of a child for more than 120 hours and in the child's stool for 144 hours after ingestion.[5] Cyclonite is metabolized by the liver to carbon dioxide, bicarbonate, and formic acid.[6] Rat studies indicated that most of a cyclonite dose is excreted in the feces for as long as 21 days after exposure.[1] However, studies with radiolabeled RDX in rats suggested that elimination was primarily through exhaled air and urine.[3] Information about the half-life of cyclonite is limited. The estimated apparent terminal elimination half-life was reported to be 15.1 hours.[5]

The most common symptoms in people ingesting C-4 are seizures, spontaneous vomiting, abdominal pain, weakness, dizziness, and headache. Other reported clinical symptoms and laboratory abnormalities included loss of consciousness, renal failure, metabolic acidosis, hypokalemia, and rhabdomyolysis. There are no reports of human fatalities from cyclonite ingestion.[1]

ANIMAL POISON CONTROL CENTER DATA

The ASPCA Animal Poison Control Center (APCC) consulted on 14 calls regarding exposure of dogs to cyclonite plastic explosives between January 2004 and January 2011. These cases were reported from nine states as well as from a military base abroad (*see the sidebar "C-4 ingestion in a military working dog"*). No deaths were reported in the APCC database, but not all cases were followed up. Dogs involved were typically state police dogs, explosives-detecting dogs, or

military working dogs.[7]

Signs developed in 57% of the cases. Seizures were seen in 87.5% of animals exhibiting clinical signs. Other clinical signs or laboratory abnormalities included vomiting, acidosis, fasciculations or tremors, harsh respiratory sounds and crackles, elevated liver enzyme activities, hyperesthesia, oral ulcers, tachycardia, polydipsia, and polyuria. Hyperthermia, hyperventilation, dyspnea, transient blindness, and injected and pale mucous membranes were also reported.

DIAGNOSIS

A diagnosis of cyclonite poisoning is based on a history of exposure and the presence of typical clinical signs. Blood cyclonite concentration measurement is not readily available in most clinical settings.

High-performance liquid chromatography can be used to determine plasma concentrations of cyclonite. In five people acutely exposed to cyclonite, plasma concentrations of cyclonite strongly correlated with clinical and laboratory presentation.[8] In veterinary medicine,

this analysis is uncommon and finding a laboratory to perform it may be difficult.

TREATMENT

If a patient is not exhibiting clinical signs and the exposure is recent, emesis can be induced under veterinary supervision either with hydrogen peroxide (2.2 ml/kg orally, repeat in 10 to 15 minutes if first attempt is unsuccessful) or apomorphine (0.03 mg/kg intravenously or 0.25 mg/kg diluted with saline solution and instilled into the conjunctival sac).[9] Because of the putty-like consistency of C-4, it may stay in the animal's stomach for hours before signs develop.

Activated charcoal (1 to 3 g/kg orally) can be administered cautiously as aspiration may occur. Cyclonite is not water soluble, and the aqueous slurry of activated charcoal may have limited benefit.[8,10] However, since the absorption of cyclonite is usually delayed, activated charcoal is commonly administered in cyclonite-exposure cases.

There is no specific antidote available for treating cyclonite toxicosis. Treatment is supportive and symptomatic. Close patient monitoring is necessary as seizures may occur rapidly. Seizures are expected to respond to diazepam (0.5 to 2 mg/kg intravenously).[9] If seizures persist, phenobarbital (2 to 5 mg/kg) can be given in addition to diazepam. Intravenous fluid therapy at two times the maintenance rate with isotonic crystalloid is recommended. Vomiting can be treated with antiemetics: maropitant (1 mg/kg subcutaneously once a day), ondansetron (0.1 to 0.2 mg/kg intravenously b.i.d. to q.i.d.), or metoclopramide (0.2 to 0.5 mg/kg subcutaneously or intravenously t.i.d.).[9] Gastrointestinal protectants such as sucralfate (0.25 to 1 g orally t.i.d.) and famotidine (0.5 mg/kg intravenously or subcutaneously one or two times daily) can be given.[9]

If serious signs develop, monitor the patient's serum chemistry profile, complete blood count, electrolytes, and acid-base status. Clinical signs may last for days. Elevated liver enzyme activities have been reported for weeks beyond the resolution of other signs.[6]

Hemodialysis has not been shown to reduce C-4 concentrations, shorten the clinical period, or decrease seizure activity.[11]

PROGNOSIS

The outcome in most cases is expected to be good provided seizures are controlled quickly and no other complications, such as aspiration, develop. Complete recovery with appropriate medical attention is expected in most cases. VM

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Your pharmacy and veterinary generic drugs: A win-win solution in the battle for this business

Jeff Rothstein, DVM, MBA
President, Progressive Pet Animal Hospitals

"The Times They Are a-Changing" — that was the title of a meeting I recently led for all of the doctors and managers in my hospital group (Progressive Pet Animal Hospitals). We discussed the results of a recent veterinary care usage study that identified key contributing factors for the decline in the number of dog and cat visits to veterinary clinics in the past several years.[1,2] Statistics show that nearly one-third of pet owners have cut back on the number of visits to their veterinary hospital,[3] and 45% of clients are postponing care for sick pets.[4]

As veterinary visits have dropped, pet owners' willingness or ability to spend money on medications has declined as well. Whether it's for heartworm preventives or antibiotics for a urinary tract infection, many clients are less compliant about administering medications to their pets than in the past.

All of these issues reduce veterinary practice revenue and profit, and ultimately challenge practice viability. Most importantly, they threaten the patients' health and quality of life.

Price sensitivity and pharmacy vulnerability

A study published in 1999 revealed that pet owners ranked price low on a list of factors they deemed important when choosing a veterinarian.[5] Therefore, veterinarians believed that if the quality of their services remained high, they could raise prices without reducing client demand for services and still increase revenue. This may have been true once, but the times they have "a-changed." The economic recession and the rising cost of veterinary care pose major challenges for future veterinary practice growth.[1,2] Pet owners have expressed alarm about the amount and frequency of price increases in veterinary care.[1,2]

With regard to price sensitivity, the pharmacy is one of the most at-risk areas of a veterinary practice's business. And because the pharmacy has traditionally accounted for about 30% of a practice's gross revenue, this is a real concern. Clients usually choose to have their veterinarian perform all the medical care for their pets, but veterinary-prescribed medications are a commodity that clients can now easily purchase from online pharmacies and retail superstores.

Some veterinarians are resigned to relinquish a majority of their pharmacy revenue and hope to make up for it by providing more medical services at higher costs. But how? Doing so may reduce your pharmacy revenue and could cause price-sensitive clients to seek medical services elsewhere. One study found that 26% of pet owners consistently look for less-expensive veterinary options.[1,2]

The pharmacy battle will continue to escalate

As an owner of multiple veterinary practices, I think it is important to fight to keep our veterinary pharmacy business because it has a big impact not only on practice profitability, but also on practice value. This alone should be a motivator for you to battle to retain your pharmacy business. And it will be a battle, as the pressures from competitive pharmacies continue to grow. If Congress enacts legislation such as House Resolution 1406 — which would require veterinarians to provide clients written prescriptions for all medications prescribed — this will undoubtedly make it easier for clients to have their prescriptions filled elsewhere based on price.

Your pharmacy's armory: Convenience, compliance, trust

In one survey, 77% of pet owners said they preferred to purchase prescription pet medications at their veterinarian's office.[6] Convenience and compliance are important reasons to encourage clients to purchase their pets' drugs during an office visit. ➔

Jeff Rothstein, DVM, MBA
Dr. Rothstein is the president of Progressive Pet Animal Hospitals and Management Group, which owns and operates a group of small-animal hospitals in southeastern Michigan.

As part of your battle to bolster your pharmacy, implement a multimodal strategic approach to help ensure clients choose your hospital as their pets' pharmacy:

Describe your pharmacy's advantages
Educate clients about the benefits of purchasing medications from your hospital vs. purchasing prescriptions from online or outside pharmacies. Remind clients that your hospital will keep a record of all medications that each pet receives. Tell them you will always explain when to expect to see a response to treatment and any potential side effects or drug interactions. The bottom line: you are in the best position to oversee their pet's treatment and well-being.

Dispense veterinary generic drugs
You already know that veterinary generic drugs are FDA-approved and are therapeutically equivalent to their brand-name counterparts. But they also offer financial benefits for both you and your clients. Maintaining an inventory of veterinary generic drugs makes it easier to give clients more affordable, quality options. Because the cost of drugs may prevent clients from complying with your treatment recommendations, make sure clients are aware that purchasing medications from your hospital is often *not* more expensive. This is especially true when you offer generic drugs, rebates and promotions, and other options. The recent veterinary care usage study showed that the #1 way to increase dog visits and the #3 way to increase cat visits was to offer competitive product pricing.[1] So by offering generic drugs, you may increase client visits as well.

Eliminate barriers
Agree to match prices offered by a major competing pharmacy on certain products, if price is a barrier to the client. This may be controversial for some practice owners, but only about 25% of clients ask for a discounted prescription.[1,2] Why lose those sales altogether?

Evaluate pricing
Evaluate your overall drug pricing model and philosophy. Pinpoint how the pharmacy helps your hospital prosper medically and financially. The veterinary hospital pharmacy should be a profit center, but the motive for selling pharmaceuticals should be to strengthen the client-hospital relationship, not to raise your average client transaction by selling costly products.

Remember that an affordable pharmacy provides other advantages to a veterinary practice besides monetary profit. Compliance improves with cost-effective, quality drug options.

Bolster compliance
Keep in mind that compliance improves with cost-effective, quality drug options. A recent study showed that when a veterinary generic NSAID was introduced, 14% more dogs were treated with an NSAID.[7] The experience of our human counterparts supports this trend as well. A study of human patients involving 7,532 prescriptions demonstrated that those who took a generic drug had 62% greater odds of achieving adequate adherence.[8]

Strengthen the client-hospital bond
Remember that your pharmacy is also an avenue for keeping in touch with clients, often on a regular basis, when prescription refills are needed. This frequent contact leads to a stronger client-hospital bond. In addition, it gives your practice another opportunity to inquire about your clients' other pets and their health needs.

Fortify your pharmacy: Update your pricing and markup practices

One survey found that a veterinarian's recommendation was the most influential factor for pet owners in purchasing prescription pet medications, and 77% of owners said they buy medications at their veterinarian's office because they trust the medications they purchase there.[6] By providing value to your client through your pharmacy, you will further strengthen a trusting relationship.

Reasonable pricing of your pharmaceuticals is important. You do not want clients to feel you overcharged them when they see a lower price for the same product online or elsewhere. If clients perceive that your products are overpriced, then they may infer that all your fees are high — that you are the "expensive" clinic — and you will lose their trust. Be sure to evaluate your markup policy on prescription medications. One formula should not be used to calculate the markup for all products. For example, medications prescribed for patients to treat chronic conditions might have a lower markup than medications that are administered only once.

In general, you can use a higher markup on a generic vs. a brand-name product. For example, many practices typically mark up products 2 to 2.5 times their cost. In my experience, generic drugs can often be marked up 25% to 50% more than this markup and still be more cost effective for clients than the brand-name counterpart. This is a win-win-win situation for pets, clients, and clinics, as pet owners are more likely to purchase medications directly from your hospital and the pet receives prompt treatment.

Veterinary generic drugs help your pharmacy
Veterinary generic drugs are especially helpful in allowing your practice to adopt reasonable pricing and protect pharmacy revenue. They are typically 25% to 60% less expensive than pioneer drugs, allowing your hospital to tie up less money in drug inventory. Generic drugs also provide lower cost options for clients, yet these drugs can have a higher markup as discussed, which results in a higher profit margin for the practice. I have found that offering veterinary generic drug options frequently allows my practices to keep these sales in-house.

Offering veterinary generic drugs may also grow your pharmacy. A recent study showed that the simple act of offering a veterinary generic NSAID led to an increase of 10% revenue in that drug category, as well as better compliance.[7] More clients opted to treat their pets because the generic drug was priced to fit their budget, and because the cost seemed reasonable, fewer clients felt compelled to price-shop.

Veterinary generic drugs support clients and patients

The cost savings that veterinary generic drugs provide can be the factor that allows clients to choose to treat their pets, especially pets with chronic conditions. However, many clients simply are not aware generic options are available for their pets. In one survey of pet owners, more than half were unaware of generic drug alternatives to brand-name pet medications.[6] Given the choice of a generic drug from their veterinarian, however, many pet owners prefer this option. A veterinarian recommendation more than doubles clients' willingness to purchase generic pet medications.[6]

We have come to expect our own physicians to prescribe generic drugs over brand-name drugs if a generic drug is available. In fact, about 80% of prescriptions in human medicine are filled with generic drugs.[9] Simply letting your clients know they have an option to treat their pets with veterinary generic drugs makes a big difference. They appreciate your concern for their budget, and this helps build trust. From my perspective, I want the pet to receive the important drugs it needs, and I want the client to be satisfied.

Defend your pharmacy with win-win-win solutions

Veterinary practices will continue to face major challenges, including protecting their pharmacy business. As Bob Dylan sings, *There's a battle outside/And it is ragin'/It'll soon shake your windows/And rattle your walls/For the times they are a-changin'.* Each practice and practitioner must decide how they are going to prepare for battle and approach the issues facing our profession.

Remember that an affordable pharmacy provides other advantages to a veterinary practice besides monetary profit. I believe that veterinarians need to recognize the importance of the pharmacy in their clinics and use a multimodal strategic approach to keep it viable.

Offering veterinary generic drugs is a win-win-win solution for pets, clients, and practices. It can be an integral component of providing clients more affordable veterinary care options. Generic drugs are therapeutically equivalent to their brand-name counterparts, and they keep inventory costs down, boost practice profitability, save clients money, and allow more pets the opportunity to receive proper treatment and follow-up care.

Generic drugs boost practice profitability, save clients money, and allow more pets the opportunity to receive proper treatment and follow-up care.

Focusing on protecting your pharmacy is a good starting point to leading your business successfully into battle in this new era of veterinary medicine.

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Veterinary Generic Drugs

Help in the fight to keep product sales

Fritz Wood, CPA, CFP

The past few decades have shown a sea change in product sales in small-animal veterinary practices. The profession has witnessed the introduction of blockbuster product categories and drugs. Unfortunately, some veterinary practices grew increasingly, and perhaps dangerously, reliant on product sales. Two decades ago, the ratio of service sales to product sales might have been 90% services:10% products or 85%:15%, but it is now in the 65%:35% or 70%:30% range.

Today, pet owners can easily purchase popular pet drugs on the Internet, at pet retailers and farm stores, and at mass-market discount stores. Unlike service sales, product sales are relatively easily displaced at the whim of the pet-owning public. Few businesses can withstand the loss of one-third of their total gross income. Profits from product sales help every practice cover their fixed overhead expenses (*e.g.* occupancy costs, salaries and wages, monthly lease payments, utilities). So, 'flight' is not an option. 'Fight' you must.

How to compete

Michael Porter — business strategist, noted author, and longtime Harvard Business School professor — offers four options to secure a competitive advantage: selection, price, quality, and service.

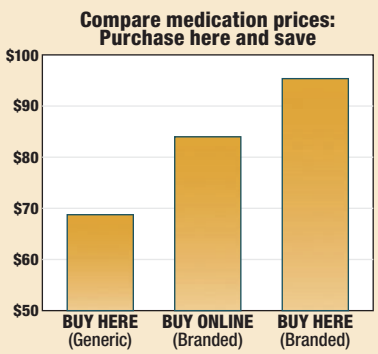
Presumably, a veterinarian's strong suits are quality and service. No alternative channel competitor has a veterinarian-client-patient relationship, and none provide the expert opinion, professional advice, handholding, peace of mind, and service provided by veterinarians and their health care teams. As for selection, your practice's own online pharmacy can offer a huge selection since the products are not stored and merchandised at your clinic. And too many practices wrongly dismiss price as a competitive advantage. We've all heard practitioners and managers lament, "I can't compete with…" Offering veterinary generic drugs allows you to compete on price. ➔

Pricing veterinary generic drugs

I present two pricing strategies to consider for offering veterinary generic drugs in practice. The first is to make the same dollar amount of profit as with the branded product.

Strategy 1*:

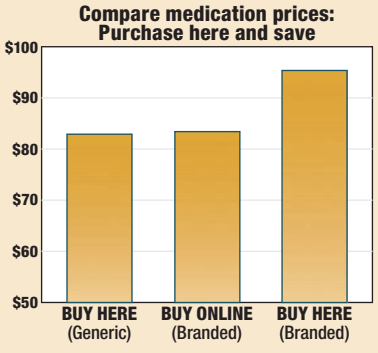
You buy a branded NSAID (75 mg, 60 count) for $47.70. You employ a 100% markup (2X), and sell the branded product for $95.40. Your gross profit is $47.70. Alternatively, you buy the generic equivalent drug for $20.99, and price it to make the same gross profit as you would with the branded NSAID, $47.70. The cost to the pet owner is $68.69 — much lower than even the online price of the branded drug ($83.98) — and the client saves $26.71 per month (or $320.52 per year). Now, you *must* shape pet owners' perception of pharmacy prices. Unless told otherwise, clients will assume your prices are higher than the alternatives; after all, you're a small business. It's wise for clinics to be perfectly transparent and forthright. I recommend sharing a simple graph (*left*) with clients.



Another reasonable, but more aggressive pricing strategy for veterinary generic drugs is to establish a price slightly below the online branded product.

Strategy 2*:

You buy a veterinary generic drug (75 mg, 60 count) for $20.99 and establish a selling price of $82.99, or $.99 below the online price ($83.98) of the branded drug. Recall that in Strategy 1 above, your gross profit under either scenario was $47.70. But by using this pricing strategy and selling the veterinary generic, your gross profit grows to $62.00 — an increase of 30%. Meanwhile, the client saves about $150 a year compared with the branded product sold at your practice. Now, your client graph might look like the one to the left.



*All prices collected on March 25, 2013.

Simple graphs like in these two examples send a host of positive messages to your clients:

- We understand that no one wants to overpay for prescription medications.
- We understand this is a competitive market.
- We're aware of and sensitive to the competition; our prices are competitive.
- We're not embarrassed about our prices — in fact, we're proud of them.
- You can count on us to provide excellent value.
- All of our prices are fair and reasonable.

The practice earns well-deserved goodwill by pointing out the various options. Clients will appreciate your honesty and candor and that your practice is sensitive to their financial situation. And if you fail to make them aware of the less-expensive option of veterinary generic drugs, when they do learn about it, you risk losing the remaining lifetime value of that client, not to mention any future referrals. And clients who believe they were deceived are far more likely to sabotage your reputation online.

Improved compliance

Even without an advanced degree in economics, you know and understand the generally inverse relationship between cost and quantity. As price decreases, quantity consumed increases. Conversely, as price increases, volume consumed decreases.

Until the laws of economics no longer apply, lower-priced veterinary generic drugs must improve compliance. A greater percentage of pet owners will be able and willing to follow through on the treatment plan you recommend. A greater percentage of pets will benefit from that treatment plan. And if you believe improved compliance results in better outcomes, it's the only possible result. So, while Strategy 1 held the unit gross profit static at $47.70, with both strategies, the volume of prescriptions dispensed would most assuredly increase with the lower-priced veterinary generic drug. Keep in mind that as the veterinary pharmacy business evolves, so should your pricing strategy.

Shrink your inventory and drug expense

Since the onset of the Great Recession, practice owners and managers have closely monitored their inventory levels and corresponding drug and supply expenses, which are the #2 practice expense after labor. In the pricing strategy examples, at any given time, the dollar value of on-hand NSAID inventory shrank by 56% (from $47.70 to $20.99). It would be beneficial if your second largest expense — drugs and supplies — was reduced by more than half.

Finally, remember that at the point of service, nothing is more convenient for the client than dispensing from the exam room. No competitor has a veterinarian-client-patient relationship, and none provide the expertise, professional advice, and service provided by veterinarians and their health care teams — all at a fair and reasonable price for you and the pet owner.

Fritz Wood, CPA, CFP
Mr. Wood is a certified public accountant and a certified financial planner who consults with veterinarians and the veterinary industry. Mr. Wood served on the Board of Directors of the American Veterinary Medical Foundation and served on the Pricing Subcommittee of the National Commission on Veterinary Economic Issues (NCVEI).

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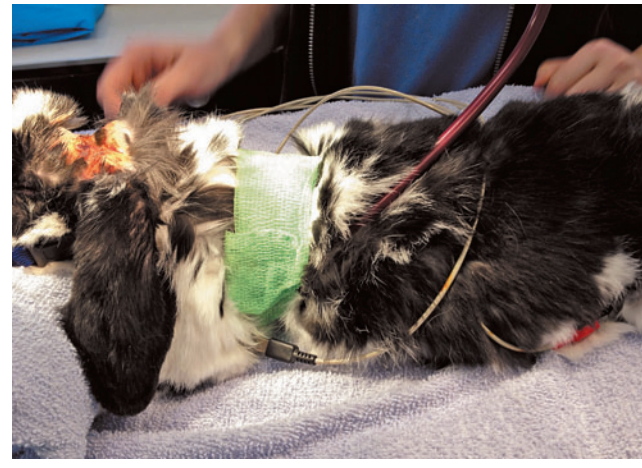
An efficient and effective inventory system

We create an inventory card—which lists the product's name and description, container size, and the company we purchase it from—for every product in our inventory. The inventory card is attached to one container of the product, which is placed toward the back of the inventory.

When someone removes the container with the card, the card gets placed in the to-be-ordered basket. Once the product has been reordered, the card is placed in the ordered basket. When the product comes in, the card gets placed back on a container—starting the whole process over again.

Brenda Girard, LVT
St. Clair Shores, Mich.



In exotics, secure your stethoscope for hands-free monitoring

We perform a lot of surgery on rabbits and pocket pets at our hospital. In the past, I found that my stethoscope would often get in the way when I monitored these patients during surgery. I would either shift the drape at the wrong moment, or, worse yet, my hand would enter the sterile field while I monitored the heart rate of a rat, for example.

To solve this problem, I now secure my stethoscope to the patient with Vetwrap (3M). The bell of my stethoscope stays in place without my having to move the drape. I simply wrap the Vetwrap securely around the patient (but not tight enough to cause any restriction or compression) after it is positioned on the table, making sure to leave a tab on the end of the wrap so I can easily remove it.

Erin Crisp, RVT
Cincinnati, Ohio

To keep myself and others from being sprayed with anal gland discharge, I keep a paper towel between us and the anal glands I'm expressing. I put on gloves, stick my finger through the center of a paper towel, and then place lube on my finger. This way if anything is discharged from the glands, it will land on the paper towel and not on our scrubs.

Kristen Weldy, lead animal health technician
Streamwood, Ill.

Cryosurgery for *eyelid masses*

This procedure is safe, effective, and minimally invasive—and general anesthesia is usually unnecessary. So it's perfect for general practice. Here are the steps in using extreme cold to treat tumors on dogs' eyelids.

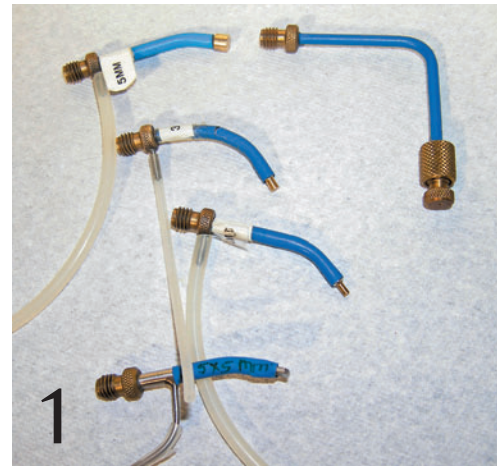
By Juliet R. Gionfriddo, DVM, MS, DACVO

Cryosurgery—the removal of tissues by freezing them—is a useful technique for treating eyelid diseases such as benign and malignant tumors and for removing distichiae and ectopic cilia. This article describes how cryosurgery can be used to remove eyelid tumors in dogs.

HOW CRYOGENS WORK

Normal eyelid tissue is refractory to damage from freezing primarily because of the tissue's

>>>1. Cryoprobes come in many sizes. Shown here on the left are an assortment of 1-mm to 5-mm solid probes and a rectangular probe. On the right is a spray nozzle that fits on the end of the cryosurgical unit and allows for a direct spray of liquid nitrogen to a surgical site.
>>>2. Cryosurgical units come in several sizes. The mini-gun, which is light and portable, is good for ophthalmic procedures.
>>>3. The cauliflower-like growth on the upper eyelid of this dog is typical of a meibomian adenoma. These masses are amenable to cryosurgery after excising the bulk of the mass that extends beyond the eyelid margin.
>>>4. A large eyelid growth at the lateral canthus. Even this large tumor is amenable to cryosurgery.



abundant blood supply, which allows for rapid rewarming and necessary nutrition to the tissues. Cryogen-treated tissue is damaged when ice crystals form inside cells. The amount of damage depends on the temperature reached and the rate of thawing of the cells.[1,2] In addition, the act of freezing causes secondary inflammation, which augments a lesion's destruction. For most eyelid lesions, two freeze-thaw cycles are recommended. Each cycle should consist of a rapid freeze followed by a slow thaw, as this process produces substantial damage to the lesion.

Several cryogens are used in medicine (*e.g.* liquid nitrogen, nitrous oxide, and carbon dioxide). Liquid nitrogen is the most popular, effective, and versatile of these cryogens. The boiling point of liquid nitrogen is -196 C (-320.8 F). It is thus able to rapidly freeze tissues to a very low temperature.

Liquid nitrogen can be delivered to the eyelid with a cotton-tipped applicator, a solid cryoprobe, or a spray tip. The cryoprobe is the safest and most useful of these modalities for eyelid surgery as it allows the user to be precise and to avoid spraying liquid nitrogen onto the globe. In addition, cryoprobes come in different sizes (from 1 mm to 6 mm) and shapes (round or rectangular), which adds to their versatility (*Figure 1*). Cryoprobes attach to handheld liquid nitrogen spray units (*Figure 2*), which are available from several commercial sources.

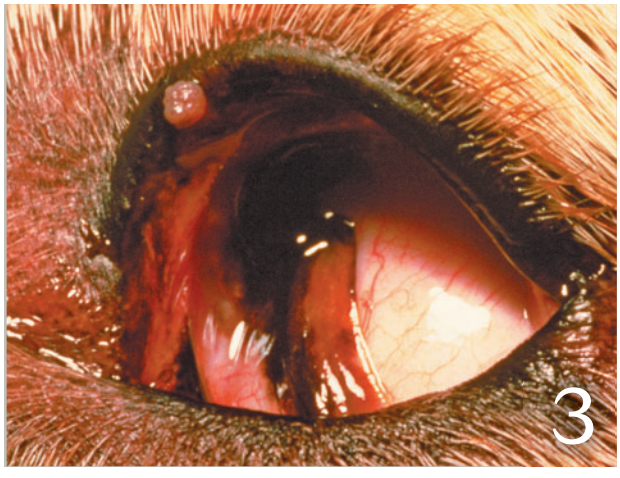
Care must be used when handling and applying liquid nitrogen because of its low temperature. Severe overfreezing could slough the eyelid.

BENEFITS OF CRYOSURGERY

The main advantages of cryosurgery over conventional incisional removal of lesions are as follows:

1. In many cases, general anesthesia is not required. The procedure can be performed either with the animal awake or sedated.
2. The surgery is relatively noninvasive.
3. Large tumors that would require removal of more than one-third of the eyelid can be treated without the need for reconstructive surgery.
4. The procedure can be safely repeated.

The most common use of cryosurgery in veterinary patients is to treat benign masses on the eyelids. From 28.7%[1] to 60%[2,3] of these masses are meibomian adenomas, which are common in aging dogs (*Figures 3 & 4*). See page 284 for the cryosurgery procedure I use to remove masses on the eyelids.


3

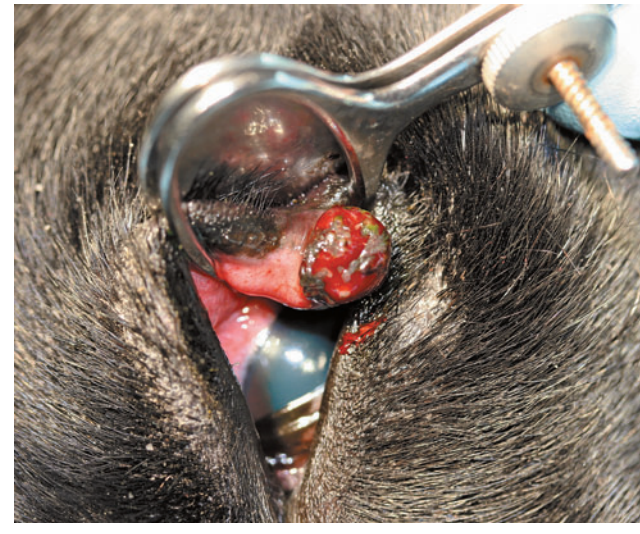

4

Cryosurgery to remove eyelid tumors: *The procedure*

STEP 1

First, manually restrain the dog, usually in lateral recumbency. Thoroughly clean the eyelid three times with dilute (1:4) baby shampoo alternated with rinses with a dilute povidone-iodine solution (not scrub)(1:50 dilution). Then place a few drops of proparacaine (2.5%) on the cornea and palpebral conjunctiva. After applying the topical anesthetic, carefully inject 2% lidocaine into the eyelid above and around the tumor (*photo, top right*). For this injection, I use a 25-ga needle and inject about 0.5 ml in large dogs and 0.25 ml in small dogs.

Next, stabilize the eyelid with a chalazion clamp (*photo, bottom right*). Besides stabilizing the eyelid, this clamp helps control hemorrhage, protects the globe from inadvertent cryonecrosis, and prevents rapid thawing of the lesion. Because the eyelids have an excellent blood supply, clamping them tightly for short periods causes no problems.



Continued on page 287.

See brief summary on page 286.

NADA 141-297, Approved by FDA

ProZinc®

(protamine zinc recombinant human insulin)

Boehringer Ingelheim

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

Description: ProZinc® insulin is a sterile aqueous protamine zinc suspension of recombinant human insulin.

Each mL contains:

recombinant human insulin	40 International Units (IU)
protamine sulfate	0.466 mg
zinc oxide	0.088 mg
glycerin	16.00 mg
dibasic sodium phosphate, heptahydrate	3.78 mg
phenol (added as preservative)	2.50 mg
hydrochloric acid	1.63 mg
water for injection (maximum)	1005 mg

pH is adjusted with hydrochloric acid and/or sodium hydroxide.

Indication: ProZinc (protamine zinc recombinant human insulin) is indicated for the reduction of hyperglycemia and hyperglycemia-associated clinical signs in cats with diabetes mellitus.

Dosage and Administration: USE OF A SYRINGE OTHER THAN A U-40 SYRINGE WILL RESULT IN INCORRECT DOSING.

FOR SUBCUTANEOUS INJECTION IN CATS ONLY.

ProZinc insulin should be mixed by gently rolling the vial prior to withdrawing each dose from the vial. Using a U-40 insulin syringe, the injection should be administered subcutaneously on the back of the neck or on the side of the cat.

Always provide the Cat Owner Information Sheet with each prescription.

The initial recommended ProZinc dose is 0.1 – 0.3 IU insulin/pound of body weight (0.2 – 0.7 IU/kg) every 12 hours. The dose should be given concurrently with or right after a meal. The veterinarian should re-evaluate the cat at appropriate intervals and adjust the dose based on both clinical signs and glucose nadirs until adequate glycemic control has been attained. In the effectiveness field study, glycemic control was considered adequate if the glucose nadir from a 9-hour blood glucose curve was between 80 and 150 mg/dL and clinical signs of hyperglycemia such as polyuria, polydipsia, and weight loss were improved.

Further adjustments in the dosage may be necessary with changes in the cat's diet, body weight, or concomitant medication, or if the cat develops concurrent infection, inflammation, neoplasia, or an additional endocrine or other medical disorder.

Contraindications: ProZinc insulin is contraindicated in cats sensitive to protamine zinc recombinant human insulin or any other ingredients in the ProZinc product. ProZinc insulin is contraindicated during episodes of hypoglycemia.

Warnings: User Safety: For use in cats only. Keep out of the reach of children. Avoid contact with eyes. In case of contact, immediately flush eyes with running water for at least 15 minutes. Accidental injection may cause hypoglycemia. In case of accidental injection, seek medical attention immediately. Exposure to product may induce a local or systemic allergic reaction in sensitized individuals.

Animal Safety: Owners should be advised to observe for signs of hypoglycemia (see Cat Owner Information Sheet). Use of this product, even at established doses, has been associated with hypoglycemia. An animal with signs of hypoglycemia should be treated immediately. Glucose should be given orally or intravenously as dictated by clinical signs. Insulin should be temporarily withheld and, if indicated, the dosage adjusted.

Any change in insulin should be made cautiously and only under a veterinarian's supervision. Changes in insulin strength, manufacturer, type, species (human, animal) or method of manufacture (rDNA versus animal-source insulin) may result in the need for a change in dosage.

Appropriate diagnostic tests should be performed to rule out other endocrinopathies in diabetic cats that are difficult to regulate.

Precautions: Animals presenting with severe ketoacidosis, anorexia, lethargy, and/or vomiting should be stabilized with short-acting insulin and appropriate supportive therapy until their condition is stabilized. As with all insulin products, careful patient monitoring for hypoglycemia and hyperglycemia are essential to attain and maintain adequate glycemic control and to prevent associated complications. Overdosage can result in profound hypoglycemia and death. Progestogens, certain endocrinopathies and glucocorticoids can have an antagonistic effect on insulin activity. Progestogen and glucocorticoid use should be avoided.

Reproductive Safety: The safety and effectiveness of ProZinc insulin in breeding, pregnant, and lactating cats has not been evaluated.

Use in Kittens: The safety and effectiveness of ProZinc insulin in kittens has not been evaluated.

Adverse Reactions: Effectiveness Field Study

In a 45-day effectiveness field study, 176 cats received ProZinc insulin. Hypoglycemia (defined as a blood glucose value of < 50 mg/dL) occurred in 71 of the cats at various times throughout the study. Clinical signs of hypoglycemia were generally mild in nature (described as lethargic, sluggish, weak, trembling, uncoordinated, groggy, glassy-eyed or dazed). In 17 cases, the veterinarian provided oral glucose supplementation or food as treatment. Most cases were not associated with clinical signs and received no treatment. One cat had a serious hypoglycemic event associated with stupor, lateral recumbency, hypothermia and seizures. All cases of hypoglycemia resolved with appropriate therapy and if needed, a dose reduction.

Three cats had injection site reactions which were described as either small, punctate, red lesions; lesions on neck; or palpable subcutaneous thickening. All injection site reactions resolved without cessation of therapy.

Four cats developed diabetic neuropathy during the study as evidenced by plantigrade stance. Three cats entered the study with plantigrade stance, one of which resolved by Day 45. Four cats were diagnosed with diabetic ketoacidosis during the study. Two were euthanized due to poor response to treatment. Five other cats were euthanized during the study, one of which had hypoglycemia. Four cats had received ProZinc insulin for less than a week and were euthanized due to worsening concurrent medical conditions.

The following additional clinical observations or diagnoses were reported in cats during the effectiveness field study: vomiting, lethargy, diarrhea, cystitis/hematuria, upper respiratory infection, dry coat, hair loss, ocular discharge, abnormal vocalization, black stool, and rapid breathing.

Extended Use Field Study

Cats that completed the effectiveness study were enrolled into an extended use field study. In this study, 145 cats received ProZinc insulin for up to an additional 136 days. Adverse reactions were similar to those reported during the 45-day effectiveness study and are listed in order of decreasing frequency: vomiting, hypoglycemia, anorexia/poor appetite, diarrhea, lethargy, cystitis/hematuria, and weakness. Twenty cats had signs consistent with hypoglycemia described as: sluggish, lethargic, unsteady, wobbly, seizures, trembling, or dazed. Most of these were treated by the owner or veterinarian with oral glucose supplementation or food; others received intravenous glucose. One cat had a serious hypoglycemic event associated with seizures and blindness. The cat fully recovered after supportive therapy and finished the study. All cases of hypoglycemia resolved with appropriate therapy and if needed, a dose reduction.

Fourteen cats died or were euthanized during the extended use study. In two cases, continued use of insulin despite anorexia and signs of hypoglycemia contributed to the deaths. In one case, the owner decided not to continue therapy after a presumed episode of hypoglycemia. The rest were due to concurrent medical conditions or worsening of the diabetes mellitus.

To report suspected adverse reactions, or to obtain a copy of the Material Safety Data Sheet (MSDS), call 1-866-638-2226.

Information for Cat Owners: Please refer to the Cat Owner Information Sheet for more information about ProZinc insulin. ProZinc insulin, like other insulin products, is not free from adverse reactions. Owners should be advised of the potential for adverse reactions and be informed of the associated clinical signs. Potential adverse reactions include: hypoglycemia, insulin antagonism/resistance, rapid insulin metabolism, insulin-induced hyperglycemia (Somogyi Effect), and local or systemic reactions. The most common adverse reaction observed is hypoglycemia. Signs may include: weakness, depression, behavioral changes, muscle twitching, and anxiety. In severe cases of hypoglycemia, seizures and coma can occur. Hypoglycemia can be fatal if an affected cat does not receive prompt treatment. Appropriate veterinary monitoring of blood glucose, adjustment of insulin dose and regimen as needed, and stabilization of diet and activity help minimize the risk of hypoglycemic episodes. The attending veterinarian should evaluate other adverse reactions on a case-by-case basis to determine if an adjustment in therapy is appropriate, or if alternative therapy should be considered.

Effectiveness: A total of 187 client-owned cats were enrolled in a 45-day field study, with 176 receiving ProZinc insulin. One hundred and fifty-one cats were included in the effectiveness analysis. The patients included various purebred and mixed breed cats ranging in age from 3 to 19 years and in weight from 4.6 to 20.8 pounds. Of the cats included in the effectiveness analysis, 101 were castrated males, 49 were spayed females, and 1 was an intact female.

Cats were started on ProZinc insulin at a dose of 0.1-0.3 IU/lb (0.2-0.7 IU/kg) twice daily. Cats were evaluated at 7, 14, 30, and 45 days after initiation of therapy and the dose was adjusted based on clinical signs and results of 9-hour blood glucose curves on Days 7, 14, and 30.

Effectiveness was based on successful control of diabetes which was defined as improvement in at least one blood glucose variable (glucose curve mean, nadir, or fructosamine) and at least one clinical sign (polyuria, polydipsia, or body weight). Based on this definition, 115 of 151 cases (76.2%) were considered successful. Blood glucose curve means decreased from 415.3 mg/dL on Day 0 to 203.2 mg/dL by Day 45 and the mean blood glucose nadir decreased from 407.9 mg/dL on Day 0 to 142.4 mg/dL on Day 45. Mean fructosamine values decreased from 505.9 µmol/L on Day 0 to 380.7 µmol/L on Day 45.

Cats that completed the effectiveness study were enrolled in an extended use field study. The mean fructosamine value was 342.0 µmol/L after a total of 181 days of ProZinc therapy.

How Supplied: ProZinc insulin is supplied as a sterile injectable suspension in 10 mL multidose vials. Each mL of ProZinc product contains 40 IU recombinant human insulin.

Storage Conditions: Store in an upright position under refrigeration at 36-46°F (2-8°C). Do not freeze. Protect from light.

Manufactured for:
Boehringer Ingelheim Vetmedica, Inc.
St. Joseph, MO 64506 U.S.A.

Manufactured by:
AAIPharma Services Corp., Charleston, SC 29405

ProZinc® is a registered trademark of Boehringer Ingelheim Vetmedica, Inc.

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STEP 2

Using small, blunt-tipped scissors or a surgical blade, excise the tumor flush with the eyelid margin, taking care to maintain the normal architecture of the palpebral margin. As with all masses, place the growth in formalin, and submit it for histologic examination.

After excising the mass, use a small curette to remove any inspissated sebaceous debris. Such debris and possibly inflammation are common because these tumors block the meibomian gland ducts, thus prohibiting the normal extrusion of secretions. If hemorrhage is extensive, place a cotton swab with a drop of phenylephrine on the wound.

STEP 3

Before you apply the cryoprobe, a piece torn from the edge of a plastic foam cup may be lubricated and placed under the eyelid to protect the cornea. However, if the chalazion clamp has a back stabilization portion, no other protection is needed.

Freeze the base of the tumor by using a cryoprobe with a diameter about the same as or slightly larger than that of the wound left by the mass excision (*photo, left*). Place the cryoprobe directly onto the cut surface of the eyelid at the base of the mass, and freeze the area until an ice ball can be seen extending 1 mm from the probe, as seen in the photo. The probe will usually stay frozen to the eyelid after the active freezing procedure has stopped and will come off when the tissue thaws.

It is important to allow thawing to occur gradually. If the animal moves while the probe is adhered to the eyelid, sterile eyewash can be used to greatly speed up the thawing process and allow the probe to be removed from the eyelid. After the probe is free, allow the eyelid to warm for about one minute and repeat the procedure one time.

COMPLICATIONS

Complications of eyelid cryosurgery are few. As in every procedure involving tissue excision or incision, infection can occur, but it is rare because of the excellent blood supply to the eyelid. The most common complications are self-trauma, tumor regrowth, and depigmentation of the frozen area. The former can be avoided by placing an Elizabethan collar on the animal and keeping the collar in place for two weeks. Depigmentation is usually temporary, and the tissue usually pigments within six months. However, remember to warn owners about the potential for depigmentation. The prognosis in patients with benign tumors is excellent. VM

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dermatology

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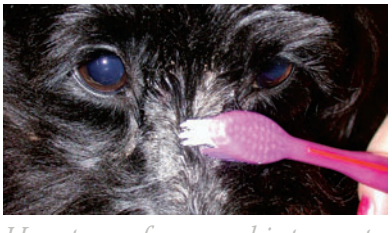
WHAT'S YOUR DIAGNOSIS?

One bulldog's *serious skin condition* p7

PLUS



How to perform and interpret **DERMATOPHYTE CULTURES** p2

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TOP 3 *dermatology* **questions clients ask** *technicians* p13

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>> How to set realistic expectations with a dermatology diagnosis
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Veterinary medicine
Essential medicine for exemplary patient care

How to perform and interpret

DERMATOPHYTE CULTURES

By Kimberly S. Coyner, DVM, DACVD

Use this guide to maximize your success with this indispensable in-house test.

Dermatophyte cultures can be challenging to perform and interpret. However, knowing how to best collect samples for culture, select and incubate culture media, and identify media culture changes and fungal colony morphology will help you avoid a misdiagnosis.

COLLECTING CULTURE SAMPLES

Hair pluck To obtain samples for dermatophyte culture, use a sterile hemostat to pluck hairs from around the periphery of a newly formed or expanding skin lesion, avoiding areas that may have been recently medicated. Ideal hairs to select are those in areas of active crusting and hairs that appear damaged or misshapen.[1]

Toothbrush technique Hair plucks can potentially miss infected hairs and may not sample infected epithelium adequately, so it is ideal to also obtain samples using the Mackenzie brush technique. For this technique, use a new toothbrush to rub gently over the suspect area, including the skin and haired margins of alopecic or scaly lesions (*Figure 1*).[1] Brush the unaffected area first, and then brush the lesions to avoid spreading spores to unaffected areas and to avoid losing spores from affected areas. Then gently embed the toothbrush bristles into the fungal culture media (*Figure 2*), taking care not to embed the bristles too deeply, which risks displacing the culture media when the bristles are removed. Use a sterile hemostat to remove hair and debris caught among the bristles, and place the material on the culture medium surface.

The Mackenzie brush technique is helpful to screen for asymptomatic carriers and to obtain samples from animals undergoing antifungal treatment in which skin lesions have clinically resolved. In these cases, stroke the toothbrush over the entire body, concentrating especially on areas with prior lesions and, in cats, on the face, ears, and paws. It is recommended to brush for one minute or to brush the length of the animal 10 times.[2] In animals undergoing antifungal therapy, repeat cultures every two or three weeks, and continue treatment until two negative culture results are obtained.[2]

In cases of suspected onychomycosis, the toothbrush can be used on the affected claw fold. Additionally, samples of claw fold fur can be obtained with a sterile hemostat, and the proximal affected nail can be sampled by using a scalpel blade to shave off small pieces of keratin. (Precleaning the nail with alcohol is recommend to help reduce accumulated saprophytic or environmental fungal organisms.) If an avulsed claw is considered for fungal culture, discard the distal part of the nail, and obtain samples by scraping the proximal concave surface of the claw.[1]

You can obtain toothbrushess in bulk from online distributors. They can be used once and discarded or gas sterilized for repeated use.

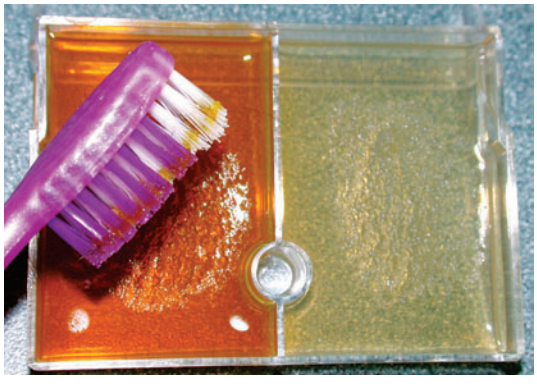


Figure 1. The Mackenzie brush technique is used to collect samples for dermatophyte culture.

Figure 2. The toothbrush bristles have been gently pressed onto the fungal culture media.

SELECTING AND INCUBATING CULTURE MEDIA

Dermatophyte test medium contains Sabouraud's dextrose agar with cycloheximide, gentamicin, and chlortetracycline as antifungal and antibacterial agents that will retard the growth of contaminant organisms. The pH indicator phenol red is also added.

Dermatophytes preferentially metabolize protein in the culture medium, releasing alkaline metabolites that turn the yellow fungal culture medium to red at the same time the dermatophyte colony appears. Most other fungi initially use carbohydrates and produce acidic metabolites; these saprophytic fungi can eventually consume protein and cause media color change, but it occurs several days after fungal growth appears.[1,3] Daily observation and logging of fungal growth correlated with media color change is, thus, important in correctly interpreting dermatophyte test medium culture results.

Culture plates are recommended over vials, as the vial openings are usually too narrow to pass toothbrush heads for inoculation or to easily sample fungal colonies for microscopic analysis.[4] To facilitate fungal sporulation and identification, it may be helpful to use a dermatophyte test medium plate that has a separate area of plain Sabouraud's agar or rapid sporulation medium, which does not contain inhibiting agents. For example, the Dermatoplate-Duo (Vetlab Supply) culture plate has dermatophyte test medium on one side and enhanced sporulation agar on the other side.

According to recommendations from a fungal culture media manufacturer, culture media should be stored at 36 to 77 F (2 to 25 C) and protected from light before inoculation.[5] The plates should be warmed to room temperature (77 to 86 [25 to 30 C]) before inoculation. Before and during the inoculation procedure, the plates should be handled in a manner that minimizes exposure of the media to the environment. Do not use expired plates or any plates that exhibit drying, cracking, discoloration, microbial contamination, or other such signs of deterioration. Excessive condensation may appear in plates that have been damaged by exposure to temperature extremes.[5]

Fungal cultures should be incubated at room temperature (77 to 86 F [25 to 30 C]) with 30% humidity.[1,5] If room temperature is not maintained, use an incubator, or send the samples to a reference laboratory for culture.[4]

Figure 3. The dermatophyte culture plate exhibits *Microsporum canis* growth (the white-to-pale-yellow fungal colonies at the top of the culture plate) that is at risk of being overgrown by the gray saprophytic fungal colonies on the bottom of the plate. Daily fungal culture observation with or without sampling suspect dermatophyte colonies and inoculating them on a new culture plate is important to ensure that saprophytes do not overgrow the dermatophytes and potentially cause a false negative culture result.

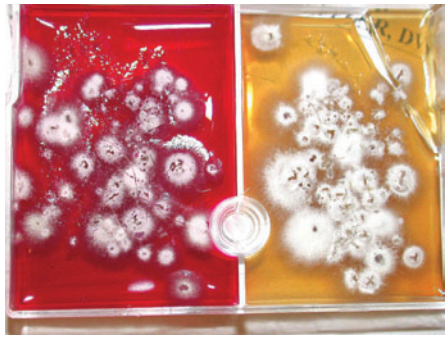


Figure 4. *Trichophyton mentagrophytes* culture often produces a white-to- cream-colored powdery surface. This culture plate has been incubated with inadequate humidity, causing cracking and separation of the culture media on the right side.

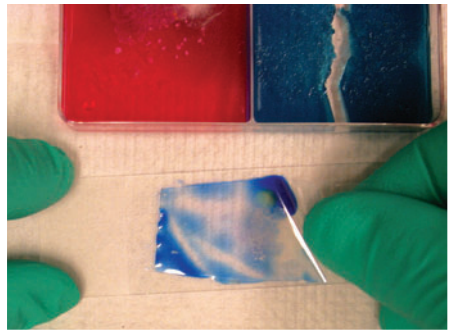


Figure 5. To obtain a sample for microscopic fungal identification, touch the tape to the top of the fungal colony and then carefully apply the tape to a slide on top of a drop of blue stain.

Most organisms will appear within seven to 10 days; however, plates should be kept for 21 days, especially when no growth is seen initially or when the sample has been obtained from a pet receiving antifungal therapy. According to a fungal culture media manufacturer, dermatophyte culture plates may be incubated in full light, although some authors recommend incubation in the dark to avoid UV light-induced inhibition of fungal growth.[1,5] In dry climates, it is suggested that plates be placed in plastic bags or containers to prevent dehydration of the media, which can inhibit organism growth.[5] After 48 to 72 hours, begin examining the plates daily for characteristic media color changes and fungal growth.

IDENTIFYING DERMATOPHYTES

Understanding macroscopic fungal colony morphology is an important first step in determining whether a dermatophyte is present. *Microsporum* and *Trichophyton* species—the most common dermatophytes in dogs and cats—are white, light yellow, tan, or buff-colored cottony-to-powdery-appearing colonies (*Figures 3 & 4*). Dermatophyte colonies are never black, green, or gray.

Additionally, with positive dermatophyte culture results, determining the number of macroscopic colonies gives you information about the severity of infection and, in animals undergoing antifungal treatment, information about the response to therapy.[4]

Microscopic evaluation of suspect fungal growth is also important since some environmental fungi can mimic dermatophytes in gross colony morphology and in their ability to turn the media red[1] and because some strains of *Microsporum canis* may not produce media color change.[6] Microscopic examination can be done in the clinic, or the entire culture plate can be sent to a reference laboratory for fungal identification (usually at a reduced cost compared with fungal culture).

Microscopic identification process

Because the organisms are zoonotic, wear gloves to avoid transmitting dermatophyte spores to your hands. Gently touch a small piece of clear acetate tape to the surface of the fungal colony, and then apply the tape to a glass slide over a drop of blue stain (methylene blue, lactophenol cotton blue, or the blue Diff-Quik solution [basophilic thiazine dye]) (*Figure 5*). Examine the slide under 100X to 400X magnification to identify the characteristic dermatophyte macroconidia.

In the early stages of growth,

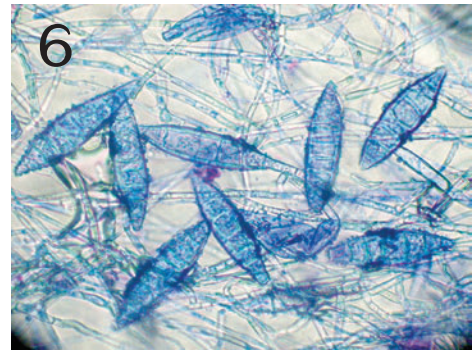
only fungal hyphae with no macroconidia may be seen, especially in cases of Trichophyton species infections. Incubate these cultures longer to allow spore development for more reliable identification.

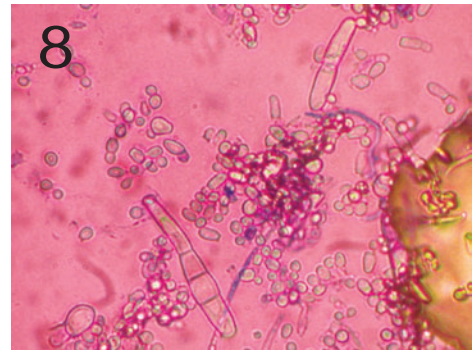
Microscopic dermatophyte characteristics

Microsporum canis spores are large, spindle-shaped, and thick-walled with six or more internal cells (*Figure 6*) and often have a terminal knob. If *M. canis* is identified, then other animals in the household should be screened via dermatophyte culture using the toothbrush technique to determine whether they are asymptomatic carriers. All pets with positive culture results should be treated with topical antifungal therapy, with or without systemic treatment. Culture-positive animals should be isolated from culture-negative animals if possible.

Microsporum gypseum produces large spindle-shaped spores with thin walls, no terminal knob, and six or fewer internal cells (*Figure 7*).

Trichophyton mentagrophytes produces long cigar-shaped macroconidia with thin walls (*Figure 8*). Spiral-shaped hyphae and numerous grapelike clusters of microconidia are also characteristic of *Trichophyton* species (*Figure 9*).[1]





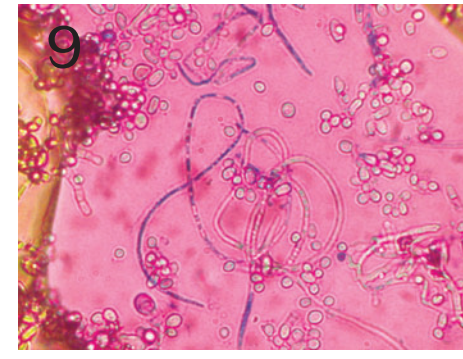


Figure 6. *Microsporum canis* macroconidia and fungal hyphae (Diff-Quik, 400X).

Figure 7. *Microsporum gypseum* has numerous macroconidia with no terminal knob and thinner walls and fewer internal cells than *M. canis* has (Diff-Quik, 400X).

Figure 8. *Trichophyton mentagrophytes* is characterized by cigar-shaped macroconidia, which may be few in number, and numerous globose microconidia (Diff-Quik, 400X).

Figure 9. Spiral hyphae are often characteristic of *T. mentagrophytes* (Diff-Quik, 400X).

Saprophytic fungi will form hyphae and often small spores, but do not form macroconidia.

In cases in which the fungal species cannot be easily identified in the clinic, submit the dermatophyte culture to a veterinary reference laboratory for fungal identification.

CONCLUSION

Diagnosing dermatophytosis in companion animals can be difficult. However, with appropriate quality control and practice, your in-house dermatophyte cultures will be more successful—and you may even reduce the need to send samples to a reference laboratory.

Nevertheless, if optimal culture media storage and dermatophyte culture incubation conditions, daily observation of fungal colony growth and media color change, and subsequent microscopic identification of suspect fungal organisms are not feasible in your clinic, then submitting samples of surface skin debris and hair (placed in a sterile red top tube) from suspect cases to a veterinary reference laboratory for fungal culture is recommended to avoid misdiagnosis. Even some veterinary dermatologists elect this option to minimize the chance of false negative or false positive dermatophyte culture results.

For references and more, visit dvm360.com/dermatophyte.

Video { Dermatology and your clients

Dr. Laird Goodman offers suggestions on how to control—not cure—dermatologic conditions in pets, plus, how to set realistic expectations for clients.

To play this video on your mobile device, scan the QR code, above.

Watch Laird Goodman, DVM, CVA, owner and hospital director of Murrayhill Veterinary Hospital in Beaverton, OR, offer his take on the best way to tackle dermatology issues with clients.

Since dermatologic conditions are often chronic, Dr. Goodman stresses how important it is to stay positive in your approach with clients. Spend an ample amount of time preparing clients for the reality—often, dermatologic diagnoses don't have a quick fix. Still, by acknowledging the client's feelings and showing that you empathize with their frustrations, you'll gain their both their trust and their compliance with your treatment protocol.

Share this video with your team so you'll all be up to date with the latest in dermatology and client communication. And as always, check out this video and much more when you visit **dvm360.com/dermatologytoolkit**.

Scan the QR code, right, to watch a video with Dr. Gene Nesbitt giving tips for a great dermatology visit that could result in business benefits for your practice.

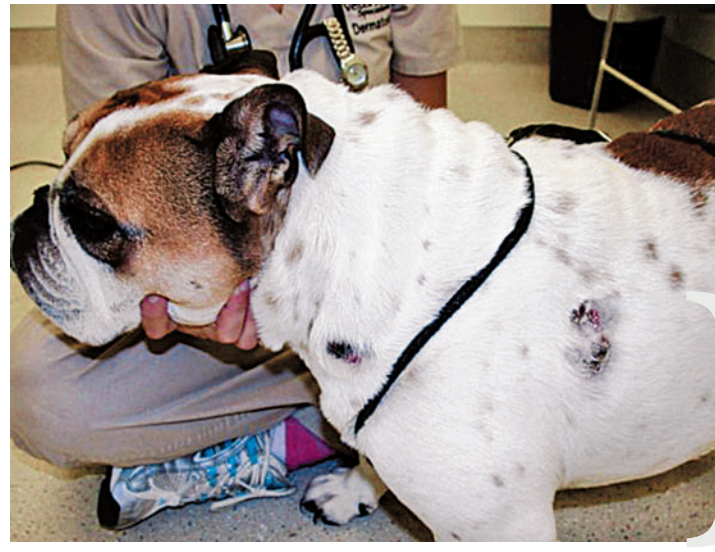
IMAGE QUIZ:
A bulldog *with* erythematous plaques

This 8-year-old bulldog has a history of slowly progressive, minimally pruritic erythematous crusted plaques on its trunk and ventrum.

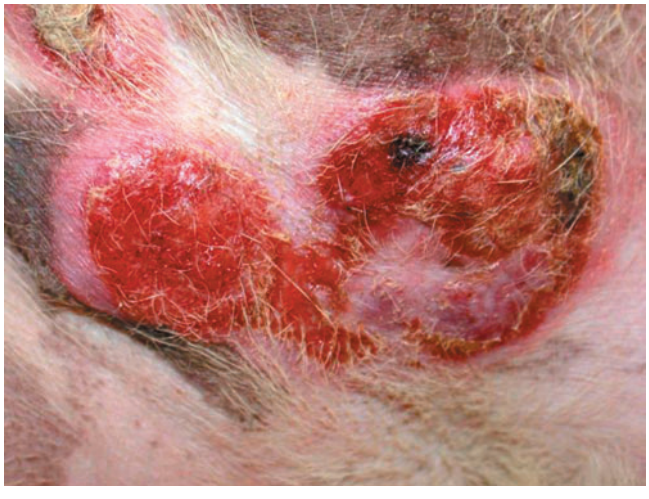
An aspirate was obtained for cytologic examination, and the results are shown below.

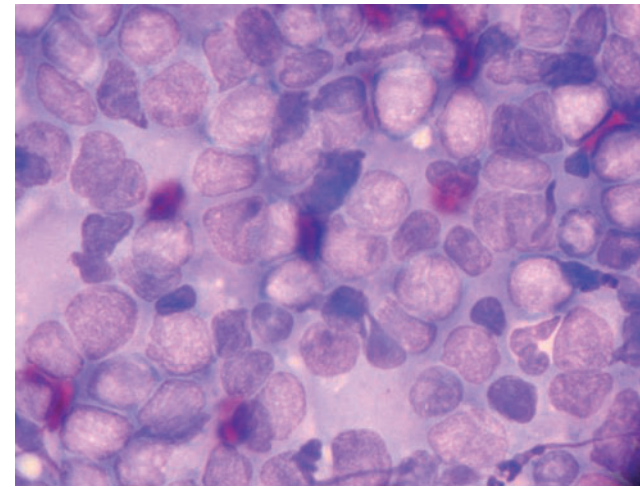
What is your diagnosis?

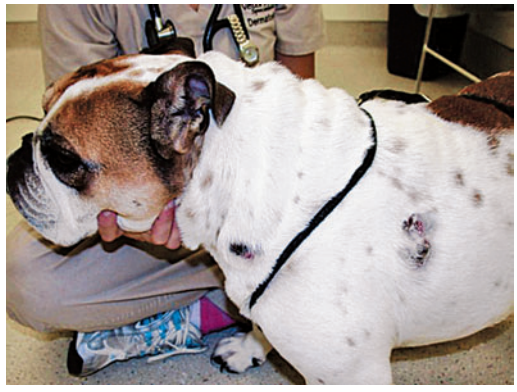
a) Mast cell tumor
b) Lymphoma
c) Plasmacytoma
d) Histiocytoma



Turn the page to find the answer.







Answer C: Lymphoma is correct!

Cytology of cutaneous lymphoma shows neoplastic lymphocytes ranging in size from small to large, with round, indented, or convoluted nuclei. Basophilic cytoplasm is scant to moderate. Uniformity of the lymphoid population without significant inflammation or plasma cell infiltration is suggestive of cutaneous lymphoma, but biopsy is required for definitive diagnosis. Biopsy will help differentiate between epitheliotropic and nonepitheliotropic lymphoma, which can affect the chemotherapy choices and prognosis.

Visit **dvm360.com/dermatologytoolkit** for more interactive online image quizzes and brush up on your diagnostic skills.

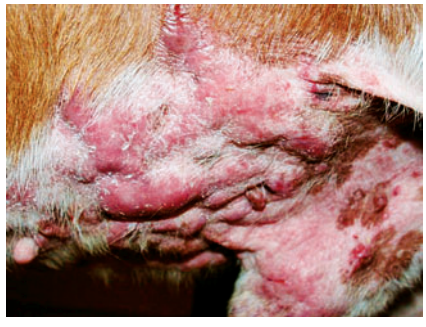


IMAGE QUIZ: A pitbull with *bullous lesions*

This young pit bull has erythematous bullous skin lesions that occasionally drain and are mildly pruritic. Antibiotics and corticosteroids have been prescribed with only partial improvement. Can you solve the case?

IMAGE QUIZ: The case of the *crusty cat*

This 8-year-old neutered male domestic shorthaired cat has a two-month history of pruritic generalized crusting dermatitis that has been poorly responsive to antibiotics and bathing. Head to dvm360.com/dermatology-toolkit for more on this case.

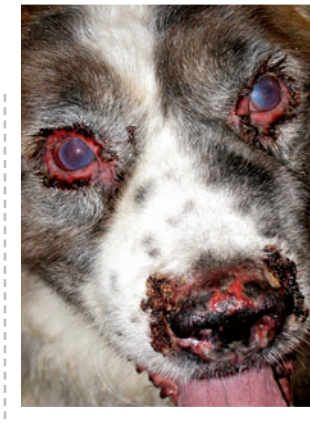


IMAGE QUIZ: The case of the *blind Akita*

A 4-year-old neutered Akita was presented for evaluation of acute onset of blindness and skin lesions characterized by inflammation, depigmentation, and crusting of the eyelids and nasal planum. What's your diagnosis?

Help clients tackle *dermatology dilemmas*

Social media can be more than skin deep. We've scraped together these tweets and posts so you can raise awareness about dermatology.

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Did you know that allergies are caused by the immune system overreacting, not a weakened immune system. Got another question? Come in and ask us!

Fact: Both canine and feline sarcoptic mites can cause lesions in people. This is one reason why regular veterinary visits are so important. Help us help you keep mites off of your pets!

Have you noticed an odor coming from Bella's ears? This could mean something is not right. Let us take a look and we'll tell you what's going on.

DYK? There's no accurate blood/skin test that can diagnose whether a pet has a food allergy. The best way we can make a diagnosis is to change your pet's food to an appropriate elimination food-trial diet. Come in and we'll tell you all about it!

Q: "How do I decontaminate my environment while treating my pet for ringworm?" You should vacuum, disinfect, and steam clean the affected environment and discard infected bedding. What other questions are on your mind?

Have you noticed any discharge from your #pets' ears? This is not normal—let the veterinarian take a look. #petcare #pethealth

If your #pet's dermatology issues (scratching until bleeding, losing hair, etc.) have you stumped, we'll play detective! #pethealth

DYK? Some breeds are more likely to develop medical problems because of their ear structure. Let's look at your #pet's ears! #pethealth

If your #pet is up all night scratching, call us! We can treat the problem and help her—and you—get some shuteye. #pethealth

Is your #pet always messing with her ears? Let's take a look and make sure everything is OK in there! #petcare #pethealth

Educate clients WITH YOUR IPAD

Use this exam-room module to help clients understand your dermatologic diagnoses.

Dermatology diagnoses can be tricky—often times there is no simple solution or quick fix for chronic conditions. But by opening up the lines of communication between you, your team and your clients, you'll increase compliance and ensure that clients' pets receive the best possible care.

One surefire way to educate clients is to use the ready-made client modules on the **dvm360** iPad app. The dermatology client module offers interactive quizzes, videos, and easy-to-process information that clients will find both interesting and educational. So next time you want to give your communication a bit of a boost, download the free app and hand the iPad over to your clients—you might be surprised at how readily they embrace your tech-savvy approach.

INTERESTED? Update your app via iTunes to check out our client education tools right now. Don't have it yet? Visit **dvm360.com/ipadapp** on your iPad to download, or search "dvm360" in the Apple App Store. As always, the dvm360 app and client modules are free to download.

Practicing Veterinarians Share Best Practices for Treating Skin Infections

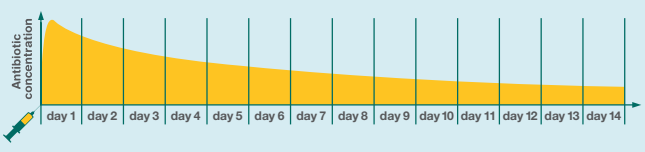
Quickly and effectively treating skin infections can be challenging for you and frustrating for your clients. Depending on pet owners to appropriately administer medication can mean you lose valuable time resolving the infection and providing the best treatment for the patient.

Timothy Smaha, DVM, of Banfield Pet Hospitals in Columbia, S.C., suggests an alternative approach to treating skin infections. "When presented with a skin infection in a dog or cat, my first treatment choice is an injectable antibiotic," Smaha said. "I use Convenia® (cefovecin sodium), because with one injection I can be assured of accurate delivery of the medication and fast resolution of the infection.

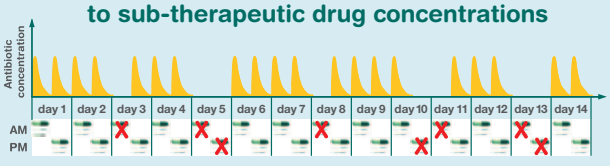
"With a course of oral antibiotics, there are too many mitigating factors," he continued. "Even well-intentioned pet owners often don't give medication at the recommended intervals—or miss doses altogether. With time-dependent antibiotics, dosing according to schedule is important. When I give the injection in clinic, I am offering the best medicine and maintaining control over the treatment."

David Bird, DVM, of Morehead Animal Hospital in Morehead City, N.C., agrees. "Even when oral medications are appropriately dosed by pet owners, it is not unusual for them to discontinue use when they see an improvement," he said. "This leaves the possibility that the infection will not resolve and could be a factor in a therapeutic failure."

CONVENIA: Guaranteed compliance assures best chance for optimal drug concentrations

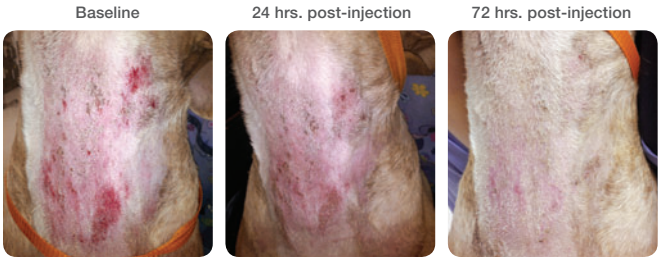


Oral antibiotics: Non-compliance may lead to sub-therapeutic drug concentrations



"CONVENIA reaches peak plasma concentrations within six hours and stays above the minimum inhibitory concentration (MIC) for up to 14 days in the tissue," Bird said.

Two-year-old American Staffordshire terrier with an acute moist pyoderma on ventral neck area, treated only with CONVENIA 8 mg/kg.*



Photos: Timothy Smaha, DVM

"I want a medication to have three attributes for treatment of skin infections: fast-acting, long-lasting, with accurate dosing. We do not have an alternative to CONVENIA that hits all three."

Timothy Smaha, DVM, Banfield Pet Hospitals, Columbia, S.C.

Along with the ability to quickly resolve the infection, both Bird and Smaha choose an injectable product over an oral antibiotic because of the accuracy of dosing. "When giving oral antibiotics, the accurate dose for a dog may fall between tablet sizes. As veterinarians, we tend to round down to the lower tablet size, which may result in the dog not getting the right therapeutic levels of the drug in its system," Bird explained. "With an injectable, very precise dosing is achieved, regardless of the patient's weight. That accuracy combined with the assurance that the pet has received the complete dose of medication are important reasons why I choose an injectable antibiotic."

Smaha added, "I want a medication to have three attributes for treatment of skin infections: fast-acting, long-lasting, with accurate dosing. We do not have an alternative to CONVENIA that hits all three."

Both doctors concur that there is one additional benefit to treating skin conditions with an injectable antibiotic, and that is the peace of mind it brings to clients. As Smaha pointed out, "I like the fact that in most cases, results are seen quickly—that makes clients happy. Happy clients and healthy pets is what practicing best medicine is all about."

IMPORTANT SAFETY INFORMATION

CONVENIA is not for use in dogs or cats with a history of allergic reactions to penicillins or cephalosporins. Similar to other cephalosporins, side effects for both dogs and cats include vomiting, diarrhea, decreased appetite/anorexia and lethargy. The safety of CONVENIA has not been determined in lactating or breeding animals. For more information, please see Brief Summary of Full Prescribing Information on page 12.

*Case included an initial skin cleansing with a dilute topical antiseptic.

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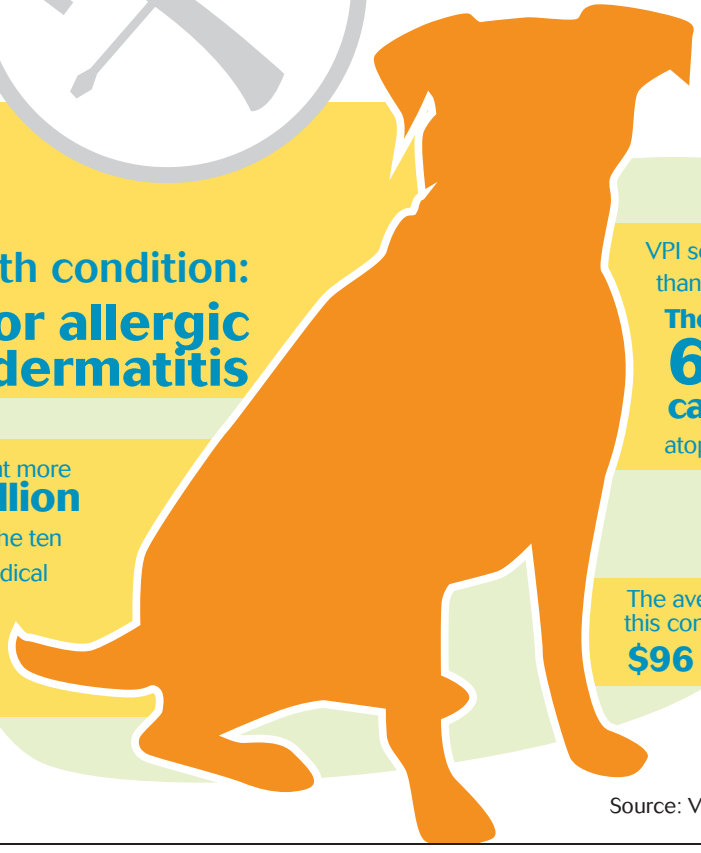
DERMATOLOGY

No.1

Canine health condition:

Atopic or allergic dermatitis



VPI searched its database of more than 485,000 insured pets.

They tallied

68,000+

canine claims for atopic or allergic dermatitis.

Policyholders spent more than **$58 million** in 2012 treating the ten most common medical conditions affecting their pets.

The average claim fee to treat this condition was

$96 per office visit.

Source: Veterinary Pet Insurance (VPI)

Brief Summary of Prescribing Information

convenia®

(cefovecin sodium)

Antimicrobial for Subcutaneous Injection in Dogs and Cats Only

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

INDICATIONS:

Dogs

CONVENIA is indicated for the treatment of skin infections (secondary superficial pyoderma, abscesses, and wounds) in dogs caused by susceptible strains of *Staphylococcus intermedius* and *Streptococcus canis* (Group G).

Cats

CONVENIA is indicated for the treatment of skin infections (wounds and abscesses) in cats caused by susceptible strains of *Pasteurella multocida*.

CONTRAINDICATIONS: CONVENIA is contraindicated in dogs and cats with known allergy to cefovecin or to β-lactam (penicillins and cephalosporins) group antimicrobials. Anaphylaxis has been reported with the use of this product in foreign market experience. If an allergic reaction or anaphylaxis occurs, CONVENIA should not be administered again and appropriate therapy should be instituted. Anaphylaxis may require treatment with epinephrine and other emergency measures, including oxygen, intravenous fluids, intravenous antihistamine, corticosteroids, and airway management, as clinically indicated. Adverse reactions may require prolonged treatment due to the prolonged systemic drug clearance (65 days).

WARNINGS: Not for use in humans. Keep this and all drugs out of reach of children. Consult a physician in case of accidental human exposure. For subcutaneous use in dogs and cats only. Antimicrobial drugs, including penicillins and cephalosporins, can cause allergic reactions in sensitized individuals. To minimize the possibility of allergic reactions, those handling such antimicrobials, including cefovecin, are advised to avoid direct contact of the product with the skin and mucous membranes.

PRECAUTIONS: Prescribing antibacterial drugs in the absence of a proven or strongly suspected bacterial infection is unlikely to provide benefit to treated animals and may increase the risk of the development of drug-resistant animal pathogens.

The safe use of CONVENIA in dogs or cats less than 4 months of age and in breeding or lactating animals has not been determined. Safety has not been established for IM or IV administration. The long-term effects on injection sites have not been determined. CONVENIA is slowly eliminated from the body, approximately 65 days is needed to eliminate 97% of the administered dose from the body. Animals experiencing an adverse reaction may need to be monitored for this duration.

CONVENIA has been shown in an experimental *in vitro* system to result in an increase in free concentrations of carprofen, furosemide, doxycycline, and ketoconazole. Concurrent use of these or other drugs that have a high degree of protein-binding (e.g. NSAIDs, propofol, cardiac, anticonvulsant, and behavioral medications) may compete with cefovecin-binding and cause adverse reactions.

Positive direct Coombs' test results and false positive reactions for glucose in the urine have been reported during treatment with some cephalosporin antimicrobials. Cephalosporin antimicrobials may also cause falsely elevated urine protein determinations. Some antimicrobials, including cephalosporins, can cause lowered albumin values due to interference with certain testing methods.

Occasionally, cephalosporins and NSAIDs have been associated with myelotoxicity, thereby creating a toxic neutropenia[4]. Other hematological reactions seen with cephalosporins include neutropenia, anemia, hypoprothrombinemia, thrombocytopenia, prolonged prothrombin time (PT) and partial thromboplastin time (PTT), platelet dysfunction and transient increases in serum aminotransferases.

ADVERSE REACTIONS:

Dogs

A total of 320 dogs, ranging in age from 8 weeks to 19 years, were included in a field study safety analysis. Adverse reactions reported in dogs treated with CONVENIA and the active control are summarized in Table 2.

Table 2: Number of Dogs* with Adverse Reactions Reported During the Field Study with CONVENIA.

Adverse Reaction	CONVENIA (n=157)	Active Control (n=163)
Lethargy	2	7
Anorexia/Decreased Appetite	5	8
Vomiting	6	12
Diarrhea	6	7
Blood in Feces	1	2
Dehydration	0	1
Flatulence	1	0
Increased Borborygmi	1	0

*Some dogs may have experienced more than one adverse reaction or more than one occurrence of the same adverse reaction during the study.

Mild to moderate elevations in serum γ-glutamyl trans-ferase or serum alanine aminotransferase were noted post-treatment in several of the CONVENIA-treated dogs. No clinical abnormalities were noted with these findings.

One CONVENIA-treated dog in a separate field study experienced diarrhea post-treatment lasting 4 weeks. The diarrhea resolved.

Cats

A total of 291 cats, ranging in age from 2.4 months (1 cat) to 21 years, were included in the field study safety analysis. Adverse reactions reported in cats treated with CONVENIA and the active control are summarized in Table 3.

Table 3: Number of Cats* with Adverse Reactions Reported During the Field Study with CONVENIA.

Adverse Reaction	CONVENIA (n=157)	Active Control (n=163)
Vomiting	10	14
Diarrhea	7	26
Anorexia/Decreased Appetite	6	6
Lethargy	6	6
Hyper/Acting Strange	1	1
Inappropriate Urination	1	0

*Some cats may have experienced more than one adverse reaction or more than one occurrence of the same adverse reaction during the study.

Four CONVENIA cases had mildly elevated post-study ALT (1 case was elevated pre-study). No clinical abnormalities were noted with these findings.

Twenty-four CONVENIA cases had normal pre-study BUN values and elevated post-study BUN values (37– 39 mg/dL post-study). There were 6 CONVENIA cases with normal pre- and mildly to moderately elevated post-study creatinine values. Two of these cases also had an elevated post-study BUN. No clinical abnormalities were noted with these findings.

One CONVENIA-treated cat in a separate field study experienced diarrhea post-treatment lasting 42 days. The diarrhea resolved.

FOREIGN MARKET EXPERIENCE: The following adverse events were reported voluntarily during post-approval use of the product in dogs and cats in foreign markets: death, tremors/ataxia, seizures, anaphylaxis, acute pulmonary edema, facial edema, injection site reactions (alopecia, scabs, necrosis, and erythema), hemolytic anemia, salivation, pruritus, lethargy, vomiting, diarrhea, and inappetance.

For a copy of the Material Safety Data Sheet, (MSDS) or to report a suspected adverse reaction call Zoetis Inc. at 1-888-963-8471.

STORAGE INFORMATION:

Store the powder and the reconstituted product in the original carton, refrigerated at 2° to 8° C (36° to 46° F). **Use the entire contents of the vial within 56 days of reconstitution.** PROTECT FROM LIGHT. After each use it is important to return the unused portion back to the refrigerator in the original carton. As with other cephalosporins, the color of the solution may vary from clear to amber at reconstitution and may darken over time. If stored as recommended, solution color does not adversely affect potency.

HOW SUPPLIED:

CONVENIA is available as a 10 mL multi-use vial containing 800 milligrams of cefovecin as a lyophilized cake.

NADA# 141-285, Approved by FDA

zoetis

Distributed by
Zoetis Inc.
Kalamazoo, MI 49007

January 2013
PAA035845A&P

TOP 3 { dermatology questions clients ask technicians

Use this information to successfully answer clients' questions about their pets' dermatology issues.

Client Why does my pet need such a high dose of antibiotics for such a long time to treat his skin infection?

Technician:

Most pets, especially dogs, with skin infections have what is called bacterial folliculitis, meaning the bacteria have colonized the hair follicles. This is in contrast to the classic "hotspot" a flea-allergic dog may create after an hour of scratching its rump, where the infection is usually very superficial. One of the most important reasons topical therapy alone is not adequate for pets with bacterial folliculitis is because their infections aren't entirely on the skin surface.

For a pet with a standard bacterial folliculitis, at least three weeks of antibiotics are needed, and the general rule is to treat until the pet's clinical signs have been resolved for one week.

Client Why can't my pet's allergies be cured?

Technician:

Allergies, whether they are due to fleas, food or environmental agents, are caused by the immune system overreacting, NOT a weakened immune system, a common client misconception. Studies have shown that animals with flea allergic dermatitis cannot be desensitized for fleas, so the only treatment is avoidance. The same is true of animals with food allergies.

Animals with environmental allergies, or atopic dermatitis, can be desensitized to what they are allergic to through the use of allergen-specific immunotherapy. Immunotherapy "retrains" the body's immune system, but, even when it works, animals usually require it for the rest of their lives to control the disease. In extremely rare cases and usually after years of therapy, immunotherapy can switch the body's immune response, and the animal no longer needs to be treated.

Client Is my pet's condition contagious?

Technician:

Both canine and feline sarcoptic mites—canine *Sarcoptes scabiei* and feline *Notoedres cati*—can cause lesions in people. The canine *Demodex* mites are not contagious to people, but *Cheyletiella* mites can be. Some dermatophyte infections are transmissible to people, with the most common being *Microsporum canis*.

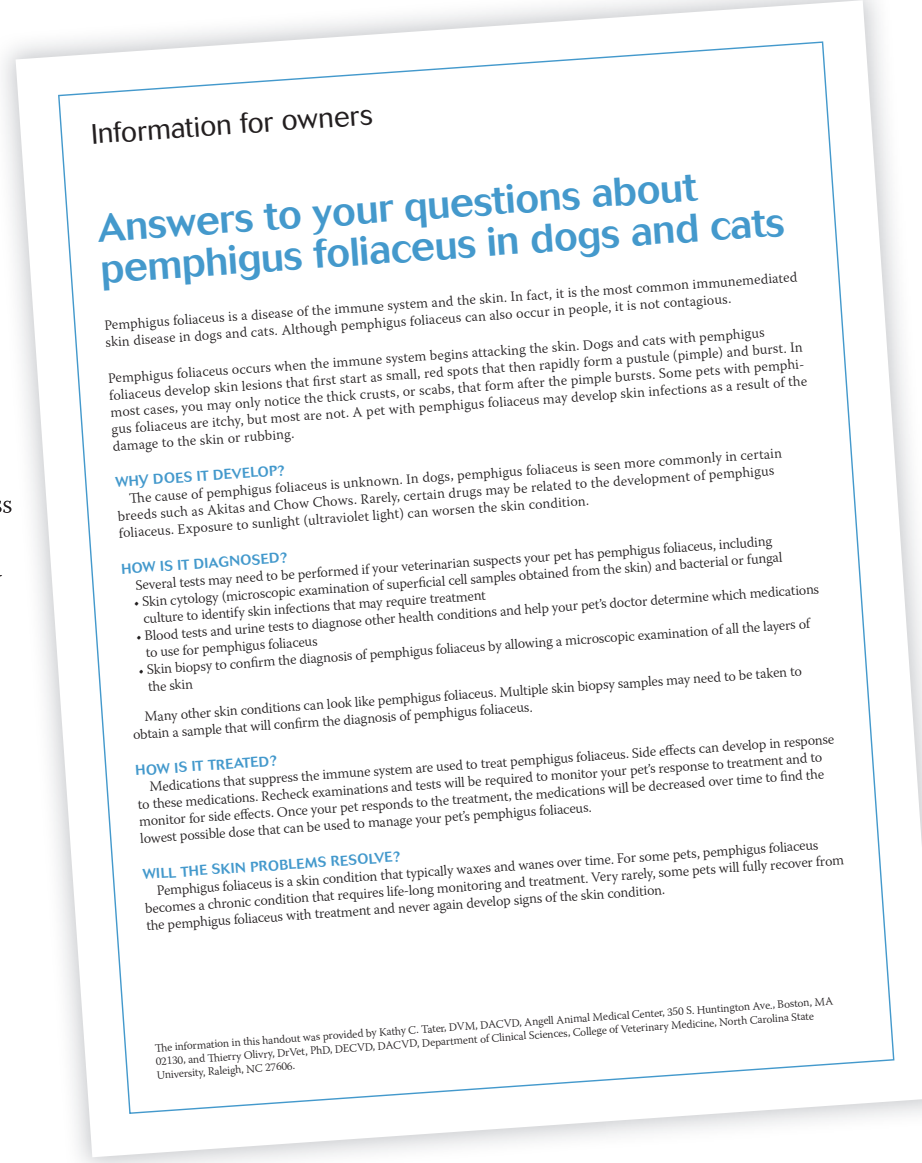
To download these handouts for your team and clients, head over to dvm360.com/dermatologytoolkit.

The facts about *pemphigus foliaceus*

Don't let a diagnosis of this common immune-mediated skin disease overwhelm clients—just give 'em the facts.

While diagnosising and treating dermatologic diseases might be an everyday occurence for you and your veterinary team, your clients may be confused and overwhelmed when their pet is discovered to have an immune-mediated disease like pemphigus foliaceus.

Use this handout to help answer their questions and address common concerns they may have about managing and treating this condition.



Information for owners

Answers to your questions about pemphigus foliaceus in dogs and cats

Pemphigus foliaceus is a disease of the immune system and the skin. In fact, it is the most common immunemediated skin disease in dogs and cats. Although pemphigus foliaceus can also occur in people, it is not contagious.

Pemphigus foliaceus occurs when the immune system begins attacking the skin. Dogs and cats with pemphigus foliaceus develop skin lesions that first start as small, red spots that then rapidly form a pustule (pimple) and burst. In most cases, you may only notice the thick crusts, or scabs, that form after the pimple bursts. Some pets with pemphigus foliaceus are itchy, but most are not. A pet with pemphigus foliaceus may develop skin infections as a result of the damage to the skin or rubbing.

WHY DOES IT DEVELOP?

The cause of pemphigus foliaceus is unknown. In dogs, pemphigus foliaceus is seen more commonly in certain breeds such as Akitas and Chow Chows. Rarely, certain drugs may be related to the development of pemphigus foliaceus. Exposure to sunlight (ultraviolet light) can worsen the skin condition.

HOW IS IT DIAGNOSED?

Several tests may need to be performed if your veterinarian suspects your pet has pemphigus foliaceus, including

- Skin cytology (microscopic examination of superficial cell samples obtained from the skin) and bacterial or fungal culture to identify skin infections that may require treatment
- Blood tests and urine tests to diagnose other health conditions and help your pet's doctor determine which medications to use for pemphigus foliaceus
- Skin biopsy to confirm the diagnosis of pemphigus foliaceus by allowing a microscopic examination of all the layers of the skin

Many other skin conditions can look like pemphigus foliaceus. Multiple skin biopsy samples may need to be taken to obtain a sample that will confirm the diagnosis of pemphigus foliaceus.

HOW IS IT TREATED?

Medications that suppress the immune system are used to treat pemphigus foliaceus. Side effects can develop in response to these medications. Recheck examinations and tests will be required to monitor your pet's response to treatment and to monitor for side effects. Once your pet responds to the treatment, the medications will be decreased over time to find the lowest possible dose that can be used to manage your pet's pemphigus foliaceus.

WILL THE SKIN PROBLEMS RESOLVE?

Pemphigus foliaceus is a skin condition that typically waxes and wanes over time. For some pets, pemphigus foliaceus becomes a chronic condition that requires life-long monitoring and treatment. Very rarely, some pets will fully recover from the pemphigus foliaceus with treatment and never again develop signs of the skin condition.

The information in this handout was provided by Kathy C. Tater, DVM, DACVD, Angell Animal Medical Center, 350 S. Huntington Ave., Boston, MA 02130, and Thierry Olivry, DrVet, PhD, DECVD, DACVD, Department of Clinical Sciences, College of Veterinary Medicine, North Carolina State University, Raleigh, NC 27606.

Online TOOL
Download this form to pass out to clients at **dvm360.com/dermatologytoolkit.**

Diet trial compliance

At-home tips for diet trials

A food allergy may be what's causing your pet's skin problems. To uncover which food or ingredient may be the culprit, you need to be committed to your pet's diet trial. To stay on track, post this hand-out, along with any other dietary information provided by your veterinarian, in a highly visible spot, such as on your refrigerator or your pet's food container.

The following points are key to the success of this diagnostic protocol:

- Feed your pet only the prescribed diet. No other foods or treats are allowed.
- Make sure all family members and friends know that your pet is receiving a special diet, and not to give outside food.
- If you need to use treats for rewards or training purposes, use some of the prescribed diet.
- If you have other pets of the same species in your house, feed them the same diet and feed them separately.
- Keep your pet out of the room during meals to avoid him or her picking up dropped food.
- If pills are prescribed for your pet, don't hide them in anything other than the prescribed diet. If giving medication is a problem, please discuss with your veterinarian.
- Flavored products, such as those found in medications, toothpaste, and certain plastic toys, must be avoided during the diet trial.
- If your pet is in the habit of eating dropped food or garbage when exercised outside, keep it on a leash.

Information provided by Hilary A. Jackson, BVM&S, DVD, DACVD, Dermatology Referral Services, 528 Paisley Road West, Glasgow G51 1RN, Scotland.

Ask good questions to get *better answers*

Your patients can't talk, so it's up to you to ask the right questions to get the information you need from clients.

The list of questions a veterinarian and her team ask as a pet's medical history is taken may vary from clinic to clinic, based on the pet's signs and reason for visiting the practice. But no matter how different each clinic's questions are, the goal remains the same—to determine what's wrong with the pet.

This handout, with 20 good questions to ask clients about their pet's skin, ears and overall health, can be a starting point to ensure you cover all your bases and get to the root of the pet's dermatologic problem quickly.

Dermatology: {20 questions *to ask* clients

The more you know about your patients, the better. Ask clients these questions while taking a dermatology history.

1. How did you first realize the ears were a problem?
2. Did you see head shaking or scratching at the ears?
3. Have you noticed an odor coming from the ears?
4. Does another pet lick the pet's ears?
5. Have you noticed any discharge from the ears?
6. Do you clean your pet's ears?
7. If yes, do you clean them on a regular basis, or only when signs occur?
8. What signs do you notice?
9. Why do you clean the pet's ears?
10. Have you ever been told to clean the pet's ears regularly?
11. Do you clean the pet's ears during grooming?
12. Do you use any ear medications? If yes, which types?
13. Is your pet itchy anywhere else?
14. Does your pet lick or groom its paws?
15. Where does the pet or lick? Please describe all sites, even if no skin lesions are present.

    Some less frequently asked questions that will be helpful as the doctor makes a diagnosis include queries about the pet's gastrointestinal health:

16. How many bowel movements a day does your pet have?
17. Is your pet gassy?
18. Do you hear stomach sounds or gurgling?
19. Do you ever see blood or mucus in your pet's stools?
20. Does your pet burp?

Environmental control of infectious disease

Take these precautions in your hospital if one of your patients is suspected of having or is known to have an infectious disease such as a methicillin-resistant or a parvovirus infection.

Online TOOL

Download this checklist by using the QR code above or by visiting **dvm360.com/dermatologytoolkit.**

1 Upon patient's arrival to the clinic

- ❍ Isolate the patient from other patients.
- ❍ Immediately usher the patient into the examination room.

2 In the examination room

- ❍ Wear protective clothing (gloves and gowns or dedicated lab coats) when handling the patient or items it has been in contact with.
- ❍ Wash hands or apply alcohol-based hand sanitizer before and after patient contact, even if gloves were worn.
- ❍ Use pens and stethoscopes dedicated to the patient.
- ❍ Use disposable thermometer covers and discard them as they are used, or use dedicated digital thermometers.

3 After discharge

- ❍ Clean and disinfect equipment dedicated to the patient.
- ❍ Disinfect exam room tables, floors, door and sink handles, light switches, scale surfaces, cages, and medical equipment (*e.g.* scales, otoscopes) used with the patient. VM

Dermatology DOs *and* DON'Ts

Lisa Petty, BS, RVT, a technician at Animal Dermatology Clinic in Indianapolis, offers these tips to keep communication lines open when you and your team are guiding clients through their pet's dermatology diagnosis.

✘ DON'T guarantee a specific timeline for a response to treatment or a specific outcome. For example, "His hair will grow back in six weeks and it will look beautiful" or "After he goes on allergy medicine he'll never scratch again. He'll never need another steroid. He'll never have another flare."

✔ DO give clients an idea of what you hope will happen and give them the success rates of different therapies.

✘ DON'T make a client feel bad or guilty for choosing a less expensive treatment protocol. "Our job is to give clients all the available options and let them choose what suits their budget and lifestyle," says Lisa Petty, BS, RVT.

✔ DO deliver what's best for clients and what's best for their pets within the scope of what pet owners tell you they can do.

✘ DON'T assume that people aren't taking good care of their pets or that they don't care about their pets based on what their pet's skin looks like. "Sometimes people will see an animal walking across the street that doesn't have any hair and they assume it's been abused," Petty says. "I tell our new team members that it doesn't mean that they haven't been well cared for. It means they really do need to see us. So we can't assume they're being neglected just because their skin and hair coat don't look good."

✔ DO make yourself available to clients. Make sure clients know that they can call at any time with a question or problem. "We want their pets to get better as much as they do, and we want to know if their pet is having a problem. If their pet is vomiting because of a medication or doesn't like the new food that we put them on for a dietary trial, we want to know that, because it's crucial to their compliance," Petty says.

Petty says at her practice, technicians follow cases so clients see the same team members each time. It's less confusing for pet owners, and clients know they have someone to talk to when they have problems.

"The worst thing that could happen is we send them home with medication, the pet starts to vomit or has diarrhea, and they stop the medication and don't call us—and we don't see them for a month. So they don't give anything that whole time between visits and they never call to let us know," Petty says.

✔ DO follow up with phone updates. "Our software is set up so we can put in reminders to call clients," she says. "And we print that list daily and call to find out how pets are doing. If the client prefers email, we use email. And email actually works really well, because there's nothing lost in translation with the message, and we can copy and paste it right into the medical record. The important thing is, we want clients to feel comfortable contacting us with any concerns they might have."

One more tip

"Gross" dermatology images educate clients

"I take digital photos of cytologic exam and skin scraping findings (bacteria, mites) through one eyepiece of the microscope by using the camera's macro setting," says Dr. Brett Wildermuth, DACVD, a veterinarian in San Diego, Calif.

He then shows the photos to clients in the exam room. The pictorial representation of the high numbers of "gross" bacteria drives home the necessity for antibiotic therapy and reduces complaints about antibiotic costs.

The next step

Skin issues, especially those associated with allergies, are some of the most common health problems you're going to see in practice. So they're a great growth opportunity—if your team is ready to learn. More importantly, handling dermatology cases well can bond clients to your practice forever.

1. Train your team. A dermatology program requires your whole team's support to flourish. One good way to get your team on board with training is to invite team members to bring their own pets into the practice for exams.

2. Make a plan. Once team members are excited and knowledgeable, your next step is to create protocols for common dermatology issues. For example, a protocol for a first-time allergy patient might include a standardized medical history form, an extended examination time and standard diagnostics (skin scraping, dermatology culture and skin cytology).

3. Explain your plan. Pet owners are more compliant if they know you have a plan, so be upfront with them from the get-go about their pet's treatment. But be realistic and outline a "plan B" in case the first approach doesn't work.

4. Work it out. Successful management of dermatology cases often requires ongoing focus on client education and patient workups rather than just treating the symptoms. If clients refuse the diagnostics or treatment you recommend, be prepared with alternatives that will still let you help the pet.

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SPECIAL SECTION
Just ASK the Expert

Inhibiting a *Lab's infatuation* with its **toy ball**

Q. One of my patients, a Labrador retriever, seems to be obsessed with his toy ball. When the owners sit down, the dog incessantly begs to play with the ball. What advice should I give the owners as to how to redirect this behavior?

John Ciribassi, DVM, DACVB
Chicagoland Veterinary Behavior Consultants
Carol Stream, Ill.
chicagovetbehavior.com

A. I suspect that this dog's behavior may be compulsive in nature. Compulsive disorder in dogs can present itself in a wide variety of ways. Common signs include tail chasing, spinning, flank sucking, imaginary fly snapping, and shadow and light chasing.

Compulsive behaviors are often normal activities related to oral (*e.g.* excessive grooming, self-chewing, flank sucking) or locomotor activities (*e.g.* spinning or tail chasing). These activities are displayed out of normal context—that is, at times when it would ordinarily not be expected for the pet to engage in the behavior. In addition, the behavior occurs to the exclusion of other normal daily activities such as eating, exercise, or other forms of play.

What's behind the behavior

It is thought that compulsive disorder has as its basis abnormalities in neurotransmitter function (serotonin or norepinephrine) as well as the possibility that it is self-reinforcing as a result of release of endogenous opioids. Based on this information, it is likely that the incessant ball play you describe is a compulsive disorder because of the amount of time the dog engages in the activity and how focused the dog apparently is when playing.

Before beginning behavior management for most forms of compulsive disorders, be certain there are no medical reasons for the behavior such as seizures, other forms of central nervous system disease, or spinal pathology.

Behavior modification

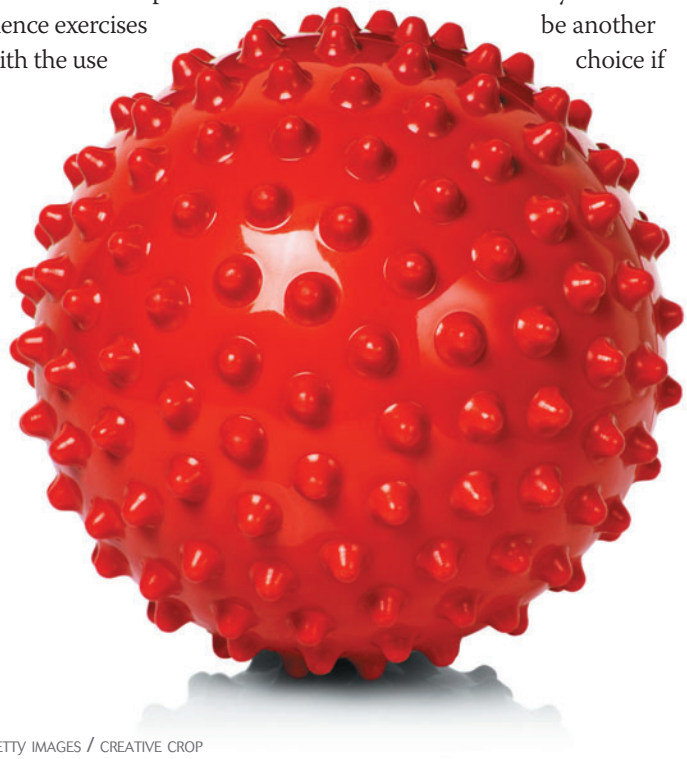
It is key when managing a compulsive disorder that all triggers to the behavior be identified and eliminated if possible. If not possible, then counter-conditioning and desensitization techniques can be used to manage the dog's response to the trigger.

In this case, access to the ball is controllable for the owners. Because continued access to the ball will make it difficult to redirect this dog's compulsion, it would be wise to discontinue play with the ball. The owners then need to absolutely resist any attempts on the dog's part

to get them to play using the ball. If they resist but then eventually give in, they will be reinforcing the behavior at a higher level, making it much more difficult for the behavior to subside (extinguish).

The owners should also offer the dog a variety of other activities to replace ball play. Frequent walks, regular training bouts, and play with a variety of alternate objects would be a good beginning. These objects should obviously not be similar to any type of ball. If the dog gains access to other objects that are similar to a ball, then the owners should consider keeping a drag leash on the dog and use this to quickly interrupt the behavior and then redirect by engaging it in a one- to two-minute session of a series of simple obedience exercises with the use of palatable treats as reinforcers given freely for each repetition of the behaviors.

It is key when managing a compulsive disorder that all triggers to the behavior be identified and eliminated if possible.



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Pharmacotherapy

The owners might also need to consider the use of antianxiety medication if the dog's degree of compulsion persists in spite of these recommendations. I would begin with clomipramine at a dose of 1 to 4 mg/kg twice a day (start at the lower end of the dose range and increase the dose gradually as needed). Fluoxetine at 0.5 to 1 mg/kg once a day would be another choice if you cannot use clomipramine (previous history of seizures or poor response to the drug in the past). A dose of 0.5 mg is a good starting point because of potential anorexia and sedation as well as idiosyncratic increase in anxiety in some dogs. You can increase the upper end of the dose range to 2 mg/kg.

Sedation and anorexia are common, mild, and temporary side effects to these medications that often are relieved with time (three to four weeks) or a reduction in dose. Be sure to perform a baseline complete blood count, serum chemistry profile, and thyroid panel (a total thyroxine concentration with or without a thyroid-stimulating hormone concentration). Then perform a complete blood count and serum chemistry profile four to six weeks after beginning the medication.

In the long-run

Be aware that dogs with a compulsive disorder may need lifelong therapy in terms of medication and consistent application of the behavior modification plan to achieve an adequate reduction in clinical signs. VM

SPECIAL SECTION
Just ASK the Expert

The best way to address FELINE ATOPY

Q. What are your tips for diagnosing and treating atopy in cats? Are cats typically sensitive to some allergens more than others?

Ian B. Spiegel, VMD, MHS, DACVD
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A. Pruritic cats usually have one of four problems:

1. Flea bite hypersensitivity
2. Cutaneous adverse food reaction
3. Environmental allergies (atopy)
4. Ectoparasites other than fleas (*e.g.* mites).

RULING OUT OTHER CAUSES OF PRURITUS

Flea allergy dermatitis is the most common cause of feline pruritic disease. Strict flea control on *all* animals *every month* is important to rule this out as the sole cause of the pruritus. Other ectoparasitic causes must be ruled out as well (*e.g. Cheyletiella*, *Notoedres*, *Otodectes*, and *Demodex* species). Whether or not these mites are detected (by evaluating samples obtained by skin scraping, hair plucks, or combing), several treatments are indicated to simply rule these out as causative factors for the pruritic disease. A broad-spectrum topical spot-on parasiticide (selamectin or moxidectin) is usually helpful. Lime sulfur is also an option.

Tests for cutaneous adverse food reaction (food allergies) are available as well. However, these food allergy tests are not usually indicated; clients are better served investing in an elimination diet (novel protein or hydrolyzed diet). Cutaneous adverse food reaction is more common in cats than in dogs and should be strongly suspected when a cat is presented for gastrointestinal signs and primarily facial dermatitis (despite parasite control).

DIAGNOSING FELINE ATOPY

As with dogs, horses, and people, the most common environmental allergens causing clinical signs are house dust or house dust mites. Other common allergens include weeds, grasses, trees, and molds, even if a cat is an indoor cat. Diagnosing feline atopic dermatitis is usually a process of elimination. Allergy testing is not necessarily a diagnostic tool for atopic dermatitis; it is a test that is indicated when a client is interested in immu-

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notherapy. One could make the argument that allergy testing is indicated for avoidance, but this is difficult in many cases.

Serology or intradermal testing can be performed when trying to determine which allergens should be incorporated into the immunotherapy formulation. Skin allergy testing is more challenging in cats as compared with dogs. The reactions seem to be more immediate and less prominent, with variability in erythema and wheal formation. In my opinion, intradermal (skin) testing would usually be the superior option in dogs and horses, while in cats, I usually perform a serology test initially.

Now, the frustration for many is the frequent negative results when allergy testing or the reluctance for clients to choose immunotherapy. A negative test result does not rule out atopic dermatitis. A subset of patients will not have positive results even with multiple intradermal tests or serology tests. For these patients, which are said to have *intrinsic atopic dermatitis*, immunotherapy is usually not an option. However, there is research looking at regionally specific immunotherapy, or immunotherapy based on the most common allergens in a particular region without relying on allergy test results.

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TREATING FELINE ATOPY

Management for environmental allergies does not always need to involve immunotherapy (oral or injectable). In fact, for many cases, it may not be the best option.

Management often involves a multimodal approach. Treating secondary bacterial and yeast (*Malassezia* species) infections and preventing parasitic causes is important. The eosinophilic granuloma complex (indolent ulcers, plaques, and granulomas) is usually due to a hypersensitivity to fleas or sensitivity to foods or environmental allergens. However, these lesions are often a result of focal bacterial infections, so antimicrobial treatments are often indicated for optimal control of these frustrating lesions.

Also, dermatophytosis is more common in cats and can mimic allergic skin disease in that a patient with ringworm may be pruritic and have hair loss. This may need to be ruled out (*e.g.* fungal culture and Wood's lamp examination) and addressed if indicated.

Antihistamines

Antihistamines may be considered, and you have several options. Some of the older-generation antihistamine choices such as hydroxyzine and chlorpheniramine can be sedating, which may prove beneficial. While in my experience antihistamines are about 10% to 30% effective, they are still sometimes indicated as an adjunctive treatment.

Essential fatty acids

Essential fatty acids (EFAs) can be helpful as well. Omega-3 EFAs such as eicosapentaenoic acid (EPA) and docosahexaenoic acid, as well as the omega-6 EFA dihomo-gamma-linolenic acid (DGLA), can decrease skin inflammation via competition with arachidonic acid for metabolic enzymes. EFAs can also modulate leukotriene and prostaglandin synthesis.

Eicosanoids are anti-inflammatory. The goal is a decrease in the inflammatory (arachidonic acid-derived) eicosanoids (inflamma-

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tory mediators) and, thus, an increase in more of the "less" inflammatory mediators. Also, EFAs help to restore normal composition of lipids to skin (barrier function) and modulate lymphocyte functions.

Cyclosporine

Cyclosporine is an excellent option for the management of atopic dermatitis with or without immunotherapy. However, when allergy testing is not elected by the owner because of the reluctance to pursue immunotherapy (injections), cyclosporine is the treatment of choice.

Modified cyclosporine (Atopica—Novartis) is the first oral nonsteroidal treatment approved for the management of feline atopic dermatitis. Atopica is a fat-soluble, cyclic polypeptide fungal product with immunomodulating activity, and it is a calcineurin inhibitor. Cyclosporine targets specific cells (T cells) in the immune system that lead to an allergic reaction. It is well-tolerated and at least 80% effective when used properly. And cyclosporine lacks major adverse effects often associated with corticosteroids.

Infections and parasites must be well-controlled or treated before you incorporate cyclosporine. Also, using the correct dose (7 mg/kg/day in cats) is important. Ideally, the modified formulation (*e.g.* Atopica) is a better choice than other forms of cyclosporine (compounded and nonmodified forms) as the bioavailability is better understood and less medication is used to achieve the desired effect.[1,2]

Corticosteroids

Corticosteroids are usually indicated at some point during the management of allergies. Ideally, corticosteroids are used only when necessary and as infrequently as possible. In my opinion, oral administration is a better option since it allows for a methodical titration and for adjustments to be made, if needed. I think that long-acting injection options are less ideal and that they should be used sparingly (*e.g.* no more than three methylprednisolone acetate injections yearly). I usually use oral prednisolone, methylprednisolone, dexamethasone, or triamcinolone.

Topical therapy

In addition to the aforementioned oral medication options and immunotherapy, topical treatments may be helpful. Some topical antimicrobials target the secondary infections. More recently, products are available that help maintain better barrier function, which is often compromised in allergic patients. Numerous topical anti-inflammatory and antipruritic options are also available.

Topical treatments often complement the other options mentioned above. In some cases, topical treatments are all that is indicated, but cats are not as receptive to this method of treatment as are other species.

A FINAL CONSIDERATION: PSYCHOGENIC ALOPECIA

In rare cases, self-mutilation and overgrooming may be a result of a psychogenic cause. If all of the aforementioned causes are addressed but the problem continues, consider behavior-modifying medications, such as fluoxetine or clomipramine.

CONCLUSION

Many management options are available for allergic cats. Every patient is different, and every client situation is unique, so the treatment plans are different for all patients. This is where the art of managing the allergic patient comes into play. VM

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SPECIAL SECTION
Just ASK the Expert

Are intact dogs less likely to get cancer?

Q. I've heard about studies linking neutered dogs with an increased cancer risk. Should I take this into consideration before performing routine spays and castrations?

Timothy M. Fan, DVM, PhD, DACVIM (internal medicine, oncology)
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A. The epidemiologic findings in a recent study provide indirect and foundational evidence for the participation of gonadal status in susceptibility to or protection from various categorical causes of death in companion dogs.[1] Based on the retrospective analysis of a very large cohort of female and male dogs, which were either gonadally sterilized (neutered) or intact, the findings of the study indicate that gonadal sterilization not only significantly impacts *when* companion dogs might die, but also provides novel information pertaining to *why* individuals die.

The study's specifics

Specifically, gonadal sterilization significantly increased life expectancy in both male and female dogs by 13.8% and 26.8%, respectively, in comparison to sexually intact individuals. Importantly, the study findings identified a substantial effect of gonadal sterilization on the cause of death, with sterilization of dogs being significantly protective for fatality associated with various categorical pathologic processes including infectious, traumatic, vascular, and degenerative disease processes.

Gonadal sterilization not only significantly impacts when companion dogs might die, but also provides novel information pertaining to why individuals die.

In contrast, sterilized dogs were significantly more likely to experience fatality associated with select neoplastic and immune-mediated processes. The identified association between increased fatalities of sterilized dogs from either neoplastic or immune-mediated diseases has the potential to direct future hypothesis-driven experiments that specifically address the participatory roles of chronic gonadal hormone exposure on tumorigenesis and immune surveillance.

In the context of cancer, sterilized dogs had a significantly increased risk of death, independent of age, associated with transitional cell carcinoma, osteosarcoma, lymphoma, and mast cell tumors; however, the increased death risk from cancer was not preserved across all tumor histologies,

as sterilization status did not significantly influence the incidence of mortality in dogs with other common cancers such as prostate carcinoma, squamous cell carcinoma, and melanoma.

More research needed

Based on these initial epidemiologic study observations, prospective investigations addressing the putative and mechanistic roles of chronic gonadal hormone exposure and specific cancer-related death risks are well-justified. However, at this point before additional hypothesis-driven experiments can be conducted, it would be premature and imprudent to recommend the avoidance of elective gonadal sterilization because of concerns of increased death risk from cancer in companion dogs. Future rigorous and definitive cause-and-effect scientific studies are required before changes in sterilization practices should be considered.

Future scientific studies are required before changes in sterilization practices should be considered.

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SPECIAL SECTION

Just ASK the Expert

Could you be using lower doses of trilostane in big dogs?

David S. Bruyette, DVM, DACVIM
VCA West Los Angeles Animal Hospital
West Los Angeles, Calif.

Veterinary Diagnostic Investigation and Consultation
Malibu, Calif.

Q. I have read that it may be better to use a lower-than-labeled dose of trilostane in large dogs that have hyperadrenocorticism. What is your recommendation?

A. In a recent paper looking at body weight and trilostane dose, there was no significant difference in trilostane dose in mg/kg of body weight or in the total amount of trilostane required daily to control clinical signs, except when the dose for dogs weighing > 30 kg was compared with that for the other groups.[1] Statistical comparisons of dose and dosage were made after the dogs were separated into groups weighing < 15 or > 15 kg; groups weighing ≤ 10 kg, 10.1 to 20 kg, 20.1 to 30 kg, and ≥ 30 kg; and groups based on body surface area vs. dose/kg and total amount of trilostane required to control the condition. Despite the lack of statistical significance, there was a trend, suggesting that as body weight increases, the amount of trilostane (mg/kg/dose as well as mg/kg/daily dose) required to control clinical signs decreases.

The labeled dose of trilostane (Vetoryl—Dechra)

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is 2.2 to 6.7 mg/kg once a day. I think, in general, that irrespective of body size, we should always attempt to use the lowest possible doses of medication that control clinical signs. This approach also allows us to decrease the frequency of adverse events that may be dose-dependent.

I prefer to start all dogs, regardless of size, at 2.2 mg/kg once a day and then reassess them seven to 10 days into treatment by evaluating clinical signs, measuring electrolyte concentrations, and performing an ACTH stimulation test. I adjust the trilostane dose based on the post-ACTH serum cortisol concentrations in conjunction with clinical signs:

- If the post-ACTH cortisol concentration is < 1.45 µg/dl, I will discontinue treatment until post-ACTH cortisol concentrations are > 9.1 µg/dl. At that point I would decrease the initial dose of trilostane by 50% and repeat the ACTH stimulation test in seven to 10 days.
- If the post-ACTH cortisol concentrations are > 1.45 and < 5.4 µg/dl and the clinical signs are improving, I would continue with the current dose of trilostane and reassess at days 30 and 90 and then every three to four months thereafter.

We should always attempt to use the lowest possible doses of medication that control clinical signs.

- If the post-ACTH cortisol concentrations are > 5.4 and < 9.1 µg/dl, I would continue with the current dose of trilostane if the clinical signs are improving and, again, reassess at days 30 and 90 and then every three to four months thereafter. If clinical signs persist, I would increase the dose of trilostane by 25% and repeat the ACTH stimulation test in seven to 10 days.
- And finally, if the post-ACTH cortisol concentrations are > 9.1 µg/dl, I would increase the dose of trilostane by 25% and repeat the ACTH stimulation test in seven to 10 days. VM

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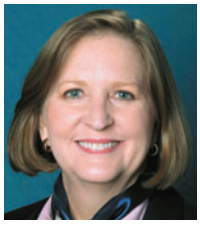
SPECIAL SECTION
Just ASK the Expert

What constitutes a diagnosis of *separation anxiety?*



Valarie V. Tynes, DVM, DACVB
Premier Veterinary Behavior Consulting
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Q. One of my patients is an 18-month-old spayed female Labrador mix that was in a shelter from 8 weeks of age until adopted.

A single owner adopted the dog, and it initially seemed fine. The owner works intermittent days that sometimes last as long as 12 hours. When the neighbors were around and the dog was home by itself, they would greet it and pet it through the fence a couple of times a day. But when the neighbors moved, the dog was left home alone on those long days with no interaction, and it began exhibiting separation anxiety-type behaviors.

The dog digs at, chews, and climbs on the fence in an attempt to get out. If placed in a crate, even for only a couple hours, it chews and digs at the crate. If given free access to come in and out of the house, it still tries to get out of the fence or comes inside and chews on furniture and other items.

The dog can be left in a car while the owner shops without exhibiting destructive behavior. When the owner visited family members who also have a dog for two weeks, the dog was fine to be left in that home with the other dog, sometimes for as long as two or three hours, without exhibiting destructive or escapist behaviors. Even if the dog was put in a separate room and the resident dog was allowed to roam freely while the family was gone, the dog in question did not exhibit any destructive behavior.

The dog does chew on things left within reach, such as shoes and plastic pill bottles, whether alone or while people are home. And the dog has never urinated, defecated, or deliberately caused self-injury when left alone. But the owner is concerned the dog will hurt itself simply by trying to climb the fence, etc.

Does this dog have true separation anxiety? The owner would like to keep the dog but can't have the dog continually trying to escape or be destructive. What options are there for this owner to keep the dog or for the dog to go to a better-fitting family?

A. The history described here demonstrates how challenging it can be to accurately diagnose separation anxiety, or *separation-related distress*, as some prefer to call it. The most common behaviors associated with separation anxiety are destruction, housesoiling, and vocalization. However, what is important to note here is that these are the behaviors reported by owners most commonly primarily because they cause a problem for the owners—vocalization often leads to complaints from neighbors, and destructive behaviors and housesoiling can lead to expensive home repairs.

The more easily missed (and often ignored) signs that a dog is distressed by separation from an owner—pacing, panting, salivating heavily, trembling, and whining—are often the earliest signs displayed by a dog with separation anxiety. Some dogs even begin displaying these signs when they see their owners preparing for departure, and most dogs with separation anxiety continue exhibiting these signs for 15 minutes to an hour after their owners depart.

To accurately diagnose separation anxiety, signs of distress associated with the owner's real or perceived absence from the dog must be present. Not all dogs with separation anxiety exhibit vocalization, destruction, and

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housesoiling; some only exhibit one or two of these signs. What is necessary are signs of anxiety or distress, and the best way to determine if these are present is to have the owner set up a video camera to videotape the dog for the 30 minutes to an hour after the owner leaves.

I am hesitant to suggest that people acquire a second dog to help the dog that has separation anxiety.

Other rule outs

In addition, always remember to rule out other causes (including behavioral and medical) of destruction, housesoiling, and vocalization. For example, if a dog is housesoiling, confirm that the dog is truly housetrained and that housesoiling *never* occurs in the owner's presence. You should also confirm that the dog does not have any medical conditions that might lead to housesoiling. If accidents do occur in the owner's presence, review housetraining protocols with the owner and make sure the dog's housetraining improves before considering a diagnosis of separation anxiety.

Destruction of household items can occur as an element of play and exploratory behavior in many dogs, even one of this age. In fact, I would be most careful to rule this out in a dog such as the one described here in which the history suggests that the dog may not be receiving adequate physical and mental stimulation or appropriate supervision. The fact that the dog exhibits some destructive chewing behavior even when the owner is present suggests that a lack of stimulation could be at least part of the problem.

Some dogs exhibit destructive behavior because other fearful or exciting stimuli may be present when the owner leaves. For example, dogs with thunderstorm phobias or other sound phobias may exhibit the type of destructive escape behavior that you describe if those stimuli occur while the owners are gone. However, if this is the case, the dog should also exhibit similar signs when the owner is present as well, but it should be noted that many dogs with fears and phobias may be somewhat less distressed when their owners are present and be extremely distressed when they are alone during the scary events.

Dogs that become excited or aggressively aroused about the presence of passing dogs, wildlife, or strange people may also exhibit destructive behavior around doors or windows in the home, where they often sit and watch people and animals pass by. Again, this type of behavior should be displayed when the owner is present as well, so a good behavioral history will help you to rule out these other causes of destructive behaviors.

Finally, many behaviorists recognize an additional diagnosis called *barrier frustration* in which a dog is simply distressed by confinement. Affected dogs may become extremely destructive in their attempts to escape confinement, regardless of whether their owners are present. These dogs are likely still experiencing severe distress, but in these cases treatment involves teaching the dogs to tolerate confinement as opposed to teaching them to tolerate being separated from their owners.

Differing degrees of separation anxiety

Behaviorists have differing opinions on subclassifications of separation anxiety. In my experience, individual dogs exhibit different degrees of separation anxiety. In the most severe cases, a dog's distress is present whenever its owner (or the person to whom it is most attached) is absent. However, many dogs with what could be considered a milder degree of separation anxiety are OK as long as some individual is present. And some dogs are OK as long as they have a canine companion present.

Unfortunately, I find this last category to be uncommon and,

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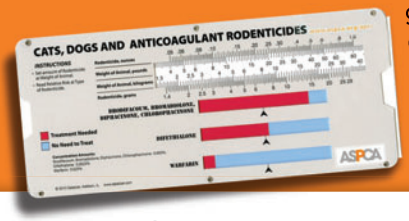

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thus, am hesitant to suggest that people acquire a second dog to help the dog that has separation anxiety. The fact that the dog described here was less distressed when in the other home with another dog may have had as much to do with being in a novel environment as being with the other dog. While some dogs begin displaying their separation anxiety immediately in any environment, in other dogs it appears to develop after a period of time in a particular environment.

Why the distress?

No one fully understands what predisposes dogs to developing separation anxiety. Some dogs with separation anxiety display signs of hyperattachment, while other dogs simply appear to be unable to cope with being alone. There is a great deal of variation in the presenting signs and histories of dogs with separation anxiety. However, once a dog has developed separation anxiety, the repeated experience of being left alone while suffering great emotional distress leads to a steady worsening of the distress over time.

Essentially, these dogs begin associating their distress with the place they are left and the state of being alone. This explains why some dogs that experience separation anxiety while being confined to a kennel may become extremely phobic of the kennel and actually harm themselves severely in an attempt to get out of the kennel.

It also probably explains why some dogs with separation anxiety are fine when left in the car. The car is a completely novel environment, and because it is rare for a dog to be left alone in a car for four to eight hours, some of them will not show distress when left alone in the car. This is not the case with all dogs, however, so do not encourage owners of dogs with separation anxiety to begin leaving their dogs in the car rather than at home without a thorough discussion of the dogs' history and behavior and the pros and cons of leaving a dog alone in the car.

Thoughts on treatment

Treatment of separation anxiety is rarely easy; it requires patience, persistence, and dedication on the owner's part. It is a condition that can often be managed even when it cannot be completely cured. And it is likely to be more easily treated if help is sought as soon after the appearance of clinical signs as possible, since the condition is likely to worsen with time.

Ultimately, separation anxiety is a treatable condition, but to treat it successfully, you must begin with an accurate diagnosis, usually confirmed by a videotape demonstrating signs of anxiety or distress when the dog is left alone.

Rehoming a dog with separation anxiety is always an option, but in my experience it is a rare person who has the luxury of never leaving home without his or her dog. Even rehoming should not be considered without a treatment plan in place for treating the problem, whether it is separation anxiety, barrier frustration, or a case of a dog that is being understimulated and underexercised. VM

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Thank you, *Veterinary Medicine*

In 1968, Dr. Carlos Cooper, the publisher of this journal at that time, telephoned me to ask if I would be willing to become a monthly columnist. He said that because I had demonstrated an ability to write articles for the journal, he felt I was qualified to write a regular department.

I told him that I was surprised and honored by his offer, but asked for a few days to think about it. That was because I was in a demanding practice at that time and swamped with work. However, I realized I was being offered a unique opportunity.

So I called Dr. Cooper back and said that I would accept his offer, provided that the contents of the column could be variable. It might be about our profession or it might be about other subjects such as politics, history, or philosophy. It might be cartoons. It might even be quite controversial.

Dr. Cooper replied, "Exactly what I want. That's why I gave you the opportunity. I think you can do an interesting, or a provocative, or an entertaining column for us every month.

More than 40 years have gone by. The journal has changed, and the world has changed. Re-reading more than 500 "Mind Over Miller" columns serves as a diary of my life. Incidents that I may have forgotten are recalled as I look at the stories I wrote or at the cartoons I drew.

These columns, which I occasionally peruse, looking for an incident or a concept to quote or to refer back to, make me recall so much of my life. There are case histories, problems within the profession, wonderful adventures, and very funny experiences.

Many of you have told me that you look forward to reading "Mind Over Miller" every month. Well, I enjoy reading past columns. They remind me of the great adventure of veterinary practice I was privileged to experience and of the good people and wonderful animals I was able to help.

Robert M. Miller, DVM, is an author and a cartoonist, speaker and Veterinary Medicine *Practitioner Advisory Board member. His thoughts in "Mind Over Miller" are drawn from 32 years as a mixed-animal practitioner. Visit his website at robertmmiller.com.*

An apology

In the November 2012 issue of *Veterinary Medicine*, my "Mind Over Miller" column extolled the virtues of the American Veterinary Medical Association's medical insurance program.

On Dec. 17, I received an unexpected and unwelcome Christmas present, as did thousands of my colleagues and fellow AVMA members.

It was a letter informing me that my medical coverage offered through the AVMA Group Health & Life Insurance Trust Programs (GHLIT) would be discontinued after 2013. I am told that nonmedical coverage offered through GHLIT will remain in effect.

This development is a result of impending changes to market conditions and the regulatory environment due to the Affordable Care Act.

I did not anticipate the end of this medical insurance plan, and I apologize if I misled any of my readers. My support for the AVMA remains unchanged. It wasn't their fault. They tried!

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