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New guidelines reduce risks and adverse effects for puppy and kitten vaccinations

Why they did it

Unlike vaccination in adult dogs and cats, vaccination in puppies and kittens poses a unique challenge with developing immunity and interference from maternal antibodies. This article's author provides an overview of basic immunology and discusses the importance of timing and risk assessment when developing vaccine protocols for pediatric patients.

Overview

Similar to adult vaccination guidelines already established—the 2011 American Animal Hospital Association (AAHA) Canine Vaccination Guidelines (aahanet.org/Library/CanineVaccine.aspx) and the 2013 American Association of Feline Practitioners (AAFP) Feline Vaccination Advisory Panel Report (catvets.com/guidelines/practice-guidelines/feline-vaccination-guidelines)—these recommendations provide guidance on vaccines that should be considered for the majority of pediatric patients (core vaccines) versus those that should only be considered in select circumstances (noncore vaccines).

Similar to the 2011 AAHA guidelines, the author recommends canine distemper virus, adenovirus type 2, and parvovirus vaccines be considered as core vaccines for dogs beginning between 6 and 9 weeks of age. Vaccines should be administered every three to four weeks until 16 weeks of age.

For feline pediatric patients, the author recommends core vaccination protocols include administering feline herspesvirus, calicivirus, and panleukopenia virus vaccinations beginning between 6 and 9 weeks of age. Vaccines should be repeated every three to four weeks until 12 weeks of age. The minimum age for rabies vaccination in either group is 12 weeks of age, but this will depend on local, provincial, and state regulations.

Considering kittens are more vulnerable to a feline leukemia virus infection than adult cats, these guidelines recommend vaccinating against it for all kittens older than 8 weeks of age after confirming negative viral status. Although the leukemia vaccination is considered a noncore vaccine, it is highly recommended for all kittens. AAFP feline vaccination guidelines recommend a similar protocol.

Noncore vaccines for pediatric canine patients include leptospirosis, bordetellosis, Lyme disease, and influenza. Vaccination against these infections depends on level of risk, lifestyle, and geographic location. Canine coronavirus and adenovirus type 1 vaccines are not recommended.

In regard to kittens, these guidelines recommend use of chlamydiosis and bordetellosis vaccines only in high-risk environments. Feline immunodeficiency virus and feline infectious peritonitis virus vaccines are not recommended.

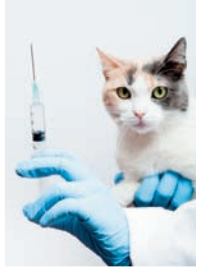
Because of the risk of feline injection-site sarcomas, the author also discusses recommended sites for kitten vaccinations. In addition to careful vaccine selection based on risk assessment and use of nonadjuvanted vaccines, subcutaneous vaccination in the distal aspect of the peripheral limbs is recommended:

- Feline leukemia virus in the left pelvic limb
- Rabies in the right pelvic limb
- Multivalent herpesvirus, calicivirus, and panleukopenia virus in the right thoracic limb

Take-home message

The use of appropriate and individualized vaccine protocols will help reduce the risk of disease while minimizing possible adverse effects.

Davis-Wurzler GM. 2013 update on current vaccination strategies in puppies and kittens. *Vet Clin North Am Small Anim Pract* 2014;44(2):235-263.



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Butorphanol vs. buprenorphine for postoperative pain control in cats

Why they did it

A variety of pain management options are available to ease pain in our feline patients. These researchers sought to compare the efficacy of butorphanol and buprenorphine in providing postoperative pain control as assessed by a validated pain scale.

What they did

As part of a randomized and blinded study, researchers evaluated 39 healthy female cats that were admitted for routine ovariohysterectomy. The cats were divided into two groups. One group received 0.02 mg/kg of buprenorphine intramuscularly, and the other received 0.4 mg/kg of butorphanol intramuscularly.

In phase 1 (n=10), the agents were given only as part of the premedication protocol before surgery. In phase 2 (n=29), the agents were included as part of the preanesthetic protocol and were also administered at the same dose at the time of wound closure.

Signs of pain were monitored in both groups beginning 20 minutes after extubation and continuing for up to 360 minutes. The same veterinary anesthesiologist performed all of the pain assessments and was blinded to the treatments that were administered.

What they found

Phase 1 was discontinued because nine of the 10 cats required rescue analgesia at the time of the first pain assessment. Among the cats in phase 2, pain scores for the buprenorphine group were significantly lower compared with cats receiving butorphanol ($P < 0.001$), and the analgesic effects appeared to last for six hours after surgery.

All cats in the butorphanol group required rescue analgesia at the time of the first pain assessment, whereas none of the cats in the buprenorphine group required rescue pain control at any time point.

Take-home message

Butorphanol should not be used alone for management of postsurgical pain in cats undergoing ovariohysterectomy. Buprenorphine given before surgery and during wound closure is preferred to provide appropriate pain control.

Warne LN, Beths T, Holm M, et al. Evaluation of the perioperative analgesic efficacy of buprenorphine, compared with butorphanol, in cats. *J Am Vet Med Assoc* 2014;245(2):195-202. VM

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

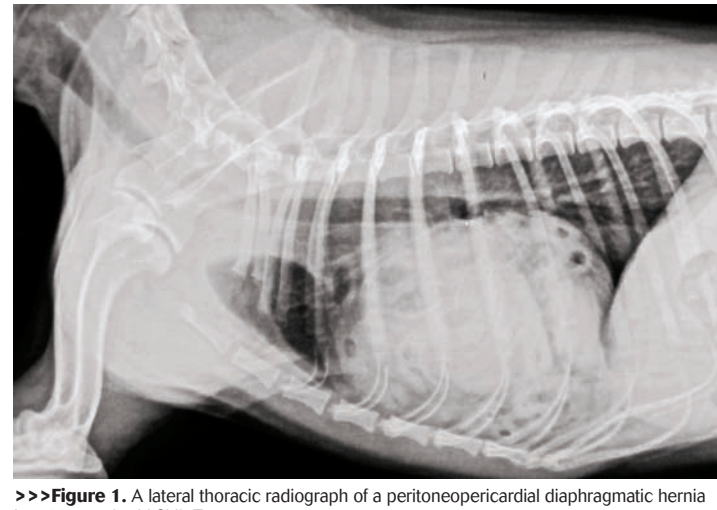
GETTYIMAGES/AGENCY ANIMAL PICTURE

Pneumopericardium
associated with peritoneopericardial diaphragmatic hernia repair in a dog

By Lysimachos G. Papazoglou, DVM, PhD, MRCVS; Michail N. Patsikas, DVM, MD, PhD, DECVDI; Anna Deligianni, DVM; Erik R. Wisner, DVM, DACVR; and Georgios Kazakos, DVM, PhD

A 22-month-old intact male Shih Tzu was referred for further investigation and treatment of intermittent vomiting and exercise intolerance of four weeks' duration. A thoracic radiographic examination showed cardiomegaly and intestinal loops in the pericardial sac (*Figure 1*).

A peritoneopericardial diaphragmatic hernia (PPDH) was diagnosed, and the dog underwent surgical repair through a ventral midline celiotomy. The dog recovered successfully from the surgery.



>>>Figure 1. A lateral thoracic radiograph of a peritoneopericardial diaphragmatic hernia in a 22-month-old Shih Tzu.

DIAGNOSTIC IMAGING

Postoperative thoracic radiographs were obtained four hours after surgery to check the position of the central venous pressure catheter placed in the left jugular vein (*Figures 2A & 2B*). The radiographic examination revealed a well-demarcated region of gas opacity surrounding the cardiac silhouette that was devoid of pulmonary vascular or airway markings. This radiolucent area was well-delineated by an opaque line representing the pericardium. The apex of the cardiac silhouette was displaced from the sternum.

A prominent right atrium and distended right auricle were clearly defined. A catheter placed in the cranial and caudal vena cava through the left jugular vein for central venous pressure measurement was also observed. Pneumopericardium was diagnosed. Pneumoperitoneum and loss of abdominal serosal detail were also evident.

TREATMENT AND FOLLOW-UP

No specific treatment was required. Recheck radiographic examination of the thorax was performed five (*Figure 3*) and 30 days after surgery, which confirmed resolution of pneumopericardium. No further abnormalities were detected. Eleven months after surgery, the dog is doing well.

DISCUSSION

Pneumopericardium, by definition, is an accumulation of free

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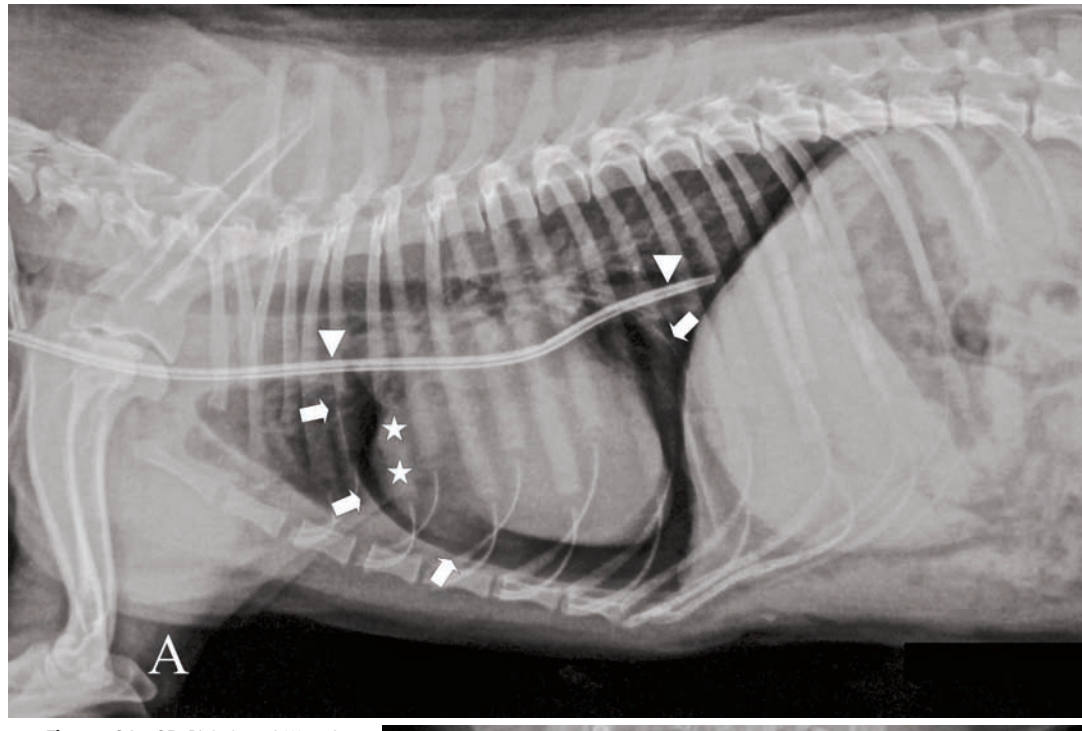
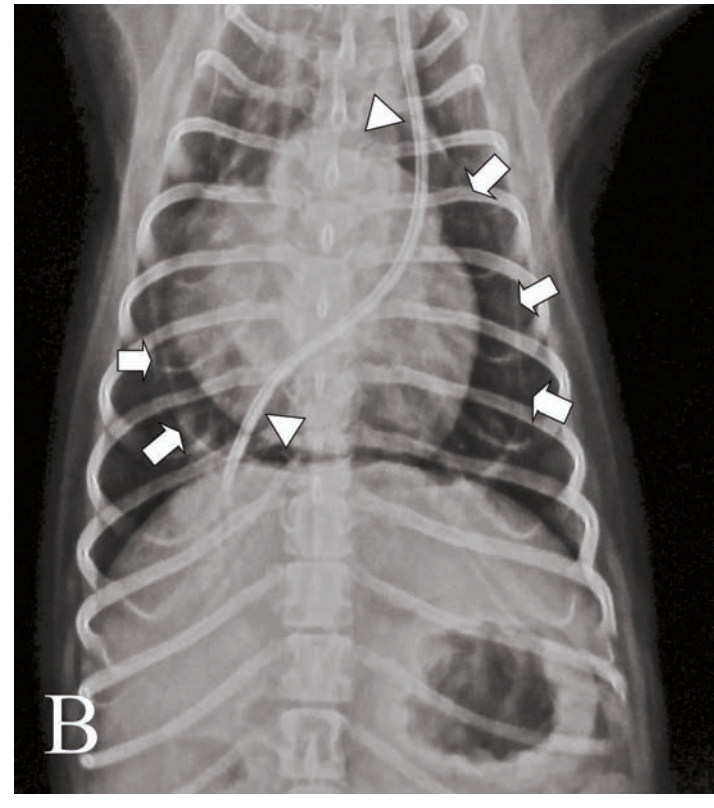
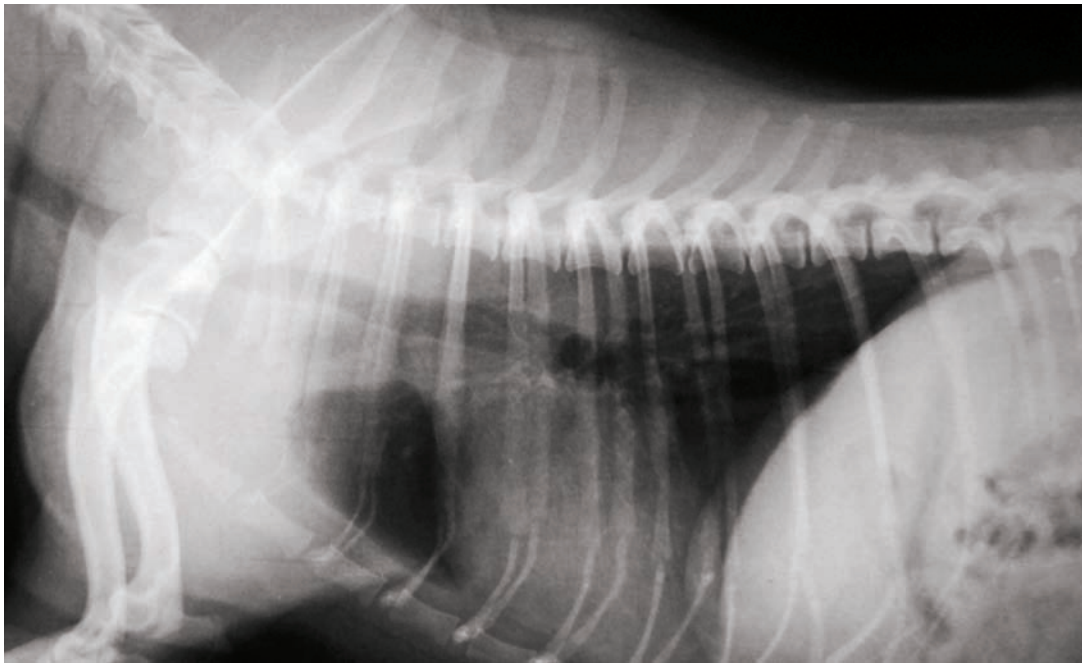




>>>Figures 2A &2B. Right lateral (A) and dorsoventral (B) thoracic radiographs obtained four hours after PPDH repair. Note the pericardium (white arrows), a pneumopericardium (radiolucent area inside the pericardium), a prominent right atrium and distended right auricle (asterisks), and a catheter placed in the cranial and caudal vena cava through the left jugular vein for central venous pressure measurement (arrowheads).

gas within the pericardial sac. This condition is not commonly reported in dogs and cats.[1-6] Pneumopericardium may be caused by trauma or may be nontraumatic. Reported causes in small animals include thoracic trauma, positive pressure ventilation, pulmonary-pericardial communication, tracheal rupture related to intubation, and alveolar rupture associated with cough and bronchospasm.[1-6]

Clinical signs of pneumopericardium may depend on the volume and rate of air



>>>Figure 3. A lateral thoracic radiograph obtained five days after surgery for a PPDH repair. The pneumopericardium had resolved.

introduced into the pericardial sac. Pneumopericardium associated with PPDH repair has not been reported in the veterinary literature.

PPDH

PPDH is a congenital anomaly in dogs that allows communication between the pericardial sac and the peritoneal cavity through a diaphragmatic defect.[7-9] Abdominal viscera that can be herniated into the pericardial sac include liver, gallbladder, omentum, intestines, spleen, and pancreas.[7,9] Adhesions between the herniated organs and pericardium or myocardium may also be seen.[7] Many dogs do not exhibit clinical signs, and PPDH is an incidental finding during routine physical or radiographic examination.[7,9]

Common clinical signs include vomiting, respiratory distress, weight loss, anorexia, lethargy, exercise intolerance, collapse, fever, and diarrhea.[7,9] Physical examination findings may be normal or may detect muffled heart sounds, thoracic borborygmi, decreased lung sounds, tachypnea, or signs secondary to cardiac tamponade.[7-9] PPDH is diagnosed by plain radiography; barium administration, ultrasonography, echocardiography, and computed tomography may also be used to confirm diagnosis. In the present case diagnosis was made by plain radiography, and no barium study was performed.

Surgical treatment is recommended in dogs with clinical signs.[7-9] Closure of the diaphragmatic defect with sutures is performed through a ventral midline celiotomy. Postoperative complications are considered minor in most dogs after PPDH repair.[7]

Pneumopericardium

Pneumopericardium might be a potential complication of PPDH repair.[8] The volume of air accumulated within a very big pericardial sac may depend on the size of the diaphragmatic defect; resultant pneumopericardium may interfere with cardiopulmonary function and should be evacuated by centesis through the diaphragm soon after diaphragmatic closure.[8,10]

In the present report, pneumopericardium was created

because the remaining air in the pericardial sac was not removed by centesis after diaphragmatic closure. Experimental progressive pneumopericardium in dogs was reported to result in cardiac tamponade, producing serious hemodynamic changes similar to those related to pericardial effusion.[10] Our dog, however, recovered uneventfully from surgery. After 48 hours of hemodynamic monitoring, the dog did not show any clinical signs related to pneumopericardium, which was diagnosed incidentally during routine imaging.

Most of the pneumopericardium clinical cases reported required no specific treatment, and all resolved spontaneously.[1,2,4-6] In one case, however, lung lobectomy for the correction of a pulmonary-pericardial communication was performed in a dog that was exhibiting no clinical signs but had a pneumopericardium to prevent the potential development of cardiac tamponade.[3]

In the present report, pneumopericardium and lack of pericardial constraint allowed the right atrium and auricle to expand beyond their normal volume. Other congenital deformities may accompany PPDH.[9] In this case, the central venous catheter that was placed through the left jugular vein entered the cranial vena cava, which is on the left side of the heart instead of the normal right side, suggesting a possible persistent left cranial vena cava.[11] Persistent left cranial vena cava is uncommonly reported in dogs, coexisting or not with other cardiac defects.[11]

Echocardiography and nonselective angiography should be performed to make the diagnosis and exclude other cardiac defects.[11] The presence of a persistent left cranial vena cava may lead to confusion if thoracic surgery or other angiographic procedures are going to be performed. No further imaging, however, was performed to confirm this diagnosis in the present report.

Conclusion

Pneumopericardium may be an interesting phenomenon that most surgeons might not be aware of. In this case, it was only detected because we chose to take four-hour postoperative radiographs for other reasons, something most surgeons would not consider clinically indicated. In our case, the pneumopericardium was a radiographic finding of minor clinical significance, which did not require treatment as it did not impede cardiopulmonary function.

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Successful treatment of *Bufo marinus* intoxication in a dog

The domain of these giant toads is expanding, so make sure you're ready to recognize and handle these toxic cases.

By Jarrod Butler, DVM

A previously healthy 3-year-old 8-lb (3.6-kg) intact male Yorkshire terrier was found seizing and hypersalivating in the owner's backyard next to a partially consumed toad.

Upon arriving at the clinic, the dog was hypersalivating, hypermetric, disoriented, and moderately tachycardic (200 bpm). Shortly after the examination, the dog had a short seizure episode and vomited parts of the toad, including aspects of the head. The dog's owner also gave the clinic the remnants of the consumed toad and a live specimen from the same area. Based on comparison of the cranial morphology, the toad was identified as a cane toad (*Bufo marinus*).

CASE MANAGEMENT

From the toad identification and consistent clinical signs, *Bufo* species toad intoxication was diagnosed, and treatment was initiated.

An intravenous catheter was placed, and the dog was started on intravenous fluids (Normosol R [Hospira]; 60 mg/kg/day). An antiemetic was administered (maropitant, 2 mg/kg subcutaneously), followed by activated charcoal (2 g/kg orally).

Shortly after receiving the charcoal, the dog started seizing but responded quickly to a single injection of diazepam (0.5 mg/kg intravenously). The diazepam also sedated the dog slightly, and his heart rate decreased from 200 to 160 bpm. A baseline complete blood count (CBC) showed a mild leukocytosis (17.6 x 10^3/µl; normal = 6 to 16 x 10^3/µl) and mild elevation in serum alanine aminotransferase (ALT) activity (258 U/L; normal = 10 to 100 U/L).

Thirty minutes after administration of diazepam, the dog redeveloped sustained tachycardia (200 bpm), which was responsive to 0.03 mg/kg of propranolol given intravenously.

Three hours after presentation, the dog developed a short period of chewing gum-like seizures, which resolved before diazepam was administered. Shortly after this episode, sustained tachycardia (210 bpm) returned with multiple episodes of ventricular premature contractions (VPCs) identified on continuous electrocardiogram (ECG). The dog was given a slow intravenous injection of lidocaine (3 mg/kg) and then a continuous rate infusion (CRI) of lidocaine at 30 µg/kg/min. The CRI was continued for two hours, after which no

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further VPCs were seen, so the dog was slowly weaned off the CRI lidocaine over an hour.

Over the next eight hours, the dog continued to recover with no further cardiac abnormalities noted on ECG and no clinical central nervous system (CNS) effects seen. A mild diarrhea was noted when the dog passed additional sections of the toad, but it resolved without treatment. The dog was discharged without any clinical signs to the owners 16 hours after presentation. Blood work evaluation 48 hours after the exposure showed complete resolution of the leukocytosis and elevated ALT activity.

Toads are most active in the spring and summer, with most clinical cases reported between June and September.

DISCUSSION

Bufo marinus, also known as the giant toad, marine toad, or cane toad, is a large nocturnal toad found mostly in Florida, Hawaii, and a small section of southern Texas. Extensions of these traditional geographical boundaries have been recently noted as a result of environmental change.[1] It's the most commonly reported source of bufotoxin exposure cases in dogs in North America.[1]

Other members of the *Bufo* genus of toads are found throughout the world, with toxic species found in every U.S. state and Canadian province. Toads are most active in the spring and summer, with most clinical cases reported between June and September.[1,2]

Clinical signs are most commonly seen after an animal mouths or consumes an adult toad. Additional cases have been reported after ingestions of dried *Bufo* species toads, toad eggs, or tadpoles as well as aphrodisiac supplements (*e.g.* Love Stone, ch'an su, Rock Hard) made from the toads.[1] Direct or referred ocular contact has also been shown to be sufficient to induce clinical signs.[1] Anecdotal reports also exist of dogs developing gastrointestinal (GI) upset and cardiac arrhythmias after consuming water from bowls where *Bufo* species had been seen sitting for prolonged periods.[1]

Toxic properties and effects

Contact with a member of the *Bufo* species exposes a person or animal to a wide range of toxins. The most common causes of clinical signs are the cardioactive substances called *bufogenins* and *bufotoxins*. These substances function similar to digoxin, via inhibition of the function of the cardiac sodium-potassium-ATPase pump, resulting in potentially fatal cardiac arrthymias.[1] These toxins have some enterohepatic recirculation, potentially prolonging the clinical effects of the toxins.[1]

Venom may also contain varying mixtures of bufotenines, which are indolealkylamines with differing degrees of oxytocic, pressor, and hallucinogenic properties. These toxins are contained in small amounts in the skin and more heavily concentrated in the parotid glands found on the head, with some species having additional toxin glands on their hindlimbs (*e.g. Incilius alvarius* [formerly *Bufo alvarius*]). Additionally, some venom is known to contain active catecholamines (epinephrine, norepinephrine), though rapid GI degradation likely limits the clinical effect.[1]

While LD_{50} values do exist for the individual bufotoxins and some bufogenins in some animals, these values provide little clinical or treatment guidance since the clinical syndrome that occurs after *Bufo* species exposure is the result of the combination of various toxins, rather than one single toxin.

GI signs (hypersalivation, retching, vomiting) after exposure are often seen immediately

or within 30 minutes. The more severe cardiac signs have occurred in as short as 15 minutes after exposure, though delayed signs up to four hours have been reported.[1,2]

The most commonly reported cardiac abnormality in dogs is tachycardia, with heart rate at times exceeding 260 bpm. More serious cardiac aberrations reported include VPCs, junctional escape beats, and atrioventricular block (first and second degree). Frequently, these arrhythmias are profound enough to cause hypotension, resulting in acute collapse or prolonged recumbency.[2,3] In people, bradycardia is the most commonly seen cardiac disturbance. This difference in people could be attributable to a more consistently seen hyperkalemia contributing to the decreased heart rate.[1,4]

Additional signs commonly reported in animals include tremors, seizures, dypsnea, tachypnea, disorientation, and ataxia. These signs were consistently reported within the first hour of exposure to the toad.[2] Hyperkalemia is a consistent hematologic abnormality found in people, though not consistently reported in animals.[1,2,4] No other hematologic abnormalities are consistently reported in people or animals.

Diagnosis

Diagnosis is based on history of exposure (toads in yard, history of interaction with toads, or evidence of toad tissue in vomitus), with rapid onset of GI signs (vomiting, hypersalivation), CNS effects (shaking, trembling, seizures), and, potentially, cardiac signs (ECG changes, collapse, pale mucous membranes). Differential diagnoses include exposure to organophosphates, grayanotoxin-containing plants (*Rhododendron*, *Kalmia*, *Pieris* species), digoxin-containing plants (*Oleander*, *Digitalis*, *Convallaria* species), beta-blockers, and methylxanthines.

Treatment

The goals of therapy in cases of *Bufo* species exposure are early decontamination, control of GI signs, and monitoring and stabilization of CNS and cardiac signs.

Decontamination. Because of the rapid onset of signs, emesis should only be employed in patients exhibiting no or mild clinical signs known to have consumed aspects of the toad. Emesis can be induced with either hydrogen peroxide (2.2 ml/kg orally, can be repeated once) or apomorphine (0.03 mg/kg intravenously).

Animals that have simply mouthed the toad receive no benefit from the induction of emesis. For such cases, immediately rinse the mouth with a copious amount of water.

Activated charcoal (2 to 4 g/kg) has been shown to bind other cardiac glycosides and is likely effective with bufotoxins as well. Administration of activated charcoal is contraindicated in an animal showing central nervous signs or significant vomiting. A second dose (six to eight hours after the initial dose) may be warranted in cases with persistent clinical signs where immunoglobulin fragments (ovine digoxin immune Fab [Digibind—Smithkline Beecham]) is not available. Gastric lavage is also a potential option, especially when large pieces or amounts of the toad have been consumed or seizure activity necessitates the use of anesthesia.

Control of GI signs. For control of additional GI signs, antiemetics (maropitant 1 mg/kg subcutaneously once a day) are indicated. Atropine should not be used for hypersalivation unless additional cardiac indications (bradycardia) also exist as it may aggravate tachyarrhythmias later in the clinical course. Seizure activity can be controlled with either diazepam (0.5 to 1 mg/kg intravenously), pentobarbital (3 to 15 mg/kg intravenously), propofol (3 to 6 mg/kg intravenously), or gas anesthesia. Tremors can also be controlled with methocarbamol (55 to 220 mg/kg intravenously to effect).

Fluid therapy is warranted to prevent dehydration from

GI signs, support cardiovascular functions, and increase the elimination of the venom. As with digoxin toxicity, noncalcium-containing fluids (*e.g.* Plasma-Lyte A [Baxter], Normosol R [Hospira]) are recommended.

Control of CNS and cardiac signs. Potential heart rate and rhythm abnormalities produced by toad toxins are varied and can change significantly over the course of the treatment period. Therefore, it's recommended that, if available, constant ECG monitoring should be used in severely affected animals.

Multiple drug therapies are available for the various cardiac arrhythmias that can present with exposure to toad toxins. Phenytoin (10 mg/kg slowly intravenously; not recommended in cats) or lidocaine (2 to 4 mg/kg slowly intravenously, followed by CRI of 25 to 100 µg/kg/min) are effective for ventricular arrhythmias, whereas propranolol (0.02 to 0.06 mg/kg intravenously) or esmolol (0.5 mg/kg slowly intravenously, followed by 50 to 200 µg/kg intravenously CRI) are preferred for supraventricular tachyarrhythmias. Atropine (0.02 to 0.04 mg/kg intravenously or intramuscularly) remains the drug of choice for bradycardia, provided that hyperkalemia is not present.

For persistent cardiac abnormalities or profound hyperkalemia, the use of ovine digoxin immune Fab should be considered. This agent directly binds digoxin and other cardioactive sterols, thereby inactivating them.[5,6] In people, the amount administered is based on serum digoxin concentrations, which may not be readily available to veterinary practitioners. Because of this, administration of one to two vials intravenously has been recommended as an initial treatment, with additional vials administered as dictated by clinical signs. Administered ovine digoxin immune Fab that does not bind digoxin is not expected to be detrimental.

Serum digoxin or digitoxin immunoassays (polyclonal) can confirm the presence of cardiac glycosides in suspected cases, though they cannot confirm a toad as the source of the toxin[1] in animals without a witnessed exposure to a toad or in the cases of supplement exposures. High-performance liquid chromatography can be used to determine the presence of toad toxins in water, food, supplements, or tissues, but the time delay for results renders it ineffective in guiding emergency management.

Monitoring

Baseline complete blood count and serum chemistry profiles should be performed to identify any underlying pathologies that may complicate treatment (hepatic disease). With cases involving profound cardiac signs, especially prolonged hypotension, renal values should be monitored for two to three days after the resolution of signs to determine if secondary renal injury develops.

Although hyperkalemia is infrequently seen in animals, serial serum potassium concentrations (every two to four hours) should be obtained for the first 12 hours of monitoring.

Conclusion and clinical relevance

The territory inhabited by poisonous *Bufo* species is expanding rapidly, as is the use and distribution of products containing extracts of these species. This increases the chances of clinical cases developing in areas where this form of toxicosis has not previously been considered as a differential diagnosis.

The multiple components of toad venom can cause a multifocal life-threatening clinical condition rapidly. So a swift diagnosis, combined with aggressive initial decontamination, is necessary to prevent extended clinical signs or fatalities. VM

View the references for this article online at **dvm360.com/BufoCase**.

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April 2015 | dvm360.com/toolkit

dvm360.com toolkit

BETTER recommendations

A special monthly package designed to help boost client compliance and make it easy for your team to educate pet owners about regular pet wellness care.

TOOLS

Client handouts

>> Reality check: How old is your pet in human years?

>> Why diagnostic tests are important to your pet

p03

Sample script

How to follow up on your recommendations for the most effective outcome

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Videos

>> Say this, not that: Getting to a better dental recommendation

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>> Stop inflicting "option paralysis" on pet owners

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PLUS

Cultivate client compliance: Be simple and direct p2

Bonus team training tool

Does your team need practice turning weak words into strong recommendations? Use this cheat sheet, available at dvm360.com/betterrecs.

Cultivate client compliance: Be *simple* and *direct* and make your best recommendation

Are your your clients failing to follow through on your advice? Check out this example of a preventive diagnostics recommendation and apply these strategies for stronger recommendations across the board.

You know that performing routine, preventive diagnostic testing is necessary not only for the early detection of disease but also for establishing baseline health values in pets. But getting your clients to agree? That's no easy task—especially when their pets appear healthy on the outside.

So we went to Fred Metzger, DVM, MRCVS, DABVP, owner of Metzger Animal Hospital in State College, Penn., for tips and advice on how he and his team tackle this common compliance obstacle.

1. Tell the truth.

Dr. Metzger is open and honest when it comes to the veterinary care he recommends for his patients. If a pet doesn't really need that annual vaccination, he lets the client know. But when it comes to annual diagnostic testing, it's a "must" recommendation for everyone, he says.

Let clients know that many conditions in pets develop before clinical signs or physical examination findings are evident—and the cost of not catching disease early can be great.

2. Practice what you preach about pets.

Do you perform annual health screenings on your own pets? Tell the client so, says Dr. Metzger. Did you recently detect an abnormality on a seemingly healthy pet, thanks to routine diagnostic testing? Let

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Get handouts here!
Download these handouts and many more tools by visiting **dvm360.com/betterrecs**.

them know that, too.

Real-life anecdotes often pack a greater punch than rattling off a bunch of statistics, and clients will appreciate the personal information you share.

3. Make it relatable.

We all know how important diagnostic testing is in human medicine—physicians are always making recommendations for annual health screenings, particularly as we get older. So why should it be different for our pets? To put it in perspective, Dr. Metzger shows clients an age analogy chart that estimates how old their pets are in human years (see the handout, available below). Just knowing that a 9-year-old dog is actually closer to 60 in human years often provides the nudge they need to understand the importance of your recommendations.

Try these tools!

Do your clients know how old their pets really are? Do they know why age matters? Scan the code, above, to download this age comparison chart to either give out to clients or display in your exam rooms to help your clients better understand their pets' health and well-being.

What about diagnostics? Scan the code, right, to download this client handout that explains why diagnostic tests are so important for pets' overall health.

3 recommendations your clients ignore & *what to do about it*

When pet owners bury their heads in the sand or tune you and your team out, they can miss important recommendations. Here's how to get their attention.

It's easy to feel frustrated, concerned for the pet and even hurt when pet owners won't heed your advice. But with patience and persistence, you can woo some of your more reluctant clients to offer the care you recommend to their pets. Consider these scenarios.

No. 1: Make pain accommodations

The second Mr. Johnson steps out the door, he and his pooch disappear from your mind. The result: You never hear whether Kingston's getting the pain medication you sent home after his surgery or whether Smokey's getting the diet you recommended to ease the sting of her osteoarthritis.

What to do:

Follow up, says Sharon DeNayer, a *Firstline* Editorial Advisory Board member and practice manager at Windsor Veterinary Clinic in Windsor, Colo. When you offer Kings-

GETTY IMAGES/IMAGE SOURCE

ton a new medicine or diet, make sure you call Mr. Johnson in the next 24 to 48 hours. At Windsor Veterinary Clinic, the technician who assisted with the pet's care performs the follow-up call. This simple step can help you uncover issues and offer solutions to make sure the pet gets the pain relief it so desperately needs. If the client reports that the pet is throwing up the medication, the follow-up caller can take that information back to the doctor and figure out whether the medication can be given differently.

DeNayer says the follow up also demonstrates the importance of your recommendation to clients. After all, you wouldn't spend the time to check in with them if you didn't believe their pets needed this care.

No. 2: Use parasite prevention

Sometimes your clients just don't get it. Perhaps they were distracted when you were trying to explain the importance of monthly parasite preventives. Maybe they just don't believe their dog or cat could ever be a victim of heartworm infection.

What to do:

Get real. This doesn't mean scaring them, but it does mean you'll have to work on offering recommendations in several different ways—and it *is* more work. Each member of the team needs to talk about parasites and zoonotic diseases, says Julie Legred, CVT, executive director of the National Association of Veterinary Technicians in America (NAVTA).

"Clients aren't always going to be picking up the message we think we're presenting," Legred says. "And a lot of times, clients will go home, do an Internet search, and find something completely off-the-wall. So it's important for us to be diligent and follow up with clients. And they need to have access to the right information at home. We have a lot of things working against us, and we need to come together as a team and get the same message across."

No. 3: Stop the table scraps

Your littlest clients are professional mess-makers. Kiddos have the capacity to wreck even the healthiest pet's diet.

What to do:

Ernie Ward, DVM, says it's important to help parents teach their children. Kids may view their pets as siblings, so it may be difficult for them to understand why Trixie can't enjoy a scoop of soft serve when ice cream's on the menu.

Repeat, repeat, repeat

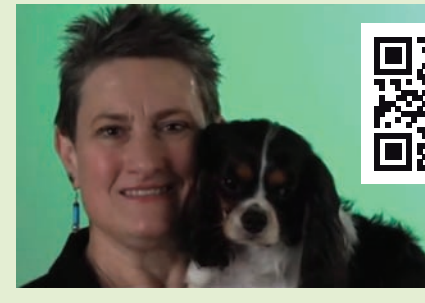
So you've made all of these recommendations to Mr. Johnson a thousand times before, and you just don't see the sense in wasting your breath at one more wellness exam. Chin up.

"This is when you have to go back to your mission as a veterinary healthcare provider," Dr. Ward says. "Your goal is to help pets live longer, healthier, fuller lives. You want to prevent disease, not just treat it."

It takes a strong person to strike out time after time and still get up to the batter's box, Dr. Ward says. "But when it comes to preventive care, that's really what we're talking about," he says. "People who hear the message repeatedly will often, over time, respond to it. You have to be patient even though you've had this conversation six years running. This time may be the time they actually act on your recommendation."

10 ways to blow a recommendation

This toolkit is all about a better recommendations—but what about things you're NOT supposed to do? Dr. Robin Downing delivers ten ways to blow a recommendation. Watch now at **dvm360.com/betterrecs** or scan the QR code, inset.



CRITICAL STAT

87% of pet owners said that a veterinarian's recommendations influences their purchase of dental hygiene products more than any other factor.

Sample script: Follow up on your recs

It should come as no surprise—the way in which you follow up is the key to effective recommendations and clients' compliance.

The way you handle scheduling and follow ups plays a large part in client compliance. Nancy Potter, a *Firstline* Editorial Advisory Board member and the practice manager at Olathe Animal Hospital in Olathe, Kan., offers this example of how to improve compliance by encouraging a client to schedule an appointment after the doctor offers a treatment plan.

You:

Dr. Smith would like to schedule a dental cleaning for Fluffy. Since the tartar and gingivitis in her mouth is significant, we'd like to schedule her as soon as possible. We have appointments available on Tuesday or Thursday next week. Which day would work best for you?

Client:

I'll check my schedule and talk to my husband then let you know.

You:

Sounds good. We know how busy people can get. Remember, we want Fluffy to stay healthy. Gum disease can cause some pretty major health problems, like heart disease and diabetes, so it's important for Fluffy to get her teeth cleaned as soon as possible.

Client:

Thanks, I know you're looking out for Fluffy's health. I'll take a look at my calendar and call you right away.

You:

That's great. If we don't hear back from you within the next few days, we'll call to see how your schedule looks. (Make a note to follow up in seven to 10 days. Then call the client.)

On the phone:

Hi, Mrs. Jones. Dr. Smith asked me to call to be sure we schedule an appointment for Fluffy to have her teeth cleaned. Did you have any more questions about the procedure? Will next Thursday work for you?

STAT SOURCE: VIRBAC ANIMAL HEALTH

Say this, not that!

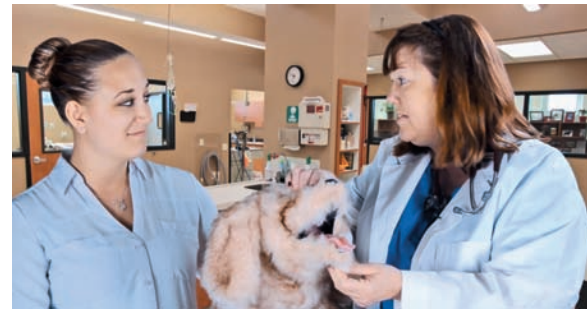
What to say to make your recommendations stick

It's painfully clear that good communication in the exam room makes for a strong relationship with clients. Watch and learn from these dvm360 experts.

Scan the QR codes below to watch these videos on your mobile device.

Tooth and nail

It can be painfully clear when poorly executed communication in the exam room results in a disastrous relationship with clients. Watch how Karen Felsted, CPA, MS, DVM, CVPM, demonstrates different approaches and language during a dental exam and the ways in which you can alienate or win over clients.



Paralyzed with options

Dr. Andy Roark says veterinarians can bolster their effectiveness in the exam room by presenting pet owners with simple, clearly distinct treatment options and strong, emphatic recommendations. Dr. Roark gives step-by-step instructions to make expert recommendations stick with pet owners long after they've left your clinic.

Hey, big spender

It's a reality in every veterinary practice, and one that can make or break your clients' trust ...cost. Dr. Jim Kramer tackles an especially sensitive, emotionally charged issue: how to recommend a really expensive treatment or procedure. But Dr. Kramer and his team don't shy away from tough conversations—watch now to get his secrets.

For more tips, tools and recommendation resources, go to **dvm360.com/betterrecs**.

6 steps to a good behavior recommendation

Making a recommendation for behavior training is a critical step to help put pets on the right path for a successful relationship with their owners. Dr. Ellen Lindell, DACVB, dispels behavior myths and offers this advice to help team members make good recommendations for trainers:

Step 1 Beware of a trainer who makes references to dominance or alpha behavior.

Step 2 Avoid a behavior trainer who relies on punishment.

Step 3 Avoid trainers who use prong collars and/or electronic collars.

Step 4 Observe a class before you make recommendations.

Step 5 Look for a trainer who uses reward-based methods.

Step 6 Choose trainers who promote a calm environment.

One more tip

3 ways to make your recommendations hold water

1. Clarify your recommendation.

What is your recommendation? If you aren't sure, don't make the client decide! Hold doctor and team meetings to discuss your standard of care.

2. Be aware of conflicts of interest.

Every veterinarian and team faces three conflicts of interest. One is the desire to hold down costs versus the duty to act as strong healthcare advocates using medical evidence for decisions. Another is the need to earn money for the business to survive versus the health-advocate role based on medical evidence. And finally, there is the divided loyalty between the interests of the pet and the interests of the client.

To reduce conflicts of interest, focus on your role. You have medical expertise to give a good recommendation.

3. Focus on value to the pet.

Clients all want to know they are receiving value. Value to the pet can be summarized this way: "Here's how much time and technology we are using for you." Value to the client can be summarized this way: "What is good for my pet? What is the reason for using that time and technology?" When communicating with clients, describe value to the pet. "What will be prevented?" (Away from negative.) "What will be better?" (Toward positive.)

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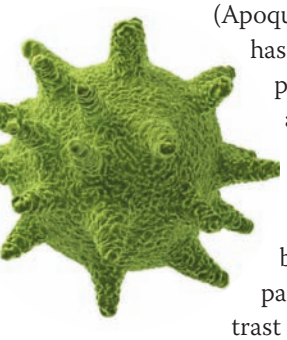
What's new with an old problem:

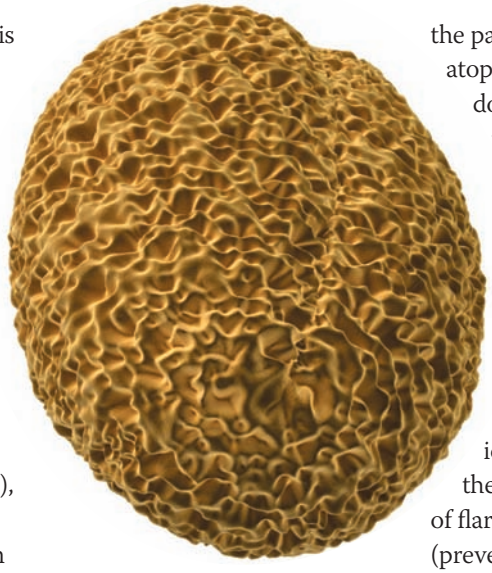
Drug options for *treating the itch* of canine **allergy**

Canine atopic dermatitis is a common and frustrating skin disease. Here are three treatments compared and contrasted, including two standards and one relatively new kid on the block. *By Elizabeth A. Layne, DVM, and Karen A. Moriello, DVM, DACVD*



Canine atopic dermatitis due to environmental allergies is a common skin disease in dogs. Until recently, the most frequently administered systemic drugs for treating pruritus associated with canine atopic dermatitis were glucocorticoids and cyclosporine (Atopica—Novartis Animal Health). However, a new medication, oclacitinib (Apoquel—Zoetis), has been approved as an antipruritic therapy.

In this article, we briefly compare and contrast glucocorticoids, cyclosporine, and oclacitinib as antipruritic therapies for canine atopic dermatitis.



CANINE PRURITUS

Over the last decade, there have been major advances in our understanding of the pathophysiology of canine atopic dermatitis.[1] It is beyond the scope of this article to provide an in-depth review of the diagnostic approach to canine pruritus, etiologic causes of pruritus, or the pathophysiology of canine atopic dermatitis, but you can download an algorithm on the diagnostic approach to pruritic dogs at **dvm360.com/PruritusDx**.

The treatment of canine atopic dermatitis is multimodal and usually includes topical therapy, allergen-specific immunotherapy, the avoidance of flare factors (preventing flea infestations), epidermal barrier repair, and the appropriate administration of systemic antipruritic drugs.[2] It is important to note that controlling pruritus is a key

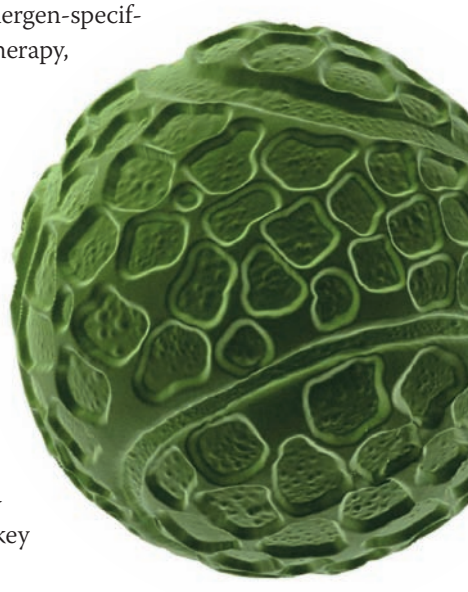


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Table 1
Comparison of antiprutitic drugs for dogs

Drug	Dose	Common side effects	Contraindications	Advantages	Disadvantages
Prednisone or prednisolone	0.5 to 1 mg/kg daily, taper to lowest effective alternate-day dose as clinical signs permit	• Short-term: increased thirst, urination, appetite, panting • Long-term: increased risk of skin or urinary tract infections, hepatopathy, gastrointestinal ulceration	• Diabetes mellitus • Hyperadrenocorticism • Pancreatitis • Gastrointestinal ulceration • Renal insufficiency • Systemic or widespread cutaneous infections • Concurrent nonsteroidal anti-inflammatory drugs	• Inexpensive • Widely available • Variety of formulations • Good efficacy	• Generally unsuitable for long-term use • Interferes with intradermal test results
Cyclosporine	5 mg/kg daily for a minimum of 30 days, taper to lowest effective frequency as clinical signs permit	• Short-term: vomiting, diarrhea • Long-term: gingival overgrowth, hypertrichosis*	• Gastrointestinal intolerance • History of or active neoplasia	• Few side effects • Good efficacy • Safe long-term use • Does not interfere with intradermal test results	• Slow onset of action • Expensive
Oclacitinib	0.4 to 0.6 mg/kg twice daily for 14 days, then once daily	• Short-term: vomiting, diarrhea, decreased white blood cell count • Long-term: none documented to date	• Demodicosis or other infection • Neoplasia • Less than 12 months of age	• Rapid onset of action • Good efficacy • Apparent safety of long-term use • Does not interfere with intradermal test results	• Lack of independent efficacy and safety data • History of limited availability

*Source: Nuttall T, Reece D, Roberts E. Life-long diseases need life-long treatment: long-term safety of ciclosporin in canine atopic dermatitis. *Vet Rec* 2014;174(suppl 2);3-12.

component in maintaining a good quality of life for dogs with canine atopic dermatitis and their owners.[3] Communication and client education about the complexity of canine atopic dermatitis and commitment to multimodal therapy is essential.

Glucocorticoids have well-documented efficacy for the treatment of pruritus associated with canine atopic dermatitis.[2,4,5] The long-term administration of glucocorticoids is associated with widely recognized complications, so strategies to reduce the dosage and frequency of administration are important. While antihistamines administered alone have poor evidence for efficacy in pruritus reduction,[5] the concurrent administration of prednisolone and trimeprazine can have a corticosteroid-sparing effect.[6] Essential fatty acids might also have a corticosteroid-sparing effect, although the optimal dose and formulation are debated.[7]

The 2001 introduction of a veterinary-specific cyclosporine provided veterinarians with a

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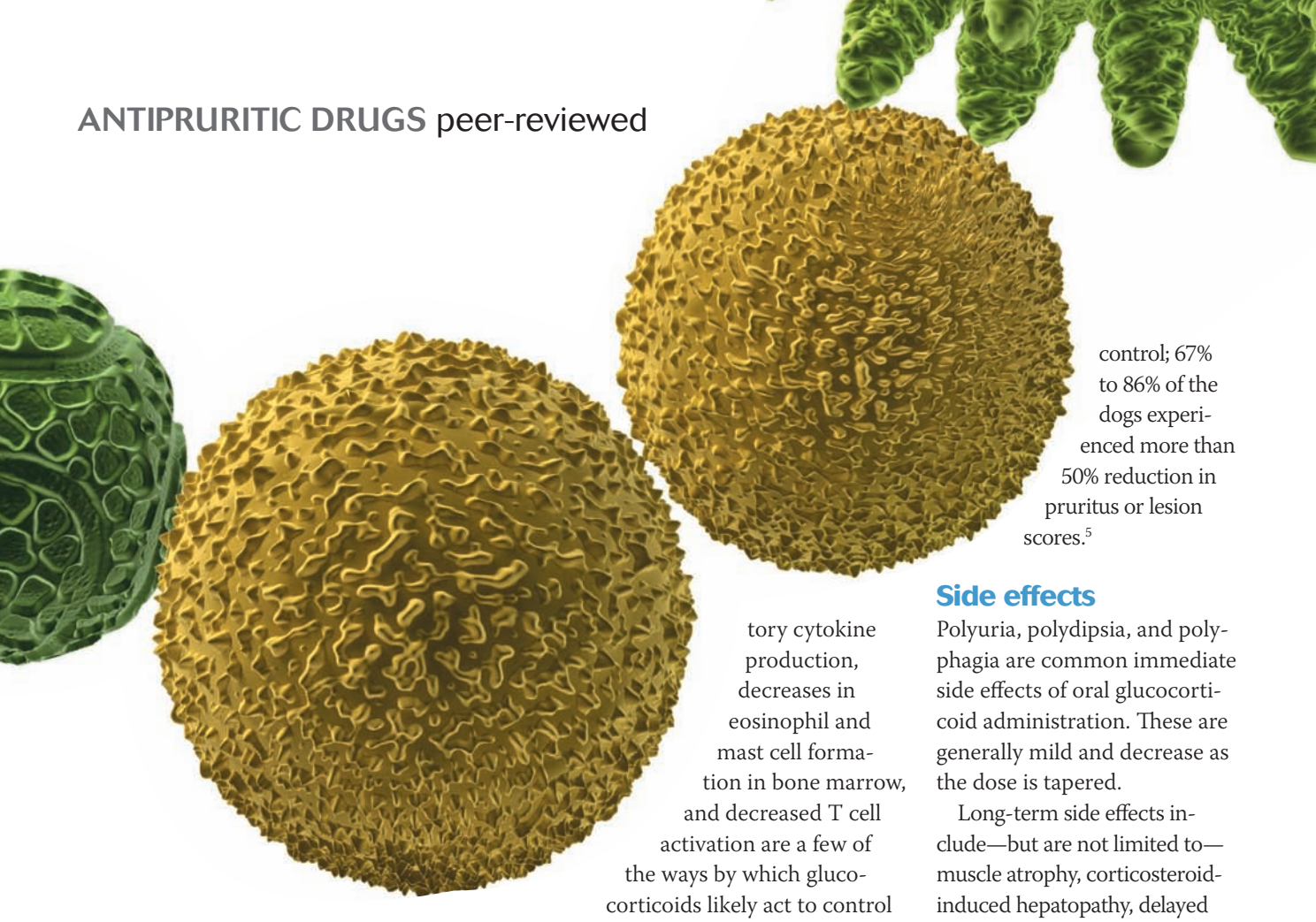


drug alternative to glucocorticoids. Compared with prednisone, cyclosporine has similar efficacy with respect to pruritus control and fewer side effects at a dose of 5 mg/kg once daily.[8-10] In 2013, oclacitinib was approved for use as an antipruritic drug for canine pruritus, adding another option for the treatment of pruritus in dogs with atopic dermatitis. *Table 1* summarizes the comparisons of these three medications.

GLUCOCORTICOIDS

Glucocorticoids bind to cytosolic glucocorticoid receptors, forming a complex that acts on nuclear glucocorticoid response elements to either promote or suppress transcription of a wide variety of genes.[11] Inhibition of proinflammatory cytokine production, decreases in eosinophil and mast cell formation in bone marrow, and decreased T cell activation are a few of the ways by which glucocorticoids likely act to control cutaneous inflammation and resultant pruritus.[11,12]

Documented efficacy

Oral glucocorticoids have long been the foundation of treatment of pruritus associated with canine atopic dermatitis.[12] In a summary review of five randomized controlled trials in which four of the studies administered oral glucocorticoids as a positive treatment control, a 50% or greater reduction in pruritus and lesion scores was noted in 40% to 80% of dogs.[4] Various dosing and tapering regimens were used, but overall owners assessed the responses as "good to excellent."[4] An update to that review includes two more randomized trials in which oral glucocorticoids were administered as a positive treatment control; 67% to 86% of the dogs experienced more than 50% reduction in pruritus or lesion scores.[5]

Side effects

Polyuria, polydipsia, and polyphagia are common immediate side effects of oral glucocorticoid administration. These are generally mild and decrease as the dose is tapered.

Long-term side effects include—but are not limited to—muscle atrophy, corticosteroid-induced hepatopathy, delayed wound healing, and increased susceptibility to skin or urinary tract infections. Because the clinical signs of corticosteroid-induced polyuria and polydipsia are indistinguishable from polyuria and polydipsia caused by diabetes mellitus and bacterial cystitis-associated inflammation is often masked, regular veterinary examinations with laboratory monitoring, including urinalysis and bacterial urine culture, are advised.[13] Gastric ulceration, calcinosis cutis, adult-onset demodicosis, and diabetes mellitus are also possible consequences of long-term glucocorticoid administration.

Indications, dosing, and usage

There are indications for both short-term and long-term

administration of oral glucocorticoids in treating canine atopic dermatitis. Acute flares of atopic dermatitis should ideally be controlled with topical glucocorticoids and topical antimicrobial therapy if secondary infections are detected.[2,14] Severe clinical signs might necessitate oral therapy. Prednisone or prednisolone are typically administered at 0.5 to 1 mg/kg orally twice daily until pruritus resolves and are then gradually tapered based on clinical response.

Longer courses of oral glucocorticoids are indicated when pruritus returns rapidly when tapering is begun or when exposure to allergens is ongoing. In these cases, the lowest effective dose administered at the lowest effective frequency that avoids corticosteroid-associated side effects should be chosen. A standard target dose is 0.25 to 0.5 mg/kg orally every other day.[2,4,12,14] The administration of long-acting repositol glucocorticoids should be avoided.[12]

Contraindications

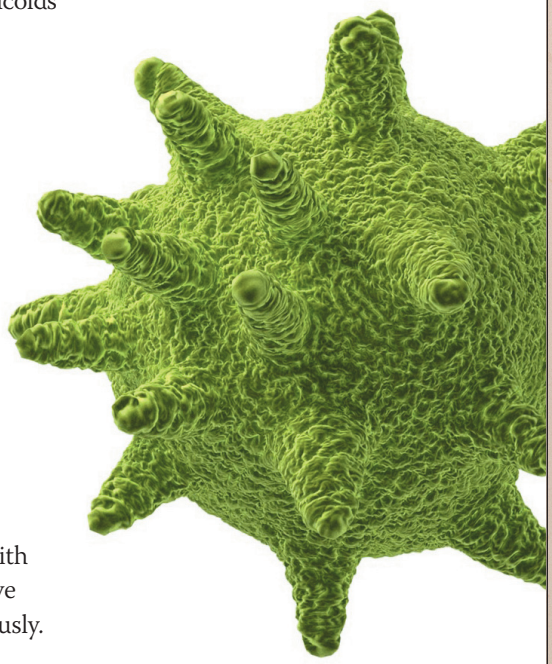
Glucocorticoids should not be administered systemically to animals with suspected or known gastrointestinal ulceration, diabetes mellitus, congestive heart failure, deep pyoderma, cutaneous or systemic fungal infections, or atypical bacterial infections.[13] Concurrent administration with nonsteroidal anti-inflammatory drugs should be avoided, and administration with concurrent immunosuppressive therapy should be done cautiously.

CYCLOSPORINE

Cyclosporine is a fungal-derived macrolide immunomodulatory agent. By inhibiting calcineurin, a T cell activation enzyme, cyclosporine therapy results in decreased T cell-mediated cytokine production. Cyclosporine also decreases mast cell and eosinophil survival and cytokine secretion in addition to limiting epidermal antigen-presenting cell activation.[15] All of these actions provide an overall reduction in proinflammatory mediators and inflammatory cell action.

Documented efficacy

There are multiple reviews of cyclosporine's use, safety, and treatment efficacy for a variety of conditions in veterinary medicine.[5,10,15,16] A review of cyclosporine's efficacy for the treatment of canine atopic dermatitis indicates that about 70%



of dogs show greater than 50% reduction in pruritus and atopic dermatitis lesion scores.[9]

Side effects

The most common short-term side effects are vomiting and diarrhea, occurring in 25% to 31% and 15% of dogs, respectively, in a recent review of 15 trials including 759 dogs.[10] Cyclosporine's adverse effects can be dose-dependent, so if gastrointestinal signs are problematic, dose reduction should be attempted before therapy is discontinued. Anecdotal clinical experience supports storing the capsules in the freezer and administering them with a meal to reduce vomiting.[17] While drug administration one hour before a meal or two hours after is advised on the Atopica product insert, one small study demonstrated no reduction in the drug's clinical efficacy for treating canine atopic dermatitis when was administered with a meal.[18]

A review of cyclosporine's efficacy indicates that about 70% of dogs show greater than 50% reduction in pruritus and atopic dermatitis lesion scores.

Long-term side effects of cyclosporine therapy are uncommon. Gingival overgrowth (also called *gingival hyperplasia*) was reported in less than 2% of dogs in the previously mentioned review.[10] Dog breeds prone to developing gingival overgrowth, including boxers, Great Danes, collies, Dalmatians, and Doberman pinschers, may be more likely to develop it as a side effect of cyclosporine therapy.[19] Dosage reduction and regular dental cleanings slow the development of gingival overgrowth.

For dogs with pruritus that is not controlled with a lower cyclosporine dose, azithromycin, in either compounded 8.5% toothpaste or orally administered capsule (10 mg/kg daily), has been demonstrated in one study to clinically reduce gingival sulcus depth.[20] The exact mechanism by which azithromycin had that effect in this study is unknown; possibilities include antimicrobial effects, local reduction of inflammation, and decreased fibroblast protein synthesis.

The Atopica product insert states that because this drug is an immunosuppressant it can increase a dog's susceptibility to infection and the development of neoplasia. As with glucocorticoids, cyclosporine can predispose patients to urinary tract infections.[21] In one study, 30% of dogs receiving cyclosporine for inflammatory skin disease had at least one urine culture result positive for bacteria.[21] These results did not always correlate with clinical signs or bacteriuria, so urine culture should be performed in addition to urinalysis.[21]

Indications, dosing, and usage

Atopica is labeled for the control of atopic dermatitis in dogs. The label dosage for control of pruritus associated canine atopic dermatitis is 5 mg/kg orally once daily. Response usually occurs within four to six weeks. Tapering of the dose frequency can be started after 30 days or when the maximum clinical response is noted; 40% to 50% of dogs achieve good control with every-other-day therapy.[9]

Dogs should be given the modified (microemulsion) formulation of cyclosporine because the unmodified formulation (Sandimmune—Novartis) has highly variable bioavailability.[14,22] Numerous compounded formulations are available, but potency and efficacy are variable.[15] Recommendations are to initiate therapy with the veterinary-licensed product to document positive response to therapy before administering a generic formulation. The

administration of compounded formulations is not recommended. Atopica is contraindicated for use in dogs with a history of neoplasia.

OCLACITINIB

Oclacitinib is a selective Janus kinase (JAK) inhibitor. It specifically inhibits interleukin-31 signal transduction. Activated T cells and keratinocytes release interleukin-31, which binds transmembrane receptors on cutaneous neurons, and through JAK activation triggers an action potential that results in a pruritic response, known as *neuronal itch stimulation*.[1,23] Interleukin-31 is a key cytokine for neuronal itch stimulation. The interleukin-31 receptor is also present on peripheral blood mononuclear cells and keratinocytes. Activation by interleukin-31 promotes the release of proinflammatory cytokines, perpetuating inflammation and pruritus.[23,24]

Documented efficacy

In preapproval trials, oclacitinib therapy produced rapid reductions in pruritus. The onset of action was more rapid than glucocorticoid therapy's was.[25] Oclacitinib was compared with both prednisolone (0.25 mg/kg or 0.5 mg/kg orally one dose) and dexamethasone (0.2 mg/kg intramuscularly one dose) in an interleukin-31 canine laboratory model of pruritus.[25] Oclacitinib reduced pruritus by 80% in one to three hours while none of the glucocorticoids showed any effect on pruritus in that time frame.[25] Prednisolone (0.5 mg/kg) demonstrated a 37% decrease in pruritus at 12 hours.[25]

Find it all here dvm360

Online tool

Download this algorithm on the diagnostic approach to pruritic dogs at **dvm360.com/PruritusDx**.

In a preapproval clinical trial of 436 dogs with allergic dermatitis, 65% of oclacitinib-treated dogs showed significant improvement in pruritus scores seven days after beginning therapy, compared with 21% improvement for placebo-treated dogs.[26] This drug has not yet been evaluated in independent clinical trials.

In a preapproval clinical trial, 65% of oclacitinib-treated dogs showed significant improvement in pruritus scores seven days after beginning therapy.

Side effects

Side effects reported in initial studies affected less than 3% of dogs and included vomiting, diarrhea, anorexia, and polydipsia. Most of these side effects were mild and resolved without treatment, although oclacitinib therapy was discontinued in some dogs.[26]

As with any immunomodulatory therapy, there is the potential for increased risk of opportunistic bacterial or fungal infections. It is important to note that the Apoquel product insert states that oclacitinib therapy might increase a dog's susceptibility to infection, including demodicosis, and may exacerbate neoplastic conditions.

Indications, dosing, and usage

Apoquel is labeled for the control of pruritus associated with allergic dermatitis and for the control of atopic dermatitis in dogs more than 12 months old. It is dosed at 0.4 to 0.6 mg/kg orally twice daily for up to 14 days, and then once daily. The drug's rapid onset is useful for situations in which immediate relief of pruritus is needed. For example, oclacitinib could be given for relief of pruritus due to flea allergy dermatitis while the owner starts an integrated flea control program.

Oclacitinib should not be administered in place of other immunosuppressive therapy, such as glucocorticoids or azathioprine, for treating autoimmune disease or cancer chemotherapy. Like cyclosporine, oclacitinib can be given to patients to alleviate pruritus before intradermal allergy testing as neither drug interferes with intradermal test results, unlike glucocorticoids. Oclacitinib should not be administered to animals less than 12 months of age or those with severe infections.

CONCLUSION

While the introduction of oclacitinib adds a valuable pruritus treatment tool, pruritic dogs still need a thorough diagnostic work-up to rule out nonallergenic causes of itch. Canine atopic dermatitis is a lifelong disease that requires lifelong management. Communication about these facts is critical for the establishment of realistic client expectations. A systematic and individualized treatment approach for each patient is important.

Ideally, pruritus due to canine atopic dermatitis can be treated with nondrug therapy such as allergen-avoidance, topical therapy, and allergen-specific immunotherapy, with oral immunomodulatory medications reserved for flare-ups. However, in severe cases, long-term medication is needed. It is important that medication tapering is attempted only after clinical signs have maximally improved and other components of the treatment plan are instituted. VM

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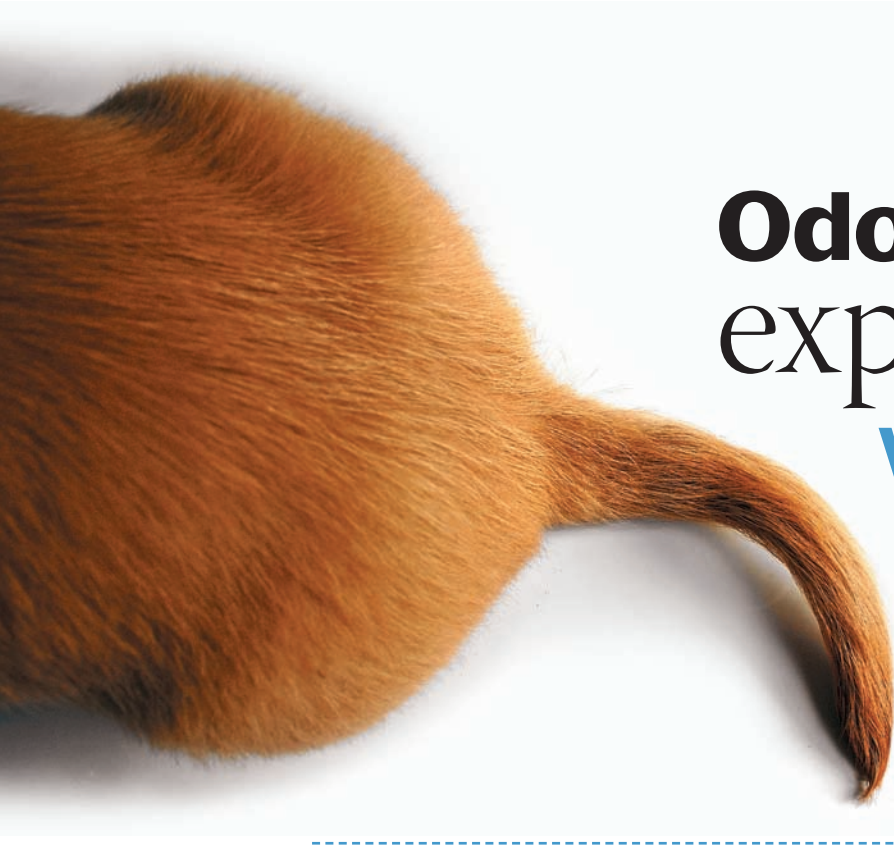

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Dr. Anne Shakespeare
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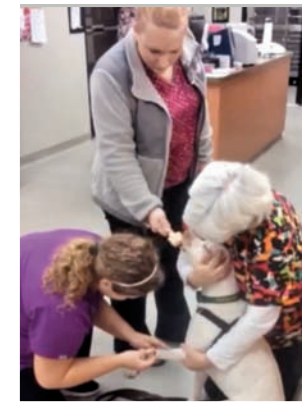
Mindy Purdun, veterinary technician
Greenville, N.C.



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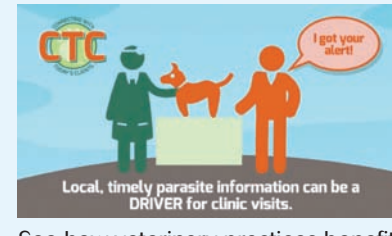

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