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Vaccines

Beyond behavioral

In animals exhibiting oral repetitive behaviors, consider the possibility of a GI component. p188

ADVANSTAR VETERINARY

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[1]Data on file.

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Compulsive disorders
Have you considered GI involvement?

New research stresses the need to explore a medical component to what you might think is solely a behavior problem—in this case, an underlying gastrointestinal problem as a cause of excessive licking and fly biting. **page188**

Kelly Ballantyne, DVM, and John Ciribassi, DVM, DACVB

» **PLUS:** Questionnaire for patients exhibiting repetitive behaviors, **page 193**

A CHALLENGING CASE
Painful periocular swelling in a cat

An ophthalmic examination provides valuable clues for diagnosing an uncommon disorder with mostly nonspecific clinical signs. **page 179**

Renee T. Carter, DVM, DACVP; Melissa Kubai, DVM; J. Daniel Rodriguez, MVZ Esp, DACVR; Aradhana Gupta, DVM, MVSc, DACVP; and Angela B. Royal, DVM, MS, DACVP

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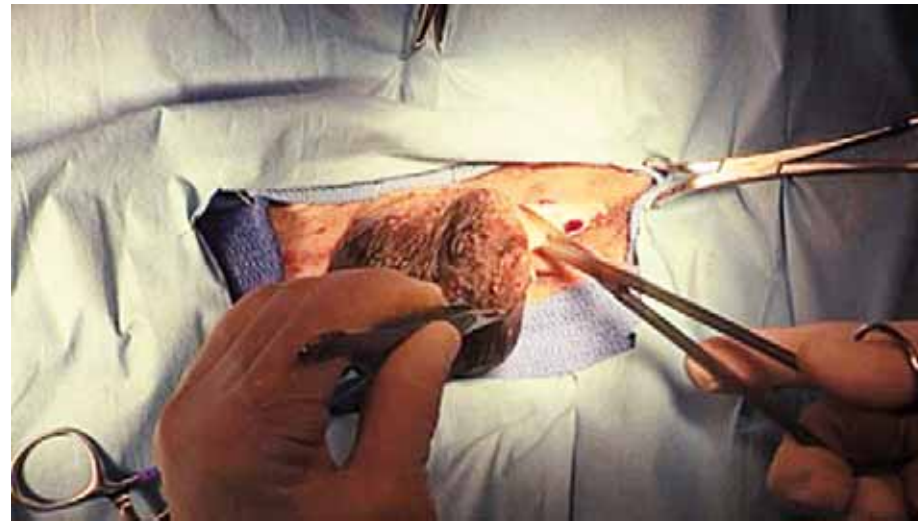
Canine scrotal urethrostomy



Dr. Don Waldron demonstrates canine scrotal urethrostomy, along with castration and scrotal ablation. Scrotal urethrostomy may be indicated in dogs with recurrent urethral obstruction due to urolith formation as well as urethral stricture or neoplasia rostral to the scrotum.

View this video at **dvm360.com/urethrostomy**.

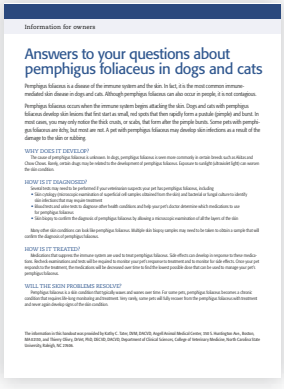
Just ASK the Expert

Managing storm phobias

Veterinary behaviorist Dr. Valarie Tynes has some tips for getting difficult clients—and owners—to better weather storms at **dvm360.com/StormPhobias**.

And ask our panel of experts your question at **dvm360.com/MyQuestion**.

CLIENT handout


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 immune-mediated 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 cells and samples obtained from the skin) and bacterial or fungal cultures 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 Tierney Olivry, DrVet, PhD, DECVD, DACVD, Department of Clinical Sciences, College of Veterinary Medicine, North Carolina State University, Raleigh, NC 27606.

Answers to clients' questions about pemphigus foliaceus in dogs and cats

Download this handout at **dvm360.com/pemphigus** to help owners of affected pets better understand what their pets are going through and ensure compliance with treatment and follow-up.

Compelling updates in endocrinology

Dr. David Bruyette gives his thoughts on the latest, most relevant advances in endocrinology, including basal insulin, trilostane, and iodine-restricted diets. View this video at **dvm360.com/EndocrinologyUpdates**.

And see Dr. Bruyette live at the CVC in Washington, D.C., May 9-13. Just visit **dvm360.com/TheCVC** to learn more and to register to attend.

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Warning: Repeated use of meloxicam in cats has been associated with acute renal failure and death. Do not administer additional injectable or oral meloxicam to cats. See the Contraindications, Warnings and Precautions section of the package insert for detailed information.

Loxicom® (meloxicam) 5 mg/mL Injection is a non-steroidal anti-inflammatory prescription medication available only through a veterinarian. As with other NSAID-class medications, signs of meloxicam intolerance may include appetite loss, vomiting and diarrhea, which could indicate side effects involving the digestive tract, liver or kidneys. Some of these side effects may occur without warning and, in rare situations may be serious, resulting in hospitalization or even death. Observe the dog or cat for signs of potential drug toxicity. If these signs occur, discontinue meloxicam therapy and contact a veterinarian immediately. Loxicom should be administered to cats only via the subcutaneous (SQ) route. Do not use intravenously (IV) in cats. Concomitant use with other anti-inflammatory drugs, such as NSAIDs or corticosteroids, should be avoided. Do not administer a second dose of meloxicam to cats. Do not follow the single, one-time dose of meloxicam with any other NSAID or with meloxicam oral suspension in cats. Do not use meloxicam in cats with pre-existing renal dysfunction. Refer to the product insert for additional safety information (including warnings, precautions and contraindications) and full directions for use.

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See brief summary on page 164.

ANADA 200-491, Approved by FDA

Loxicom®

(meloxicam) for Dogs

5 mg/mL Solution for Injection

Non-steroidal anti-inflammatory drug for use in dogs and cats only.

Brief Summary: Before use, consult the product insert, a summary of which follows.

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

Warning: Repeated use of meloxicam in cats has been associated with acute renal failure and death. Do not administer additional injectable or oral meloxicam to cats. See Contraindications, Warnings, and Precautions for detailed information.

Indications:
Dogs: Loxicom® (meloxicam) 5 mg/mL Solution for Injection is indicated in dogs for the control of pain and inflammation associated with osteoarthritis.

Carefully consider the benefits and risk of Loxicom and other treatment options before deciding to use Loxicom. Use the lowest effective dose for the shortest duration.

Contraindications: Dogs with known hypersensitivity to meloxicam should not receive Loxicom for Injection.

Warnings: Not for use in humans. Keep this and all medications out of reach of children. Consult a physician in case of accidental ingestion by humans. All dogs should undergo a thorough history and physical examination before administering any NSAID. Appropriate laboratory testing to establish hematological and serum biochemical baseline data is recommended prior to, and periodically during use of any NSAID in dogs. **Owner should be advised to observe their dogs for signs of potential drug toxicity.**

Precautions: The safe use of Loxicom Injection in dogs younger than 6 months of age, dogs used for breeding, or in pregnant or lactating bitches has not been evaluated. Meloxicam is not recommended for use in dogs with bleeding disorders. Safety has not been established for intramuscular (IM) administration in dogs. When administering Loxicom Injection, use a syringe of appropriate size to ensure precise dosing. As a class, cyclo-oxygenase inhibitory NSAIDs may be associated with gastrointestinal, renal and hepatic toxicity. Sensitivity to drug-associated adverse events varies with the individual patient. Dogs that have experienced adverse reactions from one NSAID may experience adverse reactions from another NSAID. Patients at greatest risk for renal toxicity are those that are dehydrated, on concomitant diuretic therapy, or those with existing renal, cardiovascular, and/or hepatic dysfunction. Concurrent administration of potentially nephrotoxic drugs should be carefully approached. NSAIDs may inhibit the prostaglandins that maintain normal homeostatic function. Such anti-prostaglandin effects may result in clinically significant disease in patients with underlying or pre-existing disease that has not been previously diagnosed. Concomitant use with other anti-inflammatory drugs, such as NSAIDs or corticosteroids, should be avoided. The use of another NSAID is not recommended. Consider appropriate washout times when switching from corticosteroid use or from one NSAID to another in dogs. The use of concomitantly, protein-bound drugs with Loxicom for Injection has not been studied in dogs. Commonly used protein-bound drugs include cardiac, anticonvulsant and behavioral medications. The influence of concomitant drugs that may inhibit metabolism of Loxicom 5 mg/mL Solution for Injection has not been evaluated. Drug compatibility should be monitored in patients requiring adjunctive therapy. The effect of cyclo-oxygenase inhibition and the potential for thromboembolic occurrence or a hypercoagulable state has not been studied.

Adverse Reactions: Dogs: A field study involving 224 dogs was conducted. Based on the results of this study, GI abnormalities (vomiting, soft stools, diarrhea, and inappetance) were the most common adverse reactions associated with the administration of meloxicam.

In foreign suspected adverse drug reaction (SADR) reporting, adverse reactions related to meloxicam administration included: auto-immune hemolytic anemia (1 dog), thrombocytopenia (1 dog), polyarthritis (1 dog), nursing puppy lethargy (1 dog), and pyoderma (1 dog).

Post-Approval Experience (Rev. 2009): The following adverse reactions are based on post-approval adverse drug event reporting. The categories are listed in decreasing order of frequency by body system:
Gastrointestinal: *vomiting, diarrhea, melena, gastrointestinal ulceration*
Urinary: *azotemia, elevated creatinine, renal failure*
Neurological:/Behavioral: *lethargy, depression*
Hepatic: *elevated liver enzymes*
Dermatologic: *pruritis*

Death has been reported as an outcome of the adverse events listed above. **Acute renal failure and death have been associated with the use of meloxicam in cats.**

Effectiveness:
Dogs: The effectiveness of meloxicam injection was demonstrated in a field study involving a total of 224 dogs representing various breeds, all diagnosed with osteoarthritis. This placebo-controlled, masked study was conducted for 14 days. Dogs received a subcutaneous injection of 0.2 mg/kg meloxicam injection on day 1. The dogs were maintained on 0.1 mg/kg oral meloxicam from days 2 through 14. Variables evaluated by veterinarians included lameness, weight-bearing, pain on palpation, and overall improvement. Variables assessed by owners included mobility, ability to rise, limping, and overall improvement. In this field study, dogs showed clinical improvement with statistical significance after 14 days of meloxicam treatment for all variables.

Animal Safety: Dogs: 3 Day Target Animal Safety Study -
Meloxicam injection was administered intravenously to Beagle dogs at 1, 3, and 5 times the recommended dose for three consecutive days. Vomiting occurred in 1 of 6 dogs in the 5X group. Fecal occult blood was detected in 3 of 6 dogs in the 5X group. No clinically significant hematologic changes were seen, but serum chemistry changes were observed. Serum alkaline phosphatase (ALP) was significantly increased in one 1X dog and two of the 5X dogs. One dog in the 5X group had a steadily increasing GGT over 4 days, although the values remained within the reference range. Decreases in total protein and albumin occurred in 2 of 6 dogs in the 3X group and 3 of 6 dogs in the 5X group. Increases in blood urea nitrogen (BUN) occurred in 3 of 6 dogs in the 1X group, 2 of 6 dogs in the 3X group and 2 of 6 dogs in the 5X group. Increased creatinine occurred in 2 dogs in the 5X group. Increased urine protein excretion was noted in 2 of 6 dogs in the control group, 2 of 6 dogs in the 1X group, 2 of 6 dogs in the 3X group, and 5 of 6 dogs in the 5X group. Two dogs in the 5X group developed acute renal failure by Day 4. Histological examination revealed gastrointestinal lesions ranging from superficial mucosal hemorrhages and congestion to erosions. Mesenteric lymphadenopathy was identified in 2 of 6 dogs in the 1X group, 4 of 6 dogs in the 3X group, and 5 of 6 dogs in the 5X group. Renal changes ranged from dilated medullary and cortical tubules and inflammation of the interstitium, to necrosis of the tip of the papilla in 2 of 6 dogs in the 1X group, 2 of 6 dogs in the 3X group, and 4 of 6 dogs in the 5X group.

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ANADA 200-491, Approved by FDA

Loxicom®

(meloxicam) for Cats

5 mg/mL Solution for Injection

Non-steroidal anti-inflammatory drug for use in dogs and cats only.

Brief Summary: Before use, consult the product insert, a summary of which follows.

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

Warning: Repeated use of meloxicam in cats has been associated with acute renal failure and death. Do not administer additional injectable or oral meloxicam to cats. See Contraindications, Warnings, and Precautions for detailed information.

Indications: Cats: For the control of postoperative pain and inflammation associated with orthopedic surgery, ovariohysterectomy and castration when administered prior to surgery.

Dosage and Administration: Carefully consider the potential benefits and risk of Loxicom and other treatment options before deciding to use Loxicom. Use the lowest effective dose for the shortest duration.

Cats: Administer a single, one-time subcutaneous dose of Loxicom® 5 mg/mL Solution for Injection to cats at a dose of 0.14 mg/lb (0.3 mg/kg) body weight. **Use of additional meloxicam or other NSAIDs is contraindicated. (See Contraindications).** To ensure accuracy of dosing, the use of a 1 mL graduated syringe is recommended.

Contraindications: Cats with known hypersensitivity to meloxicam should not receive Loxicom 5 mg/mL Solution for Injection. Additional doses of meloxicam or other NSAIDs in cats are contraindicated, as no safe dosage for repeated NSAID administration has been established **(See Animal Safety). Do not use meloxicam in cats with pre-existing renal dysfunction.**

Warnings: Not for use in humans. Keep this and all medications out of reach of children. Consult a physician in case of accidental ingestion by humans. For subcutaneous (SQ) injectable use in cats. Do not use IV in cats.

Do not administer a second dose of meloxicam. Do not follow the single, one-time dose of meloxicam with any other NSAID. Do not administer meloxicam oral suspension following the single, one-time injectable dose of meloxicam.

When administering any NSAID, appropriate laboratory testing to establish hematological and serum biochemical baseline data is recommended prior to use in dogs and cats. All cats should undergo a thorough history and physical examination before administering meloxicam. **Do not repeat the single, one-time dose of meloxicam in cats. Owner should be advised to observe their cats for signs of potential drug toxicity.**

Precautions: The safe use of Loxicom Injection in cats younger than 4 months of age, cats used for breeding, or in pregnant or lactating queens has not been evaluated.
Meloxicam is not recommended for use in cats with bleeding disorders. Safety has not been established for intravenous (IV) or intramuscular (IM) use in cats. When administering Loxicom Injection, use a syringe of appropriate size to ensure precise dosing.
As a class, cyclo-oxygenase inhibitory NSAIDs may be associated with gastrointestinal, renal, and hepatic toxicity. Cats that have experienced adverse reactions from one NSAID may experience adverse reactions from another NSAID. NSAIDs may inhibit the prostaglandins that maintain normal homeostatic function. Such anti-prostaglandin effects may result in clinically significant disease in patients with underlying or pre-existing disease that has not been previously diagnosed.
Patients at greatest risk for adverse events are those that are dehydrated, on concomitant diuretic therapy, or those with existing renal, cardiovascular, and/or hepatic dysfunction. Concurrent administration of potentially nephrotoxic drugs should be carefully approached and monitored. **Anesthetic drugs may affect renal perfusion; approach concomitant use of anesthetics and NSAIDs cautiously. Appropriate monitoring procedures should be employed during all surgical procedures. The use of perioperative parenteral fluids is recommended to decrease potential renal complications when using NSAIDs. If additional pain medication is needed after the single one-time dose of meloxicam, a non-NSAID class of analgesic may be necessary.**
In one study[1], one cat in each NSAID treatment group had increased intraoperative hemorrhage.
Concomitant use of meloxicam with other anti-inflammatory drugs should be avoided. Consider appropriate washout times when switching from corticosteroid use to meloxicam in cats. **As a single use product in cats, meloxicam should not be followed by additional NSAIDs or corticosteroids.**
The use of concomitantly protein-bound drugs with Loxicom Injection has not been studied in cats. Commonly used protein-bound drugs include cardiac, anticonvulsant, and behavioral medications. The influence of concomitant drugs that may inhibit metabolism of Loxicom 5 mg/mL Solution for Injection has not been evaluated. Drug compatibility should be monitored in patients requiring adjunctive therapy. The effect of cyclo-oxygenase inhibition and the potential for thromboembolic occurrence or a hyper-coagulable state has not been studied.

Adverse Reactions: Cats: A field study involving 138 cats was conducted. Of the 72 cats receiving meloxicam injection, six cats (8.3%) experienced post-treatment elevated serum blood urea nitrogen (BUN) levels. The pre-treatment values were in the normal range. Of the 66 cats in the butorphanol treatment group, no cats experienced post-treatment elevated serum blood urea nitrogen levels. Nine cats (12.5%) receiving meloxicam injection had post-treatment anemia. Pre-treatment, these cats all had hematocrit and hemoglobin values in the normal range. Four cats (6.1 %) in the butorphanol treatment group had post-treatment anemia. All but one cat, who had a mild anemia pre-treatment (hematocrit=21% and hemoglobin=7.0 g/dL) had normal pre-treatment values. Twenty-four hours after the injection with meloxicam injection, one cat experienced pain upon palpation of the injection site.

Foreign Experience:
Repeated use in cats has been associated with acute renal failure and death. In studies used for the foreign approval of meloxicam injection in cats, lethargy, vomiting, inappetance, and transient pain immediately after injection were noted. Diarrhea and fecal occult blood have also been reported.

Post-Approval Experience (Rev. 2009): The following adverse reactions are based on post-approval adverse drug event reporting. The categories are listed in decreasing order of frequency by body system:
Urinary: *azotemia, elevated creatinine, elevated phosphorus, renal failure*
Gastrointestinal: *anorexia, vomiting, diarrhea*
Neurologic/Behavioral: *lethargy, depressio*n
Hematologic: *anemia*

Death has been reported as an outcome of the adverse events listed above. **Acute renal failure and death have been associated with the use of meloxicam in cats.**

Effectiveness: Cats: The effectiveness of meloxicam injection was demonstrated in a masked field study involving a total of 138 cats representing various breeds. This study used butorphanol as an active control. Cats received either a single subcutaneous injection of 0.3 mg/kg meloxicam injection or 0.4 mg/kg butorphanol prior to onychectomy, either alone or in conjunction with surgical neutering. All cats were premedicated with acepromazine, induced with propofol and maintained on isoflurane. Pain assessment variables evaluated by veterinarians included additional pain intervention therapy, gait/lameness score, analgesia score, sedation score, general impression score, recovery score, and visual analog scale score. Additionally, a cumulative pain score, which was the summation of the analgesia, sedation, heart rate and respiratory rate scores was evaluated. A palpometer was used to quantify the pain threshold. A substantial number of cats required additional intervention in the 0-24 hour post-surgical period, with the majority of these interventions taking place within the first hour. Therefore, the percentage of cats in each group that received one or more interventions was designated as the primary assessment variable. Approximately half of the cats in each group received a pain intervention as a result of the first (time 0) post-surgical evaluation, i.e., extubation. At this point, the need to provide a pain intervention was not statistically significant between the two groups (p=0.7215). However, the median number of interventions was one per cat in the meloxicam group and two per cat in the butorphanol group and this difference was statistically significant (p=0.0021). The statistical evaluation supports the conclusion that the meloxicam test article is non-inferior to the butorphanol active control. Forty-eight of the 72 cats in the meloxicam group received one or more interventions (66.7%), and 47 of 66 cats in the butorphanol group received one or more interventions (71.2%). The number of interventions administered to the meloxicam group was less than the butorphanol group at 1, 3, 5, 8, 12, and 24 hours post-surgery. Cats receiving meloxicam injection showed improvement in the pain assessment variables.

Animal Safety: Cats: 3 Day Target Animal Safety Study - In a three day safety study, subcutaneous meloxicam injection administration to healthy cats at up to 1.5 mg/kg (5X the recommended dose) resulted in vomiting in three cats (1 of 6 control cats and 2 of 6 cats in 5X) and loose stools in four cats (2 of 6 control cats and 2 of 6 cats in 5X). Fecal occult blood was detected in ten of the twenty four cats, including two cats in the control group. This was not a dose-related event. Clinically significant hematologic changes seen included increased PT and APTT in two cats (1 of 6 control cats and 1 of 6 cats in 5X), and elevated white blood cell counts in cats having renal or GI tract lesions. Serum chemistry changes observed included decreased total protein in four of 24 cats (1 of 6 cats in 1X, 2 of 6 cats in 3X and 1 of 6 cats in 5X), concomitant increases in blood urea nitrogen (BUN) and creatinine values in 2 of 6 cats in 5X.

Histological examination revealed gastrointestinal lesions ranging from inflammatory cell infiltration of the mucosa of the GI tract to erosions. Mesenteric lymphadenopathy was identified in 1 of 6 cats in 1X. Renal changes ranged from dilated medullary (2 of 6 cats in 1X, 1 of 6 cats in 3X, and 1 of 6 cats in 5X) and cortical (3 of 6 cats in 1X, 1 of 6 cats in 3X, and 3 of 6 cats in 5X) tubules and inflammation (2 of 6 cats in 1X, 2 of 6 cats in 3X, and 2 of 6 cats in 5X) or fibrosis (2 of 6 cats in 3X and 2 of 6 cats in 5X) of the interstitium to necrosis of the tip of the papilla (5 of 6 cats in 5X).

Subsequent oral dosing - In a nine day study with three treatment groups, meloxicam injection was given as a single subcutaneous injection using doses of 0 mg/kg (saline injection), 0.3 mg/kg and 0.6 mg/kg on Day 0. Meloxicam oral suspension, 1.5 mg/mL or saline was then administered orally once-daily at the same respective dose (0.3 or 0.6 mg/kg) for eight consecutive days. Clinical adverse reactions included vomiting, diarrhea, lethargy, and decreased food consumption in the treated groups, and one day of diarrhea in one control cat. The gross necropsy report includes observation of reddened GI mucosa in 3 of 4 cats in the 0.3 mg/kg group and 1 of 4 cats in the 0.6 mg/kg group. All saline-treated cats were normal. By Day 9, one cat in both the 0.3 mg/kg group and the 0.6 mg/kg group died and another cat in the 0.3 mg/kg group was moribund. The cause of death for these cats could not be determined, although the pathologist reported pyloric/duodenal ulceration in the cats in 0.6 mg/kg group. The safety studies demonstrate a narrow margin of safety.

Injection Site Tolerance - Histopathology of the injection sites revealed hemorrhage and inflammation, myofiber atrophy, panniculitis, fibrin deposition, and fibroblast proliferation. These findings were present in cats in all groups, with the 3X cats having the most present. No safe repeat dose has been established in cats.

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I01 Dec 2012

Studying the studies

A review of evidence from trials evaluating atopic dermatitis therapies

What they did

The authors reviewed 21 randomized controlled trials published or completed between 2008 and 2011 that evaluated the prevention or treatment of atopic dermatitis in dogs. Dogs of any age or disease severity were included, and atopic dermatitis was diagnosed based on "the presence of characteristic clinical signs and the exclusion of pruritic dermatoses of similar appearance." Studies that enrolled dogs with other diseases in addition to atopic dermatitis were excluded. All studies reported measures of efficacy and safety that primarily involved the mitigation of pruritus, skin lesions scores, or both.

What they found

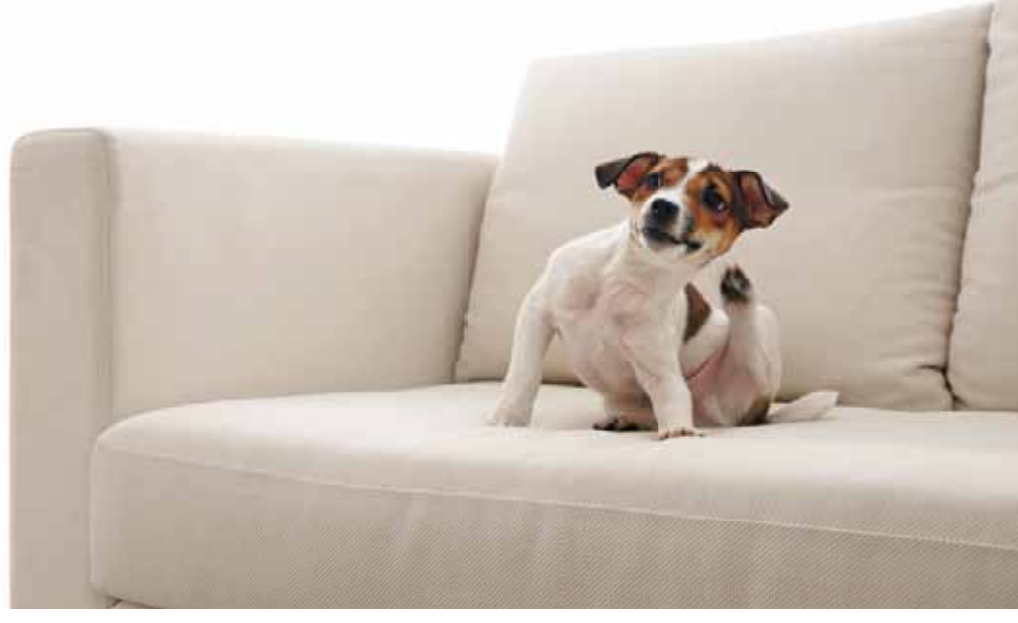
Researchers evaluated the quality of the evidence in these studies based on a quality rating scale[1] as outlined below in the context of treating patients in clinical practice:

- **High quality of evidence:** Further research is very unlikely to change our confidence in the estimate of effect.
- **Moderate quality of evidence:** Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate.
- **Low quality of evidence:** Further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate.
- **Very low quality of evidence:** Any estimate of effect is very uncertain.

No therapy was designated as high quality. Evidence of the efficacy of topical and oral glucocorticoids (0.5 mg/kg once to twice daily and tapered to effect) and oral microemulsified cyclosporine (Atopica—Novartis Animal Health; 5 mg/kg once daily and tapered to effect) was graded as moderate quality.

Data from randomized controlled trials evaluating the efficacy of generic microemulsified cyclosporine, a nano-emulsion cyclosporine formulation, injectable recombinant feline interferon and canine interferon, oral fexofenadine, and oral masitinib for the treatment of atopic dermatitis were determined to be of low quality.

Only very low quality evidence was found for the use of synthetic T-cell receptor V-beta peptides, tepoxalin, *Trichuris vulpis* eggs, single mite allergen immunotherapy, pentoxifylline, and black currant seed oil. A randomized controlled trial of a diet rich in essential fatty acids (Atopic Care—Affinity Petcare)



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provided low-quality evidence of a glucocorticoid-sparing effect when used in dogs with atopic dermatitis.

The authors acknowledge that many of the randomized controlled trials had very low numbers of subjects, which may make it difficult to detect smaller treatment effects. In addition, use of modified or unpublished severity scales as well as the variable outcome measures used made standardization difficult.

Take-home message

Topical or oral glucocorticoids and cyclosporine remain the cornerstone of therapy for dogs with atopic dermatitis in terms of safety and efficacy. New therapies have shown some promise but will require further research to ensure positive outcomes.

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

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[1]D.N. Carlotti, D.E. Jacobs. 2000. Therapy, control and prevention of flea allergy dermatitis in dogs and cats. Vet. Derm. 11: 83-99

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Amanda Bruder, CVT
Stevens Point, Wis.

A go-to list for cleaning chores

Got some free time on your hands at work? We posted a monthly cleaning list that staff members can refer to when looking for projects to do during downtime.

Amanda Bruder, CVT
Stevens Point, Wis.

Recycled vaccine tray lids make organizing easy

With limited counter space for surgical prep and anesthetic drugs, we used to have a big jumble of syringes and catheters. Although we always labeled the syringes, it was confusing whether we were grabbing the right syringe for the right patient—so we came up with this great, no-cost idea. We reuse old vaccine tray lids and sort the appropriate syringes and catheters, corresponding to each patient's name, which is written on top of the tray in a dry-erase marker. After administration, the patient's name is wiped off and the tray is ready for the next patient. Not only are we better organized, it's also a good way to recycle these trays.

Sarah Pritchard, RVT
New Liskeard, ON

We want to hear your ideas!

We know you love to read *Veterinary Medicine*'s "Idea Exchange." And we'll bet your practice has developed many clinical and management tips or useful forms to help you save time and better serve your patients and clients. Please take a moment to jot down one (or more) of your ideas, and share it with your colleagues.

This is my practice tip for "Idea Exchange" (explain each tip in a few words, and feel free to include a sketch, a photo, or your favorite form if appropriate):

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Skunk spray toxicosis

An odiferous tale

Skunks thrive across the lower 48 United States. Be prepared—your next patient may be skunked! Here's what you need to understand and treat skunk spray toxicosis.

By Charlotte Means, DVM, MLIS, DABVT, DABT

Most people have no problem identifying a North American skunk by sight or smell. Skunks are of the order Carnivora, family Mephitidae. The six species that exist in North America are the striped skunk (*Mephitis mephitis*), the Western spotted skunk (*Spilogale gracilis*), the Eastern spotted skunk (*Spilogale putorious*), two species of hog-nosed skunk (*Conepatus mesoleucus* and *Conepatus leukonutus*), and the hooded skunk (*Mephitis macroura*). Skunks are primarily crepuscular—most active during twilight, dawn, and dusk. Skunks have excellent hearing and sense of smell but do not see well.[1]

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A SKUNK'S LINE OF DEFENSE

Skunks are docile but will defend themselves when threatened. A skunk's first line of defense is defensive posturing. A skunk will hiss, stamp its feet, and raise its tail as a warning. If the warnings are ignored, a skunk will spray anal gland secretions (referred to as either *spray* or *musk*).

Skunks have two anal glands, one on each side of the anus. The anal gland secretions contain a mixture of sulfur-containing thiols. The odor—which has been described as similar to that of a combination of rotten eggs, garlic, and burnt rubber—tends to drive away most predators.[2] Skunks can spray these secretions 7 to 15 ft (2 to 5 meters) and are highly accurate in their aim. Getting sprayed by a skunk is commonly called being *skunked*. Skunk spray has been used as a biological weapon.[2]

The skunk's anal gland secretions contain seven major volatile components: three major thiols, three major thioacetates, and a methylquinoline. These are divided into thiols and acetate derivatives of the thiols. Two of these thiols, (E)-2-butene-1-thiol and 3-methyl-1-butanethiol, are responsible for the repellent odor. These two thiols constitute 51% to 70% of the anal gland secretions.

The thioacetates are not as initially odiferous on contact but are converted to more potent thiols with the addition of water. This chemical reaction may explain why some animals continue to smell skunky after a bath—thioacetates trapped in fur continue to release thiols under damp conditions.

The seventh component is an alkaloid 2-methylquinoline, which is not as volatile as the thiols and has a nitrogenous base. The chemical composition and percentages of the volatile components may vary among skunk species. Numerous minor components differ among individual skunks and species.[3,4]

EFFECTS OF SKUNK SPRAY

Although pet owners seldom witness their pets being sprayed by a skunk, the odor is immediate and unmistakable when spraying occurs. Ocular edema, conjunctivitis, drooling, and squinting are commonly

noted in animals that have been sprayed. Many dogs will rub their faces, roll, sneeze, and vomit. Temporary blindness may occur.

Exposure to skunk spray can be oral, dermal, ocular, and respiratory. Dermal absorption of the spray is minimal. The severity of signs may depend on a pet's proximity to a skunk when being sprayed and the area of exposure (face vs. legs or side). If an animal is sprayed directly in the face, inhalation can occur.

The severity of signs may depend on a pet's proximity to a skunk when being sprayed and the area of exposure.

In rare instances, Heinz body anemia, methemoglobinemia, and hemoglobinuria may occur a few hours to 24 hours after exposure (ASPCA Animal Poison Control Center Antox: Unpublished data, 2011).[5] In these cases, the thiols in the skunk spray cause oxidative damage to hemoglobin. The thiols react with oxyhemoglobin in an oxidation-reduction reaction. This reaction forms methemoglobinemia, thiyl radicals, and hydrogen peroxide. Thiyl radicals and hydrogen peroxide are highly reactive and combine with hemoglobin sulfhydryl groups, resulting in Heinz bodies and subsequent hemolysis. (Other substances that cause oxidative damage to red blood cells include onions, garlic, acetaminophen, benzocaine and other local anesthetics, naphthalene moth balls, and zinc.[5])

Although there are no reports of a cat developing methemoglobinemia from skunk spray, feline red blood cells are more sensitive to oxidative damage than are the red blood cells of other species. Cats have eight free sulfhydryl groups on their hemoglobin (versus four in dogs), which results in increased susceptibility to oxidative damage.[6,7] Japanese breeds of dogs (Tosa, Shiba Inu, and Akita) are more

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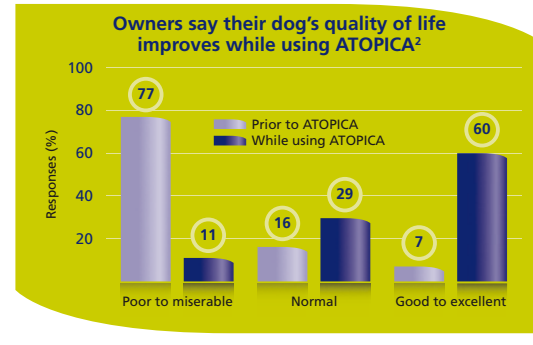

As with all drugs, side effects may occur. In a field study, the most common side effects were gastrointestinal signs.Gingival hyperplasia and papillomas may also occur during the initial dosing phase. ATOPICA is a systemic immunosuppressant that may increase the susceptibility to infection. ATOPICA is not for use in reproducing dogs or dogs with a history of neoplasia.
See page 174 for brief summary information.

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References: 1. ATOPICA User Survey, Forward Research (2004). 2. ATOPICA Customer Satisfaction Study (2008). 3. Steffan J et al. Vet Dermatol (2003) 14, p11-22.
4. Steffan J *et al.* JAVMA (2005) 226, p1855-1863.

Krebaum skunk odor removal formula*

- 1 quart fresh 3% hydrogen peroxide
- ¼ cup baking soda (sodium bicarbonate)
- 1-2 tsp of liquid dishwashing detergent

For large dogs, add one quart of tepid water to ensure complete coverage.

Mix the above ingredients together.

Bathe the animal outdoors. Apply the formula to the pet, working deeply into the fur, and allow it to set for five minutes.

Rinse with copious amount of water after five minutes.

Repeat if necessary.

Hints

- The mixture must be used promptly and will not work if stored for any length of time.
- Do not store in a closed container. The container could break as the peroxide releases oxygen.
- The pet's fur (as well as clothing, towels, and carpeting) may be bleached by the formula.

*Source: Krebaum P. Skunk odor removal. *Chem Engineer News* 1993;Oct 18:99.

susceptible to oxidative damage to red blood cells compared with other breeds of dogs.[8]

CASES OF SKUNK SPRAY TOXICOSIS

The ASPCA Animal Poison Control Center's toxicology database from November 2001 to May 2011 included cases of 107 patients (102 dogs and five cats) that were exposed to skunk spray and that developed clinical signs. Only those signs assessed as having either medium or high likelihood of resulting from the skunk spray were included. Most dogs had mild clinical signs. Clinical signs reported in the cats included odor, conjunctivitis, and squinting.

A search of the literature revealed only one report of Heinz body anemia in a dog after exposure to skunk spray.[5] Two cases were identified in the ASPCA toxicology database. One involved a 2-year-old 34.5-lb (15.63-kg) neutered male Pharaoh hound that was sprayed heavily in the face. Initial Heinz bodies were noted three to four hours after exposure and continued to worsen during the subsequent 12 hours. The dog developed mild to moderate Heinz body anemia but recovered with symptomatic and supportive care. The dog was released to the owner the next day.

A second case involved a 5-year-old 38.6-lb (17.5-kg) intact male boxer. The dog had a history of being sprayed by a skunk five times before, although it is unknown how close together the incidences occurred. The dog escaped from the house and when the owner found the dog the next morning, the dog smelled strongly of skunk spray and was tremoring. The dog was brought to an emergency clinic more than 12 hours later. Nearly 100% of the red blood cells studied contained Heinz bodies. Results of laboratory testing confirmed methemoglobinemia. The dog had a seizure and died. The owner requested cremation and did not authorize the release of

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If an animal has received a heavy spray or multiple exposures, baseline blood work should be obtained.

histopathologic and other diagnostic findings. To our knowledge, this is the only death related to a skunk spray in a dog (ASPCA Animal Poison Control Center Antox: Unpublished data, 2011).

TREATMENT

Treatment of skunk spray is primarily symptomatic and supportive. Dermal decontamination involves bathing. The goal is to convert thiols into nonodorous compounds. Thiols are not water-soluble, even with soap. A baking soda and peroxide mixture will oxidize thiols into water-soluble sulfonates (*see "Krebaum skunk odor removal formula" for recipe and instructions on page 176*). Pets should be bathed outside so the spray does not contaminate household furnishings.[4]

For ocular exposures, flush the animal's eyes with tepid water. If an animal has received a heavy spray or multiple exposures, obtain baseline blood work. A complete blood count and serum chemistry profile should be obtained on arrival at the clinic. Monitor the animal for the next 72 hours.

If clinical signs consistent with methemoglobinemia or Heinz body anemia develop, administer intravenous fluids. Blood transfusions may be required. To treat methemoglobinemia, give N-acetylcysteine at a 140-mg/kg loading dose followed by 70 mg/kg orally or intravenously every six hours for six to eight treatments.

Skunks can carry rabies. If a pet is bitten by a skunk, initiate appropriate treatment, prophylaxis, and monitoring, and report the case to the proper authorities. VM

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Vaccines

TIPS *for* safe vaccine administration & *patient care*

p4

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p12

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Take Action
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PLUS

FREQUENTLY ASKED QUESTIONS
Vaccine protocols AND *declining visits*
p2

Five ways
to get veterinary clients **on board** with **your vaccination recommendations**
p6

Veterinary medicine
Essential medicine for exemplary patient care

FREQUENTLY ASKED QUESTIONS: *Vaccine protocols* and *declining visits*

Dr. Mike Paul travels around the country giving presentations and gathering FAQs from conferences. Two areas of concern? The best practices for vaccine administration and what to do about declining client visits. Here are his answers.

Vaccine protocols

Q We do not see many animals present with infectious diseases anymore. Why do I still need to vaccinate pets on a routine basis?

The reason is simply that once a critical mass of individuals is vaccinated, the ease of transmission is reduced. In areas where there are large numbers of unvaccinated animals, these diseases do persist.

If we see a smaller percentage of protected pets, these diseases will return. So it is vital that we continue to advocate for routine core vaccines and recommend noncore vaccines as indicated by a risk assessment.

Q In my practice I never see a cat with clinical feline immunodeficiency virus (FIV) infection, but I still test all cats or kittens at their first visit for feline leukemia virus (FeLV) and FIV. If the results are negative and the cat is kept indoors, I do not vaccinate or retest for either disease. Is this a good standard of care?

FIV can be transmitted in utero, so testing kittens is important. However, the disease can also be transmitted at virtually any stage of life. Cats that spend most of their lives indoors but are let outdoors on occasion can be exposed to infected cats. Even indoor cats are at risk of infection if they live in multicat households where another cat goes outdoors.

The AAFP recommends that all kittens and young adult cats be vaccinated against FeLV regardless of lifestyle. FIV vaccines should be considered in cats that are at risk for exposure, and this conversation should be held with owners with appropriate consideration given to the positive and negative aspects of vaccination.

Q I cannot remember the last time I diagnosed leptospirosis in a client's dog, so we do not routinely vaccinate for the disease. How do I know if it is in my area?

Leptospirosis is often a challenging diagnosis. While improved diagnostics are in development, serologic testing

is not routinely performed, so it is hard to determine how many of the patients we see that are empirically treated with antibiotics may also be being treated for leptospirosis.

Emerging serovars of leptospirosis are frequently associated with wildlife. Urban wildlife, ranging from rodents to coyotes could be infected and serve as reservoirs.

A risk assessment survey of the owners would reveal lifestyle risks. Any possible exposure to sources of infection should be considered, and dogs deemed to be at risk should be vaccinated yearly against appropriate serovars. All vaccination decisions should be made with input from the pet's owner.

Declining visits

Q I have noticed a drop in feline visits in my hospital—how should I address it?

This is an industry-wide trend and it is due at least in part to the fact that, as a profession, we have not emphasized the need for and value of regular veterinary visits.

Veterinary visits can be stressful for cats and produce anxiety for owners. Cats and cat owners are different from dogs and dog owners. We need to be more sensitive to this and make it easier and less traumatic to take what appears to be a healthy cat to the veterinarian.

We need to emphasize the fact that signs of disease can be subtle and cats hide illnesses well. We need to provide a schedule and a facility that make it easier to comply, and we must demonstrate real value to the pet owner.

Every effort should be made to make feline visits as stress-free and comfortable for both the cat and the cat owner as possible.

Building a relationship as a trusted adviser and not just as a provider of services is increasingly vital as we differentiate our practices from all others and establish ourselves as the go-to sources of accurate information.

Q My clients visit me only when there is a crisis and go to less expensive facilities for vaccines. What should I do?

Unfortunately many pet owners have associated vaccines as the reason they see a veterinarian, and increasingly vaccines have become commodities that are price-sensitive.

We must learn to impart the value of preventive healthcare, which includes vaccination against infectious diseases as one component that rounds out a complete and thorough physical examination, parasite prevention and control, and early detection of disease states. The reality is, we need to increase the value perception of preventive healthcare in general.

Tips for *safe vaccine administration* and *patient care*

Liza T. Rudolph, LVT, CVT, recommends following these tips for vaccinating pets and watching for adverse effects.

The vaccine administration site should be relatively clean to minimize the introduction of bacteria during vaccination. Always follow current vaccination site recommendations as outlined by the American Animal Hospital Association (AAHA) Canine Vaccine Guidelines and the American Association of Feline Practitioners (AAFP) Feline Vaccination Guidelines. To safely administer vaccinations, proper and appropriate restraint of the patient is necessary. For example, if someone accidentally receives a needle stick when a bovine brucellosis vaccine is being administered, medical attention is required since the brucellosis vaccine is live and the disease is considered zoonotic.

It is especially important to administer a vaccine by its intended route. Significant disease can be caused when vaccines are incorrectly administered. An intranasal canine *Bordetella bronchiseptica* vaccine given subcutaneously can result in local inflammatory reactions, abscess formation, liver failure, and death. If a vaccine is administered incorrectly, it is advisable to contact the manufacturer and begin supportive treatment, if warranted.

Patient safety

When developing vaccination protocols for your geographic area, keep in mind that the veterinarian will need to evaluate patient needs on an individual basis. There is not a one-size-fits-all vaccine protocol. An apartment-dwelling dog does not face the same risk factors as a working field trail dog. To clarify usage, vaccines have been broken up into two groups called core

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and noncore. Core vaccines, some of which are required by law, protect against diseases that have public health significance, are highly infectious, and pose risk of severe disease. These vaccines are considered high-benefit and low-risk to the patient population. Administration of noncore vaccines should be based on the risk associated with vaccine administration vs. the individual's risk of contracting the disease.

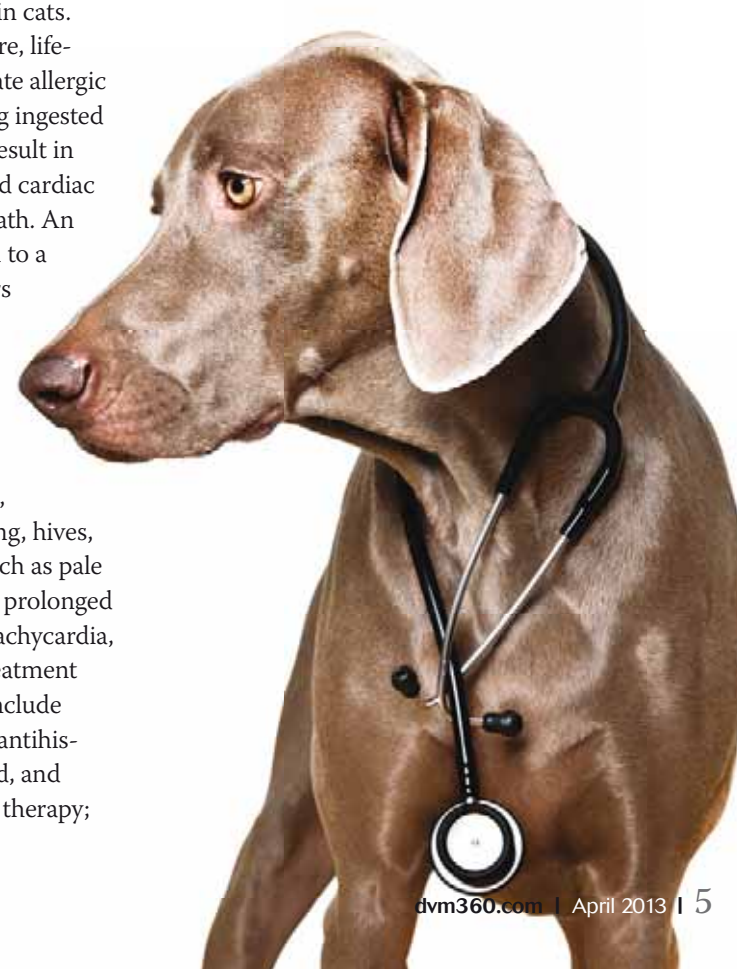
Individual situations may necessitate an altered vaccination protocol. Recent exposure to disease, illness, convalescent illness, fever, local reaction from prior vaccine, medical therapy, age, pregnancy, and whelping are all valid reasons to modify or postpone a planned vaccination. The administration of some modified-live virus vaccines can infect young puppies and kittens (less than 4 to 5 weeks of age), causing development of the disease and death. Vaccinating pregnant females with modified-live virus vaccines can lead to birth defects or abortions. The immune system of any compromised pet will be unable to mount an appropriate immune response to the administered vaccine.

Adverse reactions

Possible adverse events of vaccination include mild reactions such as local inflammation, swelling, pain, irritation, hair loss, abscess formation, or simply a failure to immunize. More severe reactions include anaphylaxis, immunosuppression, autoimmune disorders, transient infections, the development of long-term carrier states, and local development of tumors. After vaccination, patients can commonly experience a mild fever, decreased appetite, or lethargy lasting up to one or two days. The rare vaccine-related outcomes can include hypertrophic osteodystrophy and juvenile cellulitis associated with the modified-live virus distemper vaccine in Weimaraners and vaccine-associated sarcomas in cats.

Anaphylaxis is a rare, life-threatening, immediate allergic reaction to something ingested or injected that can result in shock, respiratory and cardiac failure, coma, and death. An anaphylactic reaction to a vaccine usually occurs within minutes to hours of the vaccination. It may be characterized by the sudden onset of diarrhea, vomiting, seizures, facial swelling, hives, and signs of shock such as pale mucous membranes, prolonged capillary refill time, tachycardia, and hypotension. Treatment of anaphylaxis may include administration of an antihistamine, corticosteroid, and epinephrine; IV fluid therapy; and continued monitoring and observation of the pet.

If a pet has any type of vaccine reaction, make sure to record this in the medical record so that certain vaccines are no longer administered in the future or preventive measures can be taken. The American Veterinary Medical Association (AVMA) encourages the reporting of any adverse events to the vaccine manufacturer and the U.S. Department of Agriculture's Center for Veterinary Biologics (CVB). This will aid in the monitoring and recognition of trends in the adverse effects of vaccination.



Five ways to get veterinary clients on board with your vaccination recommendations

Polish your communication skills and increase client compliance in the exam room with guidelines from Dr. Laura McClain Madsen.

Ask 10 veterinarians about their vaccination protocols and you'll probably get 10 different answers. Whether you're explaining a change of procedure in your own hospital or addressing a client's concern about why your technique differs from another clinic's, here are some tips to help clients see it your way.

1. Drop some big names.

Both the American Animal Hospital Association and the American Association of Feline Practitioners recently published comprehensive vaccination guidelines addressing selection of antigens and frequency of administration. Let your clients know that you are following the recommendations of experts in the field.

2. Be the bearer of good news.

Clients appreciate knowing you've got their best interests and those of their pets in mind. Be enthusiastic about presenting a new vaccination protocol to your clients by saying, "Good news! We don't need to booster Buffy's parvovirus shot this year. That will save you money and save her a needle poke." This way, you'll gain their trust and they'll be more likely to heed your advice.

3. Don't play the blame game.

Even if another veterinarian gives coronavirus vaccine to every animal he sees every year, don't badmouth him. Instead, say something like, "In our experience, that disease isn't a problem in this area. Here's what we recommend."

4. Be on the forefront of veterinary industry trends.

Clients will appreciate your commitment to practicing cutting-edge medicine. Whether you're switching vaccine brands or changing the frequency of boosters, tell them you're following what new research and the most current guidelines dictate. Pet owners want what's best for their pets and they like to hear you do, too.

5. Tailor the protocol to each pet in the household.

Carefully assessing the pet's lifestyle can give clients ownership in the new protocol. Engage clients in a discussion of risk factors during the examination. Does Fifi go to doggy day care or travel with the family? Does Bruno go hunting and could he be exposed to ticks? When clients feel like they're a vital part of their pet's healthcare decisions, they're more likely to follow your professional recommendations.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SHOOT these vaccine tips to clients

Use social media to raise awareness about the importance of vaccination with these tweets and posts.

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Use your smartphone to scan the QR code at left to send your first tweet right now.

Has your #pet had his or her rabies shot? Dogs, cats, ferrets, horses should all be vaccinated! #pethealth #petcare

Over their lifetime, your #pets will be exposed to deadly infectious diseases. Prevent infection through vaccination! #pethealth #petcare

Fact: Most boarding facilities require all dog and cat vaccines be up-to-date. Make sure your pet's are. #pethealth #petcare

Q: How often does my #pet need to be vaccinated? A: We can tell you about state regulations and the best timing of other vaccinations!

Q: What can I expect post-vaccination? A: It's normal for #pets to have a mild fever, little appetite, or be sluggish. Check in with us!

Rabies is 100% preventable and it still kills 55,000 people worldwide every year. Is your pet up-to-date on his or rabies vaccine? Contact us to find out!

For cats, core vaccines may include rabies, panleukopenia virus, herpesvirus, and calicivirus. Does your kitty have all of these covered?

For dogs, core vaccines may include rabies, parvovirus, and adenovirus. Does your doggy have all of these covered?

If you are boarding a pet, the facility may require vaccination against *Bordetella bronchiseptica*, a bacteria that causes a common and highly contagious disease known as kennel cough. We can help!

The virtual eradication of polio in people is just one example of the vital power provided by vaccinations. News flash: Vaccines are just as important in pets! Ask us why—we dare you.

Distracting a puppy
DURING VACCINATION

Wayne L. Hunthausen, DVM, demonstrates how to distract a puppy during an exam and vaccination visit. Plus, get the latest on vaccines for shelter animals.

The goal of puppy vaccination visits is to make them as pleasant as possible—for both the puppy and the client. By using food, toys and other distractions, Dr. Wayne L. Hunthausen demonstrates the best ways to put pups at ease. Scan the QR code here with your smartphone to watch the video now, or log on to **dvm360.com/puppydistraction**.

Audio files on **dvm360**

Kate Hurley, DVM, MPVM, discusses the role of vaccination in controlling canine infectious respiratory disease complex (CIRDC) in shelter dogs. CIRDC is a multifactorial syndrome involving an interaction between viral and bacterial pathogens, immune response, and environmental factors. To listen in, visit **dvm360.com/cirdc**.

Catherine Mullin, VMD, MS, describes protocols for vaccinating shelter animals to prevent canine parvovirus infection and feline panleukopenia. Visit **dvm360.com/sheltervaccinate** to hear more.

To download these free handouts for your clients, visit dvm360.com/vaccinationtoolkit.

What you need to know *about vaccines*

Give your clients need-to-know facts about a vital part of their pet's well-being.

Preventive medicine is a critical component in any pet's healthcare plan—and vaccinations are at the top of the list in terms of importance.

This client handout gives a general overview of recommended vaccines for dogs and cats, as well as potential side effects. Send it home with clients, making any pet-specific notes or recommendations in the margins.

The virtual eradication of polio in people is an example of the vital power of vaccinations. And they are just as important in pets.

Information from your veterinarian

What you should know about vaccines in your pets

The virtual eradication of polio in people is just one example of the vital power provided by vaccinations. And vaccinations are just as important in pets. Throughout their lives, your pets will likely be exposed to several infectious diseases that can cause severe illness or even death. But if you've taken steps to prevent infection through vaccination, you will greatly extend the life of your pets.

Which vaccines should my pet receive?

The veterinarian will recommend several core vaccines that all pets should receive in order to maintain their health and prevent serious disease. For dogs, these vaccines may include rabies, parvovirus, adenovirus, and distemper. For cats, core vaccinations may include rabies, panleukopenia virus, herpesvirus, and calicivirus. If you are boarding a pet, the facility may require vaccination against *Bordetella bronchiseptica*, a bacteria that causes a common and highly contagious disease known as kennel cough. The veterinarian may recommend other vaccines as well, depending on where you live, your pet's lifestyle and level of health, and the risk of your pet passing on disease to other pets or even you.

What should I be on the lookout for after my pet has been vaccinated?

Vaccines can cause side effects, but they are very mild in most cases. Your pet may experience a mild fever, have a decreased appetite, or be a bit sluggish for a day or two after the vaccination. In addition, you may note slight swelling or pain at the vaccination site. These are all normal reactions and do not require medical attention.

However, rarely, more severe reactions to vaccination can occur that may result in swelling in the face or limbs, generalized itching, difficulty breathing, vomiting, diarrhea, or collapse. If any of these more serious signs develop or you are concerned about any reaction in your pet, don't hesitate to contact the veterinary clinic immediately to schedule an appointment.

How often does my pet need to be vaccinated?

The frequency of vaccination will vary depending on where you live. For example, some states require a rabies vaccine once a year in all dogs and cats, while other states may allow less frequent rabies vaccination. The veterinarian can inform you about your state's regulations and the best timing of other vaccinations as well.

Imagezoo/Getty Images

PROBE for pet's history & lifestyle

Get the information you need in order to make informed decisions about a pet's vaccination protocol.

Vaccine information form

Client's name_____ **Pet's name**_____
Pet's age _____ **Species and breed**_____
Date _____

Please check the appropriate box for your pet's lifestyle. We will use this information to create an appropriate vaccination program for your pet.

Where does your pet spend its time?

☐ Indoors only ☐ Indoors sometimes and outdoors sometimes ☐ Outdoors only

What are the approximate dates of your pet's most recent vaccinations?

Disease	Date
_____	_____
_____	_____
_____	_____
_____	_____

Where did your pet come from?

☐ Stray ☐ Shelter ☐ Private home ☐ Rescue organization ☐ Breeder ☐ Other _____

How often do you board your pet or take it to a groomer?

☐ Never ☐ Once a year or less ☐ One to three times a year ☐ Four times a year or more

How often do you walk your pet in the neighborhood or a pet park?

☐ Never ☐ Once a week or less ☐ Several times a week ☐ Daily

How many other pets ae in your home?

☐ None ☐ One ☐ Two ☐ Three ☐ More than three

Please list your other pets' names and ages.

Dogs	Cats	Other
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

Vaccinations recommended for your pet:

Disease	Accept	Decline
_____	☐	☐
_____	☐	☐
_____	☐	☐
_____	☐	☐
_____	☐	☐
_____	☐	☐

I understand these recommendations as explained by my veterinarian or pet healthcare team member.

Date:

Every pet is different and as such, every vaccination protocol should be custom-tailored to each pet's individual needs, too.

Use this form to gather pertinent information about a pet's lifestyle and vaccination history, and refer back to it as you discuss your specific recommendations with clients.

SAMPLE SCRIPT

Make a CASE for vaccinations

Tired of your veterinary clients' excuses when it comes to vaccinations? Here are a few examples you might hear, with the bad (and better) ways to state your case.

Client	You
"My little old Fluffy never goes outside. Why does she need a rabies vaccine?"	**BAD:** Well, it's a core vaccine, so she should get it. *Clients probably don't understand the difference between core and non-core vaccines. Instead of confusing them with this language, give them the facts in an easy-to-understand, relatable way.* **BETTER:** I've certainly considered Fluffy's age and lifestyle in making my recommendations today. But rabies is a fatal viral disease that affects many species, including humans. If Fluffy bit a person or another animal, there could be legal ramifications, and I'd hate to see that happen. By following the state and local regulations for rabies vaccinations, we're protecting Fluffy—and you.
"I've had pets my whole life and never had a problem. Why do I need to vaccinate my Rufus?"	**BAD:** All pets need vaccines—the vaccination guidelines say so. *Although you and your staff understand the value of following vaccination guidelines, chances are, your clients would respond better to a more personalized recommendation. Let them know you've given careful consideration to their pet's age, lifestyle, and medical history to formulate an individualized vaccination protocol that's just right for their pet.* **BETTER:** There are certain vaccinations that are standard in preventing major infectious—and often fatal—diseases. But there are others that might not be as necessary for your pet. Let's talk about your dog's lifestyle and history in order to come up with the best plan.
"I don't want to vaccinate my Bella. I've heard too many horror stories about bad reactions."	**BAD:** Oh, I'm sure that won't be a problem today. *Adverse reactions to vaccines can happen but most are rare and of little significance in otherwise healthy pets. Calm your clients' nerves, but also help them understand that the benefits of vaccinating far outweigh the risks of disease.* **BETTER:** I understand your concerns, but most pets do very well after getting vaccines. We'll talk about some common side effects that you may see today, but anything more than that is very rare. Plus, by having Bella vaccinated, you're protecting her from much more serious diseases that she's otherwise susceptible to.

Structure meetings *for success*

Use this guide to create vaccination standards of care.

1 Review.

Read up on the guidelines published by the American Animal Hospital Association (AAHA) and the American Association of Feline Practitioners (AAFP) and decide how they mesh with your current standards of care. Get a comprehensive list at **dvm360.com/vetguidelines**.

2 Doctors' meeting.

Meet to review your standards of care—a vaccinations standard of care is crucial. If doctors disagree, the staff is working with a hand tied behind their back. Staff need to say, "We believe in this." If you're the doctor who wants a change, bring in supporting information. Once you've got a consensus, put it in writing (that means printed documents in binders for easy access).

3 Team meeting.

Vaccination is a part of wellness care. Since the team is the main purveyor of wellness care, practitioners should first focus on education. Just knowing what the standards are isn't enough; your team needs to know why you believe these are the right standards for your patients. Explain that while the AAFP and AAHA publish guidelines, it's not that easy to make a blanket recommendation for all pets. Have the team use a risk assessment form **(see page 14)** then review the client's responses and add to the existing knowledge base about that client and pet.

4 Role-play and change the conversation.

Have two team members act out a scenario between a client and staff member. Consider this: The AAHA/AAFP guidelines are for "healthy" animals and many pets are less than healthy. The "client" has a senior-age pet that may have a diminished response to vaccination due to age-related suppression of the immune system. Have the staff member explain the diminished response to vaccination, reduced duration of immunity, and have her give this example from the human medicine side: Flu epidemics are countered by recommending vaccinations for the young, old and immune-compromised.

Changing client behavior requires the entire practice team. Luckily, most clients consider vaccines to be the most important reason to visit the veterinarian. The next time you introduce yourself as a veterinarian, listen closely to the comments: "Oh, I just took my dog to get his shots!" The majority of the public still places value on vaccinations. Now, the challenge is using that vaccination visit to educate clients on the other important services veterinarians have to offer.

To download a PDF version of this checklist, "Patient history and lifestyle evaluation," simply visit **dvm360.com/riskassessment**.

Tweet topic

Tell Dr. Mike Paul @mikepauldvm how his risk assessment tool helped pets in your practice.

Patient RISK *assessment* tool

General risk assesment begins with a complete history and lifestyle evaluation. Dr. Mike Paul created this exclusive tool to help your practice assess patients with ease.

1. Age, breed, sex

2. Geography

> Where does the owner currently live?
> Where else has the pet lived?
> Does the owner travel frequently or take vacations with their pets?

3. Are there other pets living with the family?

This question provides information about other animals that may need veterinary services, animals as sources of disease, or social interactions that could impact the pet being evaluated.

4. Identify family members

> Children and infants
> Adults and seniors

5. Does the pet live with people who have an impaired immune system?

CDC estimates that 50% of the population have conditions that impair their immune system, rendering them susceptible to diseases of animals.

6. Where does the pet sleep?

This tells you about potential disease transmission, behavioral issues, and gives you an idea of the status of the pet in the family.

7. Indoors or outdoors?

Many people answer based on where the pet sleeps. Ask open-ended questions: Where is the pet's bed? When was the pet last outdoors?

8. When outdoors, is the pet:

> Free to run and explore?
> Confined to the yard or an exercise pen?
> Only allowed outdoors on a leash?

9. Is the pet exposed to dogs and cats other than the client's pets in any of these locations:

> Back yard or dog park
> Grooming facility or boarding kennel
> Puppy or kitten obedience class or socialization session
> Dog or cat show

10. When was the pet last vaccinated?

The veterinarian will determine the most appropriate frequency for revaccination. Based on the lifestyle and risk of exposure, additional vaccines may be needed .

> Canine core vaccines: Canine distemper, canine adenovirus, canine parvovirus, and rabies
> Feline core vaccines: Feline panleukopenia, feline herpesvirus, feline calicivirus, and rabies.
> FeLV vaccine is recommended in kittens.

The next step

Vaccines are one of the most critical components of any pet's preventive wellness plan, and it's important that pet owners know it. Follow these steps to make sure your veterinary team is prepared to promote wellness and stress the value of vaccinations.

1. Make a game plan. Do your vaccination standards of care need a careful review and update? Does your team need a refresher about why you recommend certain vaccines? It's easier than you think to get started. **Head over to page 13 for a meeting guide** to use as you prepare .

2. Get the answers you need. Now that your staff is up-to-date on vaccinations, it's time to put your efforts into action—with clients. Pet owners want to know that their pet's wellness plan is custom-tailored just for them, so make sure it is by asking the right questions and developing a vaccination protocol that's perfect for their pet's needs. The **Patient Risk Assessment Tool on page 14** is a great place to start gathering your information.

3. Be ready for resistance. From clients—not the diseases. No matter how prepared you and your staff are to pitch preventive care and vaccinations to your clients, you're bound to face some reluctance. **Turn to the tips on page 6** to fine-tune your communication skills when making vaccination recommendations.

4. Have fun with it. Make promoting patient wellness and preventive medicine fun for your team *and* your clients. Spread your message about the importance of vaccinations on social media channels like Twitter and Facebook. Pet owners will appreciate the helpful information and are sure to keep following your clinic for more. The ready-to-use **tweets and posts on page 8** will get you started.

One more tip

Charting adverse reactions to vaccines

"We keep a chart that lists incidents of adverse reaction to vaccinations," says Pam D'Esopo, a practice manager from Dedham, Mass.

She explains that they note the date; the patient's name; which vaccine was given, including the manufacturer and serial number; and the reaction signs. They also put a check mark next to the patient's name once they've notified the manufacturer of the reaction.

While reactions are rare, they do happen, and this record will be helpful in the event of a vaccine recall.

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[1]2007 Technical bulletin: Canine Leptospirosis: Overview, recent developments, and new vaccination options. Data on file, Study Report No. 3457R-60-03-204, Zoetis Inc. (field safety)

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A challenging case

Painful periocular swelling *in a cat*

An ophthalmic examination provides valuable clues for diagnosing an uncommon disorder with mostly nonspecific clinical signs.

By Renee T. Carter, DVM, DACVP; Melissa Kubai, DVM; J. Daniel Rodriguez, MVZ Esp, DACVR; Aradhana Gupta, DVM, MVSc, DACVP; and Angela B. Royal, DVM, MS, DACVP

A 4-year-old 10.1-lb (4.6-kg) spayed female domestic shorthaired cat was presented to the Louisiana State University School of Veterinary Medicine Veterinary Teaching Hospital for evaluation of painful periocular swelling of both eyes of about one month's duration.

HISTORY

The cat was kept indoors but was allowed to go outside. The cat was current on vaccinations and had no travel history outside of Louisiana. The results of feline leukemia virus and feline immunodeficiency virus testing performed before referral were negative.

Previous therapies used to treat the swelling included administering an injectable long-acting corticosteroid, a topical triple antibiotic, and oral clindamycin. After an initial improvement in clinical signs, the ocular signs quickly returned and were unresponsive to oral cefadroxil therapy.

EXAMINATIONS

On physical examination, the cat's temperature, pulse, respiratory rate, and body condition score were normal.

An ophthalmic examination revealed periocular soft tissue swelling, epiphora, and exophthalmia with decreased retropulsion of both eyes.

Vital Stats

Signalment

> 4-year-old 10.1-lb (4.6-kg) spayed female domestic shorthaired cat

History and presenting complaint

> Periocular swelling of both eyes of about one month's duration
> Previous therapies included treatment with a long-acting corticosteroid, topical triple antibiotic, and oral clindamycin, and then oral cefadroxil

Initial ophthalmic examination findings

> **Both eyes:** periocular soft tissue swelling, epiphora, and exophthalmia with decreased retropulsion
> **Left eye:** a lack of menace response, a markedly reduced palpebral reflex, marked central exposure keratitis, a superficial corneal ulcer, no active ocular motility, lateral strabismus, a marked amount of conjunctival thickening and hyperemia, and slow and incomplete pupillary light reflexes
> **Right eye:** moderate conjunctival hyperemia and chemosis

>>>1. A 4-year-old cat evaluated for painful periocular swelling in both eyes. Note the marked periocular tissue swelling present in the left eye. Epiphora and elevated third eyelids are present in both eyes. Central corneal changes are evident in the left eye and correspond to the area of exposure keratitis secondary to lagophthalmos.

These findings were most pronounced in the left eye (*Figure 1*). A lack of menace response in the left eye was noted along with a markedly reduced palpebral reflex, which had resulted in significant central exposure keratitis and the development of a superficial corneal ulcer.

No active ocular motility could be elicited from the globe, and lateral strabismus was noted. There was a marked amount of conjunctival thickening and hyperemia of the left eye. Moderate conjunctival hyperemia and chemosis were noted in the right eye. Intraocular pressures measured by applanation tonometry (TonoPen XL—Reichert Technologies) were 19 mm Hg for the right eye and 35 mm Hg for the left eye. Pupillary light reflexes were slow and incomplete in the left eye and were normal in the right eye.

On slit-lamp examination, diffuse corneal edema and keratic precipitates were noted in both eyes. Additionally, marked aqueous flare was noted bilaterally along with pars planitis in the right eye and rubeosis iridis and posterior synechia in both eyes. Pigment deposition and inflammatory changes affecting the anterior lens capsule were noted bilaterally. An inferior bullous retinal detachment was noted in the right eye. Fundic examination of the left eye was limited because of the anterior segment changes.

DIFFERENTIAL DIAGNOSES

Differential diagnoses for bilateral ocular and orbital disease in this case included infectious causes such as systemic fungal disease (cryptococcosis, aspergillosis, blastomycosis, penicilliosis, histoplasmosis)[1-9] or aerobic or anaerobic bacteria,[10,11] neoplastic processes (lymphosarcoma, squamous cell carcinoma, osteoma, osteosarcoma, fibrosarcoma),[10,12,13] and primary inflammatory disorders (eosinophilic, pseudotumor).[11,14,15]

DIAGNOSTIC TESTS

Because of the patient's fractious nature, the cat was placed under general anesthesia and intubated to allow maintenance of anesthesia with isoflurane while a complete blood count (CBC), a serum chemistry profile, thoracic radiography, and orbital and ocular ultrasonography and aspiration were performed. A temporary tarsorrhaphy of the left eye was also performed to provide corneal protection.

CBC and serum chemistry profile

The only significant abnormalities noted were hyperproteinemia (8.2 g/dl; reference range = 6 to 7.5 g/dl) and a mild mature neutrophilia (15.4 x 10^3/µl; reference range = 2.5 to 12.5 x 10^3/µl), which were both attributed to inflammation.

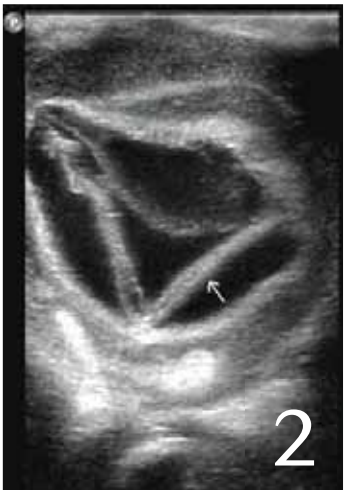
Thoracic radiography

Thoracic radiography showed a pneumomediastinum with extension into the retroperitoneum, likely induced by barotrauma. Barotrauma most commonly occurs as a complication of mechanical ventilation and results in extra-alveolar air accumulation.

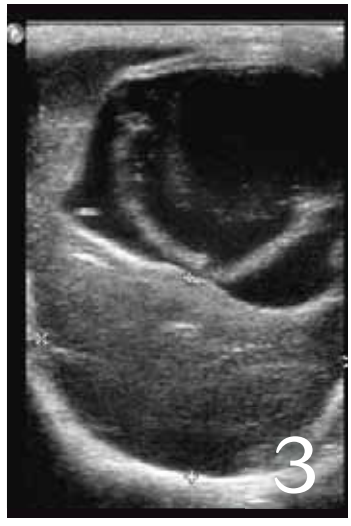
On follow-up radiography, no pulmonary parenchymal abnormalities were found, the pneumomediastinum had resolved, and thoracic radiography results were considered normal.

Ultrasonography

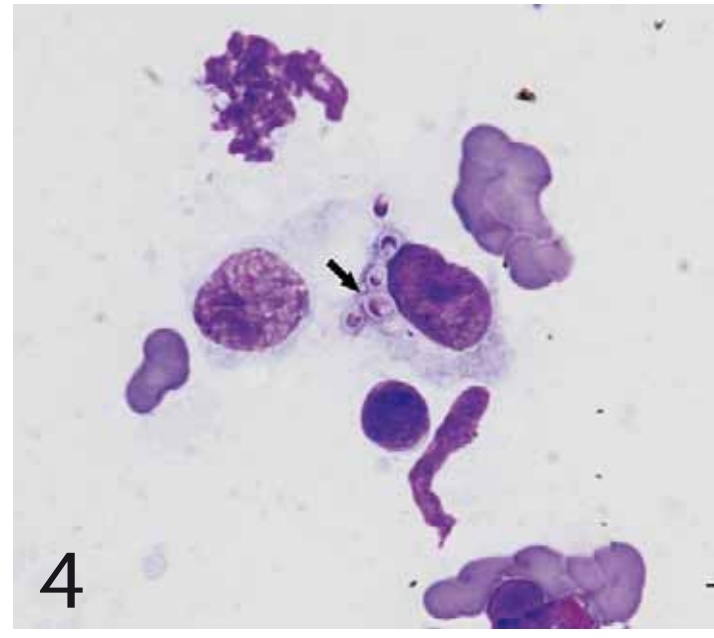
Ocular ultrasonography confirmed a partial retinal detachment in the right eye. A diffusely thickened and completely detached retina was identified



>>>2. A dorsal oblique plane ultrasonographic image of the left globe showing a diffusely thickened and completely detached retina.



>>>3. A dorsal plane ultrasonographic image of the homogenous left retrobulbar mass displacing the sclera.



>>>4. Cytologic examination findings from the fine-needle aspiration of the left retrobulbar mass seen in Figure 3. Note the macrophage with phagocytosed *Histoplasma capsulatum* yeast; rare, small, mature lymphocytes; and aggregates of erythrocytes (Diff-Quik—Dade Behring; bar = 20 µm).

in the left eye (*Figure 2*).

Orbital ultrasonography results showed a homogenous retrobulbar mass, measuring 2.2 x 1.5 cm, deforming the posterior sclera on the left side (*Figure 3*). A similar but smaller (1.9 x 0.8 cm) homogenous mass was noted in the right orbit. Fine-needle aspiration of the left retrobulbar mass was performed for cytologic examination.

Cytology

Moderate numbers of adequately preserved nucleated cells with mild-to-moderate blood contamination were noted (*Figure 4*). Moderate numbers of small, mature lymphocytes; a few slightly vacuolated macrophages; and a few nondegenerate neutrophils were present. Low numbers of small (2 or 3 µm long and 1 or 2 µm wide), round-to-oval yeast were present both extracellularly and phagocytosed by the macrophages. These yeast were surrounded by a thin clear halo and contained a small, eccentrically located, crescent-shaped purple nucleus.

The cytologic interpretation was granulomatous inflammation with intracellular *Histoplasma capsulatum* organisms.

DEFINITIVE DIAGNOSIS

Based on the results of the examinations and diagnostic tests, panuveitis, secondary glaucoma, retinal detachment, and retrobulbar granuloma of both eyes secondary to systemic histoplasmosis were diagnosed.

TREATMENT AND PATIENT OUTCOME

Antifungal therapy with itraconazole was initiated at 5 mg/kg given orally twice a day, and the topical carbonic anhydrase inhibitor dorzolamide was initiated three times a day to control the intraocular pressure in both eyes. Additionally, the eyes were treated with the topical nonsteroidal anti-inflammatory diclofenac three times a day. The left eye was treated with topical ciprofloxacin three times a day to prevent infection of the

corneal ulcer. Clinical signs were found to gradually improve over the following four weeks.

Unfortunately, owner compliance in this case was poor, and a relapse of clinical signs occurred after the owner discontinued medical therapy several months later. On subsequent examination, the patient had developed right forelimb lameness and joint effusion. Radiography of the forelimb showed lytic bony changes of the distal humerus and proximal radius and ulna. *Histoplasma capsulatum* organisms were identified by cytologic examination of aspirated joint fluid. Ultimately, because of the severity of changes in the left eye, enucleation was recommended and performed by the referring veterinarian. Antifungal therapy was reinstituted, and the patient continues to be monitored.

Histoplasmosis is often diagnosed between January and April, presumably because of the increased moisture in the soil during this time.

DISCUSSION

Histoplasmosis is a systemic mycotic infection caused by *H. capsulatum*, a dimorphic, saprophytic fungus that prefers nitrogen-rich soil and a humid environment.[5,6] Geographic distribution is primarily reported for temperate and subtropical regions. In the United States, cases are most commonly reported in regions of the Ohio, Missouri, and Mississippi river valleys.[7-9] Histoplasmosis is often diagnosed between January and April, presumably because of the increased moisture in the soil during this time.[16] Although an uncommon disorder, histoplasmosis is the second most common fungal infection reported in cats.[16]

Typical histoplasmosis is the result of inhaling fungal spores (microconidia) that originate from the mycelial phase of the fungus. At body temperature, these

spores convert to yeast and are subsequently phagocytized by pulmonary macrophages.[7,17] The organism undergoes intracellular replication in reticuloendothelial cells and may then become disseminated throughout the body through lymphatic and hematogenous routes.[9,18] This dissemination results in clinical disease that can affect the lungs, liver, spleen, choroid, lymph nodes, intestinal mucosa, bone marrow, adrenal glands, bones, and skin, producing a variety of clinical signs.[7,9]

Clinical signs and ocular findings

In most cases, cats with the disseminated form of histoplasmosis have a nonspecific constellation of signs including weight loss, weakness, dehydration, depression, fever, anorexia, and anemia.[16,18-21] The incidence of respiratory signs (dyspnea, tachypnea, coughing) ranges from 39% to 45%.[16,20]

Ocular abnormalities were reported in 24% of cases in one study.[16] The most common ocular abnormalities in patients with disseminated histoplasmosis included granulomatous chorioretinitis, anterior uveitis, and retinal detachment.[6,9] In one retrospective study in which 20 cats with histoplasmosis received an ophthalmic examination, retinal detachments were noted in 25%.[20] Granulomatous blepharitis and optic neuritis have also been reported.[17,19] To our knowledge, this case is the first with bilateral retrobulbar granulomas secondary to systemic histoplasmosis.

Diagnosis

Diagnosing this condition can be challenging since serologic tests for *H. capsulatum* antigen often yield false negative results in patients with active disease.[7,19] Thus, identification of the organism on cytologic preparations is the most likely way to obtain a rapid definitive diagnosis.[5]

Although ocular aspiration was not performed in this case to confirm the organisms within the eye, it has been reported that in cats with systemic mycoses, intraocular inflammation is caused by the organism within the eye and not as a result of a systemic inflammatory response.[9]

Recently, urine antigen testing (MVista—MiraVista Diagnostics) has become an important tool in the diagnosis of histoplasmosis. The sensitivity of this test has been reported as 94% for the detection of antigen in the urine of affected cats.[22]

Treatment

The highest reported success rate for the treatment of histoplasmosis has been with itraconazole (5 mg/kg orally twice a day).[21,23] However, the administration of a combination of amphotericin B and ketoconazole has also been successful.[19] Systemic antifungal agents should be administered until clinical signs resolve. Protracted therapy is often required.

Monitoring serial antigen concentrations will help you evaluate a patient's response to therapy and determine for how long the therapy should be continued.[24] In one study, only 55% of cats survived to discharge; the median duration of treatment for these cats was five months.[20]

It can be difficult to clear infectious organisms from within the eye, and the eye may serve as a future nidus of infection even after protracted systemic antifungal therapy. Cases with ocular involvement are considered to have disseminated disease, which is associated with a poor-to-guarded prognosis.

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See brief summary on page 186.

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Consider systemic fungal infections in cats with systemic illness, especially when ocular findings are present.

Nonspecific therapy for secondary ocular signs is also necessary. Topical anti-inflammatory agents are aggressively given to reduce anterior uveitis. Topical corticosteroids (1% prednisolone acetate, 0.1% dexamethasone) may be administered in cats without corneal ulceration. For cats with corneal ulceration, administering a topical nonsteroidal anti-inflammatory agent, such as 0.03% flurbiprofen or 0.1% diclofenac, until the corneal ulcer is resolved is recommended. Topical anti-inflammatory agents are not effective for treating posterior uveitis, so when not contraindicated, a systemic anti-inflammatory agent should also be administered.

Administering a topical cycloplegic (*e.g.* 1% atropine) is also recommended to reduce ocular pain and the incidence of posterior synechiae; however, this drug is contraindicated in patients with secondary glaucoma. In this case, intraocular pressure values were elevated in the left eye and within established reference ranges in the right eye.[25] However, given the degree of uveitis seen on examination, intraocular pressure values were considered inappropriate, and therapy with a topical carbonic anhydrase inhibitor (2% dorzolamide) was instituted three times daily in both eyes.

CONCLUSION

Consider systemic fungal infections in cats with systemic illness, especially when ocular findings are present. Ophthalmic examination results can help you diagnose systemic mycosis as there is often involvement of the uveal tract.[9] Ongoing evaluation of ocular involvement is an important component in managing cats with systemic mycosis. VM

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COMPULSIVE DISORDERS

Have you considered GI involvement?

THINKSTOCK

New research stresses the need to explore a medical component to what you might think is solely a behavior problem—in this case, an underlying gastrointestinal condition as the cause of excessive licking and fly biting.

By Kelly Ballantyne, DVM, and John Ciribassi, DVM, DACVB

Behavior consultations are commonly sought for dogs exhibiting bizarre repetitive behaviors. Examples of repetitive behaviors observed in dogs include flank sucking, fly biting, light chasing, spinning, tail chasing, hind end checking, self licking, and licking of surfaces.

These behaviors may be compulsive disorders, which are described as repetitive, ritualistic behaviors that are performed in excess of what is required for normal function and that interfere with normal daily activities.[1] Compulsive behaviors are often initially associated with conflict or frustration and are later displayed out of context in other situations of high arousal.[2] They can occupy a large percentage of a dog's daily time and adversely affect quality of life.

Treatment for compulsive disorders has mostly centered on the use of serotonin reuptake inhibitors, such as clomipramine (a tricyclic antidepressant), as well as behavior modification strategies to interrupt and redirect the problem behavior to a more appropriate activity.

However, before you begin treatment, a thorough history and medical evaluation are essential. It is especially important to rule out any medical disorders that can be a primary or contributing cause of repetitive behaviors. For example, two recent studies have shown that in the case of oral repetitive behaviors, an underlying gastrointestinal (GI) problem may be present.

A POSSIBLE GI TIE

Two studies by a group of researchers at the University of Montréal Veterinary Teaching Hospital have investigated medical causes for excessive licking of surfaces and fly biting in dogs.[3,4] This research suggests that at least some of these cases are related to medical issues causing nausea or discomfort, thus triggering the odd oral behaviors.

Excessive licking study

In a prospective clinical study by this group of researchers, 19 dogs that displayed excessive licking of surfaces were compared with a control group of 10 healthy dogs.[3]

Complete medical and behavioral histories were collected for all dogs, and they all underwent physical and neurologic examinations. Each dog then underwent a thorough diagnostic evaluation that included an abdominal ultrasonographic examination, an endoscopic examination, and biopsies of the stomach and proximal duodenum.

For those dogs that licked, the mean duration of the lick-

Between patients? An article synopsis

Two studies have identified gastrointestinal problems in dogs exhibiting excessive licking of surfaces and fly biting behavior. Once the underlying GI problems were treated, the compulsive behavior in these dogs abated significantly. These findings underscore the need to always evaluate a patient with behavior problems for medical conditions before concluding the issue is strictly behavioral in nature. Specifically for animals exhibiting oral repetitive behaviors, evaluate the GI system.

Case example: Charlie, the snapping poodle

Charlie, a 3-year-old 60-lb neutered male standard poodle, had begun snapping at imaginary items in the air about five months after he had been adopted from a rescue group. The behavior often occurred in conjunction with Charlie's stopping, freezing, and staring as if into space. However, the snapping behavior also occurred separately from this freezing and staring activity. Charlie was also reported to have intermittent soft stools. Treatment with potassium bromide for a possible seizure disorder did not improve the snapping or freezing behavior.

A standard diagnostic work-up—including a physical examination, complete blood count, serum chemistry profile, urinalysis, and fecal floatation—showed no abnormalities. Further work-up, including abdominal radiography and ultrasonography as well as an endoscopic examination to collect gastric and duodenal biopsy samples, was pursued. The results of these tests supported a diagnosis of lymphocytic-plasmacytic enteritis, and treatment with a hypoallergenic diet and metronidazole was instituted. Within a few weeks, the frequency of the fly snapping had diminished, and it had mostly discontinued by about two to three months after therapy began.

ing behavior was 32 months, and 16 of the 19 dogs licked daily. The medical evaluation revealed that 14 of the 19 licking dogs had GI abnormalities, which included lymphocytic-plasmacytic infiltration, chronic pancreatitis, and, in one dog, a gastric foreign body.

Treatment of only the underlying GI disorder resulted in significant improvement in a majority of dogs in the licking group. While no GI disorder was identified in five of the 19 dogs in the licking group, four of these five improved with use of a hypoallergenic diet plus antacid or antiemetic medication.

Fly biting study

The same group of researchers also published a prospective case series that evaluated seven dogs that were presented with a history of daily fly biting behavior.[4] The authors defined *fly biting* as a syndrome in which a dog appears to be staring at something and suddenly snaps at it.

Each dog in this case series had complete medical and behavioral histories collected in addition to undergoing physical and neurologic examinations. All the dogs were filmed during the behavioral assessment and for two hours after a meal to evaluate characteristics of the fly biting behavior. A complete blood count, serum chemistry profile, and urinalysis were performed in all dogs, and if there was a history of GI signs, a complete GI evaluation was performed. The behavioral histories of these dogs revealed that the fly biting behavior had been present from six days to four years before the study and that the behavior occurrence ranged from once daily to once every hour.

The video analyses revealed that all dogs raised their heads and extended their necks before fly biting, which may suggest esophageal discomfort. All dogs in this case series were diagnosed with a GI abnormality, and one dog was also diagnosed with Chiari malformation (a mismatch in volume between the caudal brain structures and the caudal skull associated with herniation of the cerebellum through the foramen magnum[5]).

Six of the seven dogs responded to medical treatment alone, four with complete reso-

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lution of the fly biting behavior. No psychoactive medications were administered concurrently with treatment of the medical issues.

WHAT'S THE TAKE-HOME?

Both studies reveal that GI disease can cause the repetitive behaviors of excessive licking of surfaces or fly biting and that these behaviors were significantly reduced with appropriate medical therapy for the GI issues. Future studies evaluating medical disorders in dogs with repetitive behaviors such as spinning or tail-chasing would also be worthwhile.

However, the take-home message here is not that compulsive disorders with a primary behavioral etiology do not exist. Rather, the key is recognizing that not all compulsive behaviors are strictly behavioral. All dogs with oral repetitive behaviors should undergo a complete medical work-up to rule out GI disease before evaluation for behavioral disorders (*see "Case example: Charlie, the snapping poodle" on page 190*).

If you are presented with a patient with a repetitive behavior, the questionnaire on page 193 can be provided to the owner, to be completed either before or at the time of the appointment. Instruct the owner to bring a video of the pet's behavior to the appointment if possible.

The medical evaluation should include a thorough physical and neurologic examination and assessment of a complete blood count, serum chemistry profile, and urinalysis to rule out metabolic, dermatologic, orthopedic, and neurologic abnormalities.

Based on the findings of the two studies above, if the patient is a dog presenting with oral repetitive behaviors, a thorough GI workup is also indicated. Additional diagnostics to include in this situation are fecal floatation, preprandial and postprandial serum bile acid measurement, canine pancreatic lipase immunoreactivity (cPLI), abdominal ultrasonography, and endoscopy with biopsy.

Depending on the diagnosis, therapy may include a hypoallergenic diet, antibiotics, corticosteriods, antiemetics, antacids, and anthelmintic drugs. As when dealing with any set of signs in a veterinary patient, establishing a list of differential diagnoses and then allowing diagnostic tests to sort out the true etiology is always warranted before beginning therapy. However, if a thorough work-up is not possible, nonspecific treatment with antacid therapy and a hypoallergenic diet may be beneficial. VM

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Questionnaire for **patients** exhibiting

repetitive behaviors

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1. What is the behavior problem (*e.g.* snapping at the air, spinning, tail chasing, staring, excessive licking)?

_____

2. When does this behavior occur?

_____

3. How often does the behavior occur (*e.g.* multiple times a day, once a day, once a week, once a month)?

_____

4. How long does each episode of the behavior last?

_____

5. Are there any events or interactions that appear to trigger the behavior? If so, please describe:

_____

_____

_____

6. Can you interrupt the behavior?

_____

7. Does the behavior interfere with your pet's daily activities such as eating, playing, or sleeping?

_____

8. What has been done so far to manage or treat the behavior problem?

_____

_____

If your dog displays oral repetitive behaviors, such as excessive licking or air snapping, please also answer the following questions:

If your dog snaps at the air, does he or she extend the head and neck before snapping at the air? _____

Does the behavior occur around meal times? If so, when? _____

Does your dog vomit or regurgitate. If so, how frequently? _____

Does your dog have soft stools or diarrhea? _____

Would you consider your dog's appetite decreased, normal, or increased?

_____

What does your dog eat? Please list both food and treats (brand and flavor). _____

_____

_____

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Never lose control

Most veterinarians have an interest in, and a fondness for, animals. These qualities are usually important factors in the choice of veterinary medicine as a profession. But stress, fatigue, and irritability sometimes cause veterinarians to lose their tempers. Under such circumstances, some doctors have been known to mistreat patients.

A few years ago, several of our staff complained about a young doctor who, when provoked, would become enraged and would roughly handle certain patients—even striking one. These temper tantrums were elicited when the animal's owner was not present. This meant that, when inhibited by the owner's presence, the doctor could conceal his anger. Thus, I reasoned that he could learn to swallow his anger in the owner's absence. This doctor was intelligent, capable, well-trained, personable, conscientious, and usually composed.

Stress, fatigue, and irritability sometimes cause veterinarians to lose their tempers.

I called him into my office and told him that some of our technicians and aides had reported his outbursts and abuse of our patients. He regretfully admitted to losing his temper at times and venting his ire on the patient he was treating.

This is what I told him: "There are five reasons why a veterinarian cannot abuse a patient.

"First, it is illegal. It's against the law to mistreat an animal, and if the owner could prove it, he or she could bring criminal charges against you.

"Second, it is immoral. People leave pets in this hospital under the justifiable assumption that the animals will be treated with compassion, skill, and understanding. To do otherwise is to betray their trust.

"Third, by mistreating a patient you reduce your effectiveness as a member of this practice and alienate our staff. This has already happened. Our assistants and technicians are animal-oriented people. To see a doctor abuse a patient antagonizes them. They lose respect for that doctor, and our efficiency suffers.

"Fourth, you damage yourself. Life is full of frustrations. To take them out on an animal, a child, or any other scapegoat is cowardly. If we displayed such hostility to an adult, we would probably be sued or arrested, or perhaps punched in the mouth. Thus, most of us learn to suppress tantrums and control our temper when dealing with adults. To lose control and abuse a child or an animal is a sign of immaturity and a lack of integrity. It cannot help but damage one's self-respect.

"Last, this must not happen for a very simple reason: We will not tolerate it! Do you understand?"

The veterinarian nodded, and then discussed the frustrations that had motivated his displays of temper. He thanked me for discussing the problem and for calmly and reasonably handling the situation.

Years later we met, and after exchanging pleasantries, he asked if I remembered the incident. Of course, I had. He then told me he had taken my criticism to heart, explored his feelings, and had been able to avoid future displays of temper, not only with patients but with owners as well. He thanked me for the advice that had so affected his life.

Editors' note: This column originally appeared in *Veterinary Medicine & Small Animal Clinician*.

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