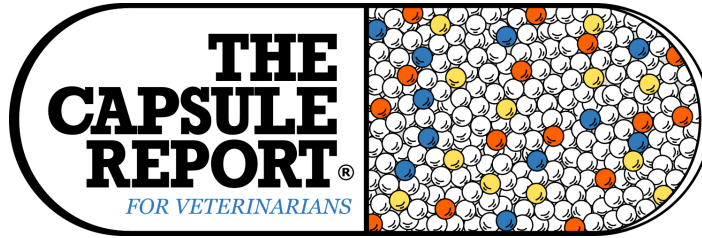


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Volume 36 Number 2

May 2017

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### Approach to a partial CCL tear

Once this surgeon becomes comfortable with a tentative diagnosis of a partial CCL, surgical reconstruction is pursued as soon as possible. Which reconstructive procedure to use is based on discussions with the client preoperatively to determine what is best for their needs and their pet's well-being. Medically managing a partial CCL, will in the vast majority of the cases, just **postpone the inevitable** and result in a patient with more advanced osteoarthritis. There is no reasonable reason, other than financial constraints on the owner's part, to keep treating a partial CCL conservatively with the hopes it will resolve on its own— it won't!!

Robert M. Radasch, DVM, MS, DACVS  
N Amer Vet Conf, 01:15

### Benefit of pimobendan

Myxomatous mitral valve disease (MMVD), a common heart disease in dogs, is characterized by a long preclinical phase, and no therapies have been definitively proven to prolong this time before onset of congestive heart failure (CHF). In this study, dogs were administered pimobendan or placebo at 0.4-0.6 mg/kg, PO, divided and given at 12-hour intervals. Each patient was determined to have reached the end of the study (i.e., primary endpoint) if diagnosed with CHF via thoracic radiography or if they died or were euthanized due to cardiac disease. An interim analysis demonstrated a **clear treatment benefit** for pa-

tients in the pimobendan group, so the study was terminated early. The pimobendan group had a median time to primary endpoint of 1228 days as compared with 766 days for the placebo group. There also was no difference in adverse events, indicating pimobendan was well tolerated with minimal side effects (the most common being vomiting and diarrhea). This study demonstrated the benefit of pimobendan in significantly prolonging the time to onset of CHF or cardiac-related death in dogs with cardiomegaly due to MMVD.

Ashley E. Jones, DVM, DACVIM  
NAVC Clin Brf, Feb 2017

### Chronic otitis and ear cleaning

Patients with chronic or recurrent otitis externa should have their infection cleared then a search for underlying causes made before they relapse again. Most dogs with this disorder will relapse until a **maintenance ear cleaning program** is instituted. This author believes every dog with a history of chronic or recurrent otitis should have weekly ear flushes with a good quality cleansing agent. They will also need a steroid topically 1-3 times a week to help keep inflammation at bay and to reduce the cerumen production

Valerie A. Fadok, DVM, PhD, DACVD  
82<sup>nd</sup> AAHA Conf, 03:15

### How to handle a missed HW preventive dose

Veterinarians need to realize that the use of macrocyclic lactones is absolutely imperative. They need to be used year-round, and we need to test patients yearly. The problem is when a dog misses a heartworm preventive dose and is infected. In areas in which the exposure potential is massive, like the Deep South where there are lots of mosquitoes and a very high mosquito infectivity rate, it is even more important. Under those circumstances small errors are compounded. OK, so then what's the trick? According to this author, it's in testing and the right antibiotic before a new heartworm preventive dose. To prevent drug resistance, we need to make sure that dogs that are infected that go on a macrocyclic lactone have clearance of the microfilariae. The author believes really strongly in doxycycline for this. It gets rid of the microfilariae and renders them noninfectious. You can protect the dog with a macrocyclic lactone but also not worry about producing greater resistance.

Clarke Atkins, DVM, DACVIM  
DVM News Mag, Mar 2017

# The Capsule Report®

## Trazodone at home before veterinary visits

Oral administration of a single dose of trazodone to cats prior to a veterinary visit resulted in fewer signs of transport- and examination-related anxiety than did a placebo and was generally well

tolerated by most cats. Use of trazodone in this manner may promote veterinary visits and, consequently, enhance cat welfare. The dose used was a single 50 mg.

Brenda J. Stevens, DVM et al.  
JAVMA, 249:2

## Misdiagnosis of hyperthyroidism

Many veterinarians mistakenly believe that the finding of a high free T4 concentration alone, especially when the total T4 concentration is within the upper half of the reference interval, confirms a diagnosis of hyperthyroidism in cats. This author's findings that ~20% of these cats turned out to be euthyroid makes it clear that the free T4 test should *never* be used alone to confirm a diagnosis of hyperthyroidism; overreliance on free T4 testing will lead to **misdiagnosis and inappropriate treatment** of many euthyroid cats.

Mark E. Peterson, DVM, DACVIM  
ACVIM For 06:15

## Substitute for doxycycline

Doxycycline has historically been the drug of choice for many bacterial and protozoal infections in dogs and cats. Over the past few years, its availability has dwindled and costs have drastically increased. These changes, in addition to discontinuation of tetracycline, have forced veterinarians to find new alternatives. Minocycline may actually have advantages over doxycycline in some disease states. Because of its increased lipophilicity, minocycline has greater penetration into physiologic sites that are difficult to penetrate (e.g., intracellular, abscesses, CNS), making it the preferred drug for infections in these sites. Minocycline may also be preferred for treating methicillin-resistant *S pseud-intermedius*. Both drugs have similar side effects, although CNS ataxia and autoimmune side effects theoretically may be more prevalent with minocycline. Both drugs also have anti-inflammatory, immunomodulatory, neuroprotective, and anthelmintic effects, although minocycline potentially has slightly greater efficacy. With similar dosing protocol and cost, **minocycline can be an excellent substitute for doxycycline**. In dogs, doses of 5-10 mg/kg, PO, q12h appear to achieve sufficient concentrations for most organisms studied; in cats, doses of 8.8 mg/kg, PO, q24h would provide appropriate concentrations for most bacteria, with minimum inhibitory concentrations of <0.5 µg/mL.

Valerie J. Wiebe, PharmD, FSVHP, DICVP  
NAVC Clin Brf, Mar 2017

## Causes of anesthetic deaths

The anesthetic-related death rate was higher for cats (11/10,000 anesthetic episodes [0.11%]) than for dogs (5/10,000 anesthetic episodes [0.05%]). Increasing age was associated with increased odds of death for both

species, as was undergoing nonelective (vs elective) procedures. Odds of death for dogs were significantly greater when preanesthetic physical examination results were not recorded (vs recorded) or **when preanesthetic Hct was outside (vs within) the reference range**. Odds of death for cats were greater when intra-anesthesia records for oxygen saturation as measured by pulse oximetry were absent. Underweight dogs had almost 15 times the odds of death as non-underweight dogs; for cats, odds of death increased with increasing body weight (but not with overweight body condition). The proportion of case patients that died after anesthetic recovery highlights the need for rigorous monitoring of patients beyond that period, both before and after hospital discharge.

Nora S. Matthews, DVM et al.  
JAVMA, Mar 15, 2017

## Sedation with dexmedetomidine

Dexmedetomidine is recommended for young, healthy, exercise-tolerant dogs. Current evidence and clinical experience both support expanded extra-label use in broader categories of patients, both human and veterinary. Very low doses are quite useful to prevent or manage post-operative delirium. Patient monitoring is important. Availability of specific antagonist (Antisedan) contributes to safety and utility. Useful for examinations and brief procedures. Profound bradycardia and hypertension may occur. Tissue perfusion is decreased. Pulse oximeters may fail to detect signal. The author avoids the anticholinergics. This author uses a low dose Dexdomitor method (typically 0.0005 to 0.0025 mg/kg), combined with Torbugesic (0.2-0.4 mg/kg) or other opioids. These low doses of Dexdomitor, when combined with an opioid, are very effective. Reversal with Antisedan (by IM injection only) leaves the mild Torbugesic effect intact. Reversal is less often needed with Dexdomitor than with Domitor.

Ralph Harvey, DVM,MS, DACVAA  
CVC San Diego, Dec 2016

## Hazards of compounded fluconazole

Compounded products are not subject to the same premarket requirements for safety, efficacy, and manufacturing quality as are FDA-approved products. As a result, compounded products have the potential to place animals at undue risk from unsafe or ineffective treatment. This study revealed marked variability in physical characteristics, strength or concentration, accuracy, and precision of fluconazole compounded products from four pharmacies in the US. Quality of suspensions was more variable than that of capsules in this study. Because such variability has the potential to affect absorption, bioavailability, and dosing of the drug, fluconazole compounded products should be prescribed with caution. Clinicians should be cognizant that generic and compounded fluconazole formulations are not interchangeable, and treatment failures, over-doses, or toxicoses may result.

Carine M. Laporte, VMD et al.  
Am J Vet Res, Apr 2017

## CKD, stimulating appetite

The effects of uremia on appetite are well known, particularly in human renal patients. The use of H2 blockers for uremic gastritis can be helpful in encouraging consumption of adequate calories. The use of mirtazapine as an appetite stimulant is helpful in those cats who can tolerate it. This author uses 1/8 of a 15 mg tablet every day to every third day depending upon response to therapy. Many cats with chronic progressive renal disease are underweight and dosing of 1/4 of a tablet as has been recommended is often followed by restlessness, anxiety and vocalizing in cats who are sensitive to it. Clients can be quite upset by this and may be less inclined to follow other treatment recommendations. Both of these forms of therapy imply being able to accomplish giving fragments of a pill to a cat on a regular basis and over a prolonged period of time. Strategies for this should be included in client education including the use of “sticky” high value food like cheese in a can, cream cheese or pill pockets and other soft treats.

*Elizabeth J. Colleran, DVM, MS, DABVP  
Atl Coast Vet Conf, 10:16*

## Anesthetizing brachycephalic breeds

Brachycephalic breeds MUST be pre-oxygenated before anesthesia. Pre-oxygenation with a tight fitting mask and oxygen flows at 2-3 L/min for as little as 3 minutes can significantly increase arterial oxygen concentrations. As brachycephalic breeds may be challenging to intubate, pre-oxygenation can buy a few minutes before patients become hypoxic. If the patient will not tolerate a tight fitting face masks, remove the diaphragm on the face mask and increase the flow rate to 4-5 L/min. Leave the facemask on through the induction period, removing it only when ready to intubate.

*Katrina Lafferty, BFA, CVT, VTS  
86<sup>th</sup> FL VMA Conf, 04:15*

## Small cell lymphoma, cobalamin deficiency

The recommended staging tests for cats with small cell and large cell lymphoma are similar with the exception of one additional test that is recommended for cats with small cell lymphoma. Cats with small cell lymphoma are at risk for **cobalamin deficiency**, which can exacerbate their clinical signs. One study of cats with small cell lymphoma found that 78% of them were cobalamin deficient, so measuring serum cobalamin and supplementing as indicated is recommended in these patients. Small cell lymphoma is unlikely to affect intrathoracic structures except for the sternal lymph node. An enlarged sternal lymph node is unlikely to change the treatment plan, but monitoring how the lymph node changes (or not) with treatment can be a helpful addition to repeat abdominal imaging when assessing response to treatment.

*Amy C. Durham, MS, VMD and Erika L. Krick, VMD, DACVIM  
Penn Annual Conf, 09:16*

## Osteoarthritis in the bird

Non-steroidal anti-inflammatories, which inhibit prostaglandin synthesis by the COX enzyme, may provide adequate quality of life initially but eventually are combined

with opioids. Meloxicam 1.6 mg/kg, PO, q12-24h has shown both analgesic and anti-inflammatory effects and is the most commonly used. With increasing or more significant amounts of pain, opioids should also be considered. Patients that have been hospitalized can be treated initially with butorphanol (1-4 mg/kg, IM, q8-12h) but most are moved to oral treatment with tramadol 20-30 mg/kg, PO, q8-12h (parrot species). Additional nutritional support for joint health can be provided with omega 3 fatty acids (0.22 ml/kg, PO, q24h).

*Geoffrey Olsen, DVM, DABVP  
Cal Vet, Mar-Apr 2017*

## Simple interrupted sutures best

Results of this study indicated that, compared with intradermal and subdermal suture patterns, external (simple interrupted and cruciate) skin suture patterns were able to withstand greater tensile strength before skin separation or complete failure. For closure of wounds or incisions in areas likely to be exposed to moderate tension, a simple interrupted or cruciate skin suture pattern should be **considered as the sole method** or in addition to other methods for skin apposition.

*Eric M. Zellner, DVM et al.  
JAVMA, 248:12*

## Types of pet food and health benefits

Boutique or “premium” wet and dry pet foods do not differ significantly from traditional diets and are instead identified by inclusion or exclusion on their ingredient lists. Boutique and “premium” pet food may use terms like “organic”, “natural”, or “human-grade” to promote their products and may avoid ingredients found in lower cost and mass market pet foods, such as corn or animal by-products. While the terms “organic” and “natural” have specific regulatory definitions, “human-grade” does not, and none of these terms denotes the quality of a particular ingredients or product. There are **no established health benefits to avoiding common or lower cost pet food ingredients** unless the dog or cat has a specific sensitivity to a particular ingredient.

*Lisa P. Weeth, DVM, DACVN  
ACVIM For, 06:16*

## Relieving the pain of osteoarthritis

NMDA receptor antagonists include ketamine and amantadine. These agents are thought to decrease central sensitization through blockade of NMDA receptors in the dorsal horn of the spinal cord. The only oral product examined in dogs is amantadine; in a study of canine OA, amantadine (3-5 mg/kg, q24h) along with meloxicam improved activity. **“Pain holidays”** using short-term (2-3 days) CRI of ketamine coupled with other analgesics can be effective in breaking chronic pain cycles. Amantadine and ketamine should not be used as single agents. Amantadine pharmacokinetics suggest BID dosing may be most appropriate.

*Carolina Medina, DVM, CVA and Patrice M. Mich, DVM, MS  
83<sup>rd</sup> AAHA Conf, 04:16*

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## Fluorouracil poisoning

The Food and Drug Administration has received reports of five dogs dying after ingesting their owners' topical cancer medication, fluorouracil cream. Pets are at **risk of illness and death** when exposed to the medication. In one case, two dogs began playing with a tube of the cream, and one punctured the tube before their owner could retrieve it. The dog that punctured the tube began vomiting, experienced seizures, and died 12 hours later. In another case, a dog ingested the contents of a tube of the cream. The owner realized the dog had ingested the medication and rushed it to the veterinarian. The veterinarian attempted treatment, but the dog's condition declined over three days, and the dog was ultimately euthanized. Although the FDA had not received reports involving cats, they are expected to be extremely sensitive to fluorouracil cream. If a person applies the cream to an afflicted area and touches a cat, the cat could ingest the medication when grooming.

*JAVMA, Mar 15, 2017*

## Egg binding in the bird

Supportive care includes elevated environmental temperature, parenteral calcium (50-100 mg/kg, IM when necessary) and vitamin D<sub>3</sub> (1000 U vitamin D<sub>3</sub>/300g body weight, IM, every 7 days), fluid therapy, and nutritional support by gavage feeding of a commercial avian nutritional formula or a hand-rearing formula. Broad-spectrum antibiotics such as enrofloxacin (15 mg/kg, PO, SQ, IM twice a day) or amoxicillin-clavulanate (125 mg/kg, PO, BID) are indicated if infection is suspected, and analgesics (e.g., butorphanol [1-2 mg/kg, IM], meloxicam [0.5-1 mg/kg, PO, or IM once a day]) are indicated for pain that is part of the pathologic state. The patient should be switched to oral dosing after 1 or 2 injections to reduce the risk for muscle necrosis. Supportive care alone is often enough to allow oviposition in stable birds, although the hen should be monitored closely for deterioration. If supportive care and medical therapy fail, oocentesis may be performed to facilitate passage of the egg. Medical therapy with leuprolide acetate (200-800 µg/kg, IM, every 3-6 weeks) to reduce reproductive hormone levels and suppress reproductive activity can be administered to temporarily prevent further egg production.

*Anthony Pilny, DVM, DABVP  
NAVC Clin Brf, 14:5*

## Formulations of omeprazole

The availability of many omeprazole formulations can complicate selection of the appropriate choices. Over-the-counter omeprazole formulations include tablets widely available in 20-mg and 40-mg sizes. A recent study demonstrated that generic enteric-coated omeprazole tablets can be divided and given to cats. Despite disruption of the enteric coating, the divided tablet was still an effective acid suppressant and was superior to famotidine at 1 mg/kg, PO, q12h. This finding allows for more appropriate over-the-counter PPI dosing in cats. A reformulated omeprazole paste for treating equine ulcers is also available (Gastro-Gard, merial.com). The paste, diluted to a concentration

of 10-40 mg/mL in cod liver or corn oil, was as efficacious as other oral formulations for raising canine and feline intragastric pH. This formulation may be a good option for cats or dogs intolerant of oral administration of capsules or tablets. Moreover, the paste is a concentrated preparation and allows for administration of liquids at greatly reduced doses as compared with the available liquid formulations. Human-labeled oral suspensions may contain xylitol, which should not be administered to canine patients.

*Emily Gould, DVM and M. Katherine Tolbert, DVM  
NAVC Clin Brf, 14:11*

## Using omeprazole in CKD patients

Patients with CKD often have gastric ulceration. In the terminal stages, this is due to uremic mucositis (which affects the entire GI tract), but before this point, gastric ulceration can occur due to chronic increases in serum gastrin levels. Hypergastrinemia may cause gastric discomfort and impact appetite even before ulceration occurs. If a CKD patient's appetite drops or the weight decreases, this author starts a proton pump inhibitor (PPI) such as omeprazole. Often omeprazole capsules are used which contain pellets, and simply instruct the owner to give an appropriate number of the pellets. PPIs **cannot be stopped abruptly** due to severe rebound acid secretion, and clients must be informed about this. Histamine-2 blockers such as famotidine are not very helpful in cats with CKD and are not an effective substitute for a PPI. If there is clear evidence of substantial ulcerative disease, sucralfate should be given as well as the PPI.

*Audrey K. Cook, BVM&S, MRCVS, DACVIM-SAIM  
Tex A&M 19<sup>th</sup> Fel For, 04:15*

## Timing of insulin injection

In order to mimic the physiologic release of insulin, ideally insulin should be given with each meal. However, the timing of the insulin injection has recently been called in question by several veterinary endocrinologists. Some authors argue that insulin should be injected 1-2 hours PRIOR to feeding to attenuate the post-prandial effect. The obvious concern with this timing of insulin is what to do if the animal will not eat. However, many suggest that this is a more "physiologic" way to administer insulin. In dogs, this author would be concerned about injecting insulin in this manner; however, in cats since they spend most of their time in a "post-prandial" state because of hepatic gluconeogenesis, the author believes this type of insulin injection timing could work. The author recommends feeding the animal and injecting the insulin at the same time. If the animal does not eat, the insulin dosage can be reduced (usually by one-half) or skipped entirely and the animal evaluated by the veterinarian to determine the cause of the anorexia.

*Deborah S. Greco DVM, PhD, DACVIM  
Mich Vet Conf, Jan 2017*

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