

“Pearls”  
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Veterinary Medicine



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### A note from your editor

For all the former written subscribers, thank you for supplying your email addresses. Hope you enjoy your “take it with me anywhere” version. Enjoy and thank you for your support.

### Monitoring hypothyroid dogs

Regarding once-a-day dosing of levothyroxine, is there a need to monitor a dog with lab tests? Probably not very often. If you have a dog that was hypothyroid and you put him on the appropriate dose and the clinical signs go away, you don't really need to test his fT4. The dog is a euthyroid dog. You might want to test a dog if it is still showing clinical signs, even though it is receiving an appropriate dose of thyroid hormone. You need to know if the dog is not euthyroid. To establish that, submit blood for an fT4 by EqD test. If that test is normal, then whatever clinical signs are present are not due to thyroid disease.

David Bruyette, DVM, DACVIM  
Vetted, Nov 2017

### Mammary tumors in the cat

Tumor size has been shown to be clearly associated with survival. Tumors <2cm in diameter (8 cm<sup>3</sup> in volume)

have a median survival time of greater than 3 years with surgery alone. Cats with tumors 2-3 cm diameter (8-27 cm<sup>3</sup> volume) had a two year survival time, and cats with tumors >3cm diameter (>27 cm<sup>3</sup> volume) had a median survival time of 6 months. Cats with mammary tumors require aggressive surgery. Local **lumpectomy** or regional mastectomies **cannot be recommended**. Unilateral or bilateral radical mastectomy with lymph node removal is recommended. Recent information currently awaiting publication suggests that cats receiving simultaneous bilateral radical mastectomy have a better survival than cats that receive staged bilateral radical mastectomies.

David Holt, BVSc, Diplomate ACVS  
Penn Annual Conf, 09:16

### Dosage of glipizide in cats

In cats, glipizide has been used successfully to treat patients with diabetes mellitus at a dosage of 2.5-5 mg, BID. The evaluation of effectiveness should not be made until a cat has been on the drug for 16 weeks, as long as the cat is doing well. Side effects of oral hypoglycemic agents include severe hypoglycemia (rare in cats), cholestatic hepatitis, and vomiting. Gastrointestinal side effects, which occur in about 15% of cats treated with glipizide, resolve when the drug is administered with food. The author has noted that use of a lower dosage (2.5 mg/cat) of glipizide is associated with fewer side effects. Furthermore, glipizide does not have a taste so the author has had success adding it as a **top dressing to canned food**.

Deborah S Greco, DVM, PhD, Diplomate ACVIM  
Mich Vet Conf, 01:17

### Calcium as a malignancy biomarker

Clients often ask why their pet's cancer was not detected on routine blood work. It remains unlikely that a standard CBC and chemistry panel will add many future malignant biomarkers. However, cancer detection is evolving to the point where some additional peripheral blood testing can provide insight to both neoplastic diagnosis and treatment response. **Calcium** is one of the older **biomarkers** in veterinary oncology. Secondary hypercalcemia of malignancy is the most common cause of elevated calcium in a dog. It is most commonly seen with large cell lymphoma and anal gland adenocarcinomas but has been reported with a wide variety of malignancies. In situations with a confirmed diagnosis, monitoring calcium

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levels is a very reliable means to establish response to therapy and early progression (prior to more obvious clinical signs). The author uses calcium levels routinely for both lymphoma and anal gland carcinomas.

Zachary M. Wright, DVM, DACVIM  
125<sup>th</sup> SD VMA Conf, 08:16

## Treating mast cell tumors with triamcinolone

Although complete excision of the primary tumor is the treatment of choice for dogs with cutaneous mast cell tumors without evidence of distant metastasis, additional treatment options are needed for tumors deemed nonresectable. In a review of medical records for 23 dogs (24 tumors) with nonresectable mast cell tumors, intralesional triamcinolone administration, alone or in combination with other treatments, appeared to be well tolerated. The overall response rate was 67%, inducing 4 tumors with a complete response and 12 with a partial response. Median time to progression was 63 days. Three dogs experienced adverse events (local hemorrhage and suspected GI ulceration). On the basis of the results of this study, the authors suggest that **intralesional** administration of **triamcinolone may be considered** as a single agent treatment for dogs with measurable cutaneous mast cell tumors. However, it is suggested that use as a single agent would be best suited for cytoreduction of tumors that are not amenable to surgery. Results suggested that intralesional triamcinolone administration may also be safely combined with systemic treatments, including orally administered glucocorticoids, chemotherapy, and radiation therapy.

Ashley Case, DVM and Kristine Burgess, DVM  
JAVMA, Jan 2018

## Respiratory rate as a predictor of heart disease

Several studies have demonstrated a correlation between increased resting respiratory rate (RRR) or sleeping respiratory rate (SRR) and congestive heart failure (CHF). A 2010 study that evaluated dogs with heart disease of varying severity found that in-hospital respiratory rates greater than 41 breaths/min were predictive of CHF. A subsequent study that investigated the ability of different parameters (e.g., echocardiographic measurements, cardiac biomarkers, physical examination findings) to predict resolution of CHF in the first 2 weeks after diagnosis confirmed the value of home monitoring. A home RRR or SRR greater than 40 breaths/min was shown to be highly sensitive in predicting CHF. Based on these studies, lower limits for SRR and RRR appear to be clinically unimportant. The upper limit of normal for SRR is approximately 25 breaths/min in dogs and 30 to 35 breaths/min in cats. RRR upper limits are slightly higher. Owners should be advised that a value above the reference limit or with a deviation of at least 25% from their pet's baseline might be **suggestive of decompensation** and indicate the need for **prompt veterinary care**.

Consistent recordings >30 breaths/min in a dog or >35 breaths/min in a cat require prompt evaluation to rule out CHF or cavitory effusion.

Brian A. Scansen, DVM, MS, DACVIM  
NAVC Clin Brf, Dec 2017

## Low-cost protocol for treatment of urethral obstruction

This author recently conducted a clinical trial to determine the efficacy of a protocol for **managing urethral obstruction** in male cats **without urethral catheterization**. The author studied 15 male cats with urethral obstruction in which conventional treatment had been declined. Cats with severe metabolic derangements or urinary calculi were excluded. Treatment included administration of acepromazine (0.25 mg, IM or 2.5 mg, PO, q8h), buprenorphine (0.075 mg, PO, q8h), and medetomidine (0.1 mg, IM, q24h) as well as decompressive cystocentesis and subcutaneous fluid administration as needed. All cats were housed in a quiet, dark environment to minimize stress. Treatment success was defined as spontaneous urination within 72 hours and subsequent discharge from the hospital. Treatment was successful in 11 of the 15 cats. In the remaining 4 cats, treatment was considered to have failed because of development of uroabdomen or hemoabdomen. Necropsy was performed on 3 cats in which treatment failed. All 3 had severe inflammatory disease of the urinary bladder, but none had evidence of bladder rupture. These findings suggest that a combination of pharmacologic treatment, decompressive cystocentesis, and a low-stress environment may allow for resolution of urethral obstruction without the need for urethral catheterization. This low-cost protocol could serve as an alternative to euthanasia when financial constraints prevent more extensive treatment in properly selected patients.

C.A. Tony Buffington, DVM, PhD, DACVN  
N Amer Vet Conf, 01:16

## Client questions about pet food labels

"My pet's food contains wheat gluten. Isn't gluten bad?" Gluten is a protein from certain grains and contains essential nutrients and amino acids. The vast majority of pets don't have adverse reactions to wheat gluten. Unlike people, pets don't develop celiac disease. It's also rare for pets to be allergic to grains and much more common for them to be allergic to meat proteins, such as chicken, beef or pork. **The bottom line:** While a gluten-free pet food can be good, avoiding wheat gluten is not necessary for cats and dogs. "Isn't whole chicken better for my pet than chicken meal?" Meat, poultry or fish meal is simply meat/poultry/fish that is cooked and dried to a powered-like consistency, which concentrates the protein. The amount of chicken that can be used in dry foods is limited by the high moisture content. Both whole chicken and chicken meal can provide excellent sources of protein. **The bottom line:** Meat, poultry and fish don't have to be whole to be nutritious.

Dottie LaFlamme, DVM, PhD, DACVN  
NAVC Clin Brf, Supp, Oct 2017

## Topical product for hot-spots

One topical remedy that has been helpful for use at home for “hot spots” is the DOUXO Calm Gel Spray (Ceva). This product contains phytosphingosine, hinokitiol, moisturizing factors, and anti-oxidants. Phytosphingosine, a precursor of ceramide, one of the major lipids in the skin barrier, has antimicrobial and anti-inflammatory effects. It has been shown to increase the production of ceramides in the skin, thus helping repair the skin barrier. It inhibits inflammatory cytokine production. Hinokitiol, or beta-thujaplicin, is derived from cedar oil, and has been shown to have antibacterial and anti-inflammatory properties. It has been shown to have efficacy in canine *Malassezia* otitis externa. Calm Gel has been very effective for heavy coated dogs prone to hot-spots. When owners first recognize the early development of these self-traumatic lesions, they can apply this product and gently massage into the skin. It can **arrest the development of the lesion**, and thus help avoid using systemic antibiotics and/or steroids.

*Brian A. Scott, DVM, DACVD  
SE Vet Conf, 06:16*

## Blood feather

Provide analgesia (butorphanol/midazolam can be given intranasally and the midazolam can be reversed). Apply pressure and crimp the distal edge of the feather to try to control bleeding. It may be necessary to remove the feather if bleeding cannot be stopped. Grasp the wing carefully to provide resistance, as these **follicles are attached to the periosteum of the bone**. Use hemostats to grasp the feather shaft at its base as close to the junction of the skin as possible and apply gentle continuous traction to remove the feather. The entire feather shaft should be removed. The follicle may still bleed but this can usually be controlled with pressure.

*Natalie Antinoff, DVM, DABVP  
22<sup>nd</sup> Int VECCS Conf, 09:16*

## Treatment of feline constipation

This author employs polyethylene glycol (MiraLAX, {PG 3350}), trickled through an NE tube (6-10 ml/kg/hr). Although it may take up to 12-18 hours, the **success rate** with this minimally invasive protocol makes it **well worth the attempt** and the patience. Once the immediate problem has been resolved, follow-up care may include dietary intervention, oral lactulose to effect, and pharmaceutical manipulation. Insoluble fiber adds bulk, distends the colon, and in that way, increases colonic water content and stimulates colonic motility. Soluble fiber is metabolized (fermentable) by colonic bacteria into short-chain fatty acids, a preferred nutrient for gastrointestinal mucosal cells. Psyllium (unflavored Metamucil; 1-4 tsp mixed with food, q12-24hr) is used for soluble fiber while wheat bran (1-2 tbs mixed with food, q12-24hr) is used as an insoluble fiber. Canned pumpkin is a popular choice for insoluble fiber and it is not unusual for cats to ingest it voluntarily, but it does not actually provide as much fiber content as other choices.

*Craig B. Webb, PhD, DVM, DACVIM  
78<sup>th</sup> CO Vet Conf, 4:17*

## Dosing schedule for mirtazapine

Mirtazapine is a tetracyclic antidepressant used in humans, but it has primarily been used in veterinary patients for its antiemetic and appetite-stimulating effects. In a masked, placebo-controlled crossover clinical trial, mirtazapine increased body weight, improved appetite score, and reduced vomiting in cats with CKD. A recommended regimen for oral administration is 1.88 mg/cat, every 24-48 hours, as needed, to achieve adequate food intake to meet energy requirements. One recommended daily oral dosing regimen for dogs is 3.75 to 30 mg (3.75 mg for dogs weighing < 7 kg [ $< 15.4$  lb], 7.5 mg for dogs weighing 8-15 kg [17.6-33 lb], 15 mg for dogs weighing 16-30 kg [35.2-66 lb], and 30 mg for dogs weighing > 30 kg [ $> 66$  lb]); however, the efficacy of mirtazapine in dogs remains to be proven. Because mirtazapine is metabolized in the liver and cleared by the kidneys, the dosing frequency should be reduced for animals with hepatic or renal disease.

*Lily N. Johnson, DVM and Lisa M. Freeman, DVM, PhD  
JAVMA, Dec 1, 2017*

## Chest radiographs in dyspneic cats?

By the time a cat presents in respiratory distress, severe underlying respiratory disease may already exist (e.g., pleural space disease, airway disease). As dyspneic patients are often unstable, limited careful handling is imperative. Often, performing radiographs in a dyspneic cat may result in severe deterioration. Cats will typically act fractious during radiographs as they are experiencing severe hypoxemia and a “fight or flight” response; this is often followed by imminent respiratory arrest. Instead, initial triage, focused physical examination/auscultation, and appropriate therapy (including oxygen support, TFAST ultrasound, therapeutic thoracocentesis, etc.) should take priority over performing radiographs. As pleural effusion is one of the most common causes of dyspnea in cats, a **therapeutic thoracocentesis may be life-saving**. This should be performed immediately in any dyspneic patient that is suspected of having pleural space disease, as it may aid in immediate stabilization of the patient. In addition, chest radiographs revealing pleural effusion are not high-yield diagnostic tests, as any underlying disease is “masked” and hidden by the pleural effusion radiographically. Rather, chest radiographs should always be performed *after* a thoracocentesis, as it will allow the clinician to evaluate heart disease and underlying pathology (e.g., underlying metastasis, diaphragmatic hernia).

*Justine A. Lee, DVM, DACVECC, DABT  
3<sup>rd</sup> Gulf Atl Conf, 11:15*

## Don't pull the ET tube too early

Depending on the patient/procedure performed, you may need to keep the endotracheal tube in place longer

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than usual. Brachycephalic patients and patients recovering from upper airway surgery have an increased risk of aspiration (or suffocation) if the tube is pulled too early. Ensure patients are awake and aware enough. People make up all kinds of guidelines, such as the “3 swallows rule” or the “5 swallows rule” to decide when to remove the ET tube. Yet, in real life, patients can swallow multiple times before they are aware enough to be extubated.

*Phil Zeltzman, DVM, DACVS, CVJ  
Vet Pract News, Jan 2018*

### Perils of compounded doxycycline

Compounded formulations of doxycycline may be prescribed for veterinary patients when FDA-approved formulations are not appropriate because of tablet or capsule size limitations or compliance problems or when FDA-approved products are not available. However, analysis of FDA-approved doxycycline tablets, capsules, and liquid suspension and compounded doxycycline formulations from 3 pharmacies found that all FDA-approved formulations had acceptable content on the day of receipt (day 1) and after 21 days of storage, but that mean doxycycline content for the 3 compounded tablet formulations was 89%, 98%, and 116% on day 1 and 86% to 112% on day 21. **None** of the compounded chews or liquid formulations **met US Pharmacopeia standards** on day 21. The consistency of these findings for the doxycycline capsule, tablet, and liquid formulations approved for use in human patients indicate they are the preferred formulations for use in veterinary patients in the United States at this time. When compounding is necessary, the author’s results indicated that compounded doxycycline tablets were closest to their stated drug content, whereas compounded liquid or chew formulations were not within acceptable drug content ranges for the duration of the study.

*Kate KuKanich, DVM, PhD et al.  
JAVMA, Oct 1, 2017*

### The forgotten node

This patient was presented and it was noticed that he had bilaterally symmetrical subcutaneous soft tissue swellings dorsal to the maxillary third premolar teeth. These swellings were well circumscribed and freely movable beneath the skin. Their appearance, bilateral symmetry, and signalment suggested the most likely differential diagnosis to be buccal (*a.k.a.* facial) lymph nodes. These can be a normal finding in any dog, but they are easier to see and palpate in young, large-breed dogs with short hair. Careful aspiration can confirm the diagnosis of lymphoid hyperplasia or normal lymph node. These nodes also may be enlarged in cases of lymphoma. The buccal (facial) lymph node is the “forgotten node,” as it is

present in only approximately 9 percent of dogs and it has not been documented in cats. Astute clients or clinicians may notice the node as a firm but movable subcutaneous swelling above the roots of the maxillary third premolar bilaterally. The node seems to be more common (or just more obvious) in large breed dogs, such as Weimaraners, Vizslas, and Labrador Retrievers.

*John Lewis, VMD, FAVD, DAVDC  
Vet Pract News, Jan 2018*

### How to adjust phenobarbital dose

A low phenobarbital serum concentration is one of the most common causes of poor seizure control. Because phenobarbital metabolism varies among patients, serum concentrations vary among patients taking the same oral phenobarbital dose. Therefore, serum concentrations should be checked to help determine if the initial dose achieves a therapeutic serum concentration. The serum concentration will also guide dose changes. Serum concentrations should be measured once steady-state is achieved. For phenobarbital this is about 2 weeks; therefore, a blood level should be checked 2 weeks after starting the drug or 2 weeks after any dosage change. So how do you adjust the dose? Because phenobarbital is cleared by first order kinetics, a dosage change (increase or decrease) should result in a proportional change (increase or decrease) in the serum concentration. This allows for a simple proportion equation that can be used to adjust the phenobarbital dose. **To determine the New Dose**, you multiply the Target Serum Concentration by the Current Dose, and then divide by the Current Serum Concentration. The initial Target Serum Concentration is 25-30 µg/mL. Some patients can be successfully managed with serum concentrations below the target range, while others may have undesirable side effects at serum concentrations within the target range. Treatment should always be individualized.

*Andrew Isaacs, DVM, DACVIM  
83<sup>rd</sup> AAHA Conf, 04:16*

### IBD

Need a reminder about why folate and cobalamin are important diagnostic markers? Here you go: Folate is only absorbed from the duodenum and is decreased in cases of chronic duodenal mucosal inflammation. Cobalamin is only absorbed from the distal small intestine and is a very specific marker for distal ileal mucosal disease. Low cobalamin and folate concentrations are indicative of severe diffuse disease, and this will limit the efficacy of oral therapy for idiopathic IBD. Supplement with cobalamin and folate before instituting therapy.

*Craig Ruaux, BVSc (Hons), PhD, MACVs, DACVIM  
DVM News Mag Supp, Dec 2017*

### Fecal microbiota transplantation (FMT)

While understanding of the canine and feline gut microbiota is still very much in its infancy, data from dogs, cats and other species clearly supports the notion that the gut microbiota is a critical factor in gastrointestinal and systemic health. Accordingly, this suggests that manipulation of the intestinal microbiota might be an important therapeutic tool. Fecal microbial transplantation or infusion of a fecal suspension from a healthy individual into the GI tract of another person to cure a specific disease was first performed in the 4<sup>th</sup> Century when people with severe diarrhea ingested a fecal suspension (yellow soup). However, profound increases or recurrent and debilitating *C. difficile* infection (CDI) in humans has led to renewed interest in FMT. Data from various human studies have reported astounding cure rates for recurrent CDI, which tends to carry a poor prognosis. This has led to expansion of study into other conditions such as ulcerative colitis (UC) and Crohn's disease (CD). FMT has also been used in animals, with abundant anecdotal information but limited objective data. FMT has been performed in dogs and cats with a variety of chronic enteropathies. FMT is of increasing interest for treatment of chronic enteropathies as an apparently safe, effective, drug-free and relatively low-cost approach. However, much needs to be defined and refined for successful and safe broader application of this approach. **Selection of the donor:** Exclusion of animals with a recent history (e.g. past 3 months) of antimicrobial therapy, immunosuppressive therapy or enteric disease is reasonable. Patients with IBD, atopy, GI malignancy, obesity, and chronic diarrhea should also be excluded from being donors. **Sample collection:** Time delays presumably result in progressive loss of some components of the microbiota. Whether short-term delays are of clinical relevance is unknown, in large part because the specific components of stool that are responsible for clinical cure are not well defined. While strict guidelines are not possible at this time, it is logical to recommend treatment occur as soon as reasonably possible after stool collection, ideally within 4 hours. Frozen-and-thawed feces has been successfully used in humans for the management of recurrent CDI, and a recent study reported lack of inferiority of frozen stool compared to fresh stool. The ability to use frozen stool eliminates many of the logistical burdens inherent to FMT, because stool collection and processing need not be tied to the procedure date and time. The use of centralized stool banks is rapidly gaining traction and has removed barriers for FMT by making available to clinicians safe, screened stool that can be shipped and stored frozen and thawed for use as needed. **Administration protocols:** The amount of donor stool used has varied; however, in a recent review, relapse was four-fold greater when <50 g of stool was used in people with RCDI. Stool is most commonly suspended in non-bacteriostatic saline; however, other diluents (e.g., yoghurt, milk, bottled water) have been successfully used. The donor stool is mixed with diluent to a consistency that can be injected via the biopsy channel of a colonoscope or administered via red

rubber tube or Foley catheter. The suspension should be filtered through gauze pads or strainer to remove large particulate matter before aspiration into the syringe. The volume of stool suspension that is deposited in the colon varies tremendously. Dosing regimens such as 10 ml/kg or less specific volumes such as 300-500 mL/patient have been used. A larger volume may be beneficial by allowing the clinician to deposit aliquots of 90-100 mL into multiple locations within the intestinal tract, including the jejunum, ileum, ascending colon, transverse colon, and upper descending colon via endoscope. Large volumes could correspondingly increase the likelihood of straining and rapid defecation post-treatment. **Conclusions and future directions:** The current collective understanding of the microbiome remains incomplete, but given demonstrated associations between the gut microbiota and conditions such as obesity, inflammatory bowel disease, diabetes, and colon cancer, there is increased interest in expanding the therapeutic scope of FMT.

*Stanley L. Marks, BVSc, PhD and J. Scott Weese, DVM, DVSc  
ACVIM For, 06:16*

### Delusional parasitosis

Delusional parasitosis (DP) is the false belief that one's skin, body, or environment is infested by parasites or inanimate objects. Pet owners with DP may present their pet to a veterinary practice as the source of their own infestation or to investigate an imagined infestation on the pet. In a recent study of 724 suspected cases of DP, the pet owners were predominantly white, female, and between the ages of 30 and 60. Pet owners with DP may cause harm to their pet in their efforts to rid them of the imagined problem and often reject the veterinarian's nonparasitic diagnosis. Conversely, pets are sometimes prescribed unnecessary treatments by well-meaning veterinarians. Pet owners with DP often have a long history of battling falsely perceived parasitosis on themselves, their pets, and in their homes. Owners usually bring in materials believed to be evidence of infestation, describe the issues at length, and may have lesions. Veterinarians must run the necessary diagnostics to rule out possible causes of clinical signs the owner describes. If there is no medically justifiable reason to treat the patient, the veterinarian must attempt to lessen the owner's distress and not prescribe unnecessary treatments. Validating their concerns and sticking to facts can help disarm frustrated owners. If a risk to the pet, owner, or other humans is perceived, appropriate local authorities or institutions should be contacted.

*K. Nelson and S.N. Kock  
NAVC Clin Brf, Jan 2018*

### Key points in February issue

- Mammary lumpectomies cannot be recommended.
- Glipzide can be applied as a top-dressing.
- Correlation between respiratory rate and CHF.
- Cathertization may not be necessary in all UO cats.
- MiraLAX can be successful in feline constipation.
- New interest in fecal transplantation