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Glucose monitoring system

The CGMS (continuous glucose monitoring system; http://www.medtronicdiabetes.com) is a device that can be strapped onto a patient so that a small needle can be inserted into subcutaneous tissue. Interstitial glucose concentrations are sampled every 5 minutes for up to 72 hours. Using such a device avoids the stress of multiple venipunctures or catheterization, and it could potentially be worn at home. However, 3 BG concentrations must be measured in every 24-hour period. In normal and diabetic dogs and cats, interstitial and serum glucose concentrations were highly correlated overall. The working range of the CGMS is approximately 40-400 mg/dL, i.e., BGs outside the range cannot be measured. In certain cases, postprandial increases in BG were not detected in the interstitial fluid. Some variation existed between patients, and the differences between serum and interstitial glucose concentrations were more marked in some patients than others. The greatest discrepancies occurred at higher BGs. No irritation resulted from sensor placement.

Ellen N. Behrend, VMD, PhD, Dip ACVIM
80th AAHA Conf Procd, 2013

Appetite stimulants in cats with renal failure

1) Famotidine (Pepcid), PRN, for appetite stimulation by resolving nausea that accompanies low gastric pH-2.5 mg, q12-24h. 2) Vitamin B12-1000 µg (1 mg), 1-2 times per week by SQ injection. 3) Mirtazapine-1/4 of a 15 mg tablet, q2-3d. 4) *FortiFlora* (Purina), sold for diarrhea control but some cats eat much better with it in their food.

Gary D. Norsworthy, DVM Dip ABVP
KY VMA Conf Procd, 10:11

Treatment of FIP

A total of 102 FIP cats were admitted to the study. Some of these cats died before the polyprenyl was received and some died before being treated for one week; when these cats were eliminated, there were 58 cats available for long-term study. Abdominal involvement was noted in 47% of the cats. Twenty-four percent had the ocular form, 21% had the neurologic form, and 9% had various other forms of FIP. More than half of the cats in the study were <2 years of age. All of the cats were treated with 3.0 mg/kg, PO of ***polyprenyl immunostimulant*** 3 times a week. All the cats entered into the study were followed for at least a year. Twenty-two percent of the cats lived for six month or longer, and 5% were alive a year later. Cats that responded to treatment showed improvement in appetite and general well-being within 3weeks. They became more interactive with the family and resumed their prior play activities. There was no control placebo group for this study because FIP is considered a consistently fatal disease. Further information can be obtained about Polyprenyl Immunostimulant at www.sassandsass.com.

Alfred Legendre, DVM, MS, Dip ACVIM
80th AAHA Conf Procd, 2013

INSIDE THIS ISSUE

Problems with compounded PZI insulin

Results of a new study highlight concerns about the use of compounded protamine zinc insulin products in animals. In the study, 112 vials of PZI (16 vials of a commercially manufactured product and 8 vials from each of 12 compounding pharmacies) were analyzed. All 16 vials of commercially manufactured PZI met USP specifications. However, only 1 of the 12 compounded PZI products met all USP specifications for all vials tested. Fifty-two vials of compounded PZI did not meet specifications for zinc concentration, and 36 vials had total insulin concentrations <90% of the labeled concentration. Use of compounded PZI insulin products could potentially lead to serious problems with glycemic control.

J. Catharine R. Scott-Moncrieff, VetMB, MS, Dip ACVIM et al.
JAVMA, 240:5

Predictive value of NT-proBNP

Natriuretic peptides have been evaluated in many human and veterinary studies as screening tools, indicators of disease severity, or prognostic indicators for cardiac disease. In human studies, serial measurements of BNP and NT-proBNP in a patient being treated for heart disease can be valuable in determining therapeutic response and prognosis. This study, the first to look at

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this diagnostic measurement in dogs with mixed mitral valve disease and congestive heart failure, suggested use of NT-proBNP to provide clients with more specific information regarding prognosis. Specifically, this study suggested that a NT-proBNP level <965 pmol/L following initiation of heart failure therapy is a positive predictor that the pet will survive >1 year after diagnosis.

J. Wolf et al.
NAVC Clin Brf, Apr 2013

Storage of compounded doxycycline

Doxycycline is a widely used antimicrobial in veterinary medicine, but no FDA-approved formulation is available for veterinary species in the U.S. As a consequence, veterinarians usually prescribe the approved human formulation for treatment of their patients, doxycycline hyclate (100-mg tablets). Pharmacokinetic studies have yielded information to guide dose selection; however, no veterinary formulations are available that are convenient to administer to dogs, cats, or horses. For this reason, tablets are typically crushed, broken, or pulverized and compressed into gelatin capsules or crushed and mixed with various vehicles to form a liquid suspension. The suspensions have been sold through compounding pharmacies for use in animals without assurance of their strength or quality. Compounded liquid suspensions have been sold, but results of this study suggest that concentrations of doxycycline in liquid suspensions compounded from commercial tablets ***cannot be assured beyond 7 days.*** Formulations made from doxycycline tablets still had doxycycline concentrations within 90%-110% of the reference standard after 7 days of storage but concentration was substantially lower (i.e., <20% of the reference standard) after 14 days of storage.

Mark G. Papich, DVM, MS, Dip ACVCP et al.
JAVMA, Jun 15, 2013

Dermatophytosis, treatment

Topical therapy and clipping of infected animals was once strongly advocated in treating animals with dermatophytosis. These measures may be helpful in preventing environmental contamination, but are often associated with an initial exacerbation of signs after the procedures are initiated. There is ***no evidence to support the efficacy of localized treatment*** for focal areas of dermatophytosis in dogs or cats. Interestingly, the sole use of products for spot treatment may be a predisposing factor for chronic subclinical infections. For generalized topical therapy, studies indicate that lime sulfur (1:16 dilution or 8 oz per gallon of water), enilconazole, and miconazole (with or without chlorhexidine) were the only consistently effective agents. Lime sulfur is odiferous and can stain, Enilconazole is not available in the United States. Miconazole containing solutions are available in both shampoo and "leave on" preparations. The use of an Elizabethan collar, particularly in cats, is recommended to prevent ingestion of these products. Again, it does not appear that focal therapy for dermatophytosis is advisable.

Dunbar Gram, DVM, Dip ACVD
MT VMA Conf Procd, 06:12

Eye drops vs. ointment

In this study, 19 cats without ocular disease were treated with either dexamethasone ointment (1 mg/g) or suspension (1 mg/mL) in both eyes. Dexamethasone concentration was measured in various structures of the eye by radioimmunoassay. The study showed that concentrations of the drug in the third eyelid, cornea, and aqueous humor were similar for both formulations 3 hours after administration. However, at 6 hours these concentrations were significantly ***higher in cats that received ointment.*** Dexamethasone reached therapeutic levels only in the third eyelid, cornea, and iris. The results suggest that dexamethasone is most effectively delivered in ointment form but reaches sufficient concentrations only in the anterior structures of the eye.

J. Bessonova et al.
NAVC Clin Brf, 9:6

Using tonometers

The main value of tonometry for general practitioners lies in the ability to detect pressure increases in dogs with red eye. These dogs could have increased IOP but may not yet be visually compromised. This author examines quite a few patients with glaucoma that have a history of red eye that was diagnosed as conjunctivitis by the referring veterinarians. Their ***vision could have been saved*** if the referring veterinarians had accurately measured IOPs. *Accurately* is the buzzword here, as the author finds that many veterinarians buy tonometers and use them only occasionally. Thus, they have little practice with them and get erroneous readings. It is quite common for them to overestimate the IOP. The instruments are easy to use, but they do have a (short) learning curve. It is also important to maintain them, calibrate them, and use the probes and rubber tips that the companies recommend, not inexpensive imitations.

Juliet R. Gionfriddo, DVM, MS, Dip ACVO
Vet Med, 106:1

CHF warning signs

Degenerative mitral valve disease (DMVD), the most common heart disease in dogs, is present in more than 33% of dogs >10 years of age. Some dogs have slow progression of disease that does not develop into congestive heart failure (CHF), but others have rapid progression to CHF. This study was designed to identify risk factors for first-onset CHF in dogs with DMVD. The ability to predict which dogs would progress faster than others would be valuable for making early treatment decisions and scheduling recheck evaluations, par-

ticularly when advanced imaging is either unavailable or too expensive. In the absence of echocardiography, both VHS (vertebral heart size) >12 and NT-proBNP >1500 pmol/L can be reliable independent indicators that CHF will occur. This information can help owners and veterinarians make recheck, treatment, and intervention decisions.

Amara Estrada, DVM, Dip ACVIM et al.
NAVC Clin Brf, Apr 2013

IV lipid emulsion therapy for poisoning

Intravenous lipid emulsion therapy (ILE), traditionally used as a component of parenteral nutrition and as a carrier for certain drugs, has emerged as a possible antidote for certain poisonings in both people and animals. Therefore, the standard approach to a poisoned patient including GI tract decontamination, supportive measures, and known antidote administration should be considered first. If the animal continues to have severe clinical signs of poisoning (i.e. treatments have failed) or if the animal is thought to have ingested a lethal dose or treatment is cost prohibitive, then ILE could be considered. No standard protocol currently exists for the use of ILE, but in all cases 20% lipid solutions were used. In the author's opinion, the animal's serum should be monitored for evidence of lipemia when additional lipid infusions are being considered and the lipid infusion should not be repeated until the lipemia has resolved. Repeated doses of ILE should be used cautiously if no clinical improvement is noted following the initial administration. Currently, the APCC recommends the use of ILE to manage severe intoxications with: amlodipine, baclofen, benzocaine, bromethalin, bupropion, CCNU, chlorpyrifos, diltiazem, doramectin, endosulfan, ivermectin, moxidectin, minoxidil, marijuana, permethrin and phenobarbital. The most common dosage given in this report was 1.5 ml/kg, as a bolus or over 30 minutes, followed by a second dose of 0.25 ml/kg

Erica L. Reineke, VMD, Dip ACVECC
VECCS Spring Symp, Apr 2013

Food responsive GI disturbances

The terminology in veterinary medicine is evolving and it is now common place for clinicians to refer to "Food Responsive Diarrhea." This term is able to encompass the classic food allergy and food intolerance while taking into account the observation that some cats will respond well to diets that are not actually designed to target a disease! A number of research efforts and publications over the last 10 years have highlighted the importance of early dietary intervention in cases of feline chronic diarrhea and vomiting. One of the most clinically significant findings of that research is that unlike a dermatologist, a gastroenterologist only needs about 2 weeks to determine if a diet trial has had an effect (8-12 for the dermatologist). So we can (and probably should) get the owner on board for attempting several food trials before we give up on seeing a beneficial effect, because it also appears that individual cats can respond to very specific diets; what diet works for one may not work for another, and visa-versa. The list of potentially beneficial diets is also expanding just about as fast as the pet food companies can produce them. Dietary intervention can also include dietary supplementation.

Craig B. Webb, PhD, DVM, Dip ACVIM
74th Co St U Conf Procd

Prednisone use in cats

Make the switch to prednisolone in cats, not prednisone. Sometimes cats fail to respond to prednisone because the diagnosis is wrong and they don't have "steroid-responsive disease," but sometimes they fail to respond because they can't convert prednisone to the active prednisolone. Eliminate the potential for failure based on poor conversion and ***start all cats on prednisolone.***

Kenneth Harkin, DVM, Dip ACVIM
Cent Vet Conf Procd, 09:07

Don't restrict protein in CHF

Restriction of dietary protein intake used to be recommended for animals with congestive heart failure (CHF). However, there is no evidence that protein restriction is necessary for patients with CHF and, in fact, it probably is deleterious since these patients are predisposed to loss of lean body mass. Unfortunately, some clinicians recommend a renal diet for patients with heart disease because many renal diets are restricted in sodium. Unless severe renal dysfunction is present, high-quality protein should be fed to at least meet canine (5.1 g/100 kcal) or feline (6.5 g/100 kcal) maintenance requirements. Clinicians should also be cautious about recommending "senior" diets as some senior diets can be very high in sodium.

Lisa M. Freeman, DVM, PhD, Dip ACVN
36th Royal Canin & OSU Symp Procd, 10:12

Feline cardiomyopathy, genetic test

Hypertrophic cardiomyopathy is defined by left ventricular hypertrophy without causative systemic or other cardiac disease. It is the most common form of heart disease in the cat. The etiology for the majority of cases is unknown. However, it is inherited in Maine coon and ragdoll breeds and is believed to be in the American shorthair, sphynx, Norwegian forest, and a few others. In the Maine coon breed it has been shown to be an autosomal dominant trait (both genders are equally affected). In the Maine coon and ragdoll breeds a mutation has recently been identified as causative for the disease. Genetic tests based on a buccal swab are now available for these breeds (www.cvm.ncsu.edu/vhc/csds/vcgl/index.html). It is a different mutation in both breeds and does not appear to be causative in other breeds.

Kathryn Meurs, DVM, Dip ACVIM
80th AAHA Conf Procd, 2013

Cranberry for urinary infection

Cranberry supplement may help prevent recurring bacterial urinary tract infection, especially infection caused by *E. coli.* It probably does not acidify the urine sufficiently to be effective in that way, but is thought to help destroy the biofilm that helps protect certain bacteria and allow them to attach to the uroepithelium. It is not recommended for use in patients suffering from or having a history of oxalate uroliths since cranberry supplements may contribute to the excretion of oxalate and favor oxalate formation because of its acidifying qualities. It is best used concurrently with appropriate antibiotic therapy and/or immediately after antibiotic therapy has eradicated infection. Cranberry juice can be used in both dogs and cats, but it is bitter tasting and it is difficult to get a pet to consume enough to accomplish the desired effect. Uro-MAXX by Animal Nutritional Products (www.anppet.com) has cranberry extract which is combined with other nutraceuticals for urinary tract health and is an easy formulation for administering one to two times daily (this author would recommend twice daily dosing). Over the-counter cranberry extract can be purchased as a health supplement. Dosing is variable, but is generally recommended at approximately 10-20 mg/kg, q12h, mixed with food.

Dawn Bowles, DVM, Dip ACVIM
Cent Vet Conf Procd, 11:10

Hazards of essential oils

Flea products that contain essential oils, defined as "minimum risk pesticides" by the EPA, can cause ***serious adverse effects in dogs and cats,*** even when applied according to label instructions. In this case series from the APCC, most of the patients exposed to the plant-derived natural flea products were symptomatic. Spot-on products were used most frequently. There are still many unknowns regarding the safety of these products. As the authors of this study indicate, the quality control of essential oil flea products is not currently regulated or monitored, and possible interactions between the essential oils themselves and other chemicals that could affect absorption are not known. Additionally, various health and other dermal conditions could alter the absorption of these products, making toxicosis more likely. Until more data and oversight of these products are available, caution owners to use them with care.

A.G. Genovese et al.
Vet Med, May 2013

Treatment of lick granuloma

The author's diagnostic approach to acral lick dermatitis (ALD) includes a radiograph of the affected area (to rule out osteomyelitis or bone neoplasm) and a biopsy (to rule out neoplasm and infection which should be amenable to antibiotic therapy). Depending upon finances and owner reluctance, these tests can be postponed until/if presumptive treatment does not work. However, these tests should be done FIRST if: 1) the dog is lame on the affected leg, 2) it is an old dog with no history of a previous ALD or 3) there is a history of trauma and/or orthopedic surgery on the affected leg. If these tests are negative or normal (or refused by the owner) the author takes a ***3-pronged approach to treatment:*** 1. Antibiotic (usually cephalexin 20-30 mg/kg, q8h) for *at least* 1 month. 2. A 'mood alterator': usually amitriptyline (2 mg/kg, q12h). 3. A topical product: capsaicin cream 0.025%, twice daily (be careful not to get in eyes; wear gloves). Apply around (but not directly *on*) the lesion for the first week, then directly on the lesion for subsequent weeks. The dog should be re-evaluated in 1 month. If there is any improvement, the treatments should be continued for another month, at which time the capsaicin should be discontinued. If the dog is still improved after the third month, the antibiotics may be discontinued, and the amitriptyline continued for 1/2 year. If at that time the dog looks clinically normal (or almost) then the amitriptyline may be discontinued if the owners wish. If at the first month recheck, there is no improvement, the diagnostic tests mentioned above should definitely be performed.

Stephen D. White, DVM, Dip ACVD
148th AVMA Conf Procd

Cruciate surgery vs. conservative

Results of this study suggested that overweight dogs with cranial cruciate ligament rupture (CCLR) have better outcomes when treated via surgical and nonsurgical methods, compared with dogs treated via nonsurgical methods alone. However, overweight medium- and large-breed dogs with CCLR treated via nonsurgical methods alone in this study typically had improvements in limb function, and almost two-thirds of such dogs had a ***successful outcome*** one year after the start of the study.

Katja L. Wucherer, DVM et al.
JAVMA, May 15, 2013

Neurologic signs in hypothyroidism

These authors demonstrated by three case reports that hypothyroid dogs may show signs of neurologic dysfunction, ***not the classic signs.*** If you note any of the following signs, consider performing pituitary-thyroid axis testing (Total T4, Free T4, TSH) to rule out hypothyroidism: absent menace response, tetraparesis, abnormal mentation, stupor/coma, head tilt, facial paralysis, nystagmus, vestibular ataxia, decreased facial sensation, short-strided gait, proximal muscle atrophy, hyporeflexia, and hypotonia.

Abigail Bertalan, VMA et al.
Vet Med, May 2013