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"Pearls" of Veterinary Medicine

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AT A GLANCE

Puppy socialization

Myth. Puppies shouldn't go outside and meet other animals until they are completely vaccinated. Puppy socialization is a sensitive developmental period during which pups are most susceptible to learning what is normal in their environment. This age generally is accepted to be between 3 and 12 weeks of age. If we follow vaccination rules, puppies wouldn't meet other dogs until they were 16 to 18 weeks old, well beyond the sensitive period. Research shows no greater risk exists of contracting infectious diseases, such as parvovirus, if a puppy is taken to classes before their full series. Animals that are inappropriately socialized may grow up to be excessively fearful, sensitive, and potentially aggressive. The risk of behavioral euthanasia far outweighs the risk of succumbing to an infectious disease.

Amy L. Pike, DVM, DACVB and Jessey Scheip, LVT, KPA-CTP
Vet Pract News, 30:2, 2018

Starting pimobendan before clinical signs

A double-blind study was conducted to determine if pimobendan might delay the onset of congestive heart failure (CHF) or death in dogs with heart disease, specifically in dogs with cardiomegaly secondary to myxomatous mitral valve disease (MMVD) with no discernible evidence of congestive heart disease (i.e., Stage B2). Pimobendan was shown to help decrease the likelihood of dogs reaching the primary endpoint (defined as time to onset of CHF, cardiac-related death, or euthanasia) by one-third, with CHF or death due to cardiac complications developing 15 months later in patients receiving pimobendan versus those receiving a placebo. The clinical implications of this study are important, as ***dogs appear to benefit from starting therapy before development of clinical signs.*** Further investigation of patients that may have progressive MMVD, even in the absence of clinical signs, would be worthwhile. If these patients are shown to have cardiomegaly, initiating pimobendan therapy may prolong the period before clinical signs of heart failure develop and prolong the patient's life.

A. Boswood
WSAVA Clin Brf, Apr 2018

At-home sedation for vet visit

Whenever possible, sedation trials have been done prior to medical visits to determine the dog's response. There are several drug options available and it may take several attempts to find the best drug or drug combination for the dog. Trazodone, a selective serotonin receptor antagonist and reuptake inhibitor (SARI), is given at a dose of 5-15 mg/kg (2.3-6.8 mg/lb), PO, and can be administered 60-90 minutes prior to leaving the house. An initial dose may be given the evening prior to the visit as well. The ideal regimen and dose for an individual dog is best determined by earlier home trials. Telazol/Acepromazine combination can be given to produce a more profound effect, including unconsciousness. This combination is typically reserved for use in dogs that are highly aggressive and trying to hurt people. Injectable acepromazine, 2.2 mg/kg, is combined with the Telazol, 10-20 mg/kg, and put in a meatball. Ideally, the dog is given the meatball on an empty stomach. Prolonged sedation and recovery may occur.

Elizabeth A. Martinez, DVM, DACVAA
VMX 2018, Feb 2018

Furosemide is effective SQ

Furosemide is the mainstay of treatment for animals with congestive heart failure. In many cases, these animals are so unstable that IV access is difficult. The general perception is that IV furosemide is necessary for its rapid onset of action; however, according to this study, ***SQ injection has about the same time of onset as does***

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IV and lasts a little longer. This is great news for veterinarians who have patients that need to be treated immediately and who want to avoid the struggle of placing an IV catheter. Although IV access may be necessary for other treatments, perhaps the SQ route should be preferred for furosemide injections in patients with congestive heart failure.

April Paul, DVM, DACVECC
WSAVA Clin Brf, 15:1

Stabilize the obstructed feline first

The only life-threatening circumstances related to obstructive or rupture uropathy are hyperkalemia and shock. If your urological emergency is blockage or a rupture requiring surgical repair, you ***must stabilize first*** before anesthetizing the patient. Asses potassium concentrations before you sedate an azotemic patient. Mortality associated with uroabdomen goes down significantly when you wait to anesthetize until the patient is stabilized and after potassium concentrations are normalized. Anesthetizing blocked cats that have an unknown potassium status to unblock them is below the standard of care.

Alesso Vigani, DVM, PhD, DACVECC
DVM News Mag, 48:11

Using methylprednisolone in the ER

IV methylprednisolone sodium succinate (MPSS) is often administered to dogs and cats with acute spinal cord injury before and after a decompressive spinal surgery. Strong opinions for and against the use of MPSS (and other steroids) exist within the veterinary community, despite the lack of evidence to support its benefits. The human literature also shows little consensus regarding the use of MPSS for acute spinal cord injury. The potential benefits of MPSS are likely associated with the limitation of ischemic and oxidative damage in the area of the damaged spine. Side effects of aggressive MPSS therapy include diarrhea, vomiting, melena, hematemesis, and anorexia. MPSS should be considered ***only when it can be administered within 8 hours*** of the initial injury. The author suggests 2 protocols for administration of MPSS. Both require an initial loading dose of 30 mg/kg, IV, followed either by a decreased dose (15 mg/kg) in 2 hours and then 8 hours after the initial bolus or by a CRI of 5.4 mg/ kg/hr, for 24 hours.

Kiko E. Bracker, DVM, DACVECC
WSAVA Clin Brf, Mar 2018

Calcitriol in feline CKD

Calcitriol is a hormone produced in the kidneys. Its production falls to nearly zero when the cat has kidney disease. It is used to prevent Renal Secondary Hyperparathyroidism (RSHPT). RSHPT is a very important complication of kidney disease that needs to be prevented. The author considers kidney disease to be present when about 40% of kidney function is lost. It may last many months to a few years before kidney failure occurs and becomes life-threatening. It is usually documented and monitored with creatinine values. It can be confirmed with a test called SDMA. Kidney disease results in two problems. First, calcitriol production drops to nearly zero. Second, the kidney loses its ability to move phosphorus from the blood into the urine resulting in blood P levels that are too high. ***Calcitriol should be started as soon as kidney disease is detected***. There are several factors in this determination, but creatinine values are a very important part of that decision. Calcitriol raises blood calcium levels without stimulating the parathyroid glands. It prevents the parathyroid gland from making increased PTH and becoming overstimulated. However, it needs to be given BEFORE parathyroid overstimulation occurs. Thus, calcitriol needs to be started early in the course of kidney disease. It is best started when the blood Ca and P levels are still normal.

Gary D. Norsworthy, DVM, ABVP et al.
Emerald Coast Vet Conf, 07:17

Predicting ovulation and delivery date in the dog

Once females have 80%-100% cornification of vaginal epithelial cells, measurement of progesterone concentrations should begin. These can be sent to almost any veterinary laboratory as well as to human hospitals. It is generally recommended to avoid serum separator tubes, and to send all samples to the same lab for progesterone analysis during a given estrus cycle for consistency of results and interpretation. When progesterone levels cross 2.0 ng/ml, this indicates the day of the LH surge, whereas a value between 4-10 ng/ml indicates ovulation; these 2 events should occur 2-3 days apart. Her ***most fertile window for breeding will be days 2-4 following ovulation.*** With normal females and normal litter sizes, whelping should occur 63 days (+/- 1) from ovulation.

Robyn R. Wilborn. DVM, MS, DACT
Emerald Coast Vet Conf, 07:17

Inducing vomiting

Emesis is most productive if performed within 2-3 hours post-ingestion. In some cases, such as ingestion of chocolate, large numbers of sugar-coated tablets, grain-based rodenticides, or plant material, emesis may be effective even after 2-3 hours due to formation of boluses of product in the stomach (chocolate, tablets) or delay in gastric emptying (grain-based products, plants). Feeding the animal a small meal prior to inducing vomiting can increase chances of an adequate emesis; for dogs, a slice of bread often works well. ***Three percent hydrogen peroxide is a preferred emetic***, especially if emesis is to be induced at home by the owner. Peroxide is readily available (needs to be "fizzy," not flat), easy to administer, and often highly effective, especially in dogs. The dosage is 1 teaspoon/5 lbs., not to exceed 3 tablespoons. Vomiting usually occurs within 10-15 minutes and the dose can be repeated once if not initially successful. Physical activity, such as chasing a ball, after administration of peroxide may help to trigger vomiting. In the process of foaming (which triggers the vomiting) the peroxide is converted to water and oxygen, so if no

vomiting occurs there is no concern about adverse effects from the retained peroxide. Overdosing with hydrogen peroxide should be avoided, as it may result in gastritis that may take days to resolve.

Tina Wismer, DVM, DABVT, DABT, MS
22nd Int VECCS Conf, 09:16

Zinc penny toxicosis

In addition to supportive care, and once the penny has been removed, chelation of the zinc is a possible treatment. Chelators of choice include Calcium disodium EDTA or D-Penicillamine. Neither treatment has been well documented for efficacy, however there are two main dosing regimens that have been proposed. Calcium disodium EDTA can be administered at 100 mg/kg, divided into 4 subcutaneous doses per day, diluted in 5% dextrose to decrease irritation at injection site. This can be administered for 5 days. The benefit is that subcutaneous administration spares the gastrointestinal upset that may occur with oral D-Penicillamine dosing. If tolerable, D-Penicillamine is dosed at 110 mg/kg/day, orally, divided in three. This oral dosing regimen can be continued for 1-2 weeks. It is important to note that if patients are in renal failure, chelators should NOT be started as they can worsen the failure. It is important to note that zinc toxicosis can also occur from ingestion of multiple topical creams such as Desitin, Boudreaux's Baby Butt Balm, and other generic over-the-counter brands.

Danielle Sawyer, DVM
So Cal VMA Pulse, May 2018

Care of the post-arrest patient

The care of an arrest patient does not end with return of spontaneous circulation; rather this is when the true care of the patient begins. In the immediate post resuscitation phase every effort should be made to maintain arterial oxygen content within the normal range. No evidence exists that supra-physiologic oxygen levels are beneficial and theoretical detrimental effects exist. While post-arrest therapeutic hypothermia has become the standard of care in human medicine it is still beyond the capabilities of most veterinary facilities. However, if hypothermia occurs during the course of the arrest then rewarming efforts should not be vigorous and the patient should be ***allowed to return to normothermia at a gradual rate***. Hyperthermia should be avoided if at all possible. There is no evidence in support of the routine use of corticosteroids, hypertonic fluids (mannitol or hypertonic saline), or prophylactic treatment with anti-seizure medications. If patients exhibit signs of intracranial hypertension then hypertonic saline or mannitol can be considered. Finally, referral to a comprehensive care facility with 24-hour capabilities should be considered for ongoing care of the post-arrest patient.

Nathan Peterson, DVM, DACVECC
CVC Kansas City, 08:17

Is famotidine necessary in kidney disease?

Veterinarians often prescribe famotidine in patients with kidney disease, but this author questions if they should be. Studies have shown no evidence of mucosal erosion or ulceration in patients with chronic kidney disease. And these patients are already receiving plenty of drugs, so why add to the burden? On top of this, PPI administration in people has been associated with a higher risk of kidney disease.

Katie Tolbert, DVM, PhD, DACVIM
DVM News Mag Supp, 12:07

Chemotherapy in elderly dogs well tolerated

Chemotherapy protocols for lymphoma may be beneficial for and tolerated by very elderly dogs ***and need not be withheld because of age*** alone, according to results of a study of 29 dogs >14 years old with multicentric lymphoma treated with a standard chemotherapy protocol (n = 22) or with prednisolone alone (7). The 7 (24%) dogs that received prednisolone alone had a median survival time of 27 days. Of the 22 dogs that received chemotherapy, 21 (95%) had complete clinical remission and one (5%) had partial remission. Median survival time for all 22 dogs was 202 days, with estimated 1- and 2-year survival rates of 31% and 5%, respectively.

Antony S. Moore, BVSc, MVSc and Angela E. Frimberger, VMD
JAVMA, Apr 1, 2018

Treating idiopathic IBD

No improvement after a diet trial? Break out the corticosteroids. If you are 21 days into the trial and the pet is not responding, it's time for corticosteroids and a diagnosis of idiopathic IBD (IIBD). This author prescribes 1-2 mg/kg prednisone (or prednisolone for a cat) per day. Pharmacokinetically, there is no difference between once-a-day and twice-a-day administration. If the patient is a dog that is not responsive *and* there is evidence of a protein-losing enteropathy, then the author will add in chlorambucil to increase survival time. For intestinal dysbiosis, food-responsive enteropathy or true IIBD, client education is as important as diagnostics and therapy. Stress to veterinary clients that you are managing the disease, not curing it, and it will take trial and error to both obtain a diagnosis and treat the problem, especially in patients that have more than one condition. Advise clients that the gut is chronically inflamed, and it takes time and testing to figure out the root cause or causes. Many clients have their own GI distress journeys, and the author has found that they understand the diagnostics and treatments surprisingly well.

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

Heartworm testing

ELISA technology allows determination of the efficacy of adulticide therapy. ELISA antigen concentration typically falls to undetectable levels 8-12 weeks after successful adulticide therapy, so a positive test persisting beyond 12 weeks post-therapy has been suggested to indicate persistent infection. However, antigen tests may remain positive for longer periods, and this author does not

assume a failure in adulticidal therapy unless the antigen test is positive >6 months after adulticidal therapy and does not advocate routine retesting until 8-12 months post-treatment. The American Heartworm Society now prefers the term "below detectable limits" or "no antigen detected" to the term "negative", when referring to antigen test results that are not positive. This is to emphasize the fact that negative tests do not rule out immature, small, or male HWI. ML therapy with either ivermectin, milbemycin oxime, moxidectin or selamectin results in clearance of microfilaria within 6-8 months. In addition, embryostasis may be permanent. Thus, the sole use of direct smears, the modified Knott test, the millipore filter test (i.e., microfilarial tests) in dogs receiving ML heartworm preventives is inappropriate, though they certainly play a supplemental role. The only routinely effective testing modality in dogs receiving monthly preventive is the use of antigen assays.

Clarke Atkins, DVM
Music City Vet conf, Feb 2018

Conjunctivitis in the cat

Conjunctival cytology is an under-utilized, but excellent diagnostic tool. This author's preferred method of obtaining the sample is through the use of a Microbrush (www.microbrush.com). The Microbrushes are lint free, electrostatically charged, small, round brushes that allow for much better sample collection than cotton tipped applicators. Roll the Microbrush in the conjunctival fornix after the application of topical anesthetic and then roll the sample out on the center of a glass slide. Stain the slide with Diff-Quick and examine under the microscope. In cases of FHV-1 only rarely are FHV-1 intra-nuclear inclusion bodies noted. Usually the findings consist of a neutrophilic to lymphoplasmacytic inflammatory response and conjunctival epithelial cells. However, identification of the intra-cytoplasmic elementary bodies of *Chlamydophila felis* or the presence of *Mycoplasma felis* on the surface of conjunctival epithelial cells may assist in the differentiation of the 3 top causes of feline conjunctivitis. Mycoplasma in particular can be easily overlooked, so examination of the slide by a clinical pathologist is worthwhile.

Wendy M. Townsend, DVM, MS,DACVO
Emerald Coast Vet Conf, 07:17

Terbinafine not a good choice for Malassezia

Results of this study indicated that, although well-tolerated, oral terbinafine hydrochloride (TBF) doses >30 mg/kg, q24h may be needed for efficacy in the treatment of canine Malassezia spp dermatitis The major takeaway from this article is to ***avoid prescribing terbinafine for Malassezia spp dermatitis treatment***. Terbinafine has been an attractive low-cost alternative to other azoles for treating Malassezia spp overgrowth, especially because it is part of many $4 and $12 prescription plans. In this commentator's experience, clinical response in dogs to terbinafine was unimpressive as compared with ketoconazole.

Karen A. Moriello, DVM, DACVD
WSAVA Clin Brf, Jan 2018

Safety of Chinese herbs

Some veterinarians are worried about the safety and possible toxicity of Chinese herbs, but this is not a concern when you buy from the companies commonly used by veterinary herbalists. Companies in China that do not have an American counterpart may add adulterants or toxic substances. A number of companies regularly used by veterinarians who use Chinese herbal formulas, have quality-control procedures and follow U.S. good manufacturing practices. Examples include Golden Flowers, Health Concerns, Jing Tang Herbals, K'an Herbals, May Way, Natural Path and World Herbs (Darcy Naturals). All these companies have websites where they describe their procedures. They all examine raw herbs to ensure they are using the right species. They avoid the use of toxic herbs containing chemicals such as aristolochic acid, avoid adulterants, and submit both the raw ingredients and the final product to laboratory tests. In addition, one company (Natural Path) uses organic herbs. At least three of the companies import raw herbs from China and process them in the U.S. The companies belong to quality assurance groups such as the National Animal Supplement Council and the Chinese Herbal Medicine Coalition which work with the Food and Drug Administration to establish certification standards for safe and effective use of their products. Jing Tang Herbals are the herbs formulated and used by Huisheng Xie, DVM, PhD, professor at the University of Florida veterinary school. Their effectiveness has been verified in a number of published case studies. Health Concerns Herbs are formulated by an American OMD.

Nancy Scanlan, DVM
Emerald Coast Vet conf, 07:17

Key points concerning antacids

The use of famotidine and other histamine-2 receptor antagonists (H2RAs) is not optimal in dogs and cats with known gastroduodenal ulceration. However, some patients do appear to respond to famotidine or even ranitidine, possibly because they have milder disease. Other key points on antacid drugs: * Proton pump inhibitors (PPIs) should generally be used in preference to H2RAs as they are more effective. * Proton pump inhibitors are most effective when given twice daily, ideally 1 hour prior to meals. * The concurrent use of PPIs and H2RAs seems to be unnecessary. * The dose of PPIs should be gradually decreased to avoid rebound hyperacidity. * Although PPIs and H2RAs seem to be well tolerated, antacids should not be used indiscriminately. * Misoprostol is only advised to help prevent NSAID induced mucosal injury in high risk patients. The listed dosage of ranitidine is 1-2 mg/kg, PO, SQ, IM, IV, q8-12h; for famotidine—0.5-1 mg/kg, PO, SQ, IM, IV, q12-24h; for omeprazole—0.5-1 mg/kg, PO, q12-24h; for misoprostol—2-5 µg/kg, PO, q8-12h (dogs only).

Jonathan Lidbury, BVMs, MRCVS, PhD, DACVIM
N Amer Vet Conf, 02:17

Lyme disease treatment guidelines

In endemic areas, it's important to screen for Lyme disease, but just because you get a positive result doesn't mean you should start treatment. This author does not treat asymptomatic patients with a positive Lyme disease result on 4DX. If a patient does display clinical signs, doxycycline is the most efficacious choice for treatment. The author's recommendation is to give 10 mg/kg, orally, once daily in the morning for 4 weeks. Four weeks of treatment have been recommended because the clinical manifestations of disease resemble those of late-stage disease in human patients, for whom relapses occur when treatment durations of less than 30 days are used. Clinical signs should be completely resolved within 2-3 days. Analgesics are not administered (e.g. NSAIDs or tramadol) at the same time as starting doxycycline—if you do, you can't definitively determine which drug is making the dog feel better. Doxycycline is not without risks—it can increase the likelihood of esophageal stricture. This is not a medication that owners should give with a treat after dinner right before going to bed, and it's important to counsel owners accordingly. Patients need to be up and moving for several hours after giving the drug. Give it at breakfast. Other drugs to consider include amoxicillin, cefovecin sodium, ceftriaxone and azithromycin, which have all been shown to be effective. In human medicine, it's common to give a single dose of doxycycline at the time of the bite to prevent Lyme disease. In people, Lyme disease is usually caught much earlier because of the "bull's-eye" erythema migrans rash seen on the skin. Typically, the disease is not caught early enough in pets for a single dose to be effective. And even if it were, a single dose of doxycycline has not been shown to prevent Lyme disease in dogs. If the lameness isn't 100 percent improved in 2-3 days, then it isn't Lyme disease. Also remember that treatment does not completely clear spirochetes from the blood.

Garret Pachtinger, VMD, DACVECC
DVM News Mag, Apr, 2018

Treatment of IBD in the cat

Treatment for IBD in cats remains empirical as data is lacking or inadequate. Studies in cats with chronic lymphoplasmacytic enteropathy have found that most patients respond to treatment with diet, antibiotics, or immunosuppressive drugs. ***Sequential treatment*** helps determine which treatment will be most effective for the individual patient. Using this approach, a diet trial is performed first for at least 7 days and response is assessed. Most cats will benefit from long term dietary therapy even if other treatments are necessary. The next step is a 14-day trial of metronidazole (15 mg/kg, PO, daily); if clinical signs improve, the dose is tapered by 25% every 2 weeks until it is discontinued. Cats that are non-responsive to diet and metronidazole are treated with oral prednisolone (2 mg/kg, PO, daily) alone or in combination with metronidazole. The prednisolone dose is tapered by 25% every 2 weeks to reach the lowest dose that controls clinical signs. Other immunosuppressive medication choices include chlorambucil (2 mg/cat, PO, every 72 hours) or cyclosporine (5 mg/kg, PO, daily). Some cats can be weaned from medications and maintain remission with dietary therapy alone. Cats with low serum cobalamin should be supplemented at 250 µg/week, SC, for 6 weeks, then one dose after 30 days. The serum cobalamin is reassessed 30 days after the last dose. Some cats will require long term monthly cobalamin supplementation. Not all owners are able to afford an optimal diagnostic investigation, including biopsies. Clinicians often must treat suspected IBD cases without diagnostic confirmation. These patients should be treated with the sequential therapy approach outlined above. Cats that have significant weight loss and watery small bowel diarrhea should be treated with cobalamin parenterally. Cats with signs of large bowel diarrhea may benefit from dietary fiber supplementation, such as 1/4 teaspoon psyllium per meal. Patients that fail to respond to these treatments can be treated with prednisolone with the understanding that it may not be the best therapy should the patient have lymphoma or an infectious component. Most cats with IBD respond well to treatment but some will fail due to compliance issues, severe disease, concurrent disease (such as hepatic or pancreatic disease, or hyperthyroidism), and misdiagnosis (especially cats that actually have lymphoma). Low serum cobalamin has been correlated with poor clinical response in cats with chronic enteropathy.

Susan Little, DVM, DABVP
3rd World Fel Vet Conf, 10:15

For what it's worth

While listening to NPR, a story on a cure for sepsis in people piqued my attention. Further research revealed the following. Dr. Lester Marik, claims to have come up with an effective treatment for sepsis. At first, some doctors called it "snake oil." Now, other doctors are coming on board and several large hospitals, including Harvard-affiliated Beth Israel Deaconess are running trials. The treatment, known as Marik's cocktail is composed of vitamin C, hydrocortisone, and thiamine. The protocol is as follows. Standard ICU care is administered. Then Vitamin C is given at 1.5 g, q6h x 4 days or until ICU discharge; IV hydrocortisone, 50 mg, q6h x 7 days or until ICU discharge followed by a taper over 3 days; IV thiamine at 200 mg, q12h x 4 days or until ICU discharge. The results of one study suggested that the early use of IV vitamin C, together with corticosteroids and thiamine may prove to be effective in preventing progressive organ dysfunction, including acute kidney injury and reducing the mortality of patients with severe sepsis and septic shock.

Bill Collins, DVM, Editor

Coming next month.

Dangers of spring-loaded mouth gags in cats.
Feeding unbalanced home prepared diets.
And much more.