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"Pearls" of Veterinary Medicine

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AT A GLANCE

Using steroids for atopy

Glucocorticoids are the mainstay of effective atopic dermatitis (AD) therapy. In many cases the side effects outweigh the benefits. Use oral prednisone or prednisolone at the lowest possible dose to control pruritus ("***comfortably itchy***" is the goal). A proposed "safe annual steroid dose" has been published: 15 x weight in lb = mg prednisolone/year and can be used as a guide for dogs being managed with long-term glucocorticoid therapy. The minimal use of long-acting injectable glucocorticoids should be avoided in the long-term management of canine AD. Temaril P is a medication that is a combination of an antihistamine, 5 mg of trimeprazine, and 2 mg of prednisolone. Using Temaril P may allow you to provide pruritus relief, often with a lower dose of corticosteroids than if using plain prednisone.

Candace A. Sousa, DVM, DABVP
20th ABVP Conf, 11:15

SQ hydrating the CKD patient

As the kidney becomes diseased, the ability to concentrate the urine is lost. Although it has not been systematically assessed in a clinical trial, adequately maintaining hydration by giving subcutaneous fluids anecdotally appears to ***substantially help quality of life***, improve appetite and activity (Grade 4). It can be a very helpful tool for owners in management of disease, but may not be necessary for every patient. The best candidates for SQ fluid therapy (75-150 ml, SQ, every 1-3 days) are those cats that appear to gain clinical benefit from management of hydration, are prone to secondary complications of chronic dehydration such as constipation, and do not suffer quality of life concerns from the procedure. If possible, supplementation with free water (orally or with a feeding tube) is preferred to avoid the sodium load that comes with the electrolyte solutions available for subcutaneous use. Feeding canned food instead of dry, or adding water to food is another way to potentially increase water consumption. Paying special attention to water sources in the house - fresh, accessible, water fountains etc., is also key.

Jessica Quimby, DVM, PhD, DACVIM
ACVIM For, 06:15

Hypomagnesemia in brachycephalics

Chronic magnesium deficiency has been associated with hypertension and obstructive sleep apnea in many species; brachycephalic dogs are at increased risk for these conditions. All but 1 of 16 bulldogs in this study had total Mg levels at or below the lowest reference value. The authors suggest decreased GI absorption of Mg in bulldogs likely plays a role in hypomagnesemia. Ionized-to-total Mg are impractical and of poor added value at present time. This author believes that Mg measurement is hardly justifiable to pet owners and that in brachycephalic patients experiencing systemic hypertension and/or severe hypercapnia, clinicians might consider ***empiric Mg supplementation***. A dose of 0.005-0.01 mEq/kg/hour with maximum rate of administration of 0.05 mEq/kg/hour in sick, anorexic, and nonazotemic dogs has been reported in a recent proceeding.

Alice Tamborini, DVM, MRCVS, DECVIM-CA
NAVC Clin Brf, 13:2

AVMA help for cyberbullying

The AVMA Board has approved a recommendation from the Office of the Executive Vice President to create the new member benefit (dealing with cyberbullying). The hotline (626-531-1140) is available 24/7. Members can get 30 minutes of confidential, free consulting time. If additional guidance is needed, the rate will be discounted. In 2015, the AVMA developed resources to address best practices for preventing online reputation problems and mitigating cyberbullying. The Online Reputation Management page is at http://jav.ma/ AVMAonlinereputation.

Am J Vet Res, Feb 2017

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Managing ruptured cornea

In general, an Elizabethan collar is recommended as a preventive measure in patients with corneal rupture or re-rupture. Topical fluoroquinolone treatment can also be initiated. In addition, a topical mydriatic such as atropine should be administered q24h to facilitate mydriasis and improve patient comfort. In the case of corneal rupture, amoxicillin-clavulanic acid (13.75 mg/kg, PO, q12h) is advantageous because it can reach therapeutic levels in the anterior chamber. Carprofen (2.2 mg/kg, PO, q2h) is also indicated as an anti-inflammatory. In addition, immediate referral to a board-certified ophthalmologist should be recommended.

D.J. Haeussler, DVM, MS, DACVO
NAVC Clin Brf, Jan 2017

What is best rate of fluid administration?

Regardless of the circumstances, conscious euvolemic or uncontrolled acute hemorrhage, ***slower rates of fluid administration are preferred***. Concerns over "'popping the clot" and re-bleeding in subjects with uncontrolled hemorrhage (splenic, liver tear) indicate that attempts to restore blood volume and pressure before surgical hemostasis can accentuate hemorrhage and mortality. These studies suggest that mean arterial pressures should not exceed 40-50 mm Hg and systolic arterial pressure should not exceed 65 mm Hg until hemorrhage is controlled. Furthermore, the administration of more aggressive fluid rates and volumes (≥30-40 ml/kg/hr; 80 ml/kg dog; 65 ml/kg cat) to anesthetized surgical candidates or animals in which hemorrhage has been controlled is likely to produce hemodilution and excess interstitial fluid accumulation impeding microcirculatory perfusion. Current evidence suggests three important recommendations regarding the rate of fluid administration: 1) lower fluid "maintenance" rates (2-3 ml/kg/hr) are adequate during anesthesia; 2) fluid "replacement" rates for controlled hemorrhage and trauma need not exceed 30 ml/kg/hr; 3) balanced crystalloids are just as effective as colloids for volume replacement unless total protein (colloid osmotic pressure) or packed cell volume needs to be restored.

William Muir, DVM, PhD, DACVAA, DACVECC
22nd Int VECCS Conf, 09:16

Using trazadone as a preanesthetic

To these authors' knowledge, the effects of orally administered trazodone as a premedication in dogs undergoing general anesthesia have not been reported. The purpose of this study was to compare the doses of propofol needed to induce general anesthesia in dogs premedicated with acepromazine or trazodone and to compare the effects of these two premedicants on cardiovascular variables in dogs undergoing anesthesia and orthopedic surgery. On the basis of the results, this author concluded that trazodone can be administered to healthy dogs at the dosages used in this study (5 mg/kg for dogs >10 kg; or 7 mg/kg for dogs <10 kg) as part of a preoperative medication protocol in combination with an opioid. In this population of dogs, preoperative treatment with trazodone did not cause any greater impact on cardiovascular variables than did acepromazine. In the authors' hospital, trazodone is also used clinically to premedicate dogs in combination with additional opioid agents.

Lindsey A. Murphy, DVM, MS et al.
JAVMA, Feb 15, 2017

IV lidocaine for analgesia

Low doses of local anesthetics administered systemically provide analgesia, and in people are more useful for chronic neuropathic pain states. Systemically administered lidocaine also appears to have anti-inflammatory, gastrointestinal prokinetic and free-radical scavenging effects. Typical doses are a loading dose of 1-2 mg/kg, IV followed by a CRI of 50 µg/kg/min in the dog. Systemic lidocaine in the cat increases systemic vascular resistance and decreases cardiac index and should be used cautiously, if at all.

Linda S Barter, BVSc, MVSc, BSc(vet), PhD, DACVAA
VECCS Symp, 04:16

Sinus arrhythmia and heart disease

Physical examination can help us rule out congestive heart failure in dogs when respiratory sinus arrhythmia is present. Respiratory sinus arrhythmia, which is a variation of heart rate during breathing, results from elevated vagal tone in dogs. Because the first response of the organism to heart failure is an increase in adrenergic tone, which then triggers an increase in heart rate and contractility, respiratory sinus arrhythmia is typically ***not compatible with the presence of congestive heart failure*** in dogs. This observation is very helpful to determine the origin of cough (cardiac or respiratory system) in older small breed dogs with mitral valve disease. A dog that is coughing but has sinus arrhythmia, does not typically have congestive heart failure (but most likely tracheal collapse or chronic bronchitis). Stress in the examination room can also lead to an increase in adrenergic tone and tachycardia. Cats typically don't have sinus arrhythmia.

Romain Pariaut, DVM, DACVIM
N Amer Vet Conf, 01:15

Management of IBD

The global therapeutic approach to biopsied confirmed IBD (enteritis) is directed at counteracting inflammation and dysbiosis and correcting nutritional deficiencies (i.e. cobalamin and/or folate deficiency). Empirical anthelmintic therapy (i.e. fenbendazole 50 mg/kg, PO, q 24hrs, for 5 days) for Giardia and antibiotic therapy (i.e. tylosin 10 -15 mg/kg, PO, q8hrs, oxytetracycline 20 mg/kg, PO, q8hrs, or metronidazole 10 mg/kg, PO, q12hrs, for 14-28 days) are often administered, if not already initiated. In patients with a positive response to antibiotics (antibiotic-responsive enteropathy), transition to a probiotic (i.e. VSL #3) can be considered. In dogs with IBD, combination therapy including VSL #3 demonstrated a protective effect with a significant decrease in clinical and histological

scores and CD3+ T-cell infiltration. Cobalamin deficiency has traditionally been treated with parentally administered Vitamin B12; however, oral therapy (cyanocobalamin 1 mg tablets, dogs with a body weight of 1-10 kg 1/4 tablet, >10-20 kg 1/2 tablet, and >20 kg 1 tablet, PO q24h) has been shown to be effective.

Marnin A. Forman, DVM, DACVIM (SAIM)
ACVIM For, 06:16

L-theanine for thunderstorm phobia

This study shows that L-theanine may be useful in treating thunderstorm phobia because it appeared to lessen the severity of clinical signs. L-theanine, an amino acid found in green tea, increases the inhibitory neurotransmitter gamma amino butyric acid along with brain serotonin and dopamine levels. Owner satisfaction with treatment was high (94%). L-theanine may be an alternative treatment or adjunct for thunderstorm phobias in dogs.

Heather Troyer, DVM, DABVP, CVA et al.
NAVC Clin Brf, 13:8

New thoughts on feline pain

Feline physiologic differences have ensured that the traditional nonsteroidal anti-inflammatory and opioid pain medications have not been used much in cats. Did you know that pruritus receptors are a subset of nociceptors? Why does that matter? Well, for instance, can we then postulate that cats with hyperesthesia of the lumbosacral area may have back pain? Thus, this author thinks that amitriptyline is a frequently overlooked and underused drug for pain-and itchiness-in cats. It is a tricyclic antidepressant that we already use to treat feline idiopathic cystitis (FIC) and feline psychogenic alopecia, thinking that it is the behavioral action of the drug that is helping. Maybe those cats with FIC or self-grooming alopecia of the caudoventral abdomen have painful bladders.

Janice Huntingford, DVM, ACVSMR, CVA, CVPP, CCRT
DVM Supp, Feb 2017

When to induce emesis

Emesis induction should only be performed with recent ingestion of a toxicant or unknown time of ingestion in an *asymptomatic* patient. The more rapidly emesis is induced post-ingestion, the greater yield of recovery of gastric contents. If several hours have elapsed since ingestion, the contents have likely moved out of the stomach and emesis will no longer be of benefit. While delayed emesis may still sometimes be successful, the amount of gastric recovery significantly decreases as time passes. That said, induction of emesis can be performed in *asymptomatic* patients up to 4 hours post-ingestion. In certain circumstances, delayed emesis induction can be performed within 4-6 hours of ingestion, provided the patient remains *asymptomatic* under the following circumstances: when certain toxins that delay gastric emptying are ingested (e.g., salicylates, opioids, anticholinergics, tricyclic antidepressants) or if the toxin is known to physically stay in the stomach for a longer duration of time or to form a large bezoar or concretion (e.g., iron tablets, a large amount of chewable multivitamins, bone or blood meal). Additional examples include: Large wads of xylitol gum; large amounts of chocolate; grapes and raisins; foreign material (e.g., sawdust/wax, kitty litter, bone meal).

Justine E. Lee, DVM, DACVECC, DABT
81st AAHA Conf

Feline hypertrophic cardiomyopathy

Diuretic therapy is indicated to eliminate pulmonary edema. Furosemide is the diuretic of choice in emergencies because it reduces LVEDP and, hence, left atrial, and pulmonary venous pressures through diuresis and venodilation. In the emergency situation, treatment with parenteral furosemide (2-4 mg/kg, IV or IM) is accompanied by the use of topical nitroglycerin (1/8-1/4 inch, TID-QID for the first 24 hours, then 8 hours on, 8 off, only if necessary) and oxygen supplementation (40%). Although furosemide diuresis is usually successful, the addition of enalapril (0.25-0.5 mg/kg, SID) is indicated in refractory cases or when biventricular failure (pleural effusion) ensues. It should be kept in mind that drugs which reduce preload (and afterload) may worsen outflow obstruction in hypertrophic obstructive cardiomyopathy (HOCM).

Clarke E. Atkins, DVM, DACVIM
100th WI VMA Conf, 10:15

When to suspect MRSP

Fortunately for veterinarians and our patients, MRSP has not acquired any of the common virulence factors that make MRSA so severe in human medicine (PVL toxin for example). As a result, MRSP is no more damaging to tissues, no more invasive, no more likely to cause infection than wild-type *S. pseudintermedius*. Skin infections by MRSP look identical to skin infections by MSSP. The same principles of opportunistic overgrowth and infection of abnormal skin due to underlying disease that applies to our understanding of superficial spreading pyoderma, bacterial folliculitis, and bacterial otitis due to MSSP, applies to MRSP. The primary difference between MSSP and MRSP in small animal medicine is failure to respond to appropriate empirical antibiotic therapy. Therefore, veterinarians should be concerned with any purulent skin infection, with cytologic evidence of paired coccoid bacteria that is not responding to antibiotics that typically have a high rate of predictable success against MSSP: cephalexin, cefadroxil, cefpodoxime, cefovecin, clavamox, clindamycin, potentiated sulfonamides, or any fluoroquinolone. If this occurs, a culture should be collected and submitted for identification and susceptibility testing. Do not worry about taking patients off antibiotics prior to skin or ear culture; false negatives while on antibiotics is a concern when culturing urine, not the skin/ears.

John C. Angus, DVM,DACVD
Derm For Vets, 10:16

Premedicating the brachycephalic

When considering premedicants for any brachycephalic breed it is necessary to choose drugs that will not lead to over sedation. Heavy sedation can leave patients with a decreased ability to ventilate appropriately. Many brachycephalic breeds are relatively tractable and adequate sedation can be achieved using more "mild" drugs such as midazolam (0.05-0.2 mg/kg)/hydromorphone (0.1-0.2 mg/kg) or midazolam/oxymorphone (0.1mg/kg). For non-painful procedures, midazolam/butorphanol (0.2-0.5 mg/kg) can be an excellent choice in brachycephalic breeds. There will be situations where patients are too aggressive or nervous for those combinations to work; in those cases, reversible sedatives such as dexmedetomidine may be warranted. Brachycephalic breeds often have increased vagal tone and may require anticholinergics to combat bradycardia. Brachycephalic cases should be closely monitored during the premed and sedation period. This is often the time when patients become distressed.

Katrina Lafferty, BFA, CVT, VTS
86th FL VMA Conf, 04:15

Allergic rhinitis in the cat

Lymphocytic-plasmacytic rhinitis and eosinophilic rhinitis occur in some dogs and cats. The nasal discharge is serous to mucoid. Rarely, secondary bacterial infection results in mucopurulent nasal discharge. Often, the affected animal has other clinical evidence of allergic disease such as vomiting, diarrhea, pruritic skin disease, and cough. Diagnosis is based on histologic findings. Omega 3/omega 6 fatty acid supplementation, antihistamines, cyproheptadine, and glucocorticoids are used in the management of this condition. Because the syndrome may be related to food hypersensitivity, a hypoallergenic diet trial may be indicated. This author frequently uses chlorpheniramine at 1-2 mg, PO, q 12 hours. Cyproheptadine may be effective at 2 mg, PO, q 12 hours. Prednisolone should be used in cats rather than prednisone; 1-2 mg/kg, PO, q 12 hours is generally effective. Resistant cases may respond to administration of cyclosporine at up to 7.5 mg/kg, PO, daily or every other day. Trough blood levels should be checked 2 weeks after starting cyclosporine to make sure that excessive blood levels are not achieved which may activate infectious diseases.

Michael R. Lappin, DVM, PhD, DACVIM
Music City Vet Conf, 03:15

Assessing proteinuria in the CKD patient

In order to say that a patient has pathological proteinuria, we need to examine three urine samples, collected over a 2 week period. Very few of us follow these rules; this author usually verifies proteinuria on two occasions, and measure a urine protein:creatinine (UPC) ratio one time. A UPC can be reliably run on a free catch specimen, so the second sample can be collected at home. Inflammatory, infectious, hemorrhagic, and neoplastic processes in the lower tract can cause substantial proteinuria. If the urine sediment examination is active (lots of red cells, white cells, transitional cells, bacteria, etc.) there is no point in measuring the UPC as the results will be unreliable. If a persistent proteinuria (defined by UPC >0.4) is confirmed, it needs to be addressed. As hypertension can drive proteinuria, the author treats this first and then reassess. If the proteinuria persists, an ACE-Inhibitor is indicated. The author use either enalapril or benazepril (0.5 mg/kg, SID-BID) It is important to recheck creatinine levels about 10 days after starting an ACEI, as they can decrease glomerular filtration rate and worsen azotemia. If the creatinine is >20% higher, the ACEI should be discontinued.

Audrey K. Cook, BVM&S, MRCVS, DACVIM-SAIM, DECVIM
Tex A&M 19th Fel For, 04:15

Fever of undetermined origin

If a definitive diagnosis is obtained, a specific treatment should be initiated. The problem arises if the clinician cannot arrive at a definitive diagnosis. In these patients, changes in the CBC usually are the only clinicopathologic abnormality. That is, results of bacterial and fungal cultures, serologic tests, PCR, imaging studies, and FNAs are negative or normal. If the patient has already been treated with a broad-spectrum bactericidal antibiotic, a therapeutic trial of immunosuppressive doses of corticosteroids is warranted. However, before instituting immunosuppressive treatment, the owners should be informed of the potential consequences of this approach: primarily that a dog or cat with an undiagnosed infectious disease may die as a result of systemic dissemination of the organism after the start of treatment. Dogs and cats undergoing a therapeutic trial of corticosteroids should be kept in the hospital and monitored frequently for worsening of clinical signs, in which case steroid therapy should be discontinued. In patients with immune-mediated (or steroid-responsive) FUO, the pyrexia and clinical signs usually resolve within 24 to 48 hours of the start of treatment.

C. Guillermo Couto, DVM, DACVIM
West VA VMA Conf, 04:16

Feeding a balanced diet

A complete and balanced diet should prevent nutritional issues—such as obesity and nutrient imbalances—from developing. Owners should be advised that providing ***additional supplements is unnecessary***. In addition, treats should be limited to <10% of the pet's total daily caloric intake (e.g., if a dog needs 1000 kcal per day, treats should contribute no more than 100 kcal). After the puppy or kitten has been spayed or neutered, its BCS should be reassessed. Caloric intake should be reduced ~30% to account for lower energy needs after the procedure. If pets are already overweight or are diagnosed with other medical issues, a board-certified veterinary nutritionist should be consulted to ensure the diet is meeting the pet's nutrient requirements and addressing medical conditions appropriately.

Deborah E. Linder, DVM, DACVN
NAVC Clin Brf, Jan 2017