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"Pearls" of Veterinary Medicine

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New recommendation for oxytocin

Medical management of dystocia should be considered if there is no evidence of obstruction, and fetal and pelvic size appear normal. Oxytocin is a peptide hormone that increases the frequency and strength of uterine contractions by promoting influx of calcium into myometrial cells. Oxytocin also promotes post-partum uterine involution, aids in control of uterine hemorrhage, and assists in expulsion of retained placentas. The dose for oxytocin has traditionally been reported at 5-20 units, IM in the dog and 2-4 units, IM in the cat. However, with an increase in the use of uterine contraction monitoring (Whelpwise, Veterinary Perinatal Specialties; www.whelpwise.com) in veterinary patients, there is a growing body of evidence to suggest that ***traditional doses may be too high***, potentially causing uterine tetany, ineffective contractions, and decreased fetal blood flow. Recent data suggests that doses of 0.5-2 units are effective in increasing the frequency and quality of contraction. The oxytocin dose may be repeated in 30 minutes if expulsion of a fetus has not resulted. If labor proceeds and a fetus is delivered, oxytocin may be repeated every 30 minutes as needed to assist in expulsion of the remaining fetuses.

L. Ari Jutkowitz, VMD, DACVECC
West Vet Conf, 02:13

Valuable Information Inside

Hazards of spring-loaded mouth gag

Many veterinarians have used spring-loaded mouth gags in cats and dogs for years to help hold the mouth open, allowing for procedures in the oral cavity. However, experts including Sandra Manfra Marretta, DVM, DAVS, DAVDC say the device is no longer recommended. A study is cited which showed spring-loaded gags generate constant force that could contribute to bulging of the soft tissues between the mandible and the tympanic bulla in cats. This force leads to the compression of the maxillary arteries as they course through the osseous structures. The maxillary arteries are the main source of blood supply to the retina and the brain. What the dental colleges are recommending now is no longer using those spring-loaded mouth gags during a procedure because it can impede on the maxillary artery if it's extended for too long. Use of a spring-loaded mouth gag could allow 1) a reduction of blood flow through the maxillary arteries to the retina and brain and result in temporary or permanent blindness, or sometimes neurologic abnormalities; 2) masticatory muscle strain and injury to the temporomandibular joints; 3) stretched tissues, which could make it more difficult to retract to allow for dental cleaning and tooth extraction. It is suggested replacing spring-loaded mouth gags with a gentler option. Cut the enclosed end off of a 25-gauge-needle cover and place it between the maxillary and mandibular canines to easily create a new stationary mouth gag.

DVM News Mag, Apr 2015

Handling the trauma patient

On arrival at the practice it is likely that the animal will have suffered a car journey and be stressed at the unfamiliarity of the situation. If possible the patient should be provided with oxygen supplementation and a very brief examination of the respiratory tract should be carried out and then the patient left to relax (as much as possible). Remember that muscle activity greatly increases the oxygen consumption of skeletal muscles. And when that essential oxygen goes to the skeletal muscles instead of the heart and brain that is when you get a respiratory and then cardiac arrest. Do not make them do anything that makes their skeletal muscles work. You can very easily restrain them to death if you are not careful. Or radiograph them to death. Or blood sample them to death. Or IV catheter them to death. If they are really, really bad then you may have to be brave and sedate/anaesthetize/intubate them. Actively taking control of the airway (which often only requires very small doses of sedative) is vastly superior to tubing them following a respiratory arrest!

Dez Hughes, BVSc, MRCVS, DACVECC
VECCS Sym, 03:14

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Midstream or cystocentesis?

Renal proteinuria is a diagnostic and prognostic marker in cats with chronic kidney disease, and the most widely used method for quantifying proteinuria is calculation of the urine protein-to-creatinine concentration ratio. Ideally, the UPC ratio should be determined for samples collected by means of cystocentesis, but this procedure may be contraindicated in some patients. Now, results of a new study involving 43 client-owned cats suggest that collection of a urine sample from the midstream phase of micturition by manual compression may be a reliable alternative to cystocentesis for the determination of UPC ratio in cats, provided that post-renal proteinuria is excluded by means of urine sediment analysis.

Hugo C.R. Vilhena, DVM, MS et al.
JAVMA, Apr 15, 2015

Sleep aids toxicosis

Sleep aids, often benzodiazepines or non-benzodiazepine hypnotics, include drugs such as zolpidem (Ambien) and eszopiclone (Lunesta). These drugs work similarly to benzodiazepines (e.g., diazepam), as they potentiate GABA transmission, increasing frequency of chloride channel opening and resulting in inhibition of neuronal excitation. While these drugs result in sedation in humans, up to 40% to 50% of dogs ingesting toxic doses of sleep aids develop paradoxical ***CNS stimulation rather than expected depression***. Clinical signs include CNS depression (e.g., depression, ataxia, weakness, paresis), CNS stimulation (e.g., hyperactivity, anxiety, agitation, panting, tremors), or other signs, such as nausea, vomiting, diarrhea, and hyperthermia. Treatment includes decontamination, activated charcoal, and for those patients demonstrating signs of CNS stimulation, the use of sedatives or anxiolytics (e.g., acepromazine at 0.05 mg/kg, IV, IM, PRN). In patients exhibiting CNS stimulation, benzodiazepines (e.g., diazepam IV) should *not* be used, as they may worsen the symptoms. Rather, the use of phenothiazines (e.g., acepromazine, chlorpromazine) or barbiturates (e.g., phenobarbital IV) should be used instead. In severe cases of respiratory or cardiac depression, the use of flumazenil, the reversal agent for benzodiazepines, can be considered.

Justine A. Lee, DVM, Dip ACVECC, Dip ABT
81st AAHA Conf

Nisin, a topical therapy

Nisin is a naturally-derived antimicrobial from *Lactococcus lactis*. It is found in cow's milk and cheese and has been used as a natural food preservative in human foods for over 30 years. Nisin is a 34 amino acid, lanthionine-containing, water-soluble polypeptide which is effective in rapidly killing gram-positive bacteria at very low concentrations. The positive charge of nisin binds the molecule in a perpendicular orientation to the bacterial cell wall followed by rapid formation of pores, leakage of cell contents, and bacterial cell death. *In vitro* data demonstrates low MIC 90s for nisin against methicillin-resistant strains of *S. pseudintermedius, S. aureus* and *S. schleiferi*. Clinical efficacy for staphylococcal pyoderma has been demonstrated in an open trial. Nisin is marketed in 6" x 8" towelettes (Preva Wipes, Bayer) for antibacterial and cleansing activity.

Kenneth W. Kwochka, DVM, DACVD
Music City Vet Conf, 02:14

Comparing glucose meters

Glucose concentration in whole blood was lower than the reference value for all tested portable blood glucose meters (PBGMs); none fulfilled the international organization for standardization (ISO) accuracy requirements. Of the 9 PBGMs tested, the Accuchek Aviva Nano (accu-chek.ca) was most accurate, with 74% of measurements within reference limits. For plasma samples, only Aviva met the standards, while FreeStyle Freedom Lite (abbottdiabetescare.com) and OneTouch VerioPro (lifescan.co.uk) approached them. Four PBGMs exhibited interference from hematocrit, affecting the PBGMs' accuracy. The disparity among PBGMs confirmed the need for accuracy evaluations prior to use in dogs. Although numerical glucose control may not be as tight in dogs compared to human patients, accuracy requirements should be no less stringent. In this study, the ***Aviva achieved the best results*** as far as accuracy, precision, and lack of hematocrit interference.

Y. Brito-Casillas et al.
NAVC Clin Brf, Apr 2015

FHV-1 ulcerative keratitis treatment options

Several antiviral drugs are currently being used to treat FHV-1 although none are approved for use in cats or for use against FHV-1. All available antiviral drugs are virostatic so to be effective most that are used topically need to be applied 5-6 times a day (idoxuridine, trifluorothymidine, vidarabine). The one exception to this is cidofovir. Because of the long half-life in ocular tissue it is effective in reducing clinical signs and virus shedding with only twice daily application. The injectable form of cidofovir is formulated into a 0.5% solution in artificial tears and can be purchased through a compounding pharmacy (Prescription Center 800-682-4664). The potential adverse effect of long term cidofovir treatment has not been investigated in cats but there have been occasional reports of stenosis of the nasolacrimal system is humans and rabbits. Famciclovir is an oral antiviral drug that has received a lot of attention recently and appears to be a very effective treatment for cats with FHV-1 infection. Optimal dose and frequency of administration has not yet been determined. Empirical dosing has ranged from 125 mg, divided BID to 40 mg/kg, TID.

Dr. Cynthia Powell
74th Co ST U Vet Conf

Preventing the allergic response

One avenue of dietary intervention/prevention to prevent the allergic response would include using a novel protein dietary restriction in allergic patients that have a consistent/predictable pattern of seasonal reactions

to help minimize allergen load. By restarting the dietary restriction one month before the typical onset of clinical signs, the restricted diet will allow the veterinarian and owner to diminish the need for cyclosporine, steroids, or other anti-inflammatory medications. At a minimum, the restricted diet will permit the use of maintenance control doses as opposed to using induction high loading doses of medications. Ultimately, this approach will help decrease cost and side effects associated with high daily doses of allergy medications, as well as prevent costly secondary infections such as Staphylococcus and Malassezia dermatitis.

Anthony A. Yu, DVM, MS, DACVD
N Amer Vet Conf, 01:13

Pannus

Chronic superficial keratitis is a progressive, bilateral immune-mediated condition that affects the cornea of dogs. Corneal disease typically starts temporally or nasally with vascularization, cellular infiltration and superficial pigmentation, but without treatment can progress to involve the entire cornea and even cause blindness. The third eyelid can be affected with or without corneal changes as a lymphocytic-plasmacytic conjunctivitis resulting in margin depigmentation and an irregular surface. Greyhounds, German Shepherds and associated breeds are more commonly affected and ultraviolet light exposure exasperates the disease. Young animals tend to have more severe disease that may be more challenging to control; while middle-aged to older dogs have a better prognosis. Diagnosis is typically based on clinical signs and signalment. Topical ophthalmic corticosteroids (prednisolone acetate or dexamethasone, TID-QID) and immunomodulators (cyclosporine or tacrolimus, BID) along with UV light reduction (provide shade, tinted Doggles; www.doggles.com/dog/eyeware) are the basis for therapy, with gradual tapering of topical steroids (dose reduction every 2-3 weeks) and only immunomodulator use SID long term if possible.

Rachel Allbaugh, DVM, MS, Dip ACVO
122nd SD VMA Conf

Treating Parvo outpatient

Because dogs that acquire parvovirus are unvaccinated and failure of vaccination is usually due to social-economic factors, owners of these dogs are often unwilling or unable to hospitalize their pet for the standard therapy. Therapy can often cost hundreds to thousands of dollars. Because of this, these authors undertook a study to compare outcomes of a standard inpatient versus an outpatient protocol. The outpatient animals were first given IV fluid resuscitation (1/4 shock dose) over 2 hours to stabilize cardiovascular parameters prior to beginning the outpatient protocol. Crystalloids (Normosol) with 20 mEq KCl/L was administered SQ at a similar fluid volume given to inpatients (with an aim of 120 mL/kg), divided QID (i.e., 30 mL/kg/dose). Cerenia, 1 mg/kg, SQ, every 24 hours) and cefovecin (Convenia, 8 mg/kg, SQ dosed once at hospital admission) is the only medical therapy provided. Early syringe feeding with small amounts of Hill's a/d every 6 hours was instituted (1 mL/kg, PO), as tolerated by patient. The authors also provided a nutritional recovery formulation (VIYO) as adjunct nutritional therapy reported to improve dietary and water intake. Preliminary results suggest this outpatient protocol was ***successful in over 85% of the patients***.

David C. Twedt, DVM, Dip ACVIM et al
N Amer Vet Conf, 01:13

Dose tapering of cyclosporine

Daily administration of cyclosporine at 7 mg/kg is efficacious for allergy-induced pruritus in cats; however, little is known about tapering this to the lowest dose necessary to control pruritus. In this study, dose tapering schedules were every other day and twice weekly. After the 4-week induction period at 7 mg/kg, the dose could be tapered to every other day in 70% of cats while still maintaining clinical remission. Up to 57% could have the dose tapered to twice weekly. The less frequent administration was associated with fewer adverse effects. The most common adverse effects were GI-related, but these were mild and did not require medical intervention. There was a trend toward transient weight loss (attributed to transient GI disturbance), but all cats regained their weight at the study's end.

J. Steffan et al.
NAVC Clin Brf, 11:9

Importance of cobalamin

Do not lose sight of the fact that cobalamin levels can be used as a diagnostic tool. Many cats with chronic GI signs receive cobalamin supplementation regardless of their endogenous level, and so that level is often left unmeasured. But research suggests that the lowest cobalamin levels are frequently found in cats with GI lymphoma, and gastroenterologists are forever struggling with the important distinction between IBD and GI lymphoma. Of course it is not that easy – cats with IBD can have very low cobalamin levels, and cats with GI lymphoma can have normal cobalamin levels. In that capacity, the initial cobalamin concentration could be an important clue. It was a previous study that alerted the profession to the importance and impact of cobalamin supplementation (250 µg, SQ, once weekly) in cats with GI disease and marked hypocobalaminemia (≤100 ng/L). Since that seminal study cobalamin levels are being measured in cats with a wide variety of non-GI diseases and hypocobalaminemia may be a significant contributor to a number of conditions. One researcher has identified hypocobalaminemia (≤200 ng/L) as a significant risk factor for a negative outcome for dogs with chronic enteropathies, highlighting the importance of this simple substance in the canine population as well.

Craig B. Webb, PhD, DVM, Dip ACVIM
West Vet Conf, 02:13

Toad intoxication in dogs

Bufo marinus, also known as the giant toad, marine toad, or cane toad, is a large nocturnal toad found mostly in Florida, Hawaii, and a small section of southern Texas. Extensions of these traditional geographical boundaries

have been recently noted as a result of environmental change. It's the most commonly reported source of bufotoxin exposure cases in dogs in North America. Other members of the *Bufo* genus of toads are found throughout the world, with toxic species found in every U.S. state and Canadian province. Toads are most active in the spring and summer, with most clinical cases reported between June and September. Clinical signs are most commonly seen after an animal mouths or consumes an adult toad. Additional cases have been reported after ingestions of dried Bufo species toads, toad eggs, or tadpoles as well as aphrodisiac supplements (e.g. Love Stone, ch'an su, Rock Hard) made from the toads. GI signs include hypersalivation, retching, and vomiting. The most common cardiac abnormality is tachycardia. The goals of therapy in Bufo species exposure are decontamination and control of GI, CNS, and cardiac signs.

Jarrod Butler, DVM
Vet Med, Apr 2015

Parvo

Glutamine supplementation is a hot topic in veterinary nutrition. In human nutrition, glutamine is a conditionally essential amino acid that has multiple functions in the sick or injured. Glutamine is the preferred energy source in enterocytes, immune cells, and endothelial cells, among others. Glutamine is a "competence factor" necessary for intestinal cell proliferation, intestinal fluid and electrolyte absorption, and mitogenic response to growth factors. Glutamine deprivation produces apoptosis. It is available as a stable powder and is supplemented at a dose of at least 1 gram/kg, per day. Glutamine has been experimentally shown to decrease the time of post-operative gastro-intestinal ileus in dogs. Glutamine supplementation within the microenteral nutrition in CPV patients may be beneficial and provides little known downside. However, further studies regarding the necessity of this amino acid in critically ill undernourished patients are still pending.

Steven Mensack, VMD, Dipl. ACVECC
West Vet Conf, 02:13

Analgesia for bony tumors

Intravenous bisphosphonates (e.g., pamidronate, zoledronate) are a mainstay of therapy for patients with primary or metastatic osseous tumors. The exact mechanism by which they relieve pain is still being elucidated, but their effect of inhibiting osteoclast action appears to be central to the pain relief effect. These drugs are expensive but relatively easy and safe to give as a one hour IV infusion on an out-patient basis. They should be given every 30 days to patients with bony tumors.

Lisa Moses, VMD, Dip ACVIM (SAIM)
82nd AAHA Conf, Mar 2015

Burr keratectomy

Diamond burr debridement (DBR) or "burr keratectomy" is gaining in popularity for the treatment of indolent ulcers. Briefly, this technique used a battery-operated, handheld diamond burr unit (Algerbrush; http://algercompany.com/) with a 2.5- or 3.5-mm burr in either a fine or medium grit. The removable burr tip is sterilized in a steam autoclave between each use. The ocular surface is routinely sterilized using a dilute 1:50 povidone iodine solution and then topical anesthesia is applied (e.g., proparacaine). Most patients then only require gentle manual restraint to prevent movement of the head during the procedur. After dry Q-tip debridement, the burr tip is passed over the entire ulcer bed in multiple even, slow circular passes, removing non-adherent epithelial tissue until stable epithelium is encountered. Routine medical management (e.g., broad spectrum antibiotic, one or two doses of topical atropine, Elizabethan collar, +/- an oral tetracycline, +/- application of a corneal contact lens) is then typically prescribed. Use of this technique has been shown to decrease corneal wound healing times in indolent ulcers and many practitioners feel more comfortable using the burr than performing either a grid or punctate keratotomy.

Elizabeth A. Giuliano, DVM, MS, Dip ACVO
N Amer Vet Conf, Vol 28

Finding xylitol amounts

Surprise! Xylitol, a sweetener that causes hypoglycemia and hepatic necrosis in dogs, appears in products you'd never suspect. New products on the market such as nasal sprays, OTC sleep aids, multivitamins, prescription sedatives, antacids, stool softeners, smoking-cessation gums and other products may contain ***unexpectedly large amounts of xylitol***. Dogs that ingest these products face a double risk—not only may poisoning result from the active ingredient but also from the xylitol. Xylitol is typically considered part of a products "proprietary ingredients," so the quantity will not be listed on the package label. While some companies are willing to release the amount of xylitol in their products, many are hesitant. Most companies are willing to share information for use in emergency case management but request that it otherwise remain confidential. When you're in doubt of the xylitol quantity in a product, it's best to contact an animal poison control center for assistance. In general, for most chewing gums, the amount of xylitol is often clinically insignificant if it's listed as the fourth or fifth ingredient. If it's listed as one of the first three ingredients, extreme caution should be taken. For drugs and dietary supplements, the regulations regarding the order of ingredients is considerably different. In this case, xylitol is often considered an "inactive ingredient" or "other ingredient"—and such ingredients are not required to be listed in order of predominance. Often they are listed in alphabetical order, which may lead an uninformed pet owner or veterinary professional to incorrectly assume that there is a very low concentration of xylitol in the product.

Ahna Brutlag, DVM, MS
Vet Med, 109:4