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"Pearls" of Veterinary Medicine

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AT A GLANCE

Mirtazapine as an appetite stimulant

Mirtazapine is a 5-HT3 receptor antagonist with appetite stimulant properties documented in healthy young cats at a dose of 1.88 mg, PO, q24h. Additional studies have shown that dosing of 1.88 mg, PO, q48h is more appropriate in cats with CKD. A double-masked, placebo-controlled crossover clinical trial in cats with CKD demonstrated that mirtazapine administration at 1.88 mg, PO, q48h, for 3 weeks resulted in ***a significant increase in appetite and activity*** and significant decrease in vomiting compared to placebo. Mirtazapine-treated cats also experienced a significant gain in bodyweight compared to placebo. Used as an anti-depressant in human medicine with the observed side effect of increased appetite and weight gain, the specific method of appetite stimulation is not well documented. Clinical experience would indicate that mirtazapine is a less reliable/predictable appetite stimulant in dogs. A small pilot study evaluating the pharmacokinetics of mirtazapine in healthy Beagle dogs has been performed. Results of this study indicate that mirtazapine appears to be metabolized much more quickly in dogs and twice daily dosing may be more appropriate in this species. As the appetite stimulation component is essentially a side effect of mirtazapine rather than a primary mechanism, it is not surprising that its clinical effect is variable and rather unpredictable.

David Twedt, DVM and Chad M. Johannes, DVM
ACVIM Forum 2017, Jun 2017

Managing IBD

Dogs and cats with chronic enteropathies that are relatively stable (not anorectic, febrile, or showing evidence of severe weight loss) should be ***initially managed with an elimination diet*** containing a novel, single protein source or a hydrolyzed-protein diet. The diet should be fed exclusively for 2-3 weeks because almost all animals will show a marked improvement or resolution in their clinical signs within the first 10-14 days. Prednisone or prednisolone (cats) must be administered at the correct dose and for the appropriate duration when warranted. Most cats (average size) are started off on 5 mg prednisolone, BID with a gradual taper over 10-12 weeks. Dogs are typically dosed with prednisone at 1-2 mg/kg, BID with a similar taper over 10-12 weeks**.** *Never exceed a total dose of prednisone of 40 mg, BID (80 mg total) in a dog, regardless of the animal's size or weight.* This author typically manages a Labrador Retriever size animal (60-70 lb) with a starting dose of prednisone of 20-30 mg BID (max).

Stanley L. Marks, BVSc, PhD, AACVIM, DACVN
78th CO STU Vet con, 04:17

Feline heart disease and nutrition

Both body condition AND muscle condition scores should be determined for every patient with heart disease at every visit. Body weight and body condition score, which primarily assesses body fat, are important because they have been ***associated with overall survival***. In one study cats that were underweight and cats that were significantly overweight had the shortest surviva, while cats in moderate body condition (4-6/9) had the longest survival. However, it also is important to assess muscle condition at every visit, particularly in cats with cardiac disease. The muscle condition score is a subjective score which assesses muscle condition in the areas of the epaxial, gluteal, scapula, and temporal areas and graded as normal muscle condition or mild, moderate, or severe muscle loss. Because of increased production of inflammatory cytokines in congestive heart failure, muscle is lost preferentially to fat. Therefore, even in overweight cats, significant muscle wasting can be present. This muscle loss has important clinical implications as it negatively impacts strength, immune function, wound healing, and

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survival. By assessing muscle condition at every visit, muscle loss can be identified at its early stages when intervention is more likely to be successful. Optimizing diet (e.g., ensuring a nutritionally balanced diet with adequate calorie and protein intake) and omega-3 fatty acid supplementation can help to reduce muscle loss.

Lisa A. Freeman, DVM, PhD, DACVN
ACVIM Forum, 06:16

Eye injuries from ear topicals

The Food and Drug Administration has issued an alert about reports of eye injury and irritation in people and dogs following application of the canine ear medications Osurnia or Claro to dogs. Most reports in people describe eye exposures as occurring during or closely following application of these medications to a dog's ears. In some reports, eye injuries occurred after the medication was applied and the dog shook its head. Other reports simply state that the medication splashed into the person's eyes. Also, two reports of corneal ulcers in people were reported. The FDA has also received 10 reports of corneal ulcers in dogs associated with the use of Osurnia and 10 reports associated with the use of Claro. Other adverse effects reported for dogs include eye irritation, conjunctivitis, squinting, and signs of eye pain after application of Osurnia or Claro to the ears.

JAVMA, Jan 15, 2018

Ringworm, environmental control

Ringworm is zoonotic, so instruct owners to wash their hands after handling their pets. If possible, owners should isolate infected animals from noninfected animals. Other pets in the household should either be tested or, if nonsymptomatic, can be bathed once weekly with an antifungal shampoo. To decontaminate their homes, owners should clean all nonporous surfaces with diluted bleach (1:10), Rescue (accelerated hydrogen peroxide), Lysol All- Purpose Cleaner or Formula 409 All-Purpose Cleaner twice a week. Carpeted areas where the ringworm positive animals are kept should be vacuumed daily. All other floor surfaces, as well as the walls, should be cleaned with Swiffer Sweeper Dry Sweeping Cloths (Amazon, Home Depot, etc) weekly, as their electrostatic nature helps attract spores. Any bedding or upholstered items that are difficult to clean, including cat trees, should be thrown out. If the bedding is easy to clean, wash it once a week with hot water and a small amount of bleach or Oxyclean. Owners of patients infected with *M. canis* should have all their cats and dogs assessed as potential carriers. If positive, their pets can be treated with topicals, with or without oral medications. If the owner is able to treat the affected dog, perform adequate environmental control; nonclinical positive pets may have negative cultures/PCRs after weekly antifungal bathing.

Anthea Schick, DVM DACVD
Vetted, Jan 2018

Recognizing feline aortic thromboembolism

The road to successful thrombolysis, as in humans, starts with fast recognition of the clinical process. Because of the risks associated with thrombolysis, the clinician wants to make sure that the patient is actually suffering from arterial thrombo-embolism (ATE). Other differentials include other non-ischemic neuropathy or orthopedic injuries (e.g. pelvic trauma). The diagnosis of ATE is usually clinical using the "5P rule" (Pulselessness, Pallor, Polar, Pain and Paralysis); however, other (and newer) tools allow for a quicker recognition. Lack of Doppler signal in the affected limb(s) and visualization of thrombus in distal aorta using ultrasound can be done, but may be time consuming. ***Measurement of glucose*** (low compared to unaffected limb/jugular) can be used. In one study, glucose concentration difference of 30 mg/dl between systemic and local affected limb blood sample has a sensitivity of 100% and a specificity of 90% in diagnosing FATE. A 1998 abstract showed a mean difference of BG in the affected limb of 50 mg/dl compared to a central BG of 182 md/dl and a mean difference of lactate in the affected limb of 10.7 mmol/L compared to 2.1 mmol/L in dogs and cats affected by a local thrombosis.

Julien Guillaumin, Doct Vet, DACVECC
23rd Int VECCS Conf, 09:17

Working with phenobarbital for seizure control

Always consider 1/2 lives when starting and/or stopping anticonvulsants. With Phenobarbital 60%-80% of epileptic dogs may be controlled effectively at 2-4 mg/kg/day. The 1/2 life of Phenobarbital is 70 hours so steady state will not be reached until 10-15 days *(steady states of drugs are usually achieved in 5 times the 1/2 life)* Monitoring of drug levels is only a guide—ask your patient if it's working. If the patient is still having seizures then they need more drug, take the drug to the toxic level before adding another anticonvulsant. The time of day that blood levels are measured is not critical; what is important is ***not to use serum separator tubes*** when measuring Phenobarbital levels. A simple way to adjust the dose is use the equation; *Desired concentration/observed concentration X current amount being taken = new dose to administer*. While on Phenobarbital the patients will have some expected alterations in their chemistries; T4 may be reduced by 50%, free T4 a 50% reduction, TSH a 50% increase and total T3 will have minimal reduction. Liver enzymes will also be affected; ALT may triple, ALP may increase 7-fold, GGT has a minor change, Albumin is unchanged but Cholesterol may increase by 50%. All these changes are seen hematologically and when the liver is then evaluated histopathologically there are few pathological changes observable.

Thomas Schubert, DVM, DACVIM
4th Gulf-Atl Vet Conf, 10:16

Bleach soaks for pyoderma

For those clients who cannot bathe every day, sprays and mousses are available. Economical but very effective

options can be used topically daily for dogs that cannot be bathed. One of the most effective topical agents for methicillin resistant staphylococci is *sodium hypochlorite*, the active ingredient in bleach. Even very diluted concentrations of bleach can be very effective. Pediatric human patients are treated with compresses soaked in household bleach 5%-6% diluted to 1/4 cup per 10 gallons of water. This equates to 60 ml per 10 gallons or 6 ml per gallon. Solutions can be mixed up and put in a sprayer bottle to apply directly to the affected sites. For facial lesions, ocular lubricant can be applied to the eyes, and compresses soaked in the solution applied. There are two veterinary shampoos utilizing sodium hypochlorite and salicylic acid: Command, Vetrimax, and Canine Skin Solutions Recovery Shampoo. These shampoos are well received by clients and appear effective clinically.

Valerie A. Fadok, DVM, PhD, DACVD
Atl Coast Vert Conf, 10:16

Too many phlebotomies lead to anemia

As a famous Greek stated 2500 years ago, doctors should "abstain from doing harm" to patients. However, some procedures have become so common that it is easily forgotten that they *do* cause harm. Performing too many radiographs (thereby increasing radiation exposure) and performing excessive diagnostic phlebotomies are common examples. In this article, the authors provided evidence that, as in human medicine, too many phlebotomies actually do significant harm to veterinary patients. The authors demonstrated unequivocally that this practice is a ***significant cause of anemia,*** that it prolongs hospital stay, and that it increases the need for blood transfusions. These complications have significant potential to influence prognosis. This comes as a wakeup call to adopt blood-conservation strategies and a more rational and balanced approach to performing diagnostic phlebotomies in veterinary patients.

Nuno Felix, DVM, MD, MS
NAVC Clin Brf, 14:11

Suture-associated cystic calculi

The nidus of these calculi in these case reports are likely the suture material. Suture materials act as a foreign body with a lithogenic potential that draw calcium ions in urine and can then crystallize and form calculi. Surgical sutures must incorporate the holding submucosal layer of the urinary bladder, but ideally should not penetrate the mucosa, as the major predisposing factor for suture-associated calculus formation is a prolonged contact time between suture material and urine. The presence of suture material within the soft-tissue structures leads to regional vascular congestion and an increased release of inflammatory mediators, with the severity of this inflammatory reaction being proportionate to the duration of suture material absorption, which explains why absorbable suture material is suspected to have a lower rate of calculus recurrence compared to non-absorbable material. When suture was needed, as in this case description, a rapidly absorbed material such as poliglecaprone 25 was used without full penetration of the mucosal layer of the urinary bladder. Complete absorption of poliglecaprone 25 at 90 to 120 days compared to 180 days in the case of polydioxanone is supportive of the role of ***poliglecaprone 25*** as a ***superior*** absorbable suture material in ***urogenital surgery***.

Jennifer Hickey, MVB, DACVR
So Cal VMA Pulse, Jan 2018

Misuse of acepromazine as antianxiety drug

Acepromazine is a fantastic sedative. However, that's all it is—a tranquilizer. Unfortunately, it's often prescribed for use in anxiety and fear-based conditions. Imagine for a moment a dog is in mid-panic attack during a thunderstorm. It will often fidget, retreat to a quiet spot, pace, etc. Now imagine it isn't able to do those things because it's in a chemically induced straightjacket. It only can lie still and be trapped in its own mind, experiencing that intense fear. This is exactly what happens with anxious dogs on acepromazine. It does nothing to treat that panic disorder. With prolonged use, dogs often are seen needing ever-higher dosages to achieve adequate sedation levels. This is because over time, the panic worsens because the patient is rendered unable to mitigate and diminish its anxiety. ***Acepromazine should never be used as a first line of defense for these types of conditions***.

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

Hemorrhage in the oral cavity

Inflamed tissues are a hallmark of active periodontal disease and are prone to heavier bleeding as compared with normal tissues. If a major vessel is damaged, procedures to control hemorrhage (i.e., direct pressure, ligation, cauterizing, topical hemostatic agents) should be instituted. In general, there are *no major* long-term ***complications*** of ***complete ligation of major vessels*** such as the maxillary and mandibular arteries. The high vascularity of the oral cavity ensures collateral circulation will be available to maintain vitality of the soft and hard tissues; the only exception to this is damage to vessels that provide major blood supply to mucoperiosteal flaps. For example, damage to the greater palatine artery can lead to failure of a hard palate flap used to close a large defect.

Kendall Taney, DVM, DAVDC, FAVD
NAVC, Clin Brf, Jan 2018

Client asks.....

"Ugh. This pet food label says the food contains 'meat by-products.' I wouldn't eat by-products; why should my pet?" By-products from chicken and other meats are the nutritious, edible portions of animals, including organ meats such as liver and kidney, that would otherwise go to waste because they aren't widely consumed by people in American culture, but are consumed in other

cultures. Also, by-products are often the first part of the prey consumed by wild hunters. **The bottom line:** Meat by-products are highly nutritious.

Dottie LaFlamme, DVM, PhD, DACVN
NAVC Clin Brf Supp, 10:17

Websites for balanced nutrition

There are two web-based businesses run by board-certified veterinary nutritionists: www.balanceit.com and www.petdiets.com. These sites have been in business for more than 10 years (think "proven track record") and their purpose is to design homemade recipes for owners who either want to feed a healthy dog or cat, or they want to feed a tailor-made recipe for a pet with medical issues. www.balanceit.com provides recipes at no-cost for healthy pets, but they charge about $50 for recipes that require specific modifications, such as food allergies. Balanceit.com offers a free recipe for healthy pets because they have a product to sell; it's an all-in-one vitamin-mineral supplement called "Balanceit Canine" or "Balanceit Feline". This supplement costs between $50 and $55 US Dollars (with free shipping to most of the USA); one container will last between 4 and 6 weeks, depending on the size of the animal and the amount of supplement needed per day. This is the ***only known complete vitamin-mineral supplement*** on the market that is specifically designed for dogs and cats being fed a homemade recipe. Many veterinarians and veterinary nutritionists around the world use this product.

Sarah K. Abood, DVM, PhD
AAHA Conf, 04:17

Reptile emergencies

Intubation is easily accomplished in all reptiles. The glottis is readily visualized in the cranial aspect of the oral cavity. There is no epiglottis. DO NOT inflate the endotracheal tube cuff. Assisted respiration should only be provided 2-4 times a minute. In a reptile, it is preferable to ventilate with an ambu-bag rather than oxygen, as the stimulus for respiration is decreasing O_2 levels. However, because of the normally low respiratory rate of reptiles, if inhalant anesthesia is required, additional ventilation may be required to maintain an adequate plane of anesthesia. Many reptiles are capable of tail autotomy, or the regeneration of the distal tail if it is amputated. This is a survival mechanism which allows them to escape from predators by losing the distal tail. Unfortunately, sometimes the "predators" are cage doors or owners' feet! ***Do not suture the skin over the tail***; this will prohibit the regeneration of tissue. If the amputation is clean, wound management is all that is required. There is a natural tissue plane of amputation; if bone is exposed, you might remove that segment of bone. This is most easily facilitated manually (with sedation) rather than surgically.

Natalie Antinoff, DVM, DABVP
22nd Int VECCS Conf, 07:1

Perineal hernia and castration

Castration significantly reduces the risk for other associated acquired diseases like perineal herniation, which leads to significant suffering and morbidity in intact dogs. For example, clinical signs and complications associated with perineal herniation include: dyschezia, obstipation, bladder retroflexion, tenesmus, rectal prolapse, incontinence, infection, surgical wound dehiscence and recurrence. In the author's opinion***, castration is a mandatory component*** of surgical treatment for perineal herniation and is associated with an increased risk of failure if not performed in conjunction with herniorrhaphy. The increased risk of surgical failure likely has to do with persistent obstruction of the pelvic canal by the enlarged prostate as well as continued production of androgens, which are responsible for weakening of the pelvic diaphragm muscles. Perineal herniation in castrated males is exceptionally rare and is a major rationale for the neutering of male dogs, especially those breeds at increased risk. Castration prevents the development of testicular neoplasia (e.g. Sertoli cell tumor, Leydig cell tumors, and seminomas), orchitis and testicular torsion and significantly reduces the risk for secondary prostatic disease. Risk for prostatic neoplasia (both carcinoma and adenocarcinoma) in neutered dogs has been determined to be up to 2.8 times greater than that of intact male dogs, but the older age of neutered dogs may be a confounding factor in some of these studies.

J. Brad Case, DVM, MS, DACVS et al.
N Amer Vet Conf, 02:17

Increasing milk production in the bitch

In this study reported, oral administration of metoclopramide (0.2 mg/kg, PO, q6h) to healthy bitches for 6 days beginning 10 to 24 hours after the end of parturition induced a ***significant increase in serum prolactin*** concentration from day 0 to day 1 and enhanced milk lactose production. It is likely that bitches with insufficient or delayed milk production could benefit from this effect.

Stefanie R. Keller, DVM et al.
Am J Vet Res, Feb 2018

Skin scrape or acetate tape?

Recently it has been reported that applying tape to a skin lesion and then squeezing the skin is as an effective way to identify Demodex mites in dogs. A study was performed to confirm this observation. Specifically, the study was to evaluate and compare the sensitivities of acetate tape impression to deep skin scraping for the diagnosis of canine demodicosis. They concluded that squeezing the skin followed by acetate tape prep was found to be as sensitive as deep skin scraping for the diagnosis of canine demodicosis. Unfortunately, the author has not had the same experience. So, if you want to do it as a screening test, in difficult to handle dogs or sensitive locations on the dog, be sure to follow it with deep skin scrapings (with sedation if needed) if the tape prep is negative.

Paul B. Bloom, DVM, DACVD, DABVP
Mich Vet Conf, 01:16

Urinary incontinence

Phenylpropanolamine (PPA), is still the mainstay of treatment. This author likes PPA as a trial drug because it not only helps differentiate classic urinary incontinence from other conditions such as vaginitis or pollakiuria, but it also helps dramatically increase quality of life for the client who is frustrated with the incontinence. The author recommends checking blood pressure every 6 months to a year in dogs treated with PPA that have concurrent renal disease, cardiac disease or hormonal disorders. ***Here's something new!*** Based on accumulated clinical experience, PPA may need to be given less frequently than we previously thought. According to urethral pressure profile studies, once-a-day dosing is preferable to 3 times a day because of downregulation of adrenergic receptors. The author used to begin PPA therapy with administration 3 times daily and then decrease from there, but the new recommendation is to start with once-a-day administration and increase frequency if needed to control incontinence. If you have a patient with urinary incontinence that has seemed to stop responding to PPA despite increasing the dosage or frequency, then the problem may be too much of a good thing. It is recommended to prescribe a washout period and then restarting with once-a-day administration. Tell the client that some patience is needed, and they may need to do some laundry while you sort out therapy. Some dogs need even less-frequent dosing—every other day or even every 3 to 4 days. As far as whether morning or nighttime administration is better, this author says it varies. It is recommended starting with evening administration to control incontinence at night. If the dog experiences sleeplessness or restlessness, switch to morning administration.

India Lane, DVM, MS, EdD, DACVIM
DVM News Mag, Jan 2018

Treatment of HCM in the cat

In cats with HCM, the median survival time for cats that survive >24 hr after an episode of CHF is 563 days, and the median survival time for cats that survive >24 hr after aortic thromboembolism is 184 days. Treatment once the cat is symptomatic is more standard than treatment before the cat is symptomatic. Balance the possible benefits of treatment with the difficulty that many clients have pilling cats. *With only two exceptions,* the benefit of treating asymptomatic cats for heart disease has never been proven: dilated cardiomyopathy secondary to taurine deficiency, and thyrotoxic heart disease. For this reason, it would be acceptable to never treat for heart disease in cats until they become symptomatic. Some clinicians advocate empirically treating cats that have significant HCM with a beta-blocker or calcium channel blocker, but no benefit has been shown. In cats with hypertrophic obstructive cardiomyopathy, in which the obstruction is moderate to severe, this author treats with a beta-blocker (atenolol: 06.25 mg, q12h) to decrease the degree of the obstruction. Obstruction can only be confirmed on echo, but cats with louder heart murmurs are more likely to have obstruction. ***Obstruction*** doesn't worsen life expectancy, if anything it ***improves life expectancy*** because the cat benefits from earlier detection and management of the disease (because of the murmur). In cats with severe left atrial dilation, or with 'smoke' in the left atrium, the author treats with an antithrombotic/anticoagulant to decrease the risk of thromboembolism. Clopidogrel (Plavix: 18.75mg, PO, q24h) is more effective than aspirin, but if the cat is very difficult to medicate, it is recommend to use aspirin (20.25 mg twice weekly). Low molecular weight heparin (enoxaparin or Lovenox: 1.25 mg/kg, SQ, q8h) would be a great choice, but it is prohibitively expensive for most clients.

Sophy A. Jesty, DVM, DACVIM
2017 AAHA Conf, 04:17

The mechanics of CPR

The physiology of blood flow generation is fundamentally different during CPR compared to spontaneous circulation. Two distinct theories exist to explain how chest compressions lead to systemic blood flow. The cardiac pump theory is based on the concept that the left and right ventricles are directly compressed, increasing the pressure in the ventricles, opening the pulmonic and aortic valves and providing blood flow to the lungs and the tissues, respectively. Recoil of the chest between compressions due to the elastic properties of the rib cage creates negative pressure within the chest, improving filling of the ventricles before the next compression. The thoracic pump theory is based on the concept that external chest compressions raise overall intrathoracic pressure, forcing blood from intrathoracic vessels into the systemic circulation, with the heart acting as a passive conduit. Given the chest wall stiffness in medium and large dogs, blood flow generated by the thoracic pump mechanism likely predominates in these patients. Therefore, it is recommended that the chest be compressed over the highest point on the lateral thoracic wall with the patient in lateral recumbency (i.e., the widest part of the chest). In contrast, in very keel chested dogs (e.g., Doberman Pinschers, sight hounds), it is reasonable to do chest compressions directly over the heart as the cardiac pump mechanism likely predominates. In markedly barrel chested dogs (e.g., English Bulldogs), compressions over the sternum with the patient in dorsal recumbency may be more effective in eliciting the thoracic pump mechanism than lateral chest compressions. In these and other large dogs with low chest compliance, considerable compression force is necessary for CPR to be effective. The compressor should maintain locked elbows with one hand on top of the other, and the shoulders should be directly above the hands. This allows compressions to be done using the core muscles rather than the biceps and triceps, reducing fatigue and maintaining optimal compression force. If the patient is on a table and the elbows cannot be locked, a stool should be used or the patient should be placed on the floor.

Daniel J. Fletcher, PhD, DVM, DACVEEC
23rd Int VECCS Conf 09:17