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"Pearls" of Veterinary Medicine

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AT A GLANCE

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Using bupivacaine in OVH surgery

In dogs undergoing ovariohysterectomy (OVH), pain scores after IP administration of bupivacaine were lower compared with a control group. In a study involving cats undergoing OVH and who received IP bupivacaine (2 mg/kg) suggested that treated cats did get effective post-op analgesia. In a separate study, it was found that IP administration of 0.25% bupivacaine (2 mg/kg) resulted in plasma concentrations that did not result in signs of bupivacaine toxicosis. Bupivacaine is affordable and now has been found to be safe and effective. We should all consider adding it to our pain protocols for routine OVH.

Kathryn Primm, DVM
DVM News Mag, May 2017

How to handle a missed heartworm preventive dose

If the lapse is one month or less, reinstitute the preventive and conduct a heartworm test at the next scheduled visit if the visit occurs more than seven months from the current date. In highly endemic areas, consider adding doxycycline therapy for one month. If a dog is receiving imidacloprid-moxidectin, a one-month lapse will likely not be problematic, provided the preventive had been given for at least four months continuously before the lapse. If the lapse is two months or longer, reinstitute the preventive immediately and consider adding doxycycline for one month. If the lapse is more than seven months, perform an antigen test and consider adding doxycycline to the macrocyclic lactone therapy for one month. For such protracted lapses, imidacloprid-moxidectin has been shown to have superior ***reach-back efficacy*** with doxycycline, when given continuously for 13 months post-lapse. In all instances, preventive therapy should be administered on a year-round basis, both for the animal's protection and to help ensure improved compliance in the future.

Clarke Atkins, DVM,DACVIM
DVM News Mag, Supp, Mar 2017

ACVIM consensus statement on epilepsy

There was no difference in seizure frequency in a randomized, double-blinded, controlled trial with the ketogenic diet, so this diet is not recommended in dogs. However, seizure frequency and monthly seizure days were significantly lower in the 21 dogs fed the MCT-based diet (medium chain triglyceride [diets for cognitive dysfunction syndrome])in a 6 months prospective, randomized, double-blinded, placebo-controlled crossover dietary trial, which makes ***MCT-based diets a valid therapeutic option for dogs with idiopathic epilepsy***. The panel does not recommend omega-3 fatty acid dietary supplementation. In a recent evidence-based review of all controlled trials conducted in people does not support the use of acupuncture in the treatment of epilepsy in people. The panel presumable extends those conclusions to veterinary medicine.

Stephanie Dugas, DVM, DACVIM
So Cal VMA Pulse, 60:10

Food allergy

Diagnosis is by food trials only – serum and skin allergy tests have not progressed to an acceptable level of accuracy. The author prefers to use prescription novel protein diets (kangaroo and oats, rabbit and potato, venison and potato, designer diets from Rayne Nutrition [raynenutrition.com] or Balance It [https://secure.balanceit.com]) rather than hydrolyzed diets. A recent review noted that hydrolyzed diets had reduced but not eliminated immunological and clinical allergenicity, and that some dogs had worsening of their clinical signs on partial hydrolysates. Over the counter diets should not be used - they are contaminated by mystery ingredients according to several recent studies.

Andrew Hillier, BVSc, MANZCUS, DACVD
SW Vet Symp, 09:15

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Calculating antiepileptic drugs

Remember that a proportion of animals will not be controlled despite medical therapy. This may be as high as 20% to 30%. In the canine this author's preference is phenobarbital, bromide, and then Keppra (levetiracetam) in that order; zonisamide would be the last to be added. In the feline, this author would use phenobarbital and then add Keppra. ***Always consider half-lives*** when starting and/or stopping anticonvulsants. With phenobarbital, 60%-80% of epileptic dogs may be controlled effectively at 2-4 mg/kg, BID. The half-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 half-life). Monitoring of drug levels is only a guide—ask the owner 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*.

Tom Schubert, DVM, DACVIM, DABVP
N Am Vet Conf, Vol 29, 01:15

New recommendations on antibiotics in pyoderma

Empirical choice of antibiotics in the treatment of pyoderma requires that we know a little bit about our organism, and when the organism is what we would call a 'methicillin-sensitive *Staph', we* know that it is very responsive to beta-lactam antibiotics. There are other antibiotics we could choose, but this author believes a lot of dermatologists and practitioners like cephalosporins because they are very safe and work quickly. The author would anticipate recommending a cephalosporin if it's a first-time pyoderma; the likelihood of that bug being resistant is low. Standard practice used to suggest treating a superficial pyoderma for at least 3 or 4 weeks with antibiotics or 1 to 2 weeks after clinical remission. This author now recommends shorter courses of oral antibiotics coupled with topical therapy for the treatment of superficial pyoderma. Whether longer courses are needed is based on response to therapy. In addition, ***pulse antibiotic therapy is no longer considered effective***. Although there is no optimal duration of antibiotic therapy for pyoderma, the author recommends treating until the infection is gone (no pustules, papules, crusts, or epidermal collarettes). Shortening the course of treatment can also be a good way to improve compliance.

Valeri A. Fadok, DVM, PhD, DACVD
NAVC Clin Brf Supp, Apr 2017

CKD and people food

Many pets with CKD receive people food, with some eating home-cooked diets exclusively. Different methods of handling meat can drastically alter nutrient profiles. The effect of various conditions (e.g., boiling, direction of cut) on protein and phosphorus concentrations of beef was assessed. Slicing (i.e., cutting the muscle fiber vertically) and boiling the meat for 10 minutes reduced phosphorus concentration by 50% while protein retention remained > 90% (compared to raw). More information about nutrient profiles for specific people food can be accessed on the USDA National Nutrient Database website: http://ndb.nal.usda.gov/.

Valerie J. Parker, DVM, DACVIM, DACVN
ACVIM For, 06:16

Levetiracetam extended-release dosage

Levetiracetam is an antiepileptic drug with multiple administration routes and few documented drug-drug interactions. Dosing for slow- and extended-release products in humans cannot be accurately extrapolated to dogs. Oral extended-release levetiracetam was administered to dogs to evaluate the effects of food on drug disposition and to establish a dosing interval to maintain serum concentrations above the minimum therapeutic concentration established in humans. Results indicated that the recommended ***dose of extended-release levetiracetam*** should be 30 mg/kg, q12h, although different products and individual animals may have different requirements. Food did not affect drug concentration in any clinically relevant manner.

M.J. Beasley and D.M. Boothe
NAVC Clin Brf, 14:11

Handling subclinical hyperthyroidism in cats

What about cats with very mild or occult hyperthyroidism (i.e., cats with high-normal T4 concentrations, slightly high free T4 values, and undetectable TSH concentrations)? Should these cats automatically be treated or is close monitoring the best and safest option? Although the answer to this is not known for certain, we have no evidence that milder degrees of hyperthyroidism causes significant harm to a cat, at least on a short-term basis. If the cat is not symptomatic, no thyroid nodule is palpated, and the diagnosis is based only on the finding of a high serum free T4 and/or low TSH concentration, it is wisest not to start treatment. In these cats, the author recommends close observation and monitoring in one month and every 3-6 months thereafter with a thorough repeat physical examination (body weight, heart rate, and thyroid palpation) and complete thyroid panel (total T4, free T4, and TSH determinations). Once there is better evidence for hyperthyroidism, such as compatible clinical signs, palpable thyroid nodule, higher total T4 concentration, or positive thyroid scan results, treatment can then be reconsidered.

Mark F. Peterson, DVM, DACVIM
ACVIM For, 06:15

Kitty Magic

While it's certainly not as nuanced as titrating a specific IV anesthesia, for fractious cats or for cats that are scared out of their minds, the drug combination in kitty magic can provide good analgesia. This drug cocktail

may be made with equal volume dexmedetomidine (0.5 mg/ml), ketamine (100 mg/ml) and butorphanol (10 mg/ml). (The author uses buprenorphine instead of butorphanol, but either one works.) The recommended dosage is 0.035 ml/kg for ill patients and 0.065 ml/kg for healthy patients, and the mixture should take effect within five to 10 minutes. Kitty magic can be stored at room temperature for up to two months. Kitty magic can be given via intramuscular injection when the cat is calm enough. But that doesn't work for particularly anxious or agitated felines, so the author offers another option: Because all of these drugs are well absorbed transmucosally, these cats are given a double dose by attaching a catheter to the end of a syringe and squirting the drugs into their hissing mouths. They are usually subdued within 20 minutes.

Tasha NcNerney, BS, CVT, CVPP, VTS
Vetted, May 2017

Fatty acids and cyclosporine

A randomized, double-blinded, placebo- controlled multicenter trial was conducted to assess the cyclosporine-sparing effect of polyunsaturated fatty acids. Dogs with atopic dermatitis (n = 36) already receiving cyclosporine were given either a combined omega-3/omega-6 fatty acid product or placebo orally for 12 weeks. The dogs were examined monthly by a dermatologist and scored based on the Canine Atopic Dermatitis Extent and Severity Index (CADESI-03). Pruritus, quality of life, overall condition, and coat quality were scored by the owner. Improvements in CADESI-03 or pruritus scores of at least 25% resulted in cyclosporine dosage decreases of about 25%. The median pruritus score was *significantly improved in the fatty acid group* compared with the placebo group with a significantly greater decrease in cyclosporine dosage. The data suggest that omega-3/omega-6 fatty acid supplementation may have a cyclosporine-sparing effect in atopic dogs. A mean dose reduction of cyclosporine has the advantage of increasing the number of dogs that tolerate cyclosporine therapy and the number of owners for whom the cost of treatment becomes lower.

M. Müller et al.
NAVC Clin Brf, 13:11

Caveat of open hip reduction

Only about 50% of hip luxations will be able to be reduced closed and stay reduced in an Ehmer or non-weight bearing sling—this is an important fact that all clients should be warned about at the onset. Furthermore, they should be mentally prepared that even though the hip was reduced closed, surgery may still be necessary. If the pet has any form of coxofemoral joint pathology (i.e., a shallow acetabulum or OA in the joint) that number, for successful management of a hip luxation closed is even lower, in the author's opinion. If the hip easily reduces, but then with normal hip flexion and extension it also easily re-luxates, the author feels the chances of a closed reduction being successful is going to be low. If closed reduction is to be successful, proper application of a modified 90-90 sling or more preferably an Ehmer sling, is mandatory. **ALWAYS, ALWAYS** recommend a re-check radiograph 5-7 days after the closed reduction was performed, to confirm that the hip is still in. If a closed reduction is going to fail, it will be in the first several days post-reduction. If the hip has re-luxated in the first several days post-reduction, chances are there is not severe muscle contraction or enough fibrous tissue deposition, to preclude open reduction and internal fixation. Furthermore, the longer the hip is out and the animal is flexing and extending the joint—the more the articular surface of the femoral head is being ground away.

Robert M. Radasch, DVM, MS, DACVS
N Amer Vet Conf, Vol 29, 01:15

Pre-op cefazolin for prophylactic surgery use

Data from this study supported clinical use such that a regimen of a total dose of 44 mg of cefazolin/kg (22 mg/kg, IV, and 22 mg/kg, IM) administered 30 to 60 minutes before surgical procedures expected to last <4 hours and a single injection of cefazolin (22 mg/kg, IV) administered 30 to 60 minutes before surgical procedures expected to last <3 hours should provide protection against the most common contaminants on the skin of dogs and cats (*S pseudintermedius* and *Streptococcus* spp). However, if *E coli* or other gram-negative bacteria are suspected, another antimicrobial and dosing regimen should be considered.

Omar J. Gonzalez, DVM et al.
Am J Vet Res, Jun 2017

Fatty acids and osteoarthritis in dogs

Omega 3 fatty acids offer perhaps the most robust evidence in the scientific literature for joint supplementation in dogs. Studies evaluating omega 3 fatty acids in the diet of osteoarthritic dogs have demonstrated improved mean peak vertical force and lameness scores. The practitioner should strive to reach 50 mg/kg, daily EPA in order to reach therapeutic levels for management of osteoarthritis. DHA has also been shown to improve learning capacity in dogs and may help improve cognitive function in geriatric patients. As a practical tool, this author doses at 100 mg/kg total omega 3 per day. Given these are fatty acids they can easily lead to soft stool or diarrhea if high doses are started rapidly. In order to minimize GI side effects, start at manufacturer label dose and slowly increase dose every 2-3 days until target dose is reached. Reduce dose at any time, if gastrointestinal signs occur. Regarding glucosamine and chondroitin, although evidence for these agents as disease modifying agents for osteoarthritis is equivocal, studies have shown these nutraceuticals are well tolerated with minimal side effects. Perhaps the most prudent use of glucosamine

and chondroitin is in the early disease states in order to minimize cartilage degradation over time.

Leilani Alvarez, DVM, DACVSMR, CVA, CCRT
N Amer Vet Conf, Feb 2017

Collecting cytology samples

For skin folds, insert a cotton-tipped applicator into the skin fold as deeply as you can and rub it along the skin. Then roll the applicator onto the slide, heat- fix the slide, and stain it. This author has found getting samples from the ***tail folds of English Bulldogs*** to be helpful in determining why the dogs are scooting around on the floor. Owners often think that anal glands need to be expressed when the issue is an irritating infection. For claw folds, gently insert a toothpick or a broken cotton- tipped applicator into the cuticle to draw out debris, which may be dark brown, thick and adherent, and then apply that debris to a slide. The debris might not look like much, but once you stain it, there may be a lot to see, especially yeast. Claw fold sampling is a good idea for dogs that are licking their paws a lot, even if the paws appear to be healthy.

Melissa Hall, DVM, DACVD
DVM News Mag Supp, Jun 2017

Determining heartworm resistance

The protocol involves determining the amount of microfilariae in the blood. if a dog presents with a history of compliance and a proper testing history and it's microfilaremic, right from the start that's going to be suspicious. Run this test: Obtain a blood sample**,** and perform a Knott's test to determine the number of microfilariae present per milliter of blood. Treat the dog with a microfilaricidal dose of a macrocyclic lactone. Test another blood sample one week later to determine the number of microfilariae now present. The authors would expect to see greater than 75% reduction. If it's less than that, it's time to suspect resistance.

Ray Kaplan, DVM, PhD and Andrew Moorhead, DVM, PhD
DVM News Mag, Supp, Mar 2017

Cetirizine use in the cat

Like dogs, antihistamine (AH) use for management of pruritus/allergic dermatitis in cats is not terribly rewarding. But individual patients may respond well, and given relative lack of side effects, it is worth trying at least 2 (independently, not at the same time) to help the pruritic cat. Cetirizine (Zyrtec) pharmacokinetics have been evaluated in the cat and it appears that a 2.5-5 mg oral dose has a half-life long enough to allow once daily dosing. It is available over-the-counter. So far there is no controlled study evaluating the clinical effectiveness of cetirizine against other AH's, but an open study in 2012 reported 41% of cats given cetirizine "***improved significantly***".

Trish Ashley DeVore, DVM, DACVD
N Amer Vet Conf, 02:17

Bromethalin toxicosis in cats

As of January, 2015, all second-generation anticoagulant rodenticides are prohibited from use, which has led to increased production of non-anticoagulant rodenticides such as bromethalin. Consequently, human exposure to bromethalin has increased, along with a parallel increase in companion animal exposure. Signs of toxicosis are divided into acute and chronic. Acute signs manifest 8-12 hours after ingestion but can occur as early as 2-4 hours. Signs of chronic toxicosis may be delayed by several days. Given this delay, bromethalin intoxication may not be provided due consideration. Cats may be at increased risk, with a lower median lethal dose (0.180-.32 mg of the bait formulation/lb). Presumptive bromethalin intoxication is established through witnessing ingestion or ***observing the green-blue dye incorporated into the product in ingesta or feces***. MRI findings can help raise the index of suspicion for poisoned cats, with diffuse white matter hyper-intensity throughout the brain and spinal cord.

Marc Kent, DVM and Eric N. Glass, DVM, MS
JAVMA, May 15, 2017

Famciclovir for treatment of FHV-1

In this retrospective study, clinical improvement was evident in the medical records of 50 of 59 (85%) cats that received famciclovir PO, 3 times/d at a low (approx. 40 mg/kg) or high dose (approx. 90 mg/kg), with or without other concurrent treatments, for presumed FHV-1 infection. Twenty-five of 32 (78%) cat owners reported that clinical signs were permanently or temporarily improved with the treatments used, and 21 of 30 (70%) cat owners perceived famciclovir as the most effective or second most effective drug for reducing clinical signs of disease in their pet. Few adverse effects were attributed to the treatment. Further studies are needed to fully evaluate the efficacy and safety of this treatment.

Sara M. Thomasy, DVM, PhD et al.
JAVMA, 249:5

Clear tape impressions for Demodex

The objective of this study was to characterize and determine the specificity and sensitivity of the squeeze tape impression technique for diagnosing *Demodex canis* infections. Clear adhesive tape (24 mm wide by 5 cm long) was placed onto 4 skin sites on each dog. The tape and underlying skin were squeezed 2 to 4 times for 2 to 3 seconds each time. Tapes were gently stretched and placed on glass slides. Deep skin scrapings were also collected. The tape impressions had 100% sensitivity and specificity, whereas the deep scrapings had only 90% sensitivity. The authors noted the tape impressions may be less invasive and more easily performed at multiple body sites as compared with deep skin scraping.

L. Vogelnest and V. Garibotto
NAVC Clin Brf, May 2017