C/E for the one who doesn't have time for C/E

"Pearls" of Veterinary Medicine

THE CAPSULE REPORT®
"on veterinary therapeutics"

Trusted By The Profession Since 1981

Volume 37 Number 8 November 2018

AT A GLANCE

Perfusion, perfusion, perfusion

In the first six hours of a critical care case, this author focuses on perfusion—and ***avoids corticosteroids and NSAIDs***. The definition of shock is considered cellular hypoxia—the patient's cells are starving for oxygen. Do corticosteroids increase oxygen to cells? No; IV fluids do (with the exception of cardiogenic shock!). The reason the author has moved away from using NSAIDs immediately in the shocky patient is that the dog's "shock organ" is the gastrointestinal tract. When an animal is in shock, it's vasoconstricting to shunt blood to its most important organs—the heart and lungs. If the gut and kidneys aren't getting appropriate blood flow during a shocky state, we ideally want to avoid NSAIDs or steroids until the patient is more stable. When in doubt, perfuse the patient first. Again, it's not corticosteroids or NSAIDs that save these patients. It's perfusion, perfusion, perfusion.

Justine Lee, DVM, DACVECC, DABT
DVM News Mag, Sep 2018

Vaccinating against CBD

Vaccination of dogs with CBD against *B. bronchiseptica* is indicated for any patient at risk of exposure to populations of dogs. However, it is this author's recommendation that if *B. bronchiseptica vaccination is indicated, neither the IN or ORAL vaccine should be used in patients with CBD.* Reason: ALL Intranasal and ORAL *B. bronchiseptica* vaccines contain attenuated (live) bacteria, sometimes in combination with a modified-live parainfluenza virus vaccine (IN). Post-vaccination replication of the vaccine antigen on the respiratory mucosa could infect the respiratory mucosa and actually precipitate an acute respiratory event.

Richard B. Ford, DVM, MS
125th SD VMA Conf, 08:16

Oral recuperation fluids

Oral recuperation fluids (ORFs) are now available and may have a role in treating parvovirus. One product that contains a proprietary blend of vitamins, minerals, fatty acids, and amino acids was recently studied and it demonstrated that some dogs recovering from parvovirus would voluntarily consume an ORF. Dogs that consumed the ORF ***started eating more quickly*** and consumed more calories compared to dogs who drank only water or dogs who did not consume any oral liquid. ORFs may provide a way to hasten recovery with outpatient protocols as well.

Marc Seitz, DVM, DABVP
Music City Vet Conf, 02:17

Methods to deliver small amount of fluids

This author uses syringe pumps or other volume-limiting devises for administration of drugs (analgesic CRIs, dopamine, etc...) but just as often use them for delivery of IV fluids to cats. A ***great way to avoid under- or over-hydration*** (the latter is a fairly common problem in really small patients). Over-hydration can lead to edema in a variety of tissues, most notably pulmonary edema. The advantage is it is easy to titrate drugs and fluids at an accurate dose. The disadvantage is some pumps are expensive; you have to learn to program them - which isn't all that hard but is something else to learn. If you don't want syringe pumps, use buretrols (or any other fluid limiting device) when administering fluids to really small patients. OR, the author's favorite, just pull up the amount of fluid that the patient needs over the expected surgery duration into a syringe and have the anesthetist titrate it in a couple of mls at a time while they are monitoring the patient. Not a continuous method of delivery but close enough to continuous, and avoids overhydration. So, for example, a 3 kg cat that needs 5 ml/kg/hour IV fluids that will be anesthetized for 2 hours, we draw up 3 kg x 5 ml/kg/hr x 2 hours = 30 mls of fluid into a syringe.

Tamara Grubb, DVM, PhD, DACVAA
Fetch San Diego, 12:17

The Capsule Report® is published monthly for veterinarians who wish to maintain high standards of practice

Antibiotic-responsive enteropathy (ARE)

Because of the apparent difficulty in diagnosing ARE with lab tests, empirical antibiotic therapy is often chosen as a means to diagnosis, instead of laboratory tests. Broad spectrum antibiotics designed to lessen bacterial numbers seem to be indicated. You can never sterilize the GI tract. However, because clinical signs are due to a combination of large numbers plus an altered host response, simply lessening the number of bacteria often seems beneficial. Oral aminoglycosides were generally considered a poor choice to treat ARE because anaerobic bacteria (which have been suggested to be more of a problem) are resistant to aminoglycosides. However, this opinion is not clearly correct as there are occasional patients that clearly improve when given amikacin orally. Tetracycline is often effective; but, giving tetracycline is inconvenient. Tylosin powder has also been useful and is revered by many clinicians. Some clinicians like metronidazole; however, this clinician has not been impressed with the efficacy of metronidazole for ARE. For patients that are EXTREMELY ill in which we need to know RIGHT NOW whether or not it will respond to antibiotics (i.e., that patient is so ill that you cannot take a chance of being 2-3 weeks from now and not having a response to therapy), the author uses a combination of enrofloxacin and metronidazole. Regardless of which drug is used, such a therapeutic trial should be performed for at least 3 weeks before a decision is made as to its efficacy. Finally, it appears that concurrently feeding a high quality elimination diet can substantially ***enhance the efficacy*** of the antibiotic therapy. Therefore, now are both used in the therapeutic trials.

Michael D. Willard, DVM, MS, DACVIM
23rd Int VECC Symp, 09:17

Pain meds for CKD

Treatment for pain is essential. Medications such as gabapentin should be prescribed at a dosage of 15-20 mg/kg, PO, q12h. In debilitated cats, a dosage of 5-10 mg/kg, PO, q12h is the initial chosen dosage. This medication is ***safe for use in all diseased states*** and the only initial side effect is sedation. After 1-2 weeks, any sedation will wear off and the cat will continue to be more comfortable. The dosage will need to be titrated up and down in order to meet the particular patient's needs. Additional pain medications such as buprenorphine, amantadine and non-steroidal anti-inflammatory drugs (NSAIDs) may also require consideration. Elevated stages of CKD may preclude safe use of NSAIDs.

Kelly St. Denis, DVM, DABVP
CVC Kansas City, 08:17

Trilostane not working?

It has to be given with food to be absorbed. So, if a patient isn't responding, verify with the owners that they always give it with food. But even when fed, some dogs don't absorb it. The author has had dogs that didn't respond, and had the trilostane in their blood measured and it's not there. If you get trilostane into the blood, it works because it blocks the synthesis of cortisol. It's important that clients give the medication with food each day, including the day they have the ACTH stimulation test performed. Some owners and vets will ***mistakenly fast the dog*** the day of the test and give the trilostane on an empty stomach, which can dramatically alter the test results. Also, variation in clinical response and ACTH stimulation test results can be seen with dogs on compounded trilostane versus Vetoryl, so switching to the name brand preparation would be a good idea if inadequate control of Cushing's is present. If the pet is clinically not responding and the ACTH stimulation test indicates inadequate adrenal suppression, the dose and/or frequency of administration of trilostane may need to be adjusted.

David Bruyette, DVM, DACVIM
Vetted, Sep 2018

Spaying and mammary tumors in cats

Like dogs, OHE reduces the risk of cats developing mammary tumors. Cats spayed before 6 months had a 91% reduction, between **7-**12 a 86% reduction, but if spayed between 13-24 months, the reduction was only 11%. The protective effect is not seen after 2 years of age in cats. Based on this, it may be ***beneficial to spay cats prior to 1 year of age***. Hormone therapy with progesterone and/or estrogen can lead to a 3-fold increase of both benign and mammary tumors.

Sue Ettinger, DVM, DACVIM
Fetch San Diego, 12:17

Effects of gabapentin in osteoarthritic geriatric cats

In a placebo-controlled crossover study of 20 osteoarthritic geriatric (>10 years old) cats, gabapentin (10 mg/kg [4.5 mg/lb], PO, q12h) was ***associated with improvements*** in owner assessments of 3 activities in which their cats had impaired mobility. However, gabapentin was also associated with significantly lower mean daily activity counts, and sedation was the most common adverse effect. Adverse events were noted in 10 cats (9 that completed the study) during gabapentin treatment (sedation, ataxia, weakness, and muscle tremors) and one cat during placebo treatment (lethargy).

Alonso G.P. Guedes, MV, PhD et al.
JAVMA, Sep 1, 2018

Feline IBD

In cats with idiopathic inflammatory bowel disease, if the response to prednisolone alone is not optimal, chlorambucil can be used as an adjunctive treatment. There are several dosing protocols that have been reported. For cats that are relatively easy to pill a dose of 2 mg per cat, PO, three times a week can be used. In smaller cats or cats that don't tolerate chlorambucil well the dose frequency can be reduced to twice weekly. For

cats that are harder to pill, pulse dosing can be used. This entails giving a dose of 20 mg/m^2 once every 2 weeks. Generally, this drug is very well tolerated in cats but it may cause myelosuppression so complete blood counts should be monitored periodically. Some cats with IBD or lymphoma also have comorbid conditions, such as diabetes, that means the use of prednisolone is contraindicated. Budesonide is a corticosteroid, which is extensively metabolized on its first pass through the liver. This means it causes fewer systemic side effects than prednisolone. In these cases, budesonide can be used instead of prednisolone. However, there may still be some systemic side effects associated with this drug. A dose of 1 mg per cat, PO, q24 hours has been recommended.

Jonathan Lidbury, BVMS, MRCVS, PhD, DACVIM, DECVIM
CVC Kansas City, 08:17

Sandwiching between propofol

Benzodiazepines can be given concurrently with propofol or alfaxalone with the potential advantages of improved muscle relaxation and lowered induction drug dose requirement. Occasionally, an excitement response can be seen following the administration of a benzodiazepine. To prevent this response, the ***benzodiazepine can be 'sandwiched'*** in-between low-doses of propofol or alfaxalone - give propofol or alfaxalone, 1 mg/kg (0.45 mg/lb), then midazolam or diazepam, 0.2 mg/kg (0.09 mg/lb), followed by another 1 mg/kg (0.45 mg/lb) of propofol or alfaxalone. Intubation may be possible at this point or additional small increments of propofol or alfaxalone given until able to intubate.

Elizabeth A. Martinez, DVM, DACVAA
VMX, 02:18

Best cranial cruciate rupture procedure

Results of this study suggested that tibial plateau leveling osteotomy (TPLO) was preferred for treating cranial cruciate ligament rupture (CCLR) in dogs weighing >15 kg and that the tightrope-like braided multifilament suture secured with metallic buttons (TR) procedure was perceived as having the highest complication rate. With results of this survey in mind, use of the TR procedure should be ***considered cautiously*** when treating CCLR. These authors believe that the perceptions of the majority of respondents to their survey, who collectively performed nearly 30,000 CCLR surgeries annually, and the currently available literature suggest that TPLO should be reliably recommended for the surgical treatment of CCLR in dogs weighing >15 kg.

Dirsko J.F. von Pfeil, Dr med vet et al.
JAVMA, Sep 1, 2018

Nutritional websites for pets with heart disease

Tufts HeartSmart website [information on heart disease for pet owners, including nutrition (e.g., low-sodium diets for dogs and cats, treats, omega-3 fatty acid supplements)]. Available at: www.tufts.edu/vet/heartsmart. Tufts Petfoodology website (information on pet food and pet nutrition for pet owners). Available at www.petfoodology.org.

Lisa M. Freeman, DVM, PhD
ACVIM Forum, 06:17

Moldy food toxicosis

Tremorgenic mycotoxins produced by molds on foods are a relatively common, and possibly under-diagnosed, cause of tremors and seizures in pet animals. Because of their relatively indiscriminate appetites, dogs tend to be most commonly exposed to tremorgens. These toxins are produced from a variety of fungi that grow on practically any food, including dairy products, grains, nuts, and legumes; compost piles may also provide a source of tremorgens. Clinical signs include fine muscle tremors that may rapidly progress to more severe tremors and seizures. Death generally occurs in the first 2-4 hours and is usually secondary to respiratory compromise, metabolic acidosis or hyperthermia. Other signs that may be seen include vomiting (common), hyperactivity, depression, coma, behavior alterations, tachycardia, and pulmonary edema. Asymptomatic animals exposed to moldy foods should be decontaminated via emesis or lavage followed by activated charcoal and cathartic. In symptomatic animals, control of severe tremors or seizures has priority over decontamination. Seizures may respond to diazepam; tremors respond best to methocarbamol (Robaxin; 55-220 mg/kg, IV, to effect). Supportive care should include IV fluids, thermoregulation, and correction of electrolyte and acid-base abnormalities. In severe cases, signs may persist for several days, and residual fine muscle tremors may take a week or more to fully resolve. Testing of stomach content, suspect foods, or vomitus for tremorgens is available through the Animal Health Diagnostic Laboratory, Michigan State University (517-355-0281).

Tina Wismer, DVM, DABT, DABVT
CVC Kansas City, 08:17

"Natural diets"

The Association of American Feed Control Officials defines the term "natural" as "A feed or ingredient derived solely from plant, animal or mined sources, either in its unprocessed state or having been subjected to *physical processing, heat processing, rendering, extraction, hydrolysis, enzymolysis or fermentation,* but not having been produced by or subject to a chemically synthetic process and not containing an additives or processing aids that are chemically synthetic *except* in amounts as may occur unavoidably in good manufacturing practices." While pet owners often envision the term natural to be synonymous with unprocessed, it is clear from the definition above that this is not the case. As a result, many owners may choose and pay a premium to feed a diet marketed as "natural" that has similar manufacturing practices as a diet without such a marketing claim.

Angela Witzel Rollins, DVM, PhD, DACVN
Music City Vet Conf, 02:18

Meniscal damage

What this author can tell an owner is that with surgery (cruciate) we can minimize the chances of a meniscal injury. Without surgery there is a high incidence of meniscal injury. The problem is again along that scale "I don't know where a brace will fall." Will it help protect the meniscus the same as surgery, or will it not make a difference such as doing nothing? This does bring up a good point about meniscal damage. ***A "meniscal click" will only get you about 30%-40% correct*** at identifying a meniscal injury. If you add in a positive McMurray test and pain on hyperflexion that may improve to about 50%. This author feels if a dog has a meniscal tear they will not benefit from a brace because it will do nothing to help with the pain and discomfort. The problem is if at best you can diagnose a meniscal injury in 50% of patients, then how does one approach determining if there is meniscal injury? An MRI could be considered but is costly and requires general anesthesia, arthroscopy could be considered but personally would be below the standard of care to go to surgery to identify a meniscal injury but not treat the CCL rupture. Therefore, if the owners want their dog in a brace then they must undergo a stifle ultrasound. If there is evidence of meniscal damage then that dog will not be a good candidate for a brace; if they don't appear to have meniscal damage then we can give it a shot knowing that an ultrasound is not 100%.

Matt Brunke, DVM, CCRP, CVPP, CVA
Fetch San Diego, 12:17

Prognostic indicator for FIV, FeLV

Only reduced RBC counts at time of FIV and FeLV diagnosis have been shown to be a ***negative prognostic indictor*** for survival; in this study, FeLV-infected cats with reduced RBC counts at diagnosis had a death ratio 3.5 times higher than FeLV-infected cats with normal RBC counts at diagnosis. Thus, blood counts should be evaluated at diagnosis and all follow-up examinations for retrovirus-infected cats.

E. Spada et al.
WSAVA Clinician Brief, Sep 2018

Hip dysplasia and nutrition

Nutrition is thought to be a large contributor to joint laxity and thus hip dysplasia (HD); however, no dietary *deficiencies* cause HD. Dietary excesses on the other hand can contribute to the development of HD. For example, increased calcium and vitamin D lead to alterations in endochondrial ossification, and delayed bone remodeling. Diets high in excessive vitamin C can lead to hypercalcemia and diets with a high anion gap lead to increased synovial fluid production, which in and of itself has been shown to be a risk factor for hip laxity. Feeding diets to promote rapid growth have been shown to have a higher incidence of HD and also cause early fusion of the acetabular growth plates. Increased body weight is not a *cause* of HD, but it certainly has very important clinical consequences in susceptible dogs. Therefore, ***weight reduction is an effective preventative strategy***. In the lifespan study of 49 Labradors it was reported that heavier dogs (dogs allowed to eat ad lib) developed radiographic OA on an average of 6 years earlier than the dogs in the restricted fed group. Furthermore, heavier dogs required long-term treatment for OA on average 3 years earlier than their restricted fed littermates.

David Dycus, DVM, MS, CCRP, DACVS
Music City Vet Conf, 02:18

Nocita may help replace some opioids for pain

For some procedures, you can avoid the use of opioids if adequate local techniques are employed. Thanks to Aratana Therapeutics, we have the use of Nocita, the 72-hour extended-release bupivacaine. This drug means that we can do away with the lengthy hospitalizations necessary for animals with pain that's controlled with a constant rate infusion of opioids and other medications. Although Nocita is only licensed for use with cruciate surgery, this author has successfully used it in any surgery where previously regular bupivacaine was used.

Michael Petty, DVM, CVPP, CVMA, CCRT, CAAPM
Vetted, Sep 2018

Controlling pruritus with fatty acids

Oral fatty acids supplements, similar to antihistamines, have been shown to reduce the amount of glucocorticoid required to control itch in allergic patient by about 15%-25%. In addition, this author uses fatty acids to support the skin barrier function, an important aspect of management of the atopic dog. For the latter purpose, one can use oral supplements or topical applications of lipids. It is not completely clear which fatty acid formulation or even which class of fatty acids provides the best support for the skin. Combinations of omega 3 and omega 6 fatty acids may be ideal for support of the barrier function. Some limited clinical studies suggest that 180 mg of omega 3 fatty acids/5 kg body weight provides good anti-pruritic actions, and it is this dosage that this author uses most frequently to support atopic dogs (for reduction of pruritus).

James O. Noxon, DVM, DACVIM
MI Vet Conf, 01:18

Cephalexin MIC and dosage

Cephalexin at 25 mg/kg, PO, q12h has a 90% likelihood of clinical success in dogs when treating isolates with a MIC =2 µg/ml. The likelihood of success for isolates with MICs of 4 µg/ml and 8 µg/ml is only 73% and 47%, respectively. Alternative drugs should be considered at these higher MICs based on culture and susceptibility report results. If a bacterial isolate is resistant to oxacillin, it should also be considered resistant to all other ß-lactam drugs, including cephalexin and cephalothin. Alternative drug classes should be used to treat such infections.

M.G. Papich et al.
WSAVA Clinician Brief, Sep 2018

New canine lymphoma blood test (cLBT)

This is a new biomarker approach for diagnosis of canine lymphoma from a blood test. The test uses an algorithm to evaluate the relative levels of C-reactive protein and haptoglobin in the blood, along with patient age and presence of lymphadenopathy to distinguish between lymphoma and other diseases that may have a similar clinical presentation. The test can be useful when the cytology findings support lymphoid hyperplasia but the clinical suspicion is for lymphoma. It can also be helpful in discovering the cause of hypercalcemia. The cLBT scores have been show to decrease with treatment and the magnitude of increase over time can help predict when a patient will clinically relapse. Additionally, the cLBT score at the time of diagnosis has been shown to have prognostic significance. Dogs with cLBT scores >4.11 had a median survival time of 7 months when treated with the UW Madison chemotherapy protocol, compared to a median survival time of 16 months when the score was between 3.29 and 4.11. It has also been shown that the lower the cLBT score observed during induction chemotherapy, the better the long-term prognosis. For motivated owners, the cLBT can be a tool to help understand the progression of their dog's lymphoma. More information, including sample submission forms can be found here: www.avactaanimalhealth.com/how-to-use/usa-veterinarians/.

Michael D. Lucroy, DVM, MS, DACVIM
Emerald Coast Vet Conf, Jun 2018

Feline idiopathic chronic rhinitis

In cases where nasal biopsies are not obtained, a therapeutic nasal flush should still be performed under general anesthesia prior to starting empirical therapy in order to help maximize the likelihood of treatment success. Secondary bacterial infections should first be treated. Lipid soluble antibiotics that achieve high concentrations in airway lining fluid are good first choices. When antibiotic selection is not based on culture results, empirical choices should be broad spectrum, including activity against common nasal opportunistic pathogens including Mycoplasma spp and Bordetella. Macrolides and azalides (e.g., azithromycin), fluoroquinolones, and tetracyclines are good empirical choices, and should be employed for 3 weeks. Once secondary infections have been treated, this author determines whether or not the rhinitis is corticosteroid responsive with a trial of anti-inflammatory prednisone or prednisolone. It has been the author's experience that most cases of chronic rhinitis are in fact corticosteroid responsive if therapy is started in a properly prepared nasal airway (i.e., after nasal flush and antibiotic therapy). Typically start at 1-2 mg/kg/day in dogs, and 2-3 mg/kg/day in cats, for 14 days, with regular communication with the client during this time. Ideally, if patients are corticosteroid responsive, it is recommend starting a training period with a facemask and spacer device, and implementing inhaled corticosteroid therapy as soon as possible. Start at high inhaled doses of fluticasone propionate (220 µg metered dose inhaler), 1 puff twice daily with a facemask and spacer device. Once inhalation therapy has comfortably been implemented, start 25% dose reductions of the oral corticosteroid therapy every 2 weeks, with regular monitoring of clinical signs during the dose reduction. For patients who are prednisolone-responsive, but may not be candidates for inhalation therapy, the author recommends a longer course of therapy at 1-2 mg/kg/day (up to 1 month), followed by a more gradual dose reduction (25% reduction every 3-4 weeks), with frequent monitoring for corticosteroid-induced side effects.

Stephan A. Carey, DVM, PhD, DACVIM
MI Vet Conf, 01:18

AHS guidelines for heartworm treatment in the cat

If a cat displays no overt clinical signs despite radiographic evidence of pulmonary vascular/interstitial lung disease consistent with heartworm disease, it may be prudent to allow time for a spontaneous cure to occur. The course of infection can be monitored at 6- to 12-month intervals by repeat antibody and antigen testing and thoracic radiography. In those cats destined to recover, regression of radiographic signs and especially seroconversion of a positive antigen test to negative status provide evidence that the period of risk probably has passed. Prednisone in diminishing doses often is effective medical support for infected cats with radiographic evidence of lung disease whether or not they appear ill. Prednisone also should be initiated whenever antibody- and/or antigen-positive cats display clinical signs. An empirical oral regimen is 2 mg/kg/day, declining gradually to 0.5 mg/kg, every other day by 2 weeks and then discontinued after an additional 2 weeks. At that time the effects of treatment should be reassessed based on the clinical response and/or thoracic radiography. This treatment may be repeated in cats with recurrent clinical signs. Cats that become acutely ill need to be stabilized promptly with supportive therapy appropriate for treating shock.

American Heartworm Society
Emerald Coast Vet Conf, Jun 201

Short Picks

For persistent pneumothorax, "blood patching" may be tried to speed healing. A blood patch is performed by injecting 25-50 ml of fresh whole blood directly into the chest with the hope that the clotting factors helps to speed up the healing of the tear in the lung tissue.

Elizabeth Rozanski, DVM, DACVECC, DACVIM
NY ST VMA Conf, 05:18

Like human Noroviruses, Feline Caliciviruses (FCV) are highly contagious and survive in the environment for up to one month. Thus, very good hygiene and disinfectant with effectiveness against FCV are needed (look for disinfectants that are ***labeled effective against Norovirus***). To kill FCV on clothes, a wash cycle with a temperature of at least 60°C is required.

Regina Hofmann-Lehmann, Dr. med. vet.
Fred Scott Feline Symp, Jul 2018