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"Pearls" of Veterinary Medicine

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AT A GLANCE

Rate of fluids during surgery questioned

For many years much focus has been given to debates on which fluid to administer (colloids versus crystalloids) when another topic of great import is "how much should we be giving?" The classic approach to IV fluid therapy in the average anesthetized veterinary patient has been a recipe based 10-20 mL/kg/hr of a balanced isotonic crystalloid for the duration of the surgical procedure. Recently, however, people have begun to question whether rates such as these are excessive for the average patient. Excessive IV fluid administration may promote interstitial edema, impede pulmonary function and gas exchange, decrease tissue 0_2 tension, impair wound healing and potentially lead to overt fluid overload. In general, most studies demonstrate that perioperative fluid therapy influences complication rates and length of hospital stay. A zero-balance fluid therapy approach to the anesthetized patient may be achieved with a conservative rate of IV crystalloid ***administration of 3-5 mL/kg/hr***. However, this may be insufficient in major surgery or for critical patients.

Linda Barter, BVSc, MVSc, PhD, DACVAA
21st IVECCS Conf, 09:15

Questions use of colloids

At this time there is inadequate evidence in veterinary medicine to know whether the use of synthetic colloids is good or bad in dogs and cats with sepsis. That being said, there is significant concern that they are harmful in human patients with sepsis. Two concluding statements from the recent literature offered by the author are: As colloids are not associated with an improvement in survival, and as they are more expensive than crystalloids, it is hard to see how their continued use in the patients (with trauma, burns or following surgery) can be justified outside the context of randomized clinically controlled trials. And, because there are safer and equally effective alternatives in the form of crystalloids, use of synthetic colloids should be avoided except in the context of clinical studies.

Claire R. Sharp, BSc, BVMS(Hons), MS, DACVECC
Int VECCS Conf, 09:14

End-of-life care, nutrition

Ensuring that cancer patients, particularly those with oral tumors, are receiving adequate nutrition is important. High-quality diets are recommended. There are several diets specifically formulated for patients with cancer; however, there is no evidence to support a change in survival in patients fed these diets. There is evidence that these diets may be useful in cancer patients who are underweight and potentially suffering from cancer cachexia. ***Feeding tubes are not recommended*** by the author for veterinary cancer patients. Often when feeding tubes are required in veterinary patients, the patient's quality of life has declined to a point where continued life is not in the best interest of the patient. Feeding tubes enable owners who may be having trouble letting go to continue to feed the patient and keep them alive long past the point where their quality of life is acceptable. It is the author's opinion that euthanasia should be considered when cancer patients are unable or unwilling to eat.

81st AAHA Conf, 03:14
Sara Allstadt Frazier, DVM, DACVIM (Oncology)

Viral papillomas

Viral papillomas are not a new entity in clinical practice, but in the author's experience there has been an apparent resurgence of young dogs presenting with canine oral papillomas. In the author's clinical experience, this may be associated with increasing contact between young dogs in a variety of high-exposure situations (e.g.,

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day care, group dog-walkers, dog parks). Humoral immunity protects against viral challenge, but it does not play a role in the clearance of established lesions. Cellular immunity is important for viral clearance, so vaccines are of limited help in the resolution of active lesions; however, they may aid in prevention. Likewise, recovering dogs are typically immune to reinfection. A number of therapeutic options are available, yet supporting data are limited. Based on the author's clinical experience, it appears that oral interferon at 10,000 to 20,000 U daily is often the most successful therapeutic value. There is a lack of evidence-based therapeutic data.

Karen Helton Rhodes, DVM, DACVD
NAVC Clin Brf, 14:2

Dry FIP treatment

Polyprenyl immunostimulant (PI) is manufactured by Sass and Sass, TN, USA. Polyprenyl immunostimulant is an oral drug shown to have clinical efficacy against feline herpes virus and ***dry form of feline infectious peritonitis***. It is a plant-based drug that promotes increased cytokine production. It was found to be safe and well tolerated in cats. PI has been given conditional license for the treatment of feline herpesvirus. PI has been used off-label in dry form of FIP. PI was not found to be effective in wet form of FIP. The drug is expensive but shows clinical efficacy against dry form of FIP.

Sanjay Kapil
ACVIM For, 06:16

Practical sedation

Pre-clinic sedation is important for those dogs who are anxious upon arrival at the clinic. At home administration of sedative, analgesic or anti-anxiety medications can reduce the stress of a car ride, and decrease a dog's anxiety at the time of arrival at the hospital. Remember that pain exacerbates anxiety and anxiety amplifies the pain experience. **At-home or Pre-Clinic Sedation Options**: • *Trazodone* (5-15 mg/kg, PO, 1 hour before travel/arrival). Starting dose based upon weight: =11 kg = 7 mg/kg; 11-25 kg = 5 mg/kg; reduce to 3 mg/kg for large dogs. Can be administered to dogs in the clinic; takes ~1 hour for effect in fasted dogs. Trazodone has no analgesic properties. Paradoxical excitation is uncommon, nevertheless trial dose at home is recommended. Or • *Phenobarbital* (6 mg/kg, PO, 2 hours prior to travel). A trial at home is recommended to determine appropriate dose and if this medication will produce adequate sedation. No analgesic effect. Or • *Dexmedetomidine* (For healthy, anxious dogs) (10-25 µg/kg, oral, transmucosal, 20 min before visit). Example: owners administer into the cheek pouch while the dog is in the parking lot outside your clinic. Will produce moderate to heavy sedation in very anxious dogs. A trial at home is recommended to determine the appropriate dose. Dexmedetomidine has analgesic properties. Have patient observed continually after administration to make sure they don't lay down in a position that compromises breathing. Or • *Gabapentin* (20-40 mg/kg, PO, 2-3 hours before travel/arrival). This is just not as effective in dogs as it is in cats. Try in small breed dogs. Gabapentin has analgesic properties in dogs. Worth trying if you are reluctant to use trazodone or dexmedetomidine.

Heidi L. Shafford, DVM, PhD, DACVAA
N Amer Vet Conf, 01:15

Different view of battery ingestion

In response to an article concerning ingestion of alkaline dry cell and disc-shaped lithium batteries, the author references the dangers of these batteries, stating, that they are dangerous because when they are punctured or swallowed, alkaline or acidic material can leak out and cause a severe corrosive injury. It is a misconception that these household batteries contain acid; in fact, both mentioned batteries contain alkaline or nonionic material. This is notable given the nuances of alkaline corrosives. Of greater concern is the statement that disc batteries "can cause severe GI ulceration if punctured." Actually, the reverse is true—these batteries are more dangerous and more likely to cause injury if intact. If punctured, the leaking contents do not cause severe harm. The primary mechanism of injury from lithium ion disc batteries is caused by the external electric current created across the battery, which "cooks" the tissues in contact with each side and can result in necrosis and preformation. In severe cases, the result is tracheoesophageal or aortoesophageal fistulas followed by exsanguination.

Ahna Brutlag, DVM, MS, DABT, DABVT
NAVC Clin Brf, 14:6

Relationship of declawing and house soiling

The conclusion drawn from results of the authors' multivariatc analysis was that when there were 3 to 5 cats in a household that had also undergone onychectomy, there was a greater risk of house soiling in that household. However, declawed cats were not necessarily more highly associated with multicat households. On the basis of these results and results of univariate analyses, the authors concluded that there was ***evidence for an association between onychectomy and house soiling***. Also, statistical analysis revealed that the prevalence of house soiling among cats in which the laser method of onychectomy had been used was not significantly different from the prevalence in cats with intact claws. However, the prevalence of house soiling was significantly higher among cats in which any other onychectomy method had been used.

Claudia J. Baldwin, DVM, MS et al.
JAVMA, Nov 15, 2016

Tightening cerclage wires

All wires should be placed as tightly as possible, to prevent loosening and subsequent devascularization and demineralization of bone. Tight wires can clinically be achieved using either the twisting of a straight wire, or bending of a loop-end wire. Bending a loop-end wire creates more wire tension than the twist method.

Double-wrap cerclage wires, have been described and are purported to generate more compressive forces than a single wrap pattern. If a twist method is performed, the twist must be performed under tension to create a uniform twist. A twist wire should either be cut seven to eight twists from the bone and bent flat (while continuing to twist), or it can be cut off three to four twists from the bone and left upright - if regional anatomy will allow.

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

Resuscitation of pups

Pups suffering from distress due to intrinsic causes or dystocia may require heroic measures to survive. However, with appropriate equipment and individual attention, this is very possible. Pups with pink mucous membranes and heart rates over 120 bpm, but no respiration, should have oxygen provided via small mask and have vigorous stimulation continued. This author particularly finds that pinching of the skin down the back is effective - this is a technique many bitches use naturally. The use of acupuncture point GV 26 (on midline between nose and upper lip) can assist in resuscitation as well - a simple 25 g needle can be used. This site should be "pecked" with the needle tapping against the cartilage/bone beneath the skin. While the oxygen mask is applied to the pup's face, keep its neck extended in an effort to encourage air to travel into lungs rather than stomach.

Joni L. Freshman, DVM, MS, DACVIM, CVA
Southwest Vet Symp, 09:14

The fracture "gap"

If you are rechecking your fractures at four weeks following external coaptation or after surgery and notice that the fracture line seems to have widened slightly, don't panic! Part of the healing process involves the fracture maintaining an interfragmentary strain of < 2%. The interfragmentary strain is the deformation occurring at the fracture site relative to the size of the gap. By keeping the interfragmentary strain < 2%, the body is able to allow bone to be laid down in the fracture gap. This process can cause apparent widening of the fracture line seen on radiographs and can give you the wrong impression that the fracture is getting worse. Understanding this phenomenon will help you interpret your radiographs and, more important, help you sleep at night.

David Dycus, DVM, MS, CCRP, DACVS
Vetted, Sep 2016

Role of fish oil in atopy

The role of long-chain polyunsaturated fatty acids in the management of skin disorders has not been well-studied. While dietary fatty acids in general have long been recognized as essential for the development and maintenance of healthy skin in animals, specific fatty acids and supplements are more difficult to research. At least four studies have shown a benefit of fish oil in atopic dogs with reduction in pruritus, self-trauma, and alopecia. A typical dose is 300 mg combined EFA/DHA per 5 kg (10 lb) body weight. This is the amount found in a typical 1-gram fish oil capsule or 1-ml dose of liquid. However, some commercial diets already contain fish oil in varying amounts so dosing should be based on the amount in the diet plus the supplement. Adverse effects are possible with excessive dosing, and the current safe upper limit in dogs is approximately three times the above dose, or 1,000 mg EPA/DHA per 5 kg.

Craig Datz, DVM, MS, DABVP, DACVN
20th ABVP Symp, 11:15

Dosage of omeprazole changed

Until recently, studies on the use of acid suppressants in dogs and cats were limited. Therefore, the recommended dosing for oral proton pump inhibitors (PPI)s (e.g., omeprazole) was anecdotal. Published doses for both cats and dogs are 0.7-1.5 mg/kg, PO, q24h for reflux esophagitis and 0.5-1 mg/kg, PO, q24h for GI ulceration. Recent studies have suggested that standard dosing recommendations for omeprazole ***should be changed*** to 1 mg/kg, PO, q12h for adjunctive treatment of conditions known to cause ulcerative GI disease in companion animals (e.g., mastocytosis, gastrinoma, NSAID toxicity) or reflux esophagitis. Further studies are needed to evaluate the recommended acid suppressant of choice in treating chronic diseases suspected to lead to gastric hyperacidity (e.g., chronic renal or hepatic disease).

Emily Gould, DVM, MS and M. Katherine Tolbert, DVM, PhD
NAVC Clin Brf, Nov 2016

Treating cats with FIC

How do these authors treat an acute episode of LUT signs for either the first time or an infrequently recurrent event? They treat nearly all FIC cats of this type with a combination of buprenorphine and acepromazine PO for 5-7days. The combination of an analgesic and a tranquilizer with properties that also decrease urethral tone seems like a compassionate and appropriate choice of treatment. It is likely that the tranquilizer reduces the activity of the autonomic nervous system which is useful in the initial treatment of FIC. The authors believe that this helps to acutely decrease clinical signs in cats with acute episodes of FIC or flares of chronic FIC, though this has not been specifically studied. Whether this regimen reduces future episodes of FIC has also not been tested. They take the opportunity at the first visit to discuss with the owners that even a first event of FIC may be associated with recurrence and that there may be steps that can be taken to reduce this likelihood when environmental enrichment and modification are successfully implemented.

Dennis J. Chew, DVM and CAT Buffington, DVM
VA VMA Conf 02:15

Treatment of CHV-1

Clinical reports describing the use of topical ocular application of 1% trifluridine ophthalmic solution or 0.1% idoxuridine ophthalmic solution have indicated that these

topical treatments are apparently successful in the treatment of dogs with CHV-1 infection. Although its clinical use has been described, no controlled studies have evaluated the efficacy and safety of topical ocular treatment with trifluridine in dogs with ocular CHV-1 infection, to the authors' knowledge. The results of this study showed that topical ocular application of 1% trifluridine ophthalmic solution was well tolerated and effective at reducing disease scores and viral shedding duration in dogs with experimentally induced ocular CHV-I infection, but may require frequent administration.

Chloe, B. Spertus, DVM et al.
Am J Vet Res, Oct 2016

Resistant Staph

if you are seeing a pyoderma that has failed to respond to two different classes of oral antibiotic, repeated courses of a previously successful antibiotic or one dose of cefovecin, start thinking about resistance and submit a culture. If you grow a methicillin-resistant staph on your culture, regardless of what the report says, consider all penicillins, cephalosporins, cephamycins, amoxicillin-clavulanic acid, ticarcillin-clavulanic acid, and carbapenems to be resistant. In addition, due to possible horizontal drug resistance, fluoroquinolones should probably be avoided. (They may be risk factors for the development of MRS.) Despite multidrug resistance, there are typically one or more reasonable options such as trimethoprim-sulfonamide, doxycycline, aminoglycosides, and chloramphenicol, although often not without concerns. Consider adding in topical therapy! Bathing with a 3 or 4 percent chlorhexidine shampoo as often as daily can be a useful adjunct to treating with systemic antimicrobials. While possible, human owners/guardians do not generally get resistant staph infections from their dogs. With that being said, we are dealing with resistant bacteria and it is prudent to use proper precautions since there are still so many unanswered questions.

Tiffany Tapp, DVM, DACVD,
Cal Vet, Nov/Dec, 2016

Electrical safety in the hospital

One of the most common misconceptions when it comes to electrical safety, whether in a veterinary practice, home or public space, is that the biggest danger is electrocution. In reality, a fire is much more likely to result from misused electrical components—power strips, specifically—than electrocution. A common thing people say is, 'Oh there aren't enough outlets; I'll use this power strip.' The number-one thing that causes fires in veterinary practices is the ***misuse of power strips***. Overloaded power strips can overheat, smoke and ignite. **Dos** regarding power strips: > Do use a power strip for electrical equipment only. They're not designed for high-wattage items. > Do buy the best-quality power strip you can find. Some cheaper versions sold at discount stores aren't even surge protectors; they're multi-plugs with an extension. Check the rating of the strip for the level of amps or wattage it can handle. The higher the rating, the less likely it is to overheat. > Do plug the strip straight into the wall. Never plug it into an extension cord or multi-plug that's already plugged into the wall. **Don'ts:** > Don't plug items such as space heaters, coffeepots or autoclaves into a power strip. They use too much wattage. Plug those items directly into a wall outlet. Burn marks near the outlets in grooming areas are caused by 'arcing'—when a high-wattage item like a dryer cage is plugged in or unplugged without the power switch being turned off and the electrical current starts flowing between the plug and the outlet. Always turn off the power before plugging in or unplugging.

Phil Seibert, CVPM
DVM News Mag, 46:8

Pilling a cat

To trick cats into taking pills, this clinician uses Easy Cheese by Kraft, to wit: Make a line of cheese, then a dot, then another line. The dot contains the pill. Cats eat the cheese quickly, and swallow the pill without noticing they consumed it. It doesn't work if the pill is just placed in a glob of cheese; the cat will spit the pill out. It's the line-dot-line technique that consistently works.

Dr. Michelle Danna-Christian
DVM Supp, Oct 2016

Opioids in brachycephalic dogs

For pain management this author prefers hydromorphone (0.1 mg/kg), methadone, oxymorphone (0.1 mg/ kg) or fentanyl for severe pain, and buprenorphine (0.02 mg/ kg) for mild pain. This author frequently combines pure mu agonists with butorphanol (0.1 mg/kg) to reduce the chances of vomiting, and to add a sedative to the cocktail. Methadone is useful because it causes little nausea or vomiting, but it's expensive, difficult to find and carries a diversion potential. Fentanyl is the CRI drug of choice for these patients because of its titrability. It is usually used at lessened doses of 3- 5 µg/kg/hr, intraop and 1-3 µg/ kg/hr postop. Keep in mind that brachycephalic patients have a high degree of vagal tone to begin with, so the usual opioid doses may really worsen bradycardia and add to sleep and respiratory issues. Since opioids can also cause anxiety and nausea, it is critical in brachycephalic patients to combine these with the appropriate sedative, such as midazolam, dexmedetomidine, butorphanol or even acepromazine as a last resort, to avoid adding stress and respiratory distress to these patients.

Phil Zeltzman, DVM, DACVS, CVJ
Vet Pract News, 28:6

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