

"Pearls"
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AT A GLANCE

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Use of pimobendan in feline heart failure

While the data sheet for pimobendan (Vetmedin) lists hypertrophic cardiomyopathy as a contraindication to its use, observational studies have reported that pimobendan is well tolerated in cats with other cardiomyopathies and heart failure. Furthermore, a small, retrospective study of cats with HCM and heart failure reported a median survival time of 626 days for cats that received pimobendan, versus 103 days for cats that did not receive pimobendan. At a minimum, these findings warrant further investigation of pimobendan in cats with heart failure. Many cardiologists, including the author, use pimobendan in cats with heart failure on a regular basis for several years, and have not noted adverse effects. The question of whether pimobendan is harmful to cats with dynamic left ventricular outflow obstruction (DLVOTO) is as yet unanswered. Ultimately, until there is convincing evidence of a benefit for any therapy in addition to furosemide to treat heart failure in cats, it remains very **appropriate to treat with furosemide alone**, particularly for cats that experience their first episode of heart failure. The author treats many feline heart failure cases with furosemide alone.

Simon Dennis, BVetMed, MVM, DECVIM
Atlantic Coast Vet Conf, 10:17

Analgesia for the geriatric

Since tramadol use in small animal patients has been plagued by issues with palatability, tablet sizes (for cats and small dogs) and recent literature that suggests its relative poor analgesic capabilities, we are left with codeine, hydrocodone, and oxycodone as chronic pain relievers for more severe pain. Although literature suggests that these drugs lack analgesic effects typical of what humans experience, this author has found **good to excellent results** with use of hydrocodone for milder level pain (such as that post TPLO first days at home) and oxycodone for severe pain (such as that of osteosarcoma) in dogs. For cats, oral trans-mucosal buprenorphine or more concentrated buprenorphine (Simbadol) provides excellent severe pain treatment. For additional chronic pain relief, clonidine can be used and appears to be an excellent addition for axial and CNS pain (herniated disc disease). The listed dosage of hydrocodone is 0.1-0.2 mg/kg, q8-12h. Oxycodone is listed as 0.1-0.3 mg/kg, q8-12h.

Andrea L. Looney, DVM, DACVAA, DACVSMR
N Amer Vet Conf, 02:17

Leave those ears alone!

There are several signs that are normal in the cat as concerns their ears, but they may be assessed as abnormal by the owner and the cat presented for that abnormality. Many cats, especially orange tabby cats will have a large amount of waxy exudate as a normal occurrence. If that wax is seen as abnormal and cleaning is elected, often the amount of waxy exudate produced is increased - this can then be a vicious cycle. - Leave those ears alone. Many cats when scratched and rubbed on the top of their head and around their ears will respond with excessive head shaking. This does not imply ear disease necessarily. - Leave those ears alone. Cats under sedation for other procedures often have their ears cleaned without having any previous complaint from the owner concerning ear disease or any clinical signs that there is an abnormality. In spite of a normal/intact tympanic membrane, these cats may wake up from anesthesia/sedation with vestibular signs to include head tilt and nystagmus. Fortunately, the signs are usually temporary. Don't be tempted to clean these ears unless there is a reason. - Leave those ears alone. So... in most cases, leave those ears alone.

Sandra R. Merchant, DVM, DACVD
4th Gulf Atlantic Vet Conf, 10:16

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Recommendations for feline over-due vaccinations

The following recommendations represent expert opinion and are intended to provide a practical approach to immunizing cats when conventional vaccination guidelines have not been

followed: **Overdue during the initial vaccine series:** While most practices administer the initial core vaccine series to kittens at intervals of 3-4 weeks, cats exceeding a 6-week interval between any of the initial doses should receive 2 additional doses, 3-4 weeks apart. The same is true during the initial 2-dose series recommended for cats receiving non-core vaccines. If the interval between doses exceeds 6 weeks, 2 additional doses, 3-4 weeks apart should be administered. **Overdue for CORE vaccine booster:** ASSUMING USE OF A MLV VACCINE, administer a single dose of a combination core vaccine regardless of the number of years that have lapsed. **Overdue for Feline Leukemia booster:** This is complicated... compared to kittens, adult cats are significantly more resistant to developing progressive disease associated with FeLV infection. For this reason, significant differences of opinion exist with respect to *conventional intervals* (annual, biennial, triennial recommendations exist). It would be reasonable to recommend that the initial 2-dose series should be restarted in the event a cat is more than 3 years overdue for vaccination.

Richard B. Ford, DVM, MS, DACVIM, DACVPM (Hon)
SD VMA Conf, 08:16

Medical management of dystocia

Medical management can be considered for dystocia if the fetuses are viable with no evidence of distress, the dam is in good health, the labor has not been protracted, the cervix is dilated and the fetal size is consistent with a possible vaginal delivery. If medical management is attempted the dam should be well hydrated with normal electrolytes. This may require administration of intravenous fluids. Oxytocin should be administered 1-3 IU, SC or IM and the dam should be monitored for progression of labor. If a fetus is not delivered after 30-45 minutes calcium gluconate may be administered slowly IV (0.5-1.5 mL/kg) while monitoring EKG. If no further progress is made the oxytocin dose can be repeated or may be increased to 5-20 IU, SC or IM. Oxytocin dosing may be repeated up to 3 times. If this fails to result in delivery of a fetus the patient should proceed to surgery for caesarean section. Only 1/3 of dogs with dystocia will respond to administration of oxytocin alone.

Nathan Peterson, DVM, DACVECC
CVC San Diego, 12:16

UTI and use of cranberry extract

Cranberry extract supplementation has been suggested for UTI prevention. Initially it was thought that this extract produced an inhospitable acidic urine environment. However, it has now been shown that the American cranberry contains a natural bioactive tannin (proanthocyanidin, PAC-A) which inhibits *E. coli* fimbriae adhesion to the uroepithelium. This activity results in reduced bacterial

numbers via bacterial elimination through urinary wash-out and reduced pathogenic colonization and infection. A similar activity has been shown against *Enterococcus faecalis*. Pharmaceutical cranberry extract with PAC-A is available in concentrated formulation in veterinary medicine. Recent *in vitro* and *in vivo* studies in dogs have demonstrated **efficacy and safety**.

Gary P. Oswald, DVM, DACVIM
ACVIM Forum, 06:17

IBD

Rule out small intestinal bacterial overgrowth (SIBO) or antibiotic-responsive enteropathy with an antibiotic trial. Oh, and it's no longer called SIBO. The more appropriate term is "intestinal dysbiosis." SIBO implies that the patient's intestine has too many organisms or an overgrowth of pathogenic organisms. But in patients with chronic enteropathy, they tend to have a change in the GI microbiome that is correlated with dysfunction. This author continues the diet trial and adds in 20-25 mg/kg of tylosin twice daily for 4-6 weeks, as well as probiotics and prebiotics. For clients who feed raw food or home-cooked food to their pets, a prebiotic such as fructooligosaccharide powder can be purchased from the health food store and should constitute 1% of the diet, which comes out to 1 g powder/100 g of food fed. This author uses metronidazole for patients with stress colitis or sepsis. It is preferred that patients receive tylosin over metronidazole for treatment of chronic enteropathy.

Craig Ruauux, BVSc, (Hons), PhD, MACVs, DACVIM
DVM Supp, 12:17

Treating ears at home

The use of the Auriflush (Intervet/ScheringPlough) can really enhance removal of exudates so that you can start with a clean ear. Prior to dispensing otic medications, it is essential to determine whether the owners will be able to treat the ears at home. If not, it is better to consider the use of BNT ointment or preferably ear wicks. BNT (Baytril, Nizoral, triamcinolone) is made by BCP Compounding Pharmacy in Houston, TX. This ointment is a repositol which is very good for yeast infections and mild bacterial infections, but it is imperative that the ear drum is intact. Ear wicks are great as they minimize owner contact with the ear. The wicks are placed into a cleaned and dried ear, then wetted with the solution of choice. They can be left in for 1-2 weeks, with wetting every 3-4 days. This author obtains ear wicks from Jorgenson Laboratories (www.JorVet.com).

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

Using dexamethasone

When using different steroids, clinicians must be careful to recognize the relative glucocorticoid potency of each drug. Dexamethasone has a longer duration of action than other steroids. When switching from injectable dexamethasone to an oral steroid, the oral steroid is usually **started 24 hours after dexamethasone has been discontinued**. Dexamethasone does not affect cortisol assays, so it can be administered to patients with suspected hypoadrenocorticism before an ACTH stimulation test or before blood is obtained for cortisol testing.

However, continued use of dexamethasone (or any other steroid) will suppress the hypothalamic-pituitary-adrenal axis, which in turn will suppress endogenous cortisol concentrations.

*Kiko E. Bracker, DVM, DACVECC
NAVC Clin Brf, Mar 2018*

Hip reduction

Closed reduction of recent hip luxations (<5 days) is often indicated if there is good coxofemoral conformation, there are no associated pelvic or coxofemoral fractures and the pet owner is aware that ~50% of the patients will experience a re-luxation of the hip in the convalescent period. Negative prognostic factors for maintaining closed hip reduction include chronicity, poor hip conformation, obesity, elderly, weak/poor muscle tone, and multi-limb dysfunction. General anesthesia is required for analgesia, immobilization, and muscular relaxation. The technique for closed reduction of dorsal hip luxation has been described elsewhere. Reduction is confirmed via the thumb pinch test, the triangle test and, ultimately, radiography. **Once reduced, it is important** to evacuate all blood clot, inverted joint capsule, etc. from the acetabulum by continual, deep, internal/external rotation of the hip while firm pressure is applied laterally to push the femoral head deep in the acetabulum. You've often worked >10 minutes to get the hip reduced, don't be afraid to spend an additional 5 minutes doing your best to help it stay reduced!

*Ross H. Palmer, DVM, MS, DACVS
N Amer Vet Conf, 01:16*

Gabapentin, pain management for geriatrics

Gabapentin can be very effective for managing neuro-pathic and maladaptive pain states, however, sedative side effects can be severe in older pets. The author prefers to start at a low dose of 3-5 mg/kg, PO, TID and slowly titrate upward every 7-10 days to no more than 10 mg/kg, PO, TID. The sedative side effects almost always wane after 7-10 days of administration, therefore, with this titration method, most dogs will tolerate the medication without sedation. Gabapentin is a tasteless powder and can easily be sprinkled on a favorite food to increase compliance in administration. Although the drug is not renal toxic, it is cleared by the kidneys, therefore dose reduction in patients with chronic renal insufficiency is advocated. Pregabalin is a similar drug that is more potent with fewer side effects and longer half-life as compared to gabapentin but is significantly more expensive. Preferred dose is 1-3 mg/kg, PO, BID. Remember to always use a multi-modal approach with pain medications. This will allow synergism with the other drugs and allow for lower and safer dosing.

*N Amer Vet Conf, 02:17
Leilani Alvarez, DVM, DACVSMR, CVA, CCRT*

Osteosarcoma, holistic approach

A more holistic alternative to chemotherapy has recently been investigated using a mushroom derivative called I'm Yunity. At a high dose of 100 mg/kg/day, PO,

I'm Yunity prolonged the average survival time of 5 dogs with splenic HSA to 199 days. Side effects were not observed but the medication at this dose for a large dog is expensive. Both metronomic chemotherapy and I'm Yunity are promising alternatives but the current studies have very low power with less than 10 dogs treated in each study.

*Kathryn Taylor, DVM, MS, DACVIM
SE Vet Conf, 06:16*

Dermal decontamination

When dealing with sticky substances (e.g. gum, glue traps, tar, etc.), the use of solvents should be avoided as solvents may cause dermal irritation or burns. Any remaining exposed sticky material should be covered with paper towels, baby powder or vegetable oil to avoid further entrapment of the animal with the agent. To remove sticky substances from mammals, trim the fur to remove as much of the substance as possible. Then work a small amount of vegetable oil, mineral oil, mayonnaise or peanut butter through the rest of the substance until it breaks down into "gummy balls." Afterwards, wash with liquid dishwashing detergent. For birds, do not trim the feathers, just utilize vegetable oil, mineral oil, mayonnaise, or peanut butter and then mist.

*Tina Wismer, DVM, DABVT, DABT, MS
22nd Int VECC Symp, 09:16*

Vaginal cytology

Vaginal cytology examinations should be performed 2-3 times per week until >80% of the vaginal epithelial cells show evidence of cornification. Vaginal cytologies are simple to perform, but use care to direct the swab dorsally first, and then horizontally, and also to fully insert the swab (~4-5 inches) until gentle resistance is met. Gently roll the swab onto a slide, use routine Diff-Quik staining, and evaluate the slide using the 10x or 20x objective. The goal is not to examine the slide in great detail, but rather to gain an overall impression of the percentage of cells with cornification (angular/folded edges, pyknotic or absent nuclei, etc.) and make a quick subjective assessment (e.g. ~50% of the cells show evidence of cornification). Inflammatory cells such as neutrophils should be rare during proestrus and estrus. Remember that cornification of vaginal epithelial cells is actually an indirect measurement of estrogen influence. Any dog (or cat) with predominantly cornified vaginal epithelial cells is under the influence of estrogen and has been for several days. (This is important for ruling out some of the hormonal challenges associated with spayed females such as ovarian remnant syndrome.) It is important to stress to owners that cornification of vaginal epithelial cells indicates that the female has progressed from proestrus into estrus but does NOT indicate that she is in her most fertile time window for breeding. (Ed. Note: next month, predicting ovulation and due date.)

*Robyn R. Wilborn, DVM, MS, DACT
Emerald Coast Vet Conf, 07:17*

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Rabies injection site alopecia

Focal cutaneous vasculitis has been described at the site of previous rabies vaccination. Yorkshire Terriers, Silky Terriers and Poodles appear to be predisposed. Lesions are typically located over the caudal or lateral thigh or between the shoulder blades at the site of previous rabies vaccine injections. Lesions can be roughly circular to irregular in shape with variable alopecia, hyperpigmentation and scaling. The lesions generally appear 3-6 months after the subcutaneous administration of rabies vaccine and can persist for months to years. Treatment of vaccine related alopecia/vasculitis is determined by the severity of the lesions. Dogs with solitary lesions at the site of vaccination can be treated with pentoxifylline, 10 mg/kg, q8h and Vitamin E, 400-800 IU, q12h. This treatment combination may take 2-3 months before improvement is noted. In cases of vaccine site lesions and distant lesion the above treatment can be used in addition to prednisone at doses of 2-4 mg/kg, q24h with tapering of the prednisone as improvement is noted. Cases that are resistant to prednisone therapy can be treated with dapsone (1 mg/kg, q8h) or sulfasalazine (20-40 mg/kg, q8h). The combination of tetracycline and niacinamide may also be effective. In some cases, therapy can be discontinued in 4-6 months. Other cases may require prolonged medical therapy. Surgical removal of solitary vaccine associated lesions is curative. Dogs with previous vaccine site lesions may develop additional lesions following subsequent administration of rabies vaccine. The risks of new lesions should be discussed with owners prior to subsequent rabies vaccine administration.

*Jenise C. Daigle, DVM, DACVS
SW Vet Symp, 10:16*

Treating Food allergy

Looking at GI symptoms can be very helpful, especially in the dog, and help point you in the direction of an adverse food reaction (AFR). If a non-seasonal pruritic dog has more than 3 bowel movements/day, a AFR should be suspected. Also, if the dog has fecal mucus, low fecal consistency score, excessive flatulence, and borborygmus, a AFR could be possible. Most reports suggest that an elimination diet trial last for 6-12 weeks. The author typically performs the elimination phase for 8 weeks. However, this can vary case by case and may depend on how many additional complicating factors are present (such as secondary infections, atopic flare, flea flare, etc.). *Week one*, the elimination diet starts. It is very important to stress to the owners/client, that nothing should enter their pet's mouth besides the new food, water, and any medications. The pet should not be allowed to lick the other pet food bowls or even the floor where human food has fallen. The pet should also not be allowed to eat things on walks. This is very important. By *week 2-4*, all concurrent GI signs should be resolved. If not, another elimination diet should be started. For example, if a dog has 4-5 bowel movements per day before starting the elimination diet, by week 4 (even week 2), the bowel movement number per day should be below 3. By *week 8*, the patient should

have a recheck exam and be reevaluated.

*Kaci Stetina, DVM, DACVD
4th Vet Derm Forum, 10:16*

Tips for dealing with blocked cats

When in doubt, leave the catheter in longer. Do whatever it takes to increase the cat's water (enteral fluid) intake during hospitalization. Reach for the 3.5-F catheter, not the 5-F catheter. **Use prazosin** for urethral spasms, **not phenoxybenzamine**. It has a high margin of safety and doesn't taste bad, and powder in capsules can be eyeballed, divided into two to four doses, and mixed in food 2-3 times a day. The dose is 0.25 mg for small cats, 0.5 mg for large cats, 2-3 times a day. Perform decompressive cystocentesis as soon as possible with a 25-ga needle. Having a hard time with the tomcat catheter? Try using a peripheral intravenous catheter.

*Julie Fischer, DVM, DACVIM
Vetted, Mar 2018*

Methicillin-resistance Staph

In specific cases there are additional therapies that can augment antiseptic shampoo/rinses. For owners that are unable or unwilling to bathe their dogs frequently, many of the same antiseptic ingredients such as chlorhexidine can be found in sprays, lotions, or mousse products designed to be applied and left on the skin. For fold pyoderma or localized dermatitis use wipes, pads, and ointments/gels. In addition to the common antiseptic-ingredient containing products, also consider using Nisin wipes (Preva Wipes: DVM Pharmaceutical). Nisin is an antimicrobial peptide that was developed and marketed for treatment and prevention of bovine mastitis. It is particularly effective against Staphylococcus, including methicillin-resistant strains. Nisin is not effective against Pseudomonas. Mupirocin ointment is an excellent choice for Staphylococcus and is recommended frequently for lip fold pyoderma or focal deep pyoderma, but has little action against gram-negative bacteria. Silver sulfadiazine is a favorite for Pseudomonas. Hyperosmolar honey or sugar therapy is highly effective in management of deep wounds, burns, or otherwise severely compromised skin with secondary bacterial contamination.

*John C. Angus, DVM, DACVD
Derm Forum, 10:16*

Seizures in cats, phenobarbital

Phenobarbital remains the drug of choice for treating seizures in cats. It is well tolerated, safe, and predictable. Dose: Starting dose is 2.5 mg/kg, PO, BID. Side Effects: Sedation, excessive thirst and urination, and incoordination occasionally occur. Facial pruritis, generalized pruritis with distal limb edema, thrombocytopenia, and leukopenia are also reported side effects of phenobarbital in cats. Hepatotoxicity is rarely reported in cats. Monitoring: The target serum concentration is 25-30 µg/mL, although lower levels may be necessary in some cats that become too sedate. Levels should be checked 2 weeks after starting, 2 weeks after any dosage change, and every 6 months.

*Andrew Isaacs, DVM, SACVIM
83rd AAHA Conf, 03:16*

Ototoxicity of topical otic preparations

There is frequently a discussion of the ototoxicity of agents put into ears. Remember that it is inner ear damage, specifically vestibular and/or cochlear damage that occurs with ototoxic agents, not middle ear damage. In order for a drug to cause damage to the inner ear it must either get to the inner ear hematogenously or by traveling thru the middle ear and entering the inner ear thru the vestibular (oval) or cochlear (round) window(s). In humans because ofloxacin otic solution (Floxin Otic) is the only topical agent to be labeled by the FDA for use when the tympanic membrane is perforated, oral antibiotics have traditionally been used in this situation. However, according to otolaryngologists because the risk of cochlear damage with the use of other topical medications seems quite small, perforation alone is not an indication for oral antibiotics. The opinion of this author is that the **concern for ototoxicity** due to topical medications is **overstated**. This position is supported by a consensus panel on reviewing the use of ototopical antibiotics. In their report they stated "There have been very few irrefutable cases of ototoxicity reported (after proper use of a topical otic preparation). Under many circumstances, it is difficult to separate the underlying disease process, which is also known to cause ototoxicity, from ototopical drug use." They go on to state "For more than 40 years, the most common treatment has been aminoglycoside combination drops. A longstanding debate over the safety of these drops centers on ototoxicity. Even though the theoretical risk exists, there have been few reported cases in the literature, considering the millions of doses given." Agents are chosen more for their effectiveness than the concern about ototoxicity, especially since there are very few agents that have been proven to be safe in cases of a ruptured TM. It is more important to get rid of the infection than to avoid (effective) drugs because of ototoxicity concerns. Also, just because the TM is intact doesn't mean that the barrier function is complete, therefore, even in the presence of an intact TM it is possible to get drugs into the middle/inner ear.

*Paul Bloom, DVM, DACVD, DABVP
CVC Kansas City, 08:17*

Heat pretreatment in heartworm testing

When test results conflict with clinical expectations, the added step of heat pretreatment (HPT) of the sample should be considered. Patient-side diagnostic tests rely on the presence of soluble heartworm antigen for the detection of heartworm infection. In cases where soluble antigen is bound to endogenous antibodies, forming an insoluble unit in the bloodstream known as an "immune complex," the antigen is essentially blocked from detection. This blocking has been linked to several factors: a) Inflammation, including the robust response to a recent heartworm infection. b) Administration of a heartworm preventive. c) The presence of circulating microfilariae. These factors can disrupt the antigen-to-antibody ratio, resulting in a negative antigen

test in an infected dog. Pretreatment denatures the proteins within the circulating immune complex so that antibodies precipitate and the antigen is freed, making it available for detection. It is not necessary to heat-treat every sample that tests negative, but if heartworm infection is suspected and the test result is negative, HPT can help ensure an appropriate diagnosis. Antigen testing of a heat-treated sample cannot distinguish between dead and living worms. If an infected dog has received adulticidal therapy but an HPT serum sample tests positive, it does not necessarily indicate that treatment failed. Whether HPT is used or not, veterinarians should test for both antigen and microfilariae 6 to 12 months after the last dose of adulticide. HPT is best performed by veterinary diagnostic laboratories. It can be performed at minimal cost in 1-3 days and may even be available as an add on to a previously submitted sample. If it is not feasible to have a lab conduct the HPT panel, practitioners can follow a simplified HPT protocol in-clinic, however, the sensitivity of this technique is unknown. **Step 1:** Dilute serum sample with an equal volume of 0.9% NaCl. Put diluted serum in a glass collection tube. **Step 2:** Place ~250 mL tap water in a 500 mL glass beaker. **Step 3:** Microwave beaker to the point of boiling (~2 minutes in a 1,000-Watt oven). **Step 4:** Remove heated water from microwave and place tube(s) with diluted sample in the heated water for 10 minutes. [Note: remove the rubber stopper before heating; some warping of the tube is expected.]. **Step 5:** Repeat antigen test.

*Brian A. Digangi, DVM, MS, DABVP
NAVC Clin Brf, 15:9*

Incomplete heartworm adulticide efficacy

Closing the gap in treatment so that all stages present are susceptible can help prevent persistent heartworm infection post-adulticide therapy. Melarsomine kills adults and mature L5 larvae that are at least 4 months post-infection. Macrolide preventives reliably kill L3 and L4 larvae that are present up to 2 months post-infection; thus, there is a 2-month gap when immature L5 larvae are not sensitive to either preventive or melarsomine and can later develop into adult heartworms. Allowing 2 to 3 months to lapse after preventive treatment before administering melarsomine can help close this gap and allow all stages present to be sensitive to melarsomine and prevent treatment failure. Melarsomine is not 100% effective, and not all worms are killed in every patient. The extended 3-dose treatment protocol has a higher efficacy than the 2-dose protocol. The American Heartworm Society **recommends the 3-dose protocol for all dogs treated for heartworms**, regardless of stage, because of its higher efficacy and lower risk for pulmonary complications. This may involve greater cost for the owner and a longer period of exercise restriction, but the potential benefit for the patient outweighs this added cost and inconvenience.

*Jennifer Anne Sidley, DVM, DACVIM
WSAVA Clin Brf, Apr 2018*
