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Heartworm resistance proved

Researchers have now identified preventive-resistant heartworm isolates from the Mississippi Delta region that develop in adult dogs receiving routine monthly heartworm preventives. Resistance has been demonstrated across the macrocyclic lactone product class. All currently approved products have failed to prevent heartworm development in dogs when tested in experimentally induced infection models with Mississippi River Valley isolates. These products include ivermectin, selamectin, milbemycin oxime and moxidectin. This means ***treatment of heartworm-positive dogs should be immediate and aggressive,*** as noted in the newly revised CAPC guidelines (for details, see www.capcvet.org). The "slow kill" therapy sometimes prescribed by veterinarians is never appropriate, as researchers have demonstrated that using this modality–repeated macrocyclic lactone administration over a period of time–increases the proportion of circulating microfilariae that possess resistance markers. Current products are still effective against many strains of heartworm and several control other parasites. Preventives are still the best protection we have, and consistently administering them is key to maintaining pet health.

Dwight Bowman, PhD and Susan Little, DVM, PhD
DVM News Mag, Sep 2013

INSIDE THIS ISSUE

Sublingual immunotherapy

In the author's clinical experience with atopic dogs, treated by many veterinary dermatologists in varying geographic areas of the USA since 2009, approximately 60% of dogs with AD that have not had prior immunotherapy attempts will have substantial improvement of their clinical signs with this formulation. The response rate for dogs that have had prior immunotherapy failure is also substantial -about 50% of dogs that are "shot failures" due to lack of efficacy, difficulty with administration, or anaphylactic reactions can be successfully treated with sublingual immunotherapy (SLIT). It's especially encouraging that dogs have been seen that completely failed "allergy shots" and often respond very well to SLIT. This is consistent with experimental evidence that shows that the mechanism of SLIT is somewhat different than that of injection immunotherapy. SLIT is not just a different route of administration to produce the same effect, it's actually in some ways a different treatment altogether.

D.J. DeBoer
2013 N Amer Vet Derm Forum Procd

Knotless suture material

The 4-0 absorbable glycomer 631 (V-Loc, www.covidien.com) is barbed in such a manner to dismiss knot tying. In this study, the intestinal closure site leaked at 53 mm Hg for the barbed suture, whereas leakage was noted at 34 and 28 mm Hg for the 3-0 and 4-0 suture tied with knots, respectively. All groups had leakage through a suture hole. Here, the barbed, knotless suture provided a ***better seal than traditional suture.*** The barbs did not appear to cause more damage to the intestinal wall during passage, and the barbs held the anastomotic line secure under pressure. Use of this suture in laparoscopic procedures holds promise.

Jonathan Miller, DVM, MS, Dip ACVS
NAVC Clin Brf, May 2013

Use of ketoconazole with cyclosporine

Even though this study demonstrated administration of ketoconazole (KTZ) at 5 mg/kg/day and cyclosporine (CsA) at 2.5 mg/kg/day may be as effective as CsA at 5 mg/kg/day alone, *this is off label use.* This author does not support this drug combination for several reasons. First, it is important to know whether a dog responds to CsA; starting a drug combination that *may* be as effective is not the same as knowing it *will* be effective. Second, many dogs can be transitioned to q48h dosing of CsA, decreasing dose and cost. Third, routine laboratory monitoring of serum biochemistry profiles is necessary in dogs receiving KTZ; concurrent use may be false economy. On a final note, atopic dermatitis management is complex and requires tending to many flare factors.

Karen A. Moriello, DVM, Dip ACVD
NAVC Clin Brf, Jun 2013

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Building communications skills

Communication skills are vital to building healthy veterinarian-client relationships, enhancing client satisfaction and compliance with recommendations, and improving patient medical outcomes. Fortunately, communication skills are eminently teachable. This fact is often overlooked as "communication" is frequently considered as a single, broad construct attributable to an innate quality or personality trait rather than as a defined skill set. In fact, specific communication skills can be learned and implemented with great success. Appropriate training programs and workshops, such as the frank™ Communication Series (www.frankworkshops.com) can improve the communication skills of all veterinary practice staff. Online tools, such as the Pet Wellness Report (www.petwellnessreport.com) can help to enhance communication between the veterinarian, clinic staff, and pet owner.

Clin Update, Jun 2013

Use of Vetsulin

One important change that occurred with the relaunch of Vetsulin is the manufacturer's recommendations regarding handling of the insulin. Vetsulin should be *shaken thoroughly* until a homogeneous, uniformly milky suspension is obtained. This is a markedly different way of handling insulin, so be sure to read the package insert for further handling instructions. This insulin is available only at a concentration of 40 IU/ml, so make sure you provide U-40 insulin syringes to owners. Reassess the dog's clinical signs and perform a serial blood glucose curve one week after starting therapy. While the manufacturer's package insert recommends once-a-day initial dosing, this author has not found this to be effective in most patients. It is suggested that an initial starting dose of 0.5 U/kg be given SQ, twice a day. With the return of this product to the market, it will be the ***author's preferred initial insulin*** for the initial management of diabetes in dogs.

David S. Bruyette, DVM, Dip ACVIM
Vet Med, Jul 2013

Adequan for osteoarthritis

Disease-modifying osteoarthritic agents are products that are not FDA-approved medications or are not known to have a primary analgesic mechanism of action, or both, but which seem to have a positive influence on patients with osteoarthritis. The polysulfated glycosaminoglycans exert their action by inhibiting collagenase and promoting the formation of fibrocartilage, which should have the dual effect of improving the clinical status of the patient as well as slowing the course of osteoarthritis. While not entirely a settled matter in humans, evidence is beginning to accumulate that the combination of glucosamine and chondroitin (not either one used alone) exerts a positive structure-modifying effect on the cartilage, thus interfering with the progression of OA. The only FDA-approved drug in this category is Adequan, which in the author's hands has a more rapidly demonstrable and reproducible effect than oral supplements. Adequan may be administered (off-label) via a subcutaneous route with similar bio-availability as the IM route (established at least in cats), allowing it to be dispensed for the owner to give at home. This decreases considerably the cost and inconvenience to the owner, which in turn adds greatly to compliance. The author also uses it regularly (off-label, currently) in cats.

Mark E. Epstein, DVM, Dip ABVP
CVC Wash DC Conf Procd, 04:12

Rifampin for meth resistant Staph

Rifampin is an old antibiotic that has seen recent interest because of its activity against methicillin-resistant *Staphylococcus.* Equine practitioners have been familiar with rifampin for many years because of its use for treating infections caused by *Rhodococcus equi.* Now, small animal veterinarians are being introduced to this antibiotic because of its activity against methicillin-resistant *Staphylococcus.* Rifampin is a bactericidal antibiotic that acts by inhibiting bacterial RNA polymerase. It is highly lipophilic, with a high volume of distribution and good absorption in practically all animal species studied. Rifampin is active against most strains of methicillin-resistant *Staphylococcus pseudintermedius,* (although resistance among canine isolates has been identified. Rifampin has been effective for treatment of canine pyoderma caused by *Staphylococcus pseudintermedius* at a dose of 5 mg/kg, once daily for 10 days. Another study had success with 5-11 mg/kg twice daily. A dose of 10 mg/kg per day, usually split into two doses, 12 hours apart has been recommended, although some veterinary formularies have recommend a much higher dose. Adverse effects, which are associated with high doses, include liver injury and GI disturbance. In dogs, hepatotoxicosis is the most common adverse reaction and 20%-25% of dogs receiving 5-10 mg/kg develop increases in liver enzymes and some develop hepatitis. To avoid adverse effects, it is recommended not to exceed a dose of 10 mg/kg per day. Rifampin has an unpalatable taste. It also may produce a discoloration (orange-red color) to the urine, tears, and sclera. Owners should be warned of this possibility.

Mark G. Papich, DVM, MS, Dip ACVCP
2013 N Amer Vet Derm Forum Procd

Spironolactone for CHF

While potassium-sparing diuretics were once solely allocated to the late stages of heart failure or to patients with hypokalemia, they have recently come to the forefront in the battle against neurohormonally mediated progression of cardiac disease. Aldosterone promotes the production of Na+/K+ exchangers along the luminal surface of the distal tubule and collecting

ducts and it is now recognized to contribute to myocardial fibrosis, augmentation of sympathetic tone and possibly diuretic resistance. It has been postulated that the aldosterone antagonist (and potassium-sparing diuretic) spironolactone has the ability to inhibit myocardial fibrosis and ***promote mortality benefits.*** Spironolactone is well absorbed from the GI tract but it has a relatively slow onset of action, peaking at 2-3 days after administration. It undergoes rapid hepatic metabolism to pharmacologically active canrenone. Spironolactone is administered to dogs at a dose of 1-2 mg/kg, orally, every 12 hours, in conjunction with an ACE inhibitor and loop diuretic, to combat congestive heart failure.

Barret J. Bulmer, DVM, MS, Dip ACVIM
112th Penn Vet Conf Procd, 03:12

Using cardiac biomarkers in the cat

Cats with respiratory distress should be stabilized on the basis of information obtained through history taking, physical examination, and any other diagnostic testing that can be performed safely (e.g., ECG, radiography, thoracocentesis, echocardiography, and NT-proBNP assay). Plasma NT-proBNP concentrations >270 pmol/L in cats with respiratory signs support congestive heart failure as the probable cause of the observed clinical signs with approximately 93% sensitivity and 87% specificity. Results at or near the cutoff values should be interpreted cautiously. Whenever possible, echocardiography should be performed to confirm the presence and identify the type of underlying heart disease. Pursuit of noncardiac causes of respiratory signs should be considered when the NT-proBNP concentration is <270 pmol/L.

Mark A. Oyama, DVM, Dip ACVIM et al.
JAVMA, Jul 1, 2013

New recommended fluid rates

Conventional intraoperative fluid administration for most is "recipe based" (ml/kg/hr) and administered at rates that cannot be justified either physiologically or medically. Recent evidence generated by studies conducted in humans and experimental animals suggest that a more "restrictive," rather than "liberal," approach for fluid administration should be practiced. Conventional rates for fluid administration (10-15ml/kg/hr) during surgery are not justifiable and become excessive the longer they are administered. Fluid selection and administration should be procedure specific. Insensible losses, and fluid requirements associated with surgically induced trauma (tissue handling) suggest fluid administration rates during operation closer to 2-3 ml/kg/hr (<5 ml/kg/hr), rather than the current conventional rates of 10-15 ml/kg/hr. Blood loss should be treated in a 1:1 ratio with blood or a colloid. The administration of a crystalloid to correct anesthesia-associated hypotension is temporary at best and often ineffective.

Bill Muir III, DVM, PhD, Dip ACVA
Vet Pract News, 24:9

Heartworm and *Wolbachia*

Wolbachia are intracellular bacteria that infect numerous species of filarial worms including heartworms. Many contend that these friendly inhabitants play a role in the pathogenesis of diseases caused by heartworms and other filarids. Contention is that host immune responses directed at *Wolbachia* can actually go awry and enhance the disease process in heartworm infections. Some also contend that elimination of *Wolbachia* spp. from heartworms may affect the survival of adult heartworms and microfilariae, the ability of microfilariae to infect and develop within mosquito vectors, and may decrease the host's errant immunologic responses when adult worms are killed or die. The life cycle of these bacteria involves several different stages. Susceptibilities of the different stages to anti-infective agents may vary. Certain of the stages may be refractory to treatment because of their ability to enter quiescent or resting states. At present, there appears to be evidence that pretreatment of heartworm infected dogs with doxycycline at the rate of 20 mg/kg, per day (10 mg/kg, BID, if necessary) for one month prior to administration of melarsomine dihydrochloride may decrease the severity post-treatment thromboembolic and immunopathologic events. Data also suggest that administration of doxycycline (together with a microfilaricide) also can aid in the elimination of microfilariae from heartworm infected dogs and can render microfilariae noninfectious to mosquitoes.

Dr. Byron L. Blagburn
2013 N Amer Vet Derm Forum Procd

Choosing antibiotics in otitis

The dose of the systemic antimicrobial agent is important since under-dosing promotes the emergence of resistant bacteria. Furthermore, it is important to choose an antibiotic to which the bacteria are susceptible. If the bacteria are intermediate or resistant to a particular antimicrobial agent, another one to which the bacteria are susceptible should be chosen since the predictive value of susceptibility tests for a drug to fail is better than their predictive value for success. On the other hand, ***topically administered antimicrobial agents*** may achieve 100 to 1000 times higher concentrations in the ear than if the drug were administered systemically, therefore they may be effective in treating the infection, even if the results of the bacterial C/S testing indicate resistance.

Lynette K. Cole, DVM, MS, Dip ACVD
West Vet Conf Procd, 02:11

Neutered animals live longer

Banfield Pet Hospital's State of Pet Health 2013 Report has revealed a correlation between spaying and neutering of pet dogs and cats and the pets' life span.

Pets are living longer, according to the report. The mean life span of a cat in 2012 was 12 years, an increase of 10% since 2002. The mean life span of a dog in 2012 was 11 years, a 4% increase since 2002. Neutered male cats live a mean of 62% longer than unneutered male cats, and spayed female cats live a mean of 39% longer than unspayed female cats, the report said. Neutered male dogs live a mean of 18% longer than unneutered male dogs, and spayed female dogs live a mean of 23% longer than unspayed female dogs. In another report, researchers with the University of Georgia looked at a sample of more than 40,000 dogs that died in veterinary teaching hospitals from 1984-2004. The mean age at death for sexually intact dogs was 7.9 years, versus 9.4 years for sterilized dogs.

JAVMA, Jul 1, 2013

Lepto vaccine to small dogs

As a recommendation: when administering Leptospirosis vaccine to a small breed dogs (i.e. those dogs whose body weight will be less than 20 lbs as their adult weight)— generally should not receive multiple doses of vaccine at the same appointment in order to reduce the risk of an acute adverse vaccine reaction. Veterinarians should consider delaying the initial doses of Leptospirosis until the small breed patient has completed the CORE vaccination series. Wait at least 2-4 weeks past the date of the last CORE vaccination.

Richard B. Ford, DVM, MMS, Dip ACVIM
PVMA Winter Sem Procd, 02:11

Quality of life scale

When the time is right, euthanasia would assure a peaceful and painless passage. When is the right time? No doubt "when" was always about the patient's quality of life (QoL). When a cancer patient's QoL declined to a low point, our families generally agreed that the gift of euthanasia was the best option for their beloved pets. How do we determine when? This author uses the Quality of Life Scale (www.pawspice.com). The program was named "Pawspice because patients are euthanized when it is appropriate. Pawspice now starts at the time of diagnosis of a life-limiting disease. It embraces palliative medicine and includes kinder, gentler standard care and transitions into hospice (comfort care), when the pet nears the very end of life.

Alice Villalobos, DVM, DPNAP
Vet Pract News, Jul 2013

The food trial

Once the diet trial is accepted by the client, the next step is to decide how long to feed. The author's feeling is that if a cat or dog truly has a food allergy, we should see signs of improvement within 6-8 weeks. There may not be complete resolution of the signs but the response should be significant enough for the client to observe. If there is no improvement in that time, the author believes that food allergy is much less likely, although we can't rule out the possibility that we chose the wrong diet! At this point, though, it makes sense to move on to other causes of pruritus. The author's strategy is to start the diet and medicate with steroids to reduce itch for the first 4-6 weeks of the diet, then stop the steroids. If the patient relapses, then food allergy seems less likely.

Valerie A. Fadok, DVM, PhD, Dip ACVD
San Diego Co VMA Conf Procd, 09:12

Split dose treatment of heartworm

Melarsomine, which is administered twice at 2.5 mg/kg, q24h, has a mean retention time 5 times longer than thiacetarsemide and its metabolites are free in the plasma, on which HW feed. With 2 doses, the efficacy is over 90% (FDA pivotal study) with the useful flexibility of a 50% worm kill with one dose. This then allows "split-dose" protocol to be utilized in severely afflicted individuals or in those in which pulmonary thromboembolism (PTE) is a concern. This method results in destruction of only one-half the worms initially (one IM injection of 2.5 mg/kg), thereby lessening the chance for embolic complications. This single dosage is followed by a 2 dose regimen in 1-3 months, if clinical conditions permit. While the manufacturer recommends this protocol for severely affected dogs, this author employs it in **all cases** unless there is financial constraint or underlying concern for arsenical toxicity (for example, preexistent severe renal or hepatic disease). One disadvantage to the "split-dose" method, in addition to the expense, is the need for 2 months' exercise restriction.

Clarke Atkins, DVM, Dip ACVIM
WV VMA Conf Procd, Apr 2013

Tramadol as a lone analgesic

Tramadol is commonly used as an oral analgesic in dogs, but there is limited published evidence supporting its use as a perioperative analgesic. Now, results of this study suggest that tramadol may not provide sufficient analgesic efficacy in dogs undergoing orthopedic surgery. In the study, 30 dogs undergoing tibial plateau leveling osteotomy for treatment of unilateral cranial cruciate ligament disease were randomly assigned to treatment with tramadol, firocoxib, or a combination of tramadol and firocoxib. Dogs that received firocoxib orally, alone or in combination with tramadol, had lower pain scores than did dogs that received only tramadol.

Diana Davila DVM et al.
JAVMA, Jul 15, 2013