

## Capsules

### *The Current Literature in Brief*



### **Muscle Loss, Debilitating Disease, & Growing Old**

Cachexia (loss of lean body mass [LBM] in the face of chronic debilitating disease) and sarcopenia (loss of LBM in a normal aging patient without concurrent illness) are associated with high mortality and morbidity in humans, and veterinary studies are beginning to document similar trends. In certain disease states, alterations in various mediators (eg, insulin) decrease the body's ability to make metabolic adaptations required to switch to fat utilization, causing muscle and LBM to be catabolized.

This retrospective study in dogs with chronic kidney disease showed that dogs classified as underweight had significantly shorter survival time as compared with both moderate and overweight dogs. This finding suggests that, as with humans, renal cachexia may affect survival time.

In humans, sarcopenia usually begins with muscle loss around the age of 30 and progresses throughout life. To date, sarcopenia has been documented in veterinary medicine but differences in pathophysiologic mechanisms have not been found between healthy young and healthy geriatric dogs. It is unclear how sarcopenia affects prognosis. As cachexia and sarcopenia are further studied, dietary and exercise recommendations may evolve to minimize the signs associated with them.

#### **Commentary**

In humans, cachexia is associated with poor appetite, fatigue, muscle atrophy, and weakness. Veterinarians may be overlooking the importance of these signs in hospice or palliative care patients, and often such measures as formulating dietary plans to increase the patient's metabolic rate and encouraging supplementation with essential fatty acids need to be addressed. Exercise also is important in delaying the breakdown of muscle, although walking may be difficult for some of these patients. By understanding these conditions, however, practitioners can provide better care to affected patients.—*Heather Troyer, DVM, DABVP, CVA*

#### **Source**

Cachexia and sarcopenia: Emerging syndromes of importance in dogs and cats. Freeman LM. *J VET INTERN MED* 26:3-17, 2012.

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## Bartonellosis in Dogs: Identifying the Source

*Bartonella vinsonii* subsp *berkhoffii* was first isolated from a dog with endocarditis in 1993 and has since been isolated from wild canines and humans. It potentially can cause cardiac arrhythmias, myocarditis, granulomatous lymphadenitis, uveitis, choroiditis, meningitis, panniculitis, polyarthrititis, radiculitis, bacillary angiomatosis, and sialometaplasia in dogs. The predominant cells that remain infected in persistently infected hosts are unknown. In this study, the invasion of canine erythrocytes by *B vinsonii* subsp *berkhoffii* was demonstrated and the results suggested that canine erythrocytes may play a role in the maintenance of bacteremia in an infected host.

### Commentary

Bartonellosis is now recognized as a potential emerging infectious disease in dogs; however, the natural behavior of the organism remains unclear. This study identified canine erythrocytes as a potential mechanism for invasion of and persistence within host cells of infected dogs. The ACVIM published a consensus statement on screening canine and feline blood donors for infectious disease in 2005.<sup>1</sup> Testing for *Bartonella* spp was only conditionally recommended because the mechanism of transmission remained unknown. If future studies verify that *Bartonella* organisms are present in canine erythrocytes in vivo and can be transmitted through blood transfusion, then screening for *Bartonella* in blood donors may be recommended.—Jennifer Ginn, DVM,MS, DACVIM

### Source

Invasion of canine erythrocytes by *Bartonella vinsonii* subsp. *berkhoffii*. Billeter SA, Breitschwerdt EB, Levy MG. **VET MICROBIOL** 156:213-216, 2012.

<sup>1</sup>Canine and feline blood donor screening for infectious disease. Wardrop KJ, Reine N, Birkenheuer A, et al. *J Vet Intern Med* 19:135-142, 2005.

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## PCR Testing & *Leptospira* Infection in Vaccinated Dogs

Although the microscopic agglutination test (MAT) is the most common test used to diagnose acute leptospirosis, it is poorly sensitive early in the disease process because serum antibodies are not present and can have poor specificity due to inability to differentiate antibodies induced by vaccine versus infection.

This prospective study evaluated real-time PCR results in 20 healthy dogs recently vaccinated for *Leptospira*. Real-time PCR is a promising modality with good sensitivity and specificity in detecting *Leptospira* DNA in blood and urine. Study dogs were divided into 2 vaccine groups, with each group receiving 1 of 2 commercial 4-serovar *Leptospira* vaccines. Blood was drawn for real-time PCR and MAT titers on days 0 (prevaccination), 3, 4, 7, 14, 21, 28, 35, 42, 49, and 56. Results showed that real-time PCR was negative for *Leptospira* DNA in all dogs at all time points. By contrast, 18 dogs mounted a positive MAT response to multiple *Leptospira* serovars by day 7. The authors concluded that real-time PCR testing for *Leptospira* DNA is not affected by recent vaccination for canine leptospirosis. Further study is warranted to determine how this test would perform in dogs naturally infected with leptospirosis and whether concurrent antibiotic treatment may yield false-negative results.

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### Commentary

The influence of leptospirosis vaccination on diagnostic tests is a pragmatic concern. Although killed vaccines do not replicate, killed viral vaccines can potentially cause positive PCR test results, thereby prompting investigation of whether commercial 4-serovar *Leptospira* bacterin would induce a positive real-time PCR reaction in whole blood of vaccinated dogs. This small study provides reasonable assurance that positive real-time PCR tests for leptospirosis indicate infection (not vaccination) in dogs. False-negative PCR tests, however, may occur in infected dogs with very low quantities of circulating bacterial DNA.—George E. Moore, DVM, PhD, DACVPM, DACVIM

### Source

Effects of recent *Leptospira* vaccination on whole blood realtime PCR testing in healthy client-owned dogs. Midence JN, Leutenegger CM, Chandler AM, Goldstein RE. *J VET INTERN MED* 26:149-152, 2012.

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## Water Loss & Canine Atopic Dermatitis

Canine atopic dermatitis is a common skin disease characterized by pruritus. One of the most recent advances in understanding this disease has been recognition of the importance of the barrier function of the skin. The current theory is that impaired barrier function may lead to increased allergen penetration and subsequent disease. In humans, a common method of assessing barrier function is measurement of transepidermal water loss (TEWL) or the volume of water that passes from inside the body to the outside through epidermal layers. Although this method was developed for humans, it has been adapted for use in dogs.

In this study, TEWL was compared in normal dogs ( $n = 50$ ), atopic dogs before treatment ( $n = 50$ ), and atopic dogs in clinical remission ( $n = 50$ ). In normal dogs, TEWL was 8.81 g/m<sup>2</sup> h. In untreated atopic dogs, the TEWL was 22.47 g/m<sup>2</sup> h compared with 12.57 g/m<sup>2</sup> h in atopic dogs in remission. Atopic dogs had a significantly higher level of TEWL than normal dogs did; however, TEWL was lower in atopic dogs whose clinical signs were in remission.

### Commentary

These studies on TEWL are documenting a primary skin barrier defect. Electron microscopy has shown that even the skin of clinically normal atopic dogs has abnormalities in lamellar body secretion and extracellular lamellar lipids when compared with normal skin. In addition, as skin lesions worsen, these changes (eg, widening of intercellular spaces, release of lamellar bodies and abnormal lipid) worsen.<sup>1</sup> In this study, the authors were able to document that treatment helps normalize the abnormality (TEWL). We do not know all of the mechanisms involved, but dry skin, as measured via TEWL, is likely a major component. This study helps make the case for treatment (immunotherapy or cyclosporine), including medication and frequent bathing.—Karen A. Moriello, DVM, DACVD

### Source

Transepidermal water loss in healthy and atopic dogs, treated and untreated: A comparative preliminary study. Corneigliani L, Vercelli A, Sala E, Marsella R. *VET DERMATOL* 23:41-e10, 2012.

<sup>1</sup>Unraveling the skin barrier: A new paradigm for atopic dermatitis and house dust mites. Marsella R, Samuelson D. *Vet Dermatol* 20:533-540, 2009.

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## Managing Cardiac Foreign Bodies: Answers in Human Literature?

While there are reports of nonprojectile cardiac and intracardiac foreign bodies in the veterinary literature, there is no standard for managing projectile metallic cardiac foreign bodies. The most consistent recommendation in human literature is to remove them; accurate localization of the foreign body is essential, yet no single imaging technique has been consistently accurate in doing so.

A 5-month-old Brittany spaniel originally presented for a puncture wound at the point of the shoulder. Radiographs showed a metallic projectile foreign body overlaying the cardiac silhouette. Heart and lung sounds were normal and the dog was treated with a 7-day course of amoxicillin. At 3.5 years of age, the dog presented with a 10-day history of decreased activity and appetite. Muffled heart sounds and irregular heart rhythm with weak and intermittently dropped pulses were noted. Pericardial effusion was detected by echo-cardiography and ascites identified by abdominal ultrasound. Radiographs indicated that the foreign body appeared to have moved. A pericardiectomy was performed, but the foreign body was not recovered; 6 months later, the dog remained asymptomatic. In a similar case, a dog developed secondary pericarditis 3 years after being shot with a shotgun. These cases suggest that, as in humans, nonsurgical management of pericardial projectile metallic foreign bodies may lead to complications that can be acute, severe, and at prolonged intervals from the original injury.

### Commentary

This report highlights several issues, including the lack of information on managing foreign bodies available in veterinary literature. Given that paucity of information, the authors provided a comprehensive review of the human guidelines for managing intracardiac foreign bodies and the reasonable strategy of using human medicine for guidance on a case-by-case basis. Because no single imaging modality has consistently or accurately located these foreign bodies, however, diagnostic workup will likely involve multimodal imaging techniques.—*Sarah Gray, DVM, DACVECC*

### Source

Diagnostic challenges and treatment options of a suspected pericardial metallic projectile foreign body in a dog. Elliott JM, Mayhew PD. *JVECC* 21:684-691, 2011.