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rDVM QUARTERLY

VETERINARY COMMUNITY NEWS FROM AMC SUMMER 2018

To Our Valued Partners In Care,

Each summer we bid farewell to our graduating interns and residents and welcome our new veterinarians who will enter our postgraduate education programs this summer. For the first time, we will welcome three additional interns for a total of 25 of the brightest young minds entering the veterinary field. We are so excited to watch their careers grow.

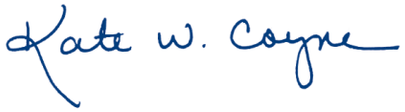
As you know, AMC has been undergoing construction to improve the client and patient experience on the second floor. We are making excellent progress and expect to have a beautiful new facility this fall. Please feel free to stop by later this year to see it for yourself.

Our Usdan Institute for Animal Health Education has been educating hundreds of pet owners and animal lovers since its inception. Our most recent events include a pet health insurance fair as well as lectures on various topics, such as choosing the right pet for your family and pet behavior. All of our Usdan Institute events are free and open to the public, so please share this information with anyone interested in keeping their pets healthy and happy. Learn more at amcny.org/usdanevents.

I would like to congratulate Dr. Phil Fox on the publication of a landmark research study that identifies how hypertrophic cardiomyopathy in cats is linked to serious health problems. Termed “The REVEAL Study,” this collaborative, international long-term investigation involved 50 veterinary centers in 21 countries in an effort to learn how this disease impacts the health of cats over more than a decade. You will learn more about this study in this issue.

Thank you for your continued trust in AMC. If there is anything you would like to share with us to make our partnership stronger, please let me know. Our relationship with our referring veterinarians is of the utmost importance and we appreciate your support.

Sincerely,



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Utility of Venous Blood Lactate Concentration Measurement in Outcome Prediction

The discovery of a marker that can both aid in prognostication and guide continued resuscitation efforts for the sickest patients can prove invaluable to the veterinary clinician. While various such parameters have been explored, venous blood lactate concentration stands out amongst the rest given its robust ability to predict outcome in heterogeneous patient populations coupled with its ease of use. An elevated venous blood lactate suggests global tissue hypoperfusion as its production is upregulated during conditions in which anaerobic metabolism predominates, such as shock. Therefore, normalization of venous blood lactate in shock patients has traditionally been accepted as an indication of the success of resuscitation efforts in restoring adequate tissue perfusion and reversing the effects of hypoxia.

Numerous studies in critically ill humans evaluating serial blood lactate concentration measurement have demonstrated that persistent hyperlactatemia, represented by either a prolonged time to normalize lactate or lower lactate clearance, predicts in-hospital mortality. Utilization of admission lactate to assess human shock patients is more controversial and possibly less reliable for predicting outcome than is serial evaluation of this parameter, although a linear increase in mortality has been reported in association with increasing initial lactate concentrations by some investigators. Importantly, the superiority of blood lactate concentration over traditional perfusion parameters (i.e. heart rate and systolic blood pressure) in outcome prediction has been well established in critically ill humans, largely because heart rate and systolic blood pressure may normalize despite ongoing shock (i.e. compensated shock states).

While the utility of lactate variables in portending outcome in critically ill humans has been well documented, veterinary literature relating these parameters to outcome is more limited. Several investigators at the Animal Medical Center, therefore, undertook a study aimed to determine whether admission lactate concentration or serial lactate measurements could predict outcome in dogs diagnosed with non-cardiogenic forms of shock. Dogs presenting to the Animal Medical Center Emergency Room with an admission venous blood lactate concentration > 2 mmol/L and physical examination findings and hemodynamic parameters consistent with shock were enrolled in the study. A cage-side venous blood analyzer was used to obtain lactate measurments. Serial venous blood samples were analyzed to determine lactime, defined as the time in hours venous lactate was > 2.0 mmol/L, as well as lactate clearance using the formula: $[lactate_{initial} - lactate_{delayed}]/ lactate_{initial} \times 100$. Primary outcome was defined as survival to hospital discharge.

EMERGENCY AND CRITICAL CARE

All 23 study dogs were diagnosed as having hypovolemic, hemorrhagic, distributive, or septic shock, and overall survival to discharge was 61%. Mean admission venous blood lactate concentration for all study participants was 7.0 mmol/L; mean admission lactate did not differ between survivors (6.3 mmol/L) and non-survivors (8.1 mmol/L; $P = 0.2$). Mean lactime for all dogs was 10.3 hours and was shorter in survivors (6.6 hours) compared to non-survivors (16 hours; $P = 0.02$) (Figure 1). A greater mean lactate clearance was recorded in survivors compared to non-survivors at hours 1 (44.3 % vs. 10.3 %; $P = 0.04$), 10 (72.5 % vs. 45.3 %; $P = 0.01$), 16 (77.6 % vs. 50.3 %; $P = 0.006$), 24 (83.8 % vs. 56.0 %; $P = 0.004$), and 36 (86.3 % vs. 65.0 %; $P = 0.02$) (Figure 2). Final mean lactate clearance was greater in survivors (83.7 %) compared to non-survivors (52.5 %; $P < 0.001$) (Figure 2).

In agreement with data reported from human studies, the present study demonstrated that in small animal shock patients sustained hyperlactatemia, represented by either a longer lactime or lower degree of lactate clearance, is associated with in-hospital mortality. Given the lack of difference in admission blood lactate concentration between survivors and non-survivors, along with the substantial overlap in this value between the two groups, the findings support the superiority of serial lactate evaluation over single-time point admission lactate measurement in differentiating hospital survivors from non-survivors.

The findings of the Animal Medical Center investigators suggest that serial measurement of venous blood lactate represents a tool by which veterinary clinicians can monitor the success of therapeutic interventions being administered to their shock patients. A persistently elevated venous blood lactate likely suggests ongoing tissue hypoxia and should prompt the clinician to continue with resuscitative therapies. Furthermore, serial lactate assessment may also provide additional prognostic information that can be useful in client decision making. That being said, the investigators advise caution with utilizing single lactate measurements in outcome prediction as well as with extrapolating study results to individual patients.

The availability of handheld lactate monitors, along with lack of evidence suggesting the superiority of arterial over venous blood samples for obtaining accurate lactate values, highlights the accessibility of this diagnostic tool for the general practitioner. Venous lactate measurement represents a convenient, non-invasive means by which the veterinary clinician can greatly enhance the treatment of their sickest patients. Given the paucity of information regarding the utility of serial lactate assessment in critically ill dogs and cats, clinicians can expect to see future studies evaluating a larger population of critically ill small animals to allow for subgroup analysis to determine if lactate parameters demonstrate enhanced prognostic ability in one particular shock class or disease process.

FIGURE 1: Comparison of lactime (hours) between surviving and non-surviving dogs in shock. In each boxplot the box represents the interquartile range, and the lines extending vertically represent the range of values. The line and open circle within each box represent the median and mean lactime, respectively. For survivors, the lower boundary of the box represents both the median and lower quartile for lactime as these values were identical. Significance was set at a *P* value < 0.05.

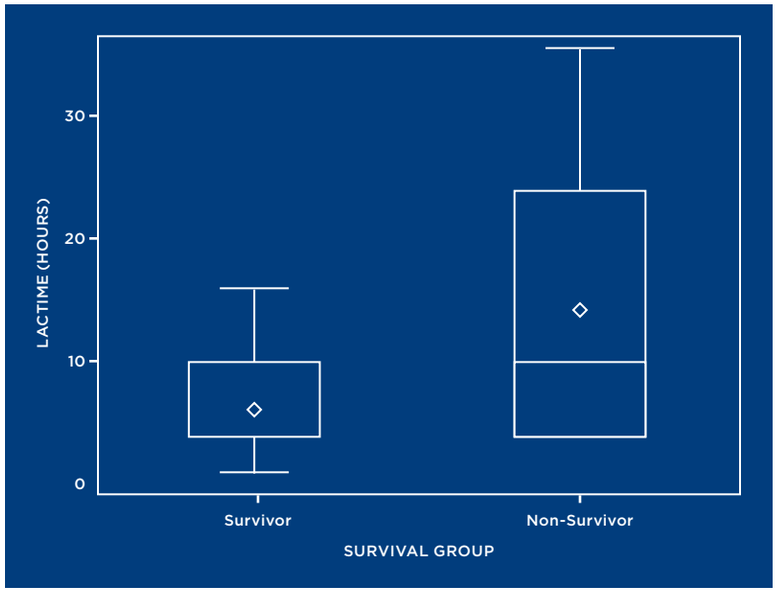
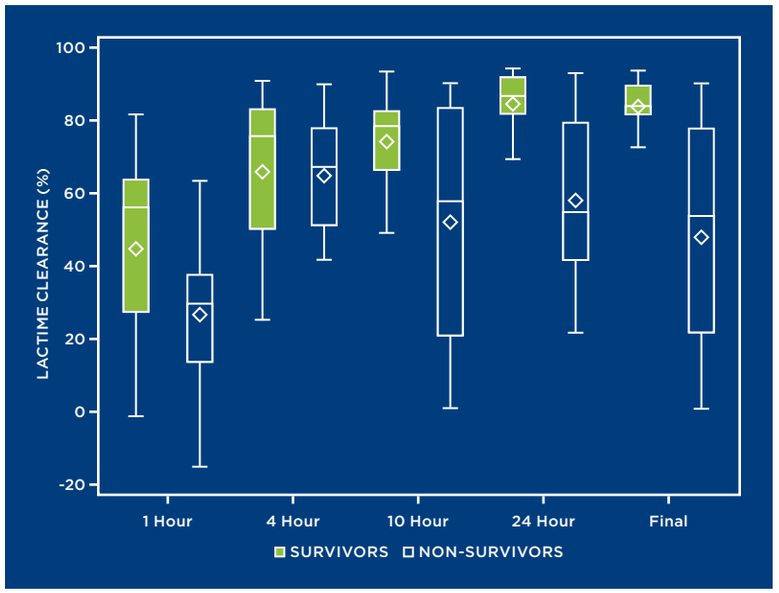


FIGURE 2: Comparison of lactate clearance (%) between surviving and non-surviving dogs in shock during the first 24 hours of hospitalization and immediately prior to death or hospital discharge (final lactate clearance). In each boxplot the box represents the interquartile range, and the lines extending vertically represent the range of values. The line and open circle within each box represent the median and mean lactate clearance, respectively. Significance was set at a *P* value < 0.05.



Gross Pathology: What's Your Morphologic Diagnosis?

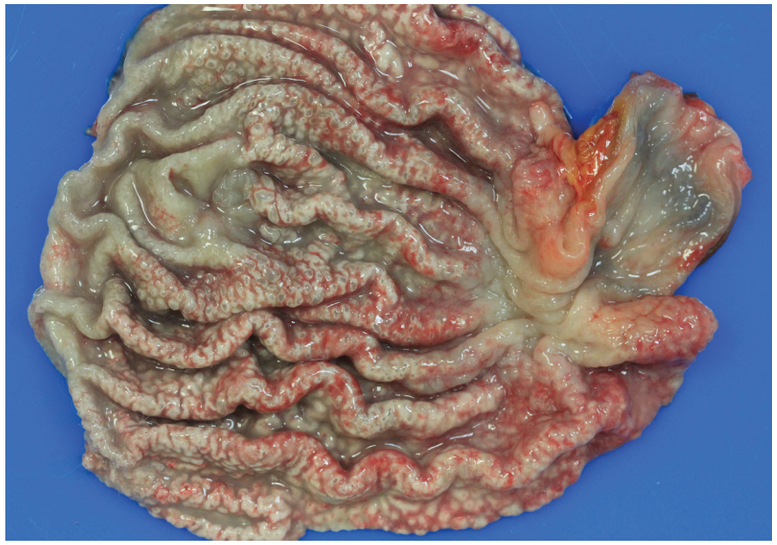
Signalment: 11 year old, male neutered domestic shorthair cat.

History: Adopted as a kitten, with suspected feline herpes at that time. At two years of age, routine bloodwork showed azotemia, and an ultrasound showed abnormal kidneys, thus renal dysplasia was suspected. The patient showed recent, intermittent increases in creatinine and continued weight loss despite syringe-feeding normal caloric amounts. Renal values included an SDMA of 63, a BUN of 104 and a creatinine of 7. Given the poor prognosis and reduced quality of life, euthanasia was elected.

Necropsy Findings: The stomach mucosa is severely thickened by firm to hard, white, multifocal to coalescing material. The kidneys are bilaterally severely atrophied, and the cortices are bilaterally irregular. The right kidney measures 3 × 2.3 × 2.2 cm and the left measures 2.8 × 2.5 × 2.1 cm. The left kidney has a large 5 mm diameter cyst within the cortex. Bilaterally, the renal medullae are firm to hard and pale. There is mild dilation of the right renal pelvis up to 2 mm. The ureters, urinary bladder and urethra are grossly within normal limits.

Multiple vessels throughout the body are firm to hard including the carotid arteries, mesenteric artery, aorta, brachiocephalic trunk and left subclavian arteries. The heart weighs 22.4 g (7.3 g/kg) and is moderately enlarged, with moderate dilation of the left atrium and auricle. The parathyroid glands are bilaterally markedly enlarged.

Please formulate differential diagnoses for the stomach based upon the history, clinical findings and images before turning the page.



Gross image of the stomach

Taryn Donovan
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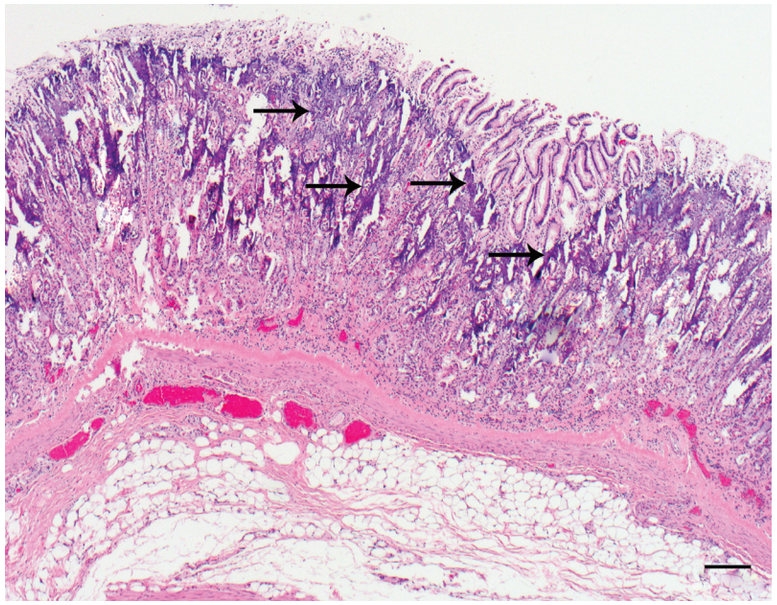
Gross diagnosis:

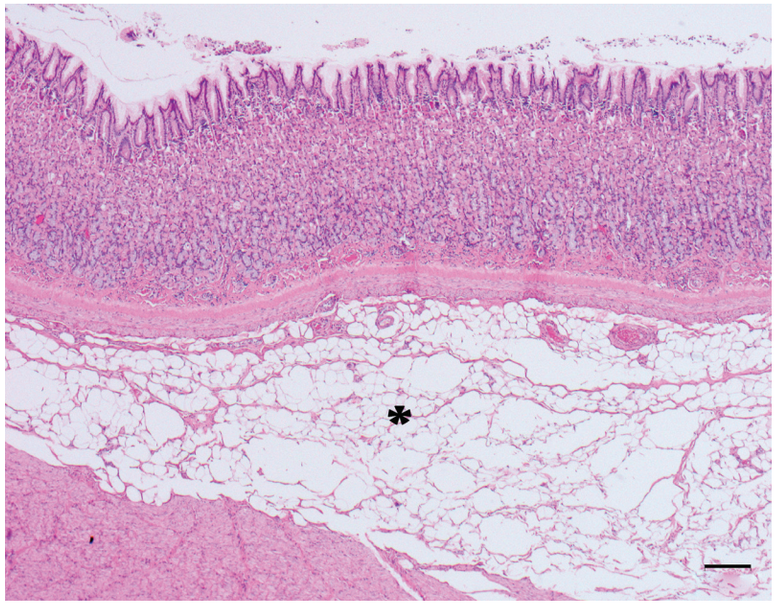
Stomach: Mineralization, mucosal, diffuse, severe

Histologic Diagnoses:

Stomach: Mineralization, multifocal, severe (metastatic calcification); gastritis, mild, multifocal, neutrophilic, lymphoplasmacytic, eosinophilic with occasional gastric gland degeneration and necrosis



Stomach, with extensive mucosal mineralization (purple staining regions shown by the arrows). Hematoxylin and Eosin, 40x, bar is 200 µm.



Normal feline fundic stomach for comparison with above. Note adipose tissue in submucosa (asterisk), a characteristic feature of the feline stomach. Hematoxylin and Eosin, 4x, bar is 200 µm.

Comments: The gross and histologic findings in the stomach are consistent with calcification caused by uremia. Uremic gastritis or gastroenteritis is a term commonly used by veterinarians to describe gastrointestinal signs associated with chronic renal failure in dogs and cats.[4] The clinical signs of uremic gastroenteritis include inappetance, weight loss, vomiting, hematemesis, and diarrhea.[4] In one retrospective study in dogs, the most common histopathologic changes observed with uremic gastropathy were edema, calcification and vasculopathy with infrequent necrosis and ulceration.[4] These findings contrast with humans, in which ulceration is common. Calcification of the gastric mucosa and submucosa was directly related to the Ca X Phos product and inversely related to severity of vasculopathy.[4] In this case, the Ca X Phos product was 62. Other common sites of calcification in animals with an elevated Ca X Phos product include the lungs, heart and kidneys.[3] Deposition of calcium under these conditions is called metastatic calcification.[3,4]

Calcium salts, usually in the form of phosphates or carbonates, can be deposited within tissues.[3] There are three major types of calcification; 1) metastatic (increased Ca X Phos product (>60), 2) dystrophic (occurring secondary to cell damage) and 3) idiopathic (unknown cause). Metastatic calcification occurs in normal tissue due to entry of large amounts of calcium ions into cells.[3] The four causes of metastatic calcification in order of importance in veterinary medicine include: 1) Renal failure, which causes phosphate retention and secondary renal hyperparathyroidism and hypercalcemia, 2) Vitamin D toxicosis, caused by ingestion of rodenticides containing cholecalciferol or calcinogenic plants, 3) Parathormone (PTH) and PTH-related protein (PTH-rp) caused by primary hyperparathyroidism (rare) or elevated PTH-rp with malignant tumors (eg lymphoma, canine anal sac apocrine adenocarcinoma) and 4) Destruction of bone from primary or metastatic neoplasia.[3]

Dystrophic calcification occurs in areas of necrosis with normal serum calcium and phosphate levels.[2,3] Dead and dying cells can no longer regulate the influx of calcium into their cytosol and calcium accumulates in the mitochondria.[3] This can occur with hyperadrenocorticism or exogenous steroid administration with calcification of the dermal collagen, epidermal and follicular basement membranes (calcinosis cutis). Calcinosis circumscripta has been classified as both dystrophic and idiopathic, in which lakes of calcium accumulate in the skin or other organs (e.g. the tongue), surrounded by macrophages and reactive fibrosis. This lesion most often occurs in young, large breed dogs, with German Shepherds overrepresented.[2,3] Calcinosis circumscripta often occurs over pressure points, bony prominences or regions of previous trauma, thus dystrophic calcification is often suspected.[2]

In this case, calcification was also observed in the kidneys and lungs. The kidneys exhibited histologic features of severe, chronic renal disease with ongoing acute changes, however, the histologic criteria for renal dysplasia were not met.[1] In cats, renal dysplasia is less commonly reported than in dogs. Renal dysplasia can be hereditary or result from neonatal infections such as feline panleukopenia virus. In this case, an insult early in life was considered more likely than renal dysplasia, given the histopathologic findings.

References:

1. Bruder MC. et al. Renal dysplasia in beagle dogs: 4 cases. *Tox Pathol* 38:1051-1057, 2010.
2. Lee EM et al. Pathomorphological features of calcinosis circumscripta in a dog. *Lab Anim Res* 2016 Mar;32(1):74-77.
3. Meyers RK and McGavin MD. Cellular and Tissue Responses to Injury. In: *Pathologic Basis of Veterinary Disease*, 4th ed. Eds. McGavin DM, Zachary JF. 2007, St; Louis, Mosby Elsevier, Pp 47-49.
4. Peters RM. et al. Histopathologic features of canine uremic gastropathy: a retrospective study. *J Vet Intern Med* 2005;19:315-320.

What's your diagnosis?

Anthony Fischetti
DVM, MS, DACVR
Head of Diagnostic Imaging

5-year-old male, castrated domestic shorthair cat with acute onset of lameness after being outside. The lameness is localized to the right stifle. Sedated orthogonal view radiographs were made, only the lateral projection is provided.

Describe the image quality of this single lateral projection. What caused this? How can it be corrected?

What's your Diagnosis?

Turn to page 12 for the diagnosis and case discussion.

To help stay abreast of and contribute to advances in medicine, AMC offers cutting-edge continuing education programs to the veterinary community. In addition, AMC's veterinarians are involved in numerous scientific research studies intended to improve quality of life and reduce illness. Indeed, clinical research contributes to new knowledge that enhances our understanding of disease, strengthens diagnostic techniques, advances new therapies, and discovers better ways to diagnose illness. Much of this work is published in peer-reviewed scientific journals and/or presented at scientific meetings and conferences. *Edited by Philip Fox, DVM, DACVIM/DECVIM-CA , DACVECC, Head of Cardiology*

CONTINUING EDUCATION

CONTINUING EDUCATION LECTURES

AMC's Partners In Practice (PIP) seminars are free and CE accredited, but require registration. Visit amcny.org/pipseminars for more information and to register.

PIP COMPREHENSIVE CLINICAL CONFERENCES

Partners In Practice Comprehensive Clinical Conferences are intended to provide several hours of comprehensive review and updates of important and contemporary topics in veterinary medicine. Upon completion, participants should gain enhanced knowledge of the selected topic. Conferences are held at AMC on Sundays from 9:00 am–3:00 pm and are both RACE and NYSED approved.

October 14
New Perspective – Preventing Mange, Fleas, Ticks & Heartworms

November 4
Veterinary Technician Lecture

December 2
Cardiology

PIP PRACTICAL CLINICAL WORKSHOPS

Partners In Practice Practical Clinical Workshops are designed to promote sound diagnosis and effective therapies. Bring and share case materials if you wish! Participate in our time-honored teaching rounds and small group, interactive workshops. Space is limited to 15 participants, so register today! These PIP Workshops are held at AMC on Tuesday evenings from 7:00-8:30 pm and are NYSED approved.

September 18
What's Your Diagnosis? X-Ray Reading Session

October 23
Contemporary Issues in Critical Care

RESEARCH HIGHLIGHTS

The Animal Medical Center recently announced the publication of a landmark research study that identifies how hypertrophic cardiomyopathy — a form of heart disease that can cause sudden death and heart failure in people — is also present in cats and linked to serious health problems in these pets. Termed "The REVEAL Study," this collaborative, international long-term investigation involved 50 veterinary centers in 21 countries in an effort to learn how this disease impacts the health of cats over more than a decade. Published in the *Journal of Veterinary Internal Medicine*, the lead author, Philip Fox, DVM, MS, DACVIM/ECVIM (Cardiology), DACVECC, is the head of Cardiology at AMC and Director of our Caspary Research Institute.

The REVEAL Study reports that hypertrophic cardiomyopathy is a global feline health problem and estimates that it might affect millions of pet cats. Although the disease has been known by veterinarians for nearly 50 years, almost nothing was known about its epidemiology until now.

Key Study Findings

- Heart failure or blood clots occurred in nearly one-third of cats afflicted with feline hypertrophic cardiomyopathy
- Cardiovascular-related death occurred in approximately 30% of the 1,008 cats with hypertrophic cardiomyopathy
- Hypertrophic obstructive cardiomyopathy (a form of the disease) did not result in shorter life expectancy or any greater complications compared to the non-obstructive form of this disease

CURRENT CLINICAL TRIALS RECRUITING PATIENTS

(For more detailed information, visit amcny.org/clinicaltrials)

Cardiology

- Evaluation of an oral nitrate medication added to conventional therapy to treat congestive heart failure in dogs

Integrative & Rehabilitative Medicine

- Pilot studies to evaluate thermographic imaging and manual muscle testing to assess hindlimb stress in dogs
- Investigation of a device (Toe Grips®) applied to nails to reduce lameness in dogs recovering from knee surgery

Internal Medicine

- Comparison of a novel blood test (SDMA) to standard creatinine blood tests used to monitor cats treated for post-renal (kidney) obstruction
- Evaluation of regular insulin administered by constant rate infusion compared to intermittent intramuscular administration to treat cats with diabetes
- Evaluation of the relationship between cobalamin and folate deficiencies and anemia in dogs

Interventional Radiology & Interventional Endoscopy

- Artificial neobladder placement for dogs with resectable lower urinary tract tumors
- Treatment of Extrahepatic Biliary Duct Obstruction (EHBDO) in dogs and cats by Endoscopic Retrograde Cholangiopancreatography (ERCP) with biliary stent placement or the use of a rescue Subcutaneous Intestinal Biliary Bypass Device (SIBB)

Oncology

- Evaluation of 25-hydroxyvitamin D concentrations in canine multicentric lymphoma treated with a CHOP-based chemotherapy protocol
- Trial of Her2-expressing vaccine in dogs with appendicular osteosarcoma
- Evaluation of efficacy and safety of feline interleukin-2 immunomodulator following surgical excision of feline fibrosarcoma
- Leukocytes infiltrating canine solid tumors may harbor oncogenic mutations
- Comparison of combination chemotherapy and immunotherapy for dogs with splenic hemangiosarcoma

RESEARCH STUDIES IN PRINT

The Animal Medical Center's doctors contributed to and completed a number of research studies (AMC doctors are listed in bold font below), whose results have been published in scientific journals this quarter. These include a number of studies involving interventional radiology to manage urinary tract disease, collapsed trachea, minimally invasive surgery to resect pancreatic cancer, and a technique to manage esophageal strictures.

Cray M, **Berent AC**, **Weisse CW**, Bagley D. Treatment of pyonephrosis with a subcutaneous ureteral bypass device in four cats. *J Am Vet Med Assoc.* 2018 Mar 15;252(6):744-753.

Fox PR, Keene BW, Lamb K, Schober KA, Chetboul V, Luis Fuentes V, Wess G, Payne JR, Hogan DF, Motsinger-Reif A, Häggström J, Trehiou-Sechi E, Fine-Ferreira DM, Nakamura RK, Lee PM, Singh MK, Ware WA, Abbott JA, Culshaw G, Riesen S, Borgarelli M, Lesser MB, Van Israël N, Côté E, Rush JE, Bulmer B, Santilli RA, Vollmar AC, Bossbaly MJ, Quick N, Bussadori C, Bright JM, Estrada AH, Ohad DG, Fernández-Del Palacio MJ, Lunney Brayley J, Schwartz DS, Bové CM, Gordon SG, Jung SW, Brambilla P, Moïse NS, Stauthammer CD, Stepien RL, Quintavalla C, Amberger C, Manczur F, Hung YW, Lobetti R, De Swarte M, Tamborini A, Mooney CT, Oyama MA, Komolov A, Fujii Y, Pariaut R, Uechi M, Tachika Ohara VY. International collaborative study to assess cardiovascular risk and evaluate long-term health in cats with preclinical hypertrophic cardiomyopathy and apparently healthy cats: The REVEAL Study. *J Vet Intern Med.* 2018 May;32(3):930-943.

Jones B, **Berent AC**, **Weisse CW**, **Hart R**, **Alvarez L**, **Fischetti A**, Horn BD, Canning D. Surgical and endoscopic treatment of bladder exstrophy-epispadias complex in a female dog. *J Am Vet Med Assoc*. 2018 Mar 15;252(6):732-743.

Pavia PR, **Berent AC**, **Weisse CW**, Neiman D, Lamb K, Bagley D. Outcome of ureteral stent placement for treatment of benign ureteral obstruction in dogs: 44 cases (2010-2013). *J Am Vet Med Assoc.* 2018 Mar 15;252(6):721-731.

Raske M, **Weisse C**, **Berent AC**, **McDougall R**, Lamb K. Immediate, short-, and long-term changes in tracheal stent diameter, length, and positioning after placement in dogs with tracheal collapse syndrome. *J Vet Intern Med*. 2018 Mar;32(2):782-791.

Sylvane B, **Prittie J**, **Hohenhaus AE**, Tozier E. Effect of cross-match on packed cell volume after transfusion of packed red blood cells in transfusion-naïve anemic cats. *J Vet Intern Med*. 2018 May;32(3):1077-1083.

Tan DK, **Weisse C**, **Berent A**, Lamb KE. Prospective evaluation of an indwelling esophageal balloon dilatation feeding tube for treatment of benign esophageal strictures in dogs and cats. *J Vet Intern Med*. 2018 Mar;32(2):693-700.

Wright KZ, **Hohenhaus AE**, **Verrilli AM**, Vaughan-Wasser S. Feline large-cell lymphoma following previous treatment for small-cell gastrointestinal lymphoma: incidence, clinical signs, clinicopathologic data, treatment of a secondary malignancy, response and survival. *J Feline Med Surg*. 2018 Jun 1:1098612X18779870. doi: 10.1177/1098612X18779870. [Epub ahead of print]

ALUMNI UPDATES

Congratulations to two distinguished AMC alumni who recently received awards at the ACVIM Forum in Seattle: Guy Pidgeon, DVM, DACVIM (SAIM), who received the 2018 ACVIM Dr. Lee & Inge Pyle Service Award, and Mark Peterson, DVM, DACVIM (SAIM), recipient of the 2018 ACVIM Robert W. Kirk Award for Professional Excellence.

ABOUT THIS NEWSLETTER

This newsletter is distributed quarterly to AMC's network of referring veterinarians, alumni and others who opt-in to receive this publication. To view past issues or to join our mailing list, please visit amcny.org/rdvm-quarterly. If you are an AMC alumnus who would like to sign up to receive periodic updates, please visit amcny.org/amc-alumni-registration.

To receive our current staff directory or if you have questions, email info@amcny.org.

For access to the AMC Patient Referral Form, visit amcny.org/referralform.

Front and back cover photos courtesy of Corey Towers

Designed by Anthony Coombs

AMC Dedicated Phone Numbers for Referring Veterinarians

AVIAN & EXOTICS
Dr. Kathy Quesenberry
Dr. Cyndi Brown
212-329-8888
Sunday – Friday
9 am – 5 pm

CARDIOLOGY
Dr. Philip Fox
Dr. Betsy Bond
Dr. Dennis Trafny
212-329-8701
Monday – Sunday
9 am – 5 pm

DENTISTRY
Dr. Dan Carmichael
Dr. Stephen Riback
Dr. Django Martel
212-329-8678
Monday – Friday
9 am – 5 pm

DERMATOLOGY
Dr. Mark Macina
212-329-8777
Tuesday – Friday
9 am – 6 pm

INTEGRATIVE & REHABILITATIVE MEDICINE
Dr. Leilani Alvarez
Dr. Barry Cherno
212-329-8860
Monday – Saturday
9 am – 5 pm

INTERNAL MEDICINE A
Dr. Beth Appleman
212-329-8619
Monday – Sunday
9 am – 5 pm

INTERNAL MEDICINE B
Dr. Douglas Palma
Dr. Dennis Slade
212-329-8675
Monday – Sunday
9 am – 5 pm

INTERVENTIONAL RADIOLOGY & INTERVENTIONAL ENDOSCOPY
Dr. Chick Weisse
Dr. Allyson Berent
212-329-8700
Monday – Friday
9 am – 5 pm

NEUROLOGY
Dr. Chad West
Dr. John McCue
Dr. Abbie Lebowitz
212-329-8770
Monday – Sunday
9 am – 5 pm

ONCOLOGY
Dr. Nicole Leibman
Dr. Ann Hohenhaus
Dr. Maria Camps
212-329-8797
Monday – Saturday
9 am – 5 pm

OPHTHALMOLOGY
Dr. Alexandra van der Woerdt
212-329-8813
Monday
10 am – 6 pm
Tuesday
10 am – 5 pm
Thursday
2 pm – 9 pm
Friday
9 am – 3 pm

RADIATION ONCOLOGY
Dr. Rachel St-Vincent
212-329-8821
Monday – Friday
9 am – 5 pm

SURGERY SERVICE 2
Dr. Dan Spector
212-329-8863
Wednesday – Saturday
9 am – 5 pm

SURGERY SERVICE 3
Dr. Pamela Schwartz
212-329-8867
Monday – Friday
9 am – 5 pm

SURGERY SERVICE 4
Dr. Rob Hart
212-329-8674
Monday – Friday
9 am – 5 pm

SURGICAL ONCOLOGY
Dr. Katie Kennedy
212-329-8723
Monday – Friday
9 am – 5 pm

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212-329-8616 or
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What's your diagnosis?

Figure 1: Same projection with arrows denoting image saturation (overexposure). Notice how the thin part of the tibial tuberosity is "burned out" and how only a halo of black is represented by the gastrocnemius muscle and skin margins. The majority of the femur is acceptable in exposure settings because of the thicker amount of tissue preventing saturation. This image prevents us from assessing parts of the stifle that are crucial to interpretation, including the infrapatellar fat pad, important for assessing stifle joint effusion. The arrowheads denote background lines seen when an image is overexposed (termed "planking"). Planking is specific to overexposure only on some digital radiography (DR) units (in this case a Cannon EDR6). These lines help technicians determine an image is overexposed at the x-ray machine (before submitting it for viewing) so that they can make an additional radiograph at a lower exposure before returning the pet to a cage or owner.

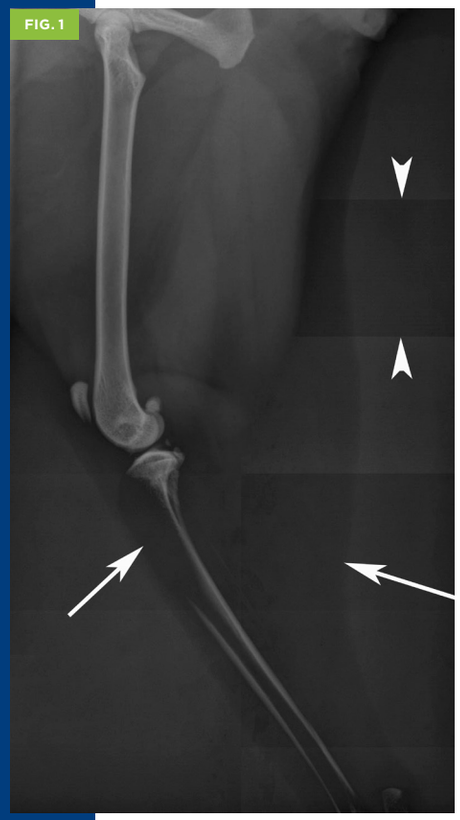
FIG. 1

Figure 2: The same cat stifle with a reduction in exposure settings and better collimation. The original exam had a kVp of 90; mAs of 3.0. After reducing the exposure (kVp 70; mAs 2.0), the new image is nicely exposed for soft tissue and bone. Notice the multifocal mineral foci in the right stifle. Debate remains as to whether or not intra-articular mineralized bodies in the cat's stifle are related to osteoarthritis. Normal meniscal ossicles can be found in other feline species. In this case, the mineralized bodies are numerous and irregular, larger than expected for an ovoid, solitary meniscal ossicle. The mineralization was interpreted as a potential sign of chronic arthritis. The cat's clinical signs could be an acute manifestation of chronic degenerative joint disease/arthritis. The cat responded well to conservative medical management (pain reduction and rest).


FIG. 2

Digital radiography has its own special artifacts. This study shows what overexposure looks like with digital radiographs. If the same settings were used with film, the entire film would have been black (not just the thinner parts). As an image gets saturated with DR, the first place you will see the overexposure is the peripheral soft tissues, followed by the thinner bones (like overcooking a pizza where the crust gets black before the center!). The incorporation of DR to veterinary medicine has vastly improved image quality of radiographs. However, it's not always "one exposure fits all." A basic understanding of kVp and mAs and their influence on radiographic exposure is needed, especially when dealing with very small anatomy (like a cat's stifle).

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