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The School of Veterinary Medicine and the William R. Pritchard Veterinary Medical Teaching Hospital would like to express sincere thanks to our collaborating educational partners:
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<td><strong>SERUM TRIGLYCERIDE CONCENTRATIONS IN NEONATAL FOALS: SERIAL MEASUREMENTS AND EFFECTS OF AGE AND ILLNESS</strong> Emily Berryhill Resident III, LA Medicine: Equine Emphasis</td>
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<td><strong>EFFECT OF PROPHYLACTIC LAPAROSCOPIC-ASSISTED GASTROPEXY ON GASTROINTESTINAL TRANSIT TIME IN HEALTHY DOGS</strong> Ingrid Balsa Resident III, Small Animal Surgery</td>
<td><strong>CARDIAC TROPONIN I IN NEONATAL THOROUGHBRED FOALS WITH RIB FRACTURES</strong> Rana Bozorgmanesh Resident III, LA Medicine: Equine Emphasis</td>
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<td>9:30 - 9:45 a.m.</td>
<td><strong>FACTORS AFFECTING OUTCOME OF ULTRASOUND-GUIDED RADIOFREQUENCY HEAT ABLATION FOR TREATMENT OF PRIMARY HYPERPARATHYROIDISM IN DOGS</strong> Dan Bucy Resident IV, Diagnostic Imaging</td>
<td><strong>A NOVEL ULTRASONOGRAPHIC ASSISTED TECHNIQUE FOR DESMOTOMY OF THE PALMAR/PLANTAR ANNULAR LIGAMENT IN HORSES</strong> Pablo Espinosa Resident III, Equine Surgery</td>
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|              | ULRSONOGRAPHIC DIAGNOSIS OF CARPAL COLLATERAL LIGAMENT INJURIES IN 20 HORSES (2000-2015)  
Lothar Vanslambrouck, Intern I, LA Ultrasound |
| 11:00 - 11:15 a.m. | EXPLORING A ROLE FOR FELINE MORBILLIVIRUS IN FELINE URINARY TRACT DISEASE  
Dayna Goldsmith, Resident III, Anatomic Pathology |
|              | EXTENSION OF ANIONIC DIET INTO THE FIRST THREE DAYS OF LACTATION AND ITS EFFECT ON CALCIUM STATUS IN POSTPARTUM DAIRY CATTLE  
Gabriele Maier, Resident III, Livestock Reproduction & Herd Health |
| 11:15 - 11:30 a.m. | TRADITIONAL AND NOVEL SEMEN PARAMETERS IN DOGS OF VARYING AGE WITH ESTABLISHED FERTILITY IN A PUREBRED DOG BREEDING PROGRAM  
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| 11:45 - 1:00 p.m. | Lunch                                                                 |
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| 1:00 - 1:15 p.m. | THE PHARMACOKINETICS OF ORAL CYTARABINE OCFOSFATE IN DOGS  
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Megan McCarthy, Resident III, Zoo & Wildlife Pathology |
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G.G. Riggs, Resident III, Dentistry and Oral Surgery |
| 1:45 - 2:00 p.m. | RETROSPECTIVE EVALUATION OF PROGNOSTIC FACTORS AND OUTCOME FOR MEDIASTINAL LYMPHOMA IN DOGS  
Erica Moore, Resident II, Medical Oncology |
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<td><strong>11-DEHYDRO THROMBOXANE B2 AS A BIOMARKER FOR INTRACRANIAL NEOPLASIA IN DOGS</strong> Jessica Rivera, Resident III, Neurology and Neurosurgery</td>
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<td>2:45 - 3:00 p.m.</td>
<td><strong>GOBLET CELL DENSITY AND DISTRIBUTION IN CATS WITH CLINICALLY AND HISTOLOGICALLY NORMAL CONJUNCTIVA</strong> Lionel Sebbag, Resident IV, Ophthalmology</td>
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<td><strong>PREVALENCE AND PROGNOSTIC IMPLICATIONS OF CIRCULATING NUCLEATED RED BLOOD CELLS IN CATS</strong> Johanna Wolf, Intern I, Small Animal Emergency</td>
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<td><strong>DIAGNOSTIC UTILITY OF NASAL Lavage GALACTOMANNAN ANTIGEN CONCENTRATIONS FOR CANINE SINONASAL ASPERGILLOSIS</strong> Sirima Yaemsiri, Resident III, Small Animal Internal Medicine</td>
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<td><strong>POSTOPERATIVE RESPIRATORY FUNCTION AND SURVIVAL OUTCOMES FOLLOWING PNEUMONECTOMY IN DOGS AND CATS: A RETROSPECTIVE STUDY</strong> Stephanie Majeski, Resident II, Small Animal Surgery</td>
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Chumkee Aziz, DVM

2006  BS, Biological Sciences, University of Texas, Austin
2012  DVM, Tufts Cummings School of Veterinary Medicine
2013  Internship, Small Animal Medicine and Surgery, ASPCA-Bergh Memorial Animal Hospital
2013-Present  Resident III, Shelter Medicine, CCAH, University of California, Davis

USING PREDICTORS OF LENGTH OF STAY (LOS) TO LIVE RELEASE FOR DOGS TO OPTIMIZE POPULATION MANAGEMENT IN SHELTERS. C. Aziz, DVM, CCAH, University of California, Davis; D Depfer, DVM and S Newbury, DVM, Department of Medical Sciences, University of Wisconsin, Madison; K Hurley, DVM, CCAH, University of California, Davis.

Objective—Analyze shelter data to predict outcome type and LOS for dogs to optimize population capacity and management.

Design—Retrospective cohort.

Animals—11,124 dogs.

Procedures—Shelter records were reviewed to obtain data on possible determinants of outcome type and LOS, including dog age, breed, intake type, as well as medical and behavioral conditions on intake. Statistical analyses were performed on determinants to predict their influence on outcome type and LOS through R, version 3.1.2.

Results—Age, breed, intake type, and medical condition on intake significantly affected outcome type and LOS. Behavioral condition on intake was not consistently documented in shelter records and was, therefore, not included in statistical analyses. Puppies were likely to have a live release and a significantly longer LOS compared to other age groups (P < 0.05). Pit bull type dogs were likely to have a non-live release and a significantly longer LOS compared to dogs of other breeds (P < 0.05). Stray dogs were likely to have a live release and a significantly longer LOS compared to dogs surrendered by their owners (P < 0.05).

Conclusions and Clinical Relevance—Evaluating the various determinants of outcome type and LOS for dogs can improve population management in shelters and can help shelters maintain an optimal daily capacity, which upholds animal welfare by preventing crowding.
EFFECT OF PROPHYLACTIC LAPAROSCOPIC-ASSISTED GASTROPEXY ON GASTROINTESTINAL TRANSIT TIME IN HEALTHY DOGS. IM Balsa, MEd, DVM1, WTN Culp, VMD, DACVS1, EG Johnson, DVM, DACVR1, K Drobatz, DVM, MS, DACVIM, DAVECC3, SL Marks, BVSc, PhD, DAVCIM, DACVN2, Departments of Surgical & Radiological Sciences1, Medicine & Epidemiology2, School of Veterinary Medicine, University of California, Davis, Department of Clinical Studies3, University of Pennsylvania

**Objective**—To determine the effect of prophylactic laparoscopic-assisted gastropexy (LAG) on gastrointestinal transit time as assessed by wireless motility capsule (WMC) in healthy dogs at-risk for developing gastric dilatation and volvulus (GDV).

**Design**—Prospective clinical trial.

**Animals**—6 client-owned healthy large-breed dogs.

**Procedures**—All dogs underwent comprehensive evaluation including laboratory testing and abdominal imaging to ensure normal health status. Dogs were transitioned to a prescription intestinal diet for 6 weeks prior to determination of gastrointestinal transit time using a WMC (SmartPill®, Medtronic Inc., Minneapolis, MN), which measures gastrointestinal pH, pressure, and temperature. LAG was performed after collection of the WMC data. Dogs remained on the intestinal diet for 6 additional weeks following LAG, and the WMC procedure was repeated to measure the effect of gastropexy.

**Results**—No complications were encountered secondary to surgery or WMC administration. The median (range in parenthesis) pre-LAG gastric, intestinal and total transit times were 7.2 (5.2–21.6), 17.3 (14.0–51.2), and 32.5 (21.1–56.9) hours, respectively. The median (range in parenthesis) post-LAG gastric, intestinal and total transit times were 9.4 (5.4–11.9), 15.2 (12.6–43.9) and 22.9 (20.6–55.7) hours, respectively. There was no significant difference in gastric emptying time (p=0.87), intestinal emptying time (p=0.40) or total gastrointestinal transit time (p=0.13) in the dogs following LAG.

**Conclusions and Clinical Relevance**—LAG as performed in this study does not significantly alter gastrointestinal transit time in healthy dogs as assessed by WMC, and WMC administration was not associated with any adverse events following LAG.
Dan Bucy, DVM

2005 BA, Biology, Carleton College, Northfield, MN
2011 DVM, Colorado State University, Fort Collins, CO
2012 Internship, Small Animal Medicine and Surgery, University of Minnesota College of Veterinary Medicine
2012-Present Resident IV, Radiology, VMTH, UC Davis

FACTORS AFFECTING OUTCOME OF ULTRASOUND-GUIDED RADIOFREQUENCY HEAT ABLATION FOR TREATMENT OF PRIMARY HYPERPARATHYROIDISM IN DOGS. D. Bucy, DVM, WR Prichard Veterinary Medical Teaching Hospital; R Pollard, DVM, PhD, Department of Surgical and Radiological Sciences; R Nelson, DVM, Department of Medicine and Epidemiology, School of Veterinary Medicine, University of California, Davis.

Objective—To assess imaging findings, biochemical data, and concurrent diseases that are associated with success or failure of ultrasound-guided radiofrequency (RF) parathyroid ablation in dogs.

Design—Retrospective cross-sectional study

Animals—32 client-owned dogs with primary hyperparathyroidism that underwent ultrasound-guided RF ablation

Procedures—Medical records from 2005-2014 were reviewed to identify patients that underwent ultrasound-guided parathyroid ablation for treatment of primary hyperparathyroidism. Dogs were separated into those with recurrent or persistent hypercalcemia and those without recurrence of hypercalcemia following therapy. Parathyroid nodule size, thyroid lobe size, nodule location, biochemical data and presence of concurrent disease were recorded. Biochemical data evaluated included total calcium, ionized calcium, parathyroid hormone concentration, phosphorus, blood urea nitrogen, and creatinine.

Results—Recurrent or persistent hypercalcemia was documented in 10/32 dogs, with an average disease free interval of 7.6 ± 8.1 months. RF parathyroid ablation was successful in 22/32 dogs. Parathyroid nodule width \( (P = 0.036) \), height \( (P = 0.028) \), and largest cross-sectional area \( (P = 0.023) \) were significantly larger in dogs that had recurrent or persistent hypercalcemia following ablation. Hypothyroidism was more common in dogs with recurrent or persistent disease \( (P = 0.044) \). No pre-ablation biochemical data were significantly associated with success or failure of RF parathyroid ablation.

Conclusions and Clinical Relevance—Dogs with larger parathyroid nodule size and/or concurrent hypothyroidism may be more likely to have recurrent or persistent hypercalcemia following RF parathyroid ablation. Pre-ablation biochemical data are not predictive of patient outcome following RF ablation.
Laura Cagle, DVM

2006   BS, Veterinary Science, University of Arizona
2010   DVM, University of Prince Edward Island, Canada
2011–2012 Internship, Small Animal Emergency Medicine, University of California, Davis
2012–2013 Research Fellowship, University of California, Davis
2013–Present Resident III, Emergency / Critical Care Medicine, VMTH, UC Davis

INDICATIONS AND OUTCOME ASSOCIATED WITH POSITIVE-PRESSURE VENTILATION IN DOGS AND CATS: 128 CASES (2010 – 2013). L. Cagle, DVM, WR Pritchard Veterinary Medical Teaching Hospital; S Epstein, DVM, DACVECC; K Hopper BVSc, PhD, DACVECC, Department of Surgical and Radiological Sciences, School of Veterinary Medicine, University of California, Davis.

Objective- To determine the indications and outcome of positive-pressure ventilation (PPV)
Design- Retrospective case series
Animals- 112 dogs and 16 cats.
Procedures- Medical records from 2010 to 2013 were reviewed; signalment, indication, duration, and outcome for PPV were recorded.
Results: Indications for PPV were hypoxemia in 42% cases (50 dogs and 4 cats), hypoventilation in 38% cases (38 dogs and 10 cats), excessive respiratory effort or fatigue in 16% (18 dogs and 2 cats) and other in 6 dogs. Pneumonia (54/128, 42%) was the most common disease process necessitating PPV in 42% of cases. Median (range) duration of PPV was 25.7 (0.1 to 957) hours. Separated by indication for PPV, rates of weaning from mechanical ventilation were: hypoxemia (15/54, 28%), hypoventilation (11/48, 23%), excessive respiratory effort/fatigue (4/20, 20%), and other (2/6, 33%) and was not significantly different between groups. Survival to discharge was 22% (28/128) overall and highest in the hypoxemia group (28%, 15/54). Brachycephalic dogs were more likely to be weaned (13/27, 48%) versus non-brachycephalic dogs (17/85, 20%; p=0.0114) and there was no difference in the weaning rate in dogs versus cats.
Conclusion and Clinical Relevance: PPV is associated with a high mortality rate in dogs and cats. Unlike previous studies, indication for PPV was not associated with outcome; this may be due to the inclusion criteria of this study. Weaning rates in this study period were markedly lower in the hypoventilation group while similar for the hypoxemia group when compared to a previous study at the same institution.
IDENTIFICATION OF OCCULT MICROMETASTASES AND ISOLATED TUMOR CELLS WITHIN REGIONAL LYMPH NODES OF PREVIOUSLY DIAGNOSED NON-METASTATIC (STAGE 0) CANINE CARCINOMAS. KM Casey, DVM, WR Pritchard Veterinary Medical Teaching Hospital; MA Steffey, DVM, Department of Surgical and Radiological Sciences; VK Affolter, DVM PhD, Department of Pathology, Microbiology, and Immunology, School of Veterinary Medicine, University of California, Davis.

Objective: To evaluate carcinoma cases, previously diagnosed as stage 0, for the presence of small volume metastatic lesions in regional lymph nodes using an elaborated pathologic examination and pancytokeratin (panCK) immunohistochemistry.

Design – Retrospective case series.

Samples – 20 regional lymph nodes diagnosed as non-metastatic.

Procedures – Previously diagnosed non-metastatic lymph nodes were step-sectioned and histologically evaluated for the presence of metastases, micrometastases, and/or isolated tumor cells (ITC). Sections were evaluated for metastases using panCK immunohistochemistry.

Results: Overall 25% (5/20) of lymph nodes contained micrometastases (n=1) or ITC (n=4). Of the original 20 lymph nodes, 13/20 (65%) were not evaluated at the time of initial biopsy for panCK. Within this subset, 3/13 bisected lymph nodes contained either a micrometastasis (n=1) or ITC (n=2). In contrast, 7/20 (35%) lymph nodes were evaluated at the time of initial biopsy using immunohistochemistry for panCK and were found to be non-metastatic. Step-sectioning and application of panCK identified 2/7 cases (28.6%) with ITC in previously diagnosed non-metastatic lymph nodes. In 20% (4/20) scattered individual epithelial cells or aggregates were identified on the surface of, or embedded within, extracapsular adipose tissue. These paraffin-embedded lymph node blocks were sectioned at 200 μm intervals and panCK immunohistochemistry identified one additional ITC.

Conclusions and Clinical Relevance: This study demonstrates the increased efficacy of serial step-sections combined with panCK immunohistochemistry to identify small volume metastases in regional lymph nodes. The prognostic significance of carcinoma micrometastases and ITC is currently unknown in dogs and warrants further prospective study with larger case numbers.
**DIAGNOSTIC UTILITY OF CD204, CD163, AND IBA1 IN CANINE ARTICULAR HISTIOCYTIC SARCOMA AND SYNOVIAL CELL SARCOMA.** KM Casey, DVM, WR Pritchard Veterinary Medical Teaching Hospital; VK Affolter, DVM, PhD and PF Moore, DVM, PhD, Department of Pathology, Microbiology, and Immunology, School of Veterinary Medicine, University of California, Davis.

**Objective:** Evaluate the expression and distribution of CD204, CD163, and Iba1 immunoreactivity in normal canine synovium and elucidate the diagnostic utility of the aforementioned antibodies in distinguishing canine synovial cell sarcoma (SCS) from periarticular/articular histiocytic sarcoma (p/aHS).

**Design –** Prospective case series.

**Samples** – Formalin-fixed paraffin-embedded (FFPE) samples of normal canine synovium (n=4), p/aHS (n=11), and SCS (n=8).

**Procedures** – FFPE normal synovium, p/aHS, and SCS were evaluated histologically (hematoxylin and eosin) and immunohistochemically labelled with CD204, CD163, Iba1, and CD18 antibodies.

**Results:** Normal canine synovium comprises an unevenly distributed mixture of round-polygonal cells and flattened spindloid cells that exhibit variable expression of CD18 > Iba1 > CD204 > CD163. Sub-synovial dendritic cells follow a similar hierarchical expression. p/aHS are sub-synovial, multinodular masses composed of sheets of pleomorphic round-spindloid histiocytes exhibiting strong CD18 and Iba1 expression and a range of CD204 and CD163 expression. SCS are frond- and villous-like neoplasms composed of a core of neoplastic synoviocytes admixed with cytologically bland round cells with histiocyte-like morphology. Neoplastic cells lack immunoreactivity to CD18 and Iba1 with variable CD204 and CD163 expression. Cytologically bland exfoliating cells variably express CD18 > Iba1 > CD204 > CD163.

**Conclusions and Clinical Relevance:** This study identifies CD18 and Iba1 as the most discriminating antibodies for distinguishing between SCS and p/aHS while CD204 and CD163 are less discriminating. Future immunophenotyping in frozen tissue with CD1a, CD11b, and CD11c will further elucidate the cell of origin in SCS and aid in distinguishing amongst infiltrating populations of cytologically bland cells in SCS.
EVALUATION OF THE USE OF POST-OPERATIVE ADJUVANT CHEMOTHERAPY IN DOGS WITH PRIMARY LUNG TUMORS. K. Couto, DVM, WR Pritchard Veterinary Medical Teaching Hospital; K Skorupski, DVM, DACVIM (Oncology), Department of Surgical & Radiological Sciences, UC Davis; K Mathews, DVM, DACVS, Department of Clinical Sciences, North Carolina State University; C McKendry, Department of Statistics, North Carolina State University; M Hauck, DVM, DACVIM (Oncology), Department of Clinical Sciences, North Carolina State University

Objective – To evaluate the impact of post-operative adjuvant cytotoxic chemotherapy in dogs undergoing surgical resection of primary lung tumors.

Design – Retrospective case series.

Animals – 76 client-owned dogs with histologically confirmed primary lung carcinomas.

Procedures – Medical records of dogs undergoing surgical resection of primary lung tumors were reviewed to obtain clinical and tumor data, treatment specifics, and overall survival (OS). Factors compared between groups and evaluated for association with outcome included presence of clinical signs at presentation, lymph node enlargement, metastases at diagnosis, completeness of excision, and tumor size. Chi-squared and Wilcoxon rank sum tests were used to compare characteristics between treatment groups. A logistic regression model was used to determine if any factors were associated with treatment. The Kaplan-Meier method was used to estimate outcome (P<0.05).

Results – Primary lung tumors were resected in 76 dogs between 2003 and 2013 (40 from NCSU and 36 from UCD). In total, 44 dogs underwent surgical resection alone and 32 received post-operative adjuvant chemotherapy in addition to surgical resection. Chemotherapeutic agents used included carboplatin, vinorelbine, doxorubicin, and vinblastine. No significant differences in patient or tumor characteristics were found between treatment groups. In the logistic regression model, no correlations were found with administration of post-operative chemotherapy. Outcome was similar between groups and median survival times (MST) for patients undergoing surgical resection alone versus adjuvant chemotherapy were 566 and 502 days respectively (P=0.894).

Conclusion – Outcome was similar in dogs with primary lung tumors undergoing surgical resection alone versus patients undergoing post-operative adjuvant chemotherapy in this study.
EXPLORING A ROLE FOR FELINE MORBILLIVIRUS IN FELINE URINARY TRACT DISEASE. DA Goldsmith, DVM, WR Pritchard Veterinary Medical Teaching Hospital; F Dela Cruz, BS Biomedical Engineering, University of California, Davis; AM Gaynor, PhD, Molecular Microbiology and microbial Pathogenesis, Washington University in St. Louis; PA Pesavento DACVP, DVM, PhD, School of Veterinary Medicine, University of California, Davis.

Objective—Determine if feline morbillivirus (FmoPV) is present within the US, and if present, establish whether there is an association with urinary tract disease.

Design—Case Series

Animals—61 cats

Procedures—Urine and kidney samples were collected from necropsy (n=35) and clinical cases (n=26) at the UC Davis teaching hospital. These samples were opportunistically collected without knowledge of clinical history. A total of 88 samples from 61 cats were obtained and tested for FmoPV using a nested reverse transcriptase PCR. For necropsy cases, the renal histology and case history were reviewed and the feline lower urinary tract disease (FLUTD) and feline chronic kidney disease (CKD) status was determined.

Results—FmoPV was detected in 3 cats and sequenced using a degenerate primer strategy. This sequence exhibited 92% homology to published FmoPV sequences in GenBank. Of these three cases, two were clinical cases with no history of urinary tract disease, and one was a necropsy case with CKD.

Conclusions and Clinical Relevance—FmoPV was identified for the first time within the US. FmoPV DNA was extracted from only 6.25% of cats with CKD, suggesting that the majority of CKD cases in California are not the result of FmoPV infection.
TRADITIONAL AND NOVEL SEMEN PARAMETERS IN DOGS OF VARYING AGE WITH ESTABLISHED FERTILITY IN A PUREBRED DOG BREEDING PROGRAM. A. Hesser, DVM, WR Pritchard Veterinary Medical Teaching Hospital; B Christensen, DVM, Department of Population Health and Reproduction; K Gonzales, DVM and H Power, Guide Dogs for the Blind, San Raphael, CA; J Thompson, DVM and C Love, DVM, College of Veterinary Medicine and Biological Sciences, Texas A&M University, College Station, TX; C Darr, T Scanlan, and S Meyers, DVM, Department of Anatomy, Physiology, and Cell Biology, School of Veterinary Medicine, University of California, Davis.

Objective—Establish baseline parameters of fresh and chilled semen using traditional and novel methods for a population of stud dogs with known fertility, and compare those findings to age.

Design—Prospective cross-sectional study

Animals—39 male dogs with lifetime fertility data

Procedures—Two semen collections were acquired manually from each animal and evaluated for motility, morphology, velocity, sperm chromatin structure, mitochondrial DNA, and flow cytometry parameters including lipid peroxidation and reactive oxygen species production. Continuous parameters (motility and flow cytometry tests) were evaluated again after extension and cooling for 48 hours at 4°C.

Results—Parameter ranges for a healthy population of fertile dogs were established for all tests. With fresh semen, as the age group increased, velocity of sperm decreased. The oldest group of dogs also had a decreased % morphologically normal sperm as compared to the other groups. Chilled semen had decreased progressive motility, and within the chilled samples, age had an inverse relationship with progressive motility. Velocity was also significantly lower in chilled samples than in fresh semen. No significant differences were appreciated between age groups of dogs in relation to fertility, despite changes in semen evaluation parameter values.

Conclusions and Clinical Relevance—Changes associated with age may not be correlated with loss of fertility in dogs. Novel parameter “normal” was established for this population of animals. This data will provide a foundation for future comparison of traditional and novel parameters of semen from infertile dogs, which may improve our ability to predict potential fertility of an animal.
EFFECT OF PROBIOTIC ENTEROCOCCUS FAECIUM SF68 DIETARY SUPPLEMENTATION IN OVERWEIGHT AND OBESE CATS WITHOUT COMORBIDITIES. A. Kathrani, BVetMed, WR Pritchard Veterinary Medical Teaching Hospital; J Larsen, DVM, Department of Molecular Biosciences, P Kass, DVM, Population Health and Reproduction, A Fascetti, VMD, Department of Molecular Biosciences, School of Veterinary Medicine, University of California, Davis.

Objective—To assess the effect of probiotic Enterococcus faecium strain SF68 supplementation on food intake, body composition and metabolic parameters in healthy overweight and obese cats.

Design—Prospective case-control study.

Animals—Twenty overweight and obese specific pathogen free cats without comorbidities.

Procedures—Cats were acclimatized to a dry diet for four weeks. After exclusion of four cats for unrelated reasons, eight cats received a daily oral probiotic for eight weeks and eight control cats received no probiotic. All cats were fed ad libitum with food intake measured daily and bodyweight weekly. Blood was collected at three time points; after four weeks of acclimatization to the diet, after eight weeks of intervention and after six weeks of washout for measurement of glucose, triglyceride, cholesterol, fructosamine, insulin, leptin, total adiponectin and deuterium oxide for body composition.

Results—There were no differences in food intake, metabolic parameters and body composition between the probiotic and control group after eight weeks of intervention and six weeks of washout (P>0.05).

Conclusions and Clinical Relevance—Short-term use of Enterococcus faecium strain SF68 dietary supplementation had no significant effect on food intake, bodyweight, body composition or metabolic parameters in overweight and obese specific pathogen free cats without comorbidities.
THE PHARMACOKINETICS OF ORAL CYTARABINE OCFOSFATE IN DOGS. D. Zwueste, DVM, WR Pritchard Veterinary Medical Teaching Hospital; K Vernau, DVM, P, Dickinson, DVM, and B. Pypendop, DrMedVet, DrVetSci, Department of Surgical and Radiological Sciences; W Vernau, BVMS, Department of Pathology, Microbiology and Immunology; H Knych, DVM, California Animal Health and Safety Lab, School of Veterinary Medicine, University of California, Davis.

Objective – To determine the pharmacokinetics of cytarabine ocfosfate (CO) and cytosine arabinoside (ara-C), determine the effect on peripheral leukocytes and evaluate for adverse effects associated with oral CO. Ara-C is the active metabolite of CO.

Design – Prospective

Animals – One dog

Procedures - A beagle received 200 mg/m² of CO orally. Blood was obtained up to 96 hours and cerebrospinal fluid (CSF) was obtained up to 72 hours after administration. CO and Ara-C concentrations were measured using HPLC. Complete blood counts and flow cytometry of peripheral leukocytes were performed up to 21 days. After three weeks the dog received 200 mg/m² of CO every 24 hours for 3 days. Blood and CSF were obtained and assessed as described. Physical exams were done daily.

Results – Single dose: the maximal plasma CO and ara-C concentration was 98.5 ng/ml and 625.3 ng/ml, respectively. The half life of CO and ara-C was 16.9 and 12.3 h, respectively. The maximal Ara-C CSF concentration was 15.3 ng/ml. Three doses: the maximal plasma CO and ara-C concentration was 306.3 ng/ml and 709.3 ng/ml, respectively. The maximal Ara-C CSF concentration was 51.5 ng/mL. CO was not detected in the CSF. Leukocyte populations did not change. Adverse effects were not detected.

Conclusions and Clinical Relevance - Ara-C concentrations following CO administration were lower than those reported following parenteral ara-C administration, while the half life was longer. CO did not enter, but Ara-C accumulated, within the CSF. Peripheral leukocytes were not affected. CO is safe to give at the described dose.
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OUTCOME OF CHRONIC NONUNION FRACTURES IN DOGS TREATED WITH RIGID FIXATION, COMPRESSION RESISTANT MATRIX AND RECOMBINANT HUMAN BONE MORPHOGENETIC PROTEIN-2. A. Massie, DVM, AS Kapatkin DVM, DACVS, MS and M Fuller DVM, DACVS, Department of Surgical and Radiological Sciences; FJM Verstraete DrMed Vet, M Med Vet, DAVDC, DECVS, DEVDC and B Arzi DVM, DAVDC, DEVDC, Department of Surgical and Radiological Sciences, School of Veterinary Medicine, University of California, Davis.

Objective - To describe a surgical technique for nonviable nonunion fractures in dogs using internal fixation and bone morphogenetic protein on a compression resistant matrix

Design - Prospective case controlled study

Animals - Dogs (n=9) with radiographic confirmed nonviable nonunion bone fractures (n=12).

Procedures - For the 7 diaphyseal fractures, previous implants were removed and the bone ends osteotomized to a level with the appearance of bone blood supply. The bones were repaired with implants as clinically indicated. The resulting fracture gap was measured in 3 dimensions and a respectively sized compression resistant matrix (CRM) was cut and infused with recombinant human bone morphogenetic protein-2 (rhBMP-2). It was implanted into the defect and covered, if possible, with a soft tissue envelope followed by subcutaneous and dermal closure. For the two condylar fractures (1 with intact and 1 with broken implants), a thin layer of CRM with rhBMP-2 was placed in a tunnel formed proximal to the transarticular screw or between the humeral condyles and over the lateral condylar part of the fracture.

Results - All dogs healed with return to full function of the limb. Post-operative inflammation was noted within 3-5 days in all dogs and resolved with no further incisional complications. All fractures achieved osseous union, with time to union from 6-20 weeks post-operatively. Increased fracture healing time was noted with both lateral humeral condylar repairs.

Conclusion and Clinical Relevance - Fracture reconstruction using internal fixation and CRM with rhBMP-2 provides clinical bone healing after nonviable nonunion fracture.
A HISTOLOGIC GUIDE TO THE NORMAL CANINE ESOPHAGUS WITH PRACTICAL APPLICATION TO CANINE ESOPHAGEAL DISEASE. M.A. McCarthy, DVM, WR. Pritchard Veterinary Medical Teaching Hospital; SL Marks, BVSc, PhD, Department of Medicine and Epidemiology; PA Pesavento, DVM, PhD, DACVP, Department of Pathology, Microbiology and Immunology, School of Veterinary Medicine, University of California, Davis.

Objectives—Provide detailed microanatomic description of the normal canine esophagus, establishing standardized grading criteria for alterations or inflammation. Apply these criteria to an important and common esophageal disease in the dog: megaesophagus.

Design—Retrospective case series.

Animals—25 clinically normal dogs, 35 dogs with megaesophagus.

Procedures—Esophagi were collected postmortem from 25 dogs without esophageal or other gastrointestinal disease. Serial sections were evaluated by H&E, immunohistochemistry, and special stains that detailed the normal range and character of all esophageal layers. These criteria were used to examine 35 cases of megaesophagus from the UC Davis VMTH archives (2005-2015).

Results—In normal esophagi, muscular thickness varied widely. Small numbers of mucosal and submucosal inflammatory cells were considered within normal limits, and mild, chronic inflammation was common in clinically normal dogs. The most consistent histologic features of megaesophagus, independent of etiology, included myodegeneration, atrophy and fibrosis. According to the standardized criteria, many cases with a previous diagnosis of esophagitis were reclassified as within normal limits. There were 5 cases with previous diagnoses of myodegeneration, 1 of necrosis, and 1 of muscular atrophy. With application of standardized criteria, there were 33 cases of myodegeneration, 6 of necrosis, and 4 of muscular atrophy.

Conclusions and Clinical Relevance—Application of the standardized criteria in cases of megaesophagus resulted in fewer diagnoses of esophagitis, and more frequent diagnosis of myodegeneration than in the archived records, providing a more accurate characterization of the disease process. Standardization of sampling and lesion interpretation constitutes a starting point to investigate manifestations of esophageal disease in the dog.
RETROSPECTIVE EVALUATION OF PROGNOSTIC FACTORS AND OUTCOME FOR PRIMARY MEDIASTINAL LYMPHOMA IN DOGS. EL Moore, DVM, WR Pritchard Veterinary Medical Teaching Hospital; W Vernau, DVM, Department of Pathology, Microbiology and Immunology; JH Burton, DVM, Department of Surgical and Radiological Science, School of Veterinary Medicine, University of California, Davis.

Objective- To describe patient characteristics, and determine prognostic factors and outcome of dogs diagnosed with primary mediastinal lymphoma.

Design- Retrospective case series.

Animals- 42 dogs.

Procedures- Cases were collected from the UC Davis Veterinary Medical Teaching Hospital medical record database from November 1993 to February 2015. Dogs with a cytologic or histopathologic diagnosis of mediastinal lymphoma and no evidence of lymphoma outside the thoracic cavity were eligible for inclusion. Signalment, clinical signs, diagnostics, treatment, and date of progression and death were recorded. Tumor samples were reviewed and classified based on cell morphology. Factors evaluated for effect on progression free survival (PFS) and overall survival (OS) included hypercalcemia, pleural effusion and treatment (CHOP versus other).

Results- Forty-two dogs were identified and 36 had follow-up available for outcome assessment. The most common clinical signs included lethargy, anorexia, and polyuria/polydipsia; 64% of dogs were hypercalcemic and 45% had pleural effusion. Thirty-two tumor samples were reviewed and classified as lymphoblastic (n=18), large cell (n=13) and large granular (n=1) lymphoma. The median PFS and OS were 133 and 183 days (range: 6-2096 days for both), respectively. Treatment with a CHOP protocol was associated with improved PFS and OS; the absence of pleural effusion at diagnosis was associated with increased OS but not PFS.

Conclusions and Clinical Relevance- Mediastinal lymphoma in dogs is characterized by nonspecific clinical signs, hypercalcemia and pleural effusion. The results of this study suggest that while the prognosis is poor, survival may be improved with treatment of a multi-agent chemotherapy protocol.
Objective—Determine levels of 11-dehydro-thromboxane B₂ (11TxB₂) in dogs with a variety of neurological and non-neurological diseases using an enzyme immunoassay, in order to ascertain if this metabolite can provide adjunctive diagnostic data as a biomarker for intracranial neoplasia.

Design—Prospective study.

Animals—170 dogs.

Procedures—Urine, serum, and CSF samples were stored immediately following collection at -20°C (or at 4°C for up to 7 days prior to -20°C storage). Samples were then analyzed via enzyme immunoassay.

Results—11TxB₂ was reliably detected in urine, but not in serum or CSF. Storage at 4°C up to 7 days did not significantly affect urine TxB₂ levels, and concurrent corticosteroid or non-steroidal anti-inflammatory medication did not apparently affect levels within the study group as a whole. While certain intracranial neoplasias were noted to have higher levels of 11TxB₂, an overlap in 11TxB₂ urine levels was noted between non-neurological and neurological animal groups.

Conclusion and Clinical Relevance—Although some of the highest 11TxB₂ values were seen in animals with intracranial neoplasia, overlap with other neurological disease groups was present. Assay of 11TxB₂ is feasible; however, additional analysis of a larger study population will be necessary to determine whether a threshold urine 11TxB₂ level may be useful as a diagnostic biomarker.
BIOMARKER DEVELOPMENT FOR HYPERTROPHIC OSTEOODYSTROPHY IN DOGS. N. Safra, DVM, PhD, A Kol, DVM, PhD, Dip ACVP (clinical pathology); E Johnson, DVM, DACVR, Department of Surgical and Radiological Sciences; C Korff, BS, Veterinary Student III, WR Pritchard Veterinary Medical Teaching Hospital; P Hitchens, PhD, Swedish University of Agricultural Sciences; E Maverakis, MD and A Mitra, MD, Department of Dermatology, School of Medicine, UC Davis; M Bannasch, BS, RVT and NC. Pedersen, DVM, PhD, CCAH, SVM, Center for Companion Animal Health; DL Bannasch, DVM, PhD, Department of Population Health and Reproduction, School of Veterinary Medicine, University of California, Davis.

Objectives - Identify biomarkers that may have diagnostic, prognostic or therapeutic implications in dogs with hypertrophic osteodystrophy (HOD).

Design- Prospective case control study.

Animals- 26 affected and 102 unaffected dogs.

Procedures- A diagnosis of HOD was based on signalment, clinical symptoms, characteristic radiographs, and response to treatment. Cases with recurrent episodes, involvement of two or more organ systems and negative response to NSAIDs were defined as severe. Candidate biomarkers were measured in serum of affected dogs and compared with unaffected controls using MILLIPLEX MAP Canine Cytokine/Chemokine Magnetic Bead Panel by EMD Millipore. Wilcoxon rank-sum (Mann–Whitney) test was used to compare mean ranks and to evaluate correlations with clinical signs.

Results- Markers with significant differences between affected and unaffected dogs were IL-6, TNF, GM-CSF, IL-1beta, IP-10, IL-10. HOD clinical signs associated with tested markers were pyrexia (IL-6), diarrhea (IL-8), vomiting (IL-1beta), pustules (IL-8), and relapsing episodes (IL-6, GM-CSF).

Conclusions and clinical Relevance- These findings confirm HOD to be a systemic inflammatory disease that is likely to be driven by aberrant innate immunity pathways. Newly identified candidate biomarkers should be further investigated for their diagnostic and prognostic use and possibly as targets for specific therapy.
GOBLET CELL DENSITY AND DISTRIBUTION IN CATS WITH CLINICALLY AND HISTOLOGICALLY NORMAL CONJUNCTIVA. L. Sebbag, Dr Med Vet, WR Pritchard Veterinary Medical Teaching Hospital; CM Reilly, DVM, DACVP, Department of Pathology, Microbiology, and Immunology; R Eid, DVM, WR Pritchard Veterinary Medical Teaching Hospital; DJ Maggs, BVSc (Hons), DACVO, Department of Surgical and Radiological Sciences, School of Veterinary Medicine, University of California, Davis.

Objective - To evaluate goblet cell density (GCD) and distribution in cats without clinical and histological evidence of conjunctival disease.

Design - Prospective study.

Animals - Fourteen domestic-shorthair cats euthanized for reasons unrelated to this study.

Procedures - Before euthanasia, cats were verified using slit-lamp biomicroscopy and fluorescein staining to be free of eyelid or ocular surface abnormalities. Immediately after euthanasia, bilateral conjunctival specimens including third eyelid (TEL) were collected, routinely processed, stained with PAS and H&E. Thirteen conjunctival regions were identified. For each region, 200 basal epithelial cells were counted, and GCD was expressed as a percentage of all epithelial cells.

Results - Mean GCD ranged widely by region: anterior face of the TEL = 48.8%, fornicial regions = 47.0%, palpebral regions = 38.5%, bulbar regions = 19.6%, and posterior face of the TEL = 12.6%. The anterior surface of the TEL had significantly higher GCD than did the bulbar and the palpebral regions but not the fornicial regions. Bulbar conjunctiva had significantly lower GCD than did all other conjunctival regions except the posterior surface of the TEL. No significant difference was noted between GCD of male versus female cats, dorsal versus ventral regions or lateral versus medial regions.

Conclusions and Clinical Relevance - Although conjunctival GCD ranged widely by region, the anterior surface of the TEL appears to be an excellent location for assessing conjunctival goblet cells in cats since this area has high GCD and is more readily accessible than is the palpebral, fornicial, or bulbar conjunctiva.
ASSOCIATION BETWEEN CANINE PANCREAS-SPECIFIC LIPOASE AND OUTCOMES OF DOGS WITH HEMODIALYSIS-DEPENDENT ACUTE KIDNEY INJURY. K. Takada, DVM, WR Pritchard Veterinary Medical Teaching Hospital; SE Epstein, DVM, Department of Surgical and Radiological Sciences; C Palm, DVM and LD Cowgill, DVM, PhD, Department of Medicine and Epidemiology, School of Veterinary Medicine, University of California, Davis.

Objective – To investigate if there is an association between elevated canine pancreas-specific lipase [Spec cPL™ or SPEC], as a clinical marker of active pancreatitis, and the outcome of dogs with acute kidney injury (AKI) treated with hemodialysis.

Design – Retrospective study.

Animals – 43 client-owned dogs presented to the UC Davis VMTH from August 2011 to June 2015.

Procedures – Medical records were reviewed to identify dogs that received intermittent hemodialysis for management of AKI and also had a SPEC measurement at some point during the course of illness. Outcome was assessed as survival at 30 days from admission. Surviving dogs were further categorized as dialysis-dependent or non dialysis-dependent. An elevated SPEC suggestive of pancreatitis was defined as ≥ 400 mcg/L. Data were evaluated using Mann-Whitney U test and Fisher’s exact test and are presented as median [range]. A P-value of < 0.05 was considered significant.

Results – At 30 days after admission, 30/43 (69.8%) dogs were still alive. SPEC was not significantly different between surviving and non-surviving dogs (P= 0.50). Nine of 30 (30%) surviving dogs were still dialysis-dependent, and SPEC in dialysis-dependent dogs was significantly higher than non dialysis-dependent dogs (1001.0 [177-2001] mcg/L vs 379.0 [29-1001] mcg/L, P=0.008).

Conclusions and Clinical Relevance – These results suggest an elevated SPEC, as a surrogate for pancreatitis, did not associate with survival outcome in dogs with severe AKI at 30 days. However, pancreatitis may influence the rate of recovery or may develop as a comorbid complication in dogs with more protracted AKI.
PREVALENCE AND PROGNOSTIC IMPLICATIONS OF CIRCULATING NUCLEATED RED BLOOD CELLS IN CATS. J. Wolf, Dr. med vet, WR Pritchard Veterinary Teaching Hospital; K Hopper, BVSc, PhD, DACVECC; SE Epstein, DVM, DACVECC, Department of Surgical and Radiological Sciences, School of Veterinary Medicine, University of California, Davis.

**Objective** – To evaluate the prevalence of nucleated red blood cells (NRBC) in the peripheral blood of cats and their association with mortality and underlying diseases.

**Design** – Retrospective study

**Cases** – 1654 Complete blood counts (CBC) from 958 cats

**Procedures** – All cats with a CBC from January through December of 2014 were identified. CBC and data from the medical records were collected. NRBC-positive and negative patients were identified, and in-hospital mortality, disease(s) identified and hospitalization level were compared.

**Results** – The prevalence of NRBC presence during any visit was 15.5% (250/1654), 19.8% (54/273) when presented to the emergency room, and 19.6% (11/56) when hospitalized in ICU. In-hospital mortality was not different between nRBC-positive (3.5%) and nRBC-negative (3.3%, p = 0.89) patients. The most common diseases identified were neoplasia (31.6%), urinary tract disease (27.8%) and orofacial diseases (14.1 %). 27.9% of all cases were also anemic. Anemic cases had a significantly higher number of nRBC-positive CBCs (32 % vs. 9.4 %, p < 0.001) compared to non-anemic CBCs. No differences were found in numbers of NRBC-positive CBCs and hospitalization level. Four NRBC-positive cases with no apparent disease were identified.

**Conclusions and clinical relevance** – In this variable population of cats, circulating NRBC were not a predictor of mortality nor a marker of disease severity as has been documented in humans and dogs. NRBCs can also be found in apparently healthy cats.
Objective – To evaluate the sensitivity and specificity of an *Aspergillus* galactomannan antigen (GMA) ELISA assay for diagnosis of canine sinonasal aspergillosis (SNA) when performed on nasal lavage specimens from dogs with nasal disease.

Design – Prospective study.

Animals – Ten dogs with confirmed SNA and 30 dogs with other nasal disease.

Procedures – GMA ELISA was performed on nasal lavage specimens from all dogs. In 31 dogs, left and right nasal lavage specimens were pooled for a combined GMA. In 9 dogs, separate GMA ELISA assays were performed on specimens from the left and right nostril. Galactomannan indices ≥ 0.5 were considered positive.

Results – The sensitivity and specificity of the GMA ELISA for diagnosis of canine sinonasal aspergillosis were 60% and 80%, respectively. The positive predictive value (PPV) and negative predictive value (NPV) were 50% and 86%, respectively. For the 9 dogs where separate GMA ELISA assays were performed for each nasal cavity, the interpretation of results (positive vs. negative) differed for each side for only 1 dog. In one dog with a false positive result, SNA was highly suspected based on historical infection and consistent CT findings, but could not be confirmed using rhinoscopy. Concurrent use of β-lactam antibiotics was not significantly associated with false positive results.

Conclusion and Clinical Relevance – Nasal lavage *Aspergillus* GMA ELISA is not a reliable test for the diagnosis of SNA in dogs.
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POSTOPERATIVE RESPIRATORY FUNCTION AND SURVIVAL OUTCOMES FOLLOWING PNEUMONECTOMY IN DOGS AND CATS: A RETROSPECTIVE STUDY. S. Majeski—VMD, MS, WR Pritchard Veterinary Medical Teaching Hospital; M Steffey DVM; P Mayhew BVM&S; G Hunt BVSC, PhD; and M Mellema DVM, PhD, Department of Surgical and Radiological Sciences.; D Holt BVSc, and J Runge DVM, Department of Clinical Studies, University of Pennsylvania, Philip H. Kass DVM, PhD, Department of Population Health and Reproduction, School of Veterinary Medicine, University of California, Davis.

Objective – To evaluate indication for, and outcomes following, pneumonectomy in dogs and cats, including assessment of immediate postoperative respiratory function in comparison to other animals undergoing single lung lobectomy.

Design – Retrospective case series.

Procedures – Medical records (1990–2014) of dogs and cats having undergone pneumonectomy were reviewed. Data retrieved included signalment, history, pre-operative diagnostics, operative descriptions, postoperative data including respiratory function, and post-discharge outcomes. For respiratory function comparisons, medical records of dogs having undergone single lung lobectomy via either median sternotomy (n=15) or intercostal thoracotomy (n=15) were reviewed.

Results – 23 cases (16 dogs, 7 cats) met the inclusion criteria. Pneumonectomy was performed to address congenital (1 dog, 1 cat), neoplastic (8 dogs, 1 cat), and infectious (7 dogs, 5 cats) conditions. Aspiration pneumonia occurred in 2 dogs postoperatively. Fifteen of 16 dogs (93.8%) and six of seven cats (85.7%) survived to hospital discharge. Following pneumonectomy, dogs had a significantly lower postoperative A-a gradient (P = 0.004) and a significantly higher postoperative P/F ratio (P = 0.008) versus single lung lobectomy patients. Dogs receiving a median sternotomy approach had a significantly lower postoperative A-a gradient (P = 0.022) and higher PaCO₂ (P = 0.001) versus dogs receiving an intercostal thoracotomy approach. Survival times, or times at last follow-up, ranged from 2 days to 7 years (dogs) and from 1 to 1.6 years (cats).

Conclusions and Clinical Relevance – Dogs and cats can demonstrate reasonable respiratory function immediately postoperatively, and can have acceptable long-term survival, for a variety of pulmonary diseases following pneumonectomy.
SERUM TRIGLYCERIDE CONCENTRATIONS IN NEONATAL FOALS: SERIAL MEASUREMENTS AND EFFECTS OF AGE AND ILLNESS. E. Berryhill, DVM, WR Pritchard Veterinary Medical Teaching Hospital; KG Magdesian, DVM, DACVIM, DACVECC, DACVCP, Department of Medicine and Epidemiology; JE Edman, BS, Department of Medicine and Epidemiology, School of Veterinary Medicine, University of California, Davis.

Objective – To compare serum triglyceride concentrations of healthy neonatal foals, their dams, and sick foals.

Design – Prospective study.

Animals – Seven healthy mare foal pairs. Forty nine sick foals.

Procedures - Serial serum samples were obtained from healthy foals and mares pre-suckle, immediately post-suckle, and at 12 hours, 1-2 days and 10-12 days of age and analyzed for triglyceride concentrations. Triglyceride concentrations obtained from sick foals were divided into groups based on age at collection; <1 day, 1-7 days and 8-12 days.

Results – There were no significant differences in triglyceride concentrations between foals ≤12 hours old and their dams. Foals 1-2 and 10-12 days old had higher triglycerides than postpartum foals and dams (P<0.001). Foals 1-2 days old had the highest triglyceride concentrations (median 89 mg/dl; P<0.001). Older sick foals 1-7 and 8-12 days old had higher triglycerides than sick foals <1 day old (medians 97, 108, 45 mg/dl; P=0.0001). Nonsurvivors had higher triglycerides than survivors overall (medians 116, 55 mg/dl; P<0.04). Sick foals 8-12 days old had higher triglycerides than similarly aged healthy foals (medians 108, 60 mg/dl; P<0.004).

Conclusions and Clinical Relevance – Serum triglycerides in healthy foals 1-2 and 10-12 days old are higher than those in healthy mares and early postpartum neonates, with highest concentrations at 1-2 days of age. Triglycerides in 8-12 day old sick foals are higher than those in healthy foals and are highest in nonsurvivors. Age-specific references for triglycerides should be used in foals, increased triglycerides in sick foals have prognostic value.
Objectives - To establish a potential relationship between cardiac troponin I (cTnI), ultrasound findings and indication for surgical intervention in foals with rib fractures.

Design – Prospective clinical study

Animals – 36 healthy and 48 hospitalized Thoroughbred foals, the latter including 40 with rib fractures and 8 without. Of the foals with rib fractures, 20 had concurrent systemic disease and 20 did not. Surgical stabilization was performed in 12 cases and the remaining 28 were managed medically.

Procedures – Blood samples were collected from 0-48 hour-old foals. Rib fractures were diagnosed with ultrasound. Foals were managed surgically or medically based on criteria determined by the clinicians, such as location and number of fractures.

Results – There were no significant differences in cTnI between foals with or without rib fractures (both medians = 0.08 ng/mL), nor between those treated by surgical stabilization (median = 0.07 ng/mL) and those managed medically (median = 0.08 ng/mL). There was also no significant difference between sick and otherwise healthy foals with rib fractures. cTnI was significantly higher on day 1 in non-survivors. Mortality for foals with rib fractures was 10%.

Conclusions and Clinical Relevance – cTnI was not a specific indicator of rib fractures in this study, but may be prognostic in sick foals in general. This may be due to a low rate of myocardial injury in this study. The mortality rate for foals with rib fractures was lower than previously reported. Potential reasons for the low mortality include increased awareness, earlier identification, or improved management of rib fractures.
A NOVEL ULTRASONOGRAPHIC ASSISTED TECHNIQUE FOR DESMOTOMY OF THE PALMAR/PLANTAR ANNULAR LIGAMENT IN HORSES. P. Espinosa, DVM. WR Pritchard Veterinary Medical Teaching Hospital. JE Nieto, DVM, PhD, DACVS; LD Galuppo, DVM, DACVS; S Katzman, DVM, DACVS. Department of Surgical and Radiological Sciences, School of Veterinary Medicine, University of California, Davis.

Objectives: To describe an ultrasound assisted technique for desmotomy of the palmar/plantar annular ligament (PAL), and to determine the effectiveness and intraoperative complications associated with the procedure.

Design: Cadaveric and in-vivo study.

Animals: Cadaveric horses (n=6), adult horses (n=4), and one clinical case.

Methods: Ultrasound assisted desmotomy of the palmar/plantar annular ligament (UAD-PAL) was performed in 6 cadaveric horses (6 forelimbs, 6 hindlimbs), 4 standing horses (4 forelimbs, 4 hindlimbs) immediately prior to euthanasia and one clinical case (hindlimb). A custom made hook knife was manufactured for the procedure. Complete transection was confirmed by postmortem dissection (10 forelimbs, 10 hindlimbs) and by tenoscopic examination (1 hindlimb). Volume of saline used to adequately distend the digital flexor tendon sheath (DFTS), thickness of PAL, surgery time, other intra-operative parameters and complications were recorded.

Results: Complete PAL transection was accomplished in 19/21 limbs. No iatrogenic damage to adjacent intrathecal structures was identified in any case. Correct positioning of the hook knife on the first attempt was achieved in 18/21 cases. The most common intraoperative complication was inadvertent subcutaneous placement of the hook (n=2). In the clinical case, UAD-PAL was performed under general anesthesia and followed by tenoscopic examination of the DFTS that confirmed complete transection of the PAL.

Conclusion and Clinical relevance: UAD-PAL using the hook knife was shown to be an effective method of PAL transection, and was associated with minimal intra-operative complications. The procedure can be easily performed in the standing sedated horse. In cases where thickening of the PAL is identified on ultrasonographic examination other methods should be considered for transection of the PAL.
PRELIMINARY EVALUATION OF THE EFFECT OF ACUPUNCTURE ON ACOUSTIC MYOGRAPHIC RECORDINGS OF THE MIDDLE GLUTEAL MUSCLE IN 5 SPORT HORSES. E. Millares, DVM, WR Pritchard Veterinary Medical Teaching Hospital; S Le Jeune DVM, DACVS, DECVS, DACVSMR, CVA, CertVetChiro, Department of Surgical & Radiological Science, School of Veterinary Medicine, University of California, Davis.

Objective- To assess the effect of acupuncture on acoustic myography of the middle gluteal muscle in healthy horses.

Design- Prospective controlled experimental study.

Animals- Warmblood Show Jumping horses (n=5)

Methods- Acoustic myographic sensors were placed on the surface of the right and left middle gluteal muscles. Recordings were taken while the horse was walked and trotted in hand, in a straight line, before and after acupuncture treatment, at 48 hours and at one week. Paired Wilcoxon signed rank test was used to analyze the data (p <0.025). Gait abnormalities and sensitivity at routine acupuncture points were recorded at each session.

Results- All horses tolerated the procedure well and did not exhibit any signs of lameness at any time. Sensitivity at acupuncture points was present initially in 3 horses and was abolished immediately after acupuncture in all of them. No significant difference between acoustic myographic values recorded before and after acupuncture treatments could be detected at any time point, although a tendency to significance was observed at one week after acupuncture treatment (p <0.0313) in the temporal variable recorded, suggesting a greater speed of activation of muscle fibers.

Conclusions- Acoustic myography is a non-invasive technique, which is well tolerated and easily performed in a routine clinical setting. This small pilot study could not identify any statistically significant changes in acoustic myographic data after acupuncture treatment at any time points in non-lame horses. Further studies could be performed in a greater number of horses and potentially in lame horses to evaluate this further.
Objective - To characterize a clinical syndrome of hemorrhagic cystitis in horses.

Design - Retrospective case series.

Animals - 9 horses.

Procedures - A search of the medical record database (2004-2015) was performed for horses with selection criteria for hemorrhagic cystitis: hematuria and endoscopic evidence of cystitis. Data collected included: signalment, presenting complaint, duration of signs, physical examination, clinicopathologic data, ultrasound examination and biopsy findings, treatment, and outcome.

Results - Hemorrhagic cystitis was identified in 9 horses, all males. Male horses were overrepresented compared to the hospital population (P = 0.03, OR 13.5 [0.78-23.16]). All horses had a history of gross hematuria, confirmed by urinalysis. Cystoscopy revealed apically oriented, raised, hemorrhagic lesions of the bladder mucosa. Bladder wall hemorrhage with neutrophilic infiltration (n=4) was the most common histopathologic finding, but one horse each had findings consistent with transitional cell dysplasia or suspected transitional cell carcinoma. All horses were treated with trimethoprim sulfa and 7 returned for follow up cystoscopy. Median days to cystoscopic resolution was 43. Lesions and hematuria resolved in all cases, and horses returned to their previous function.

Conclusions and Clinical Relevance - Equine hemorrhagic cystitis has not been previously described. All affected horses were male. While some histologic lesions had dysplastic or neoplastic features, all affected horses responded rapidly to therapy with resolution of lesions. These findings make this an important differential diagnosis to consider when bladder neoplasia is suspected grossly or histologically in horses with hematuria, especially given the difference in prognosis.
ASSESSMENT OF A COMMERCIAL STALL-SIDE TEST AND ANALYZER FOR THE MEASUREMENT OF EQUINE SERUM AMYLOID A. F. Wensley, BVM&S, WR Pritchard Veterinary Medical Teaching Hospital; N Pusterla, DrMedVeT, MedVet, PhD, DACVIM, Department of Medicine & Epidemiology; D Carrade-Holt, PhD and J Burges, MS, WR Pritchard Veterinary Medical Teaching Hospital; P Kass, DVM, MPVM, MS, PhD, Department of Population Health & Reproduction; K James, MPH, PhD, Student of Epidemiology School of Veterinary Medicine and School of Medicine, University of California, Davis.

Objective: Determine correlations of serum amyloid A (SAA) with plasma fibrinogen, total leukocyte count and neutrophil count with selected clinical parameters to better define inflammatory infectious and non-infectious disorders.

Design: Retrospective case-control study

Animals: 314 horses with submitted complete blood count panels

Procedures: A ‘stall side’ SAA ELISA was performed alongside each complete blood count on whole blood from equine patients at the VMTH. Based on clinical parameters horses were divided into five groups: healthy, healthy recently vaccinated, inflammatory of non-infectious origin, inflammatory of confirmed or suspected infectious origin, and non-healthy, non-inflammatory horses. Clinicopathological data was compared between groups, as well as historic anti-inflammatory and antimicrobial treatments.

Results: Horses with inflammation of an infectious origin had higher SAA values, median 181µg /ml, than those with inflammation of non-infectious origin, median 9.5µg /ml. Horses with recent pyrexia (>101.5 °F) had elevated SAA concentrations, with peak values ranging from 184 µg/ml to 2,181 µg/mL (ref. range 0-20µg /ml). Perioperative increases in SAA were not consistently reflected by hyperfibrinogenemia, pyrexia and leukocyte abnormalities. Recent vaccination of healthy horses (n=10) showed elevations of SAA concentrations, with a median SAA of 550µg /ml.

Conclusions and Clinical Relevance: SAA is a sensitive predictor of early inflammation, however SAA alone is not always a reliable assessment of inflammatory or infectious disease status.
L Vanslambrouck, DVM, WR Pritchard Veterinary Medical Teaching Hospital; MB Whitcomb, DVM MBA, B Vaughan, DVM and LD Galuppo, DVM DACVS; Department of Surgical & Radiological Sciences, School of Veterinary Medicine, University of California, Davis.

Objective- To describe the clinical and ultrasonographic features of carpal collateral ligament (CL) injuries in horses.

Design- Retrospective case series

Animals- 20 horses

Procedures- Medical records were reviewed from 2000-2015. Horses with ultrasonographic evidence of carpal CL injury were included.

Results- Carpal CL injuries were diagnosed in 20 horses, including 14 pleasure or retired horses. Median age was 16 years (range=2-26y). All but two horses had acute onset of clinical signs due to trauma (7), anesthetic recovery (6) or unknown inciting events. Horses were presented from 0-335 days (median=25d) post injury. Clinical findings included carpal swelling (19), lameness at the walk (10), varus deformity (3) and palpable joint instability (3). Injuries involved the MCL (18) and LCL (4). Two horses had biaxial injuries. Ultrasonographic lesions were graded as mild (2), moderate (4) and severe (16). CL ruptures were seen in 10 horses, most often involving the MCL insertion (8/10). Abaxial tearing of the proximal MCL was seen in 8/11 horses with injury at this location. Radiographs revealed avulsion fractures (11), osteoarthritis (11) and joint instability in 4/5 horses that underwent stressed projections. Carpal arthroscopy and standing removal of an avulsion fragment were performed in one horse each. Only one horse was euthanized for unrelated reasons. Remaining horses were treated with stall confinement, bandaging or splinting.

Conclusions and Clinical Relevance- Ultrasound documented the extent and severity of carpal CL injuries and may be preferable to stress radiography. MCL injuries appear to be more frequent than LCL injuries and can result in the development of carpal varus deformity.
EXTENSION OF ANIONIC DIET INTO THE FIRST THREE DAYS OF LACTATION AND ITS EFFECT ON CALCIUM STATUS IN POSTPARTUM DAIRY CATTLE.

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Objective – To determine the effect on blood calcium levels of extending the anionic diet of prepartum dairy cattle into the first 3 days of lactation using magnesium chloride hexahydrate.

Design – Randomized clinical trial.

Animals – 27 Adult Holstein cows (second lactation or higher) at a commercial dairy, divided into 13 treatment and 14 controls cows at calving.

Procedure – Treatment cows received 480 g oral magnesium chloride hexahydrate once daily for three days at parturition for acidification. Urine pH was measured daily for 5 days following parturition and blood was collected on day of calving, day 2 and day 4 post-calving and analyzed for ionized calcium levels. Data was analyzed using longitudinal data analysis with the PROC MIXED procedure in SAS®.

Results – Urine pH was significantly lower in treatment than control cows on days 1-4 post calving. Blood ionized calcium levels were significantly different between measurements on day 2 and 4 post calving compared to baseline but not between treatment and control groups.

Conclusion and Clinical Relevance – Oral supplementation with magnesium chloride hexahydrate resulted in the desired acidification of urine pH in the treatment group mimicking the feeding of an anionic close-up diet. Since no difference in ionized calcium levels were observed between treatment and control cows, the extension of DCAD into lactation may not represent an advantage over the current practice of discontinuing DCAD at the time of calving.
EFFICACY AND PHARMACOKINETICS OF INTRAVENOUS FAMOTIDINE IN ADULT CATTLE.
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Objective – To describe the pharmacokinetics of intravenous famotidine, and evaluate its effects on abomasal pH following administration of a single dose, or multiple doses to adult cattle.

Design – Random two-way crossover study

Animals – Four healthy, adult Angus steers with previously placed duodenal cannula located orad to the bile and pancreatic ducts.

Procedures – Treatment 1: Either 0.4 mg/kg famotidine or equivalent volume of normal saline administered IV once. Treatment 2: Either 0.4 mg/kg famotidine or equivalent volume of normal saline was administered IV every 8 hours. Whole blood and abomasal outflow samples were obtained at intervals over a 12-hour period for Treatment 1 and a 24-hour period for Treatment 2. Each steer underwent each treatment with a 24-hour washout period between. Abomasal outflow pH was determined with a bench-top pH meter and serum samples were submitted for determination of famotidine concentration.

Results – Treatment 1 increased abomasal outflow pH compared to the control for up to 4 hours after administration ($P<0.05$). Multiple doses resulted in increased abomasal pH, but the effect decreased over time. Famotidine terminal half-life (median (range)) was 3.33 (3.21-3.54) hr, volume of distribution 0.042 (0.014-1.89) L/kg, and clearance was 1.26 (0.625-11.5 mL/min/kg).

Conclusions and Clinical Relevance – Famotidine, administered at 0.4 mg/kg IV, significantly increased abomasal pH for up to 4 hours, but the effect was reduced with multiple doses. This may be due to tachyphylaxis or physiologic compensatory mechanism. Famotidine may be an effective treatment for abomasal ulceration in adult cattle. Further study of appropriate dosing frequency is needed.
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FRACTURE OF THE TEMPORAL BONE ASSOCIATED WITH TEMPOROHYOID OSTEOARTHROPATHY IN THE HORSE. 1, 2, 3 Tanner, DVM, MS1, M Spriet, DVM, MS2, P Espinosa, DVM1, K Estell, DVM3 & M Aleman MVZ Cert., PhD3. 1WR Pritchard Veterinary Medical Teaching Hospital, 2Department of Surgical & Radiological Sciences, 3Department of Medicine and Epidemiology, School of Veterinary Medicine, University of California, Davis.

Objective – To describe the computed tomographic (CT) features of temporal bone fractures in horses with temporohyoid osteoarthropathy (THO).
Design – Retrospective cross-sectional analytical study.
Animals – 39 horses.
Procedures – Skull CT images of 39 horses presented for or diagnosed with THO were evaluated for temporal bone fractures using multiplanar reconstruction. The severity of THO was graded based on the extent of surrounding new bone formation. Fusion of the temporohyoid joint was noted when present. Patient medical records were reviewed for signalment, presenting complaint, CSF analysis, and neurological examination findings.
Results – Sixteen temporal bone fractures were identified in 16 of 39 horses. Nine of these fractures were not described in the patients’ original CT reports. All fractures were minimally displaced and extended through the temporal bone in a rostrodorsal to caudoventral orientation. Two fracture configurations were identified: seven fractures extended the full width of the petrous pyramid into the cranial vault and nine fractures only extended through the lateral part of the petrous temporal bone, not involving the cranial vault. Temporal bone fracture was significantly associated with fusion of the temporohyoid joint ($P<0.0001$) and higher grade of THO ($P<0.0001$). Horses with fractures were significantly younger than horses without fractures ($P=0.0255$), and Quarter Horses were over-represented in the fractured population ($P=0.0077$). All horses with fractures had ipsilateral neurologic deficits.
Conclusions and Clinical Relevance – Temporal bone fractures are likely under-diagnosed in patients with THO due to complex regional anatomy and minimal displacement. These fractures occur with predictable configurations identifiable using CT and multiplanar reconstruction.
EVALUATION OF THE EFFECTS OF 4.7MG DESLORELIN ACETATE IMPLANTS ON EGG LAYING IN COCKATIELS (NYMPHICUS HOLLANDICUS). NM. Summa, DVM, IPSAV, WR Pritchard Veterinary Medical Teaching Hospital; D Sanchez-Migallon Guzman, LV, MS, Dip. ECZM (Avian, Small Mammal), DACZM, Department of Medicine and Epidemiology; KC Klasing, MS, PhD; E Wils-Plotz, PhD, and Nerisa E. Riedl, Department of Animal Science; PH Kass, DVM, PhD, DACVPM (Epidemiology), Department of Population Health and Reproduction; MG Hawkins, VMD, Dip. ABVP (Avian), Department of Medicine and Epidemiology, School of Veterinary Medicine, University of California, Davis.

Objective—To evaluate the effects of 4.7 mg deslorelin acetate implants on egg laying in healthy cockatiels (*Nymphicus hollandicus*).

Design—Randomized controlled study

Animals—Fifty-two cockatiels (1:1 male/female ratio)

Procedures—Twenty-six breeding pairs were first selected from a colony based on previous egg laying. The females of the selected pairs received either a 4.7mg deslorelin acetate implant (n=13) or a placebo implant (n=13) SC between the scapulas. Male and female birds from breeding pairs were placed individually in cages next to each other. Following the implant placement, the birds were housed in a 16:8 light:dark cycle with nest boxes to stimulate reproductive activity. Egg production and quality were monitored daily over 365 days.

Results—Deslorelin acetate implants significantly increased the latency of egg laying compared to placebo implants in cockatiels (*P* < 0.001). Eleven out of 13 placebo implanted birds laid eggs between 12 and 42 days following implantation, with a median of 19 days. None of the deslorelin implanted birds laid eggs within the first 6 months of the study and only 5/13 deslorelin implanted birds laid their first egg between 192 and 230 days following implant placement. No difference in egg shape, color, consistency or number of eggs per clutch was observed between the 2 groups.

Conclusions and Clinical Relevance—The 4.7mg deslorelin acetate implant suppresses egg laying in healthy cockatiels for at least 6 months. Further studies to evaluate the effect of a similar implant in other avian species or in association with reproductive disorders are necessary.
G.G. Comet Riggs, DVM

2007       BS, Animal Science, University of California, Davis
2012       DVM, University of California, Davis
2013       Rotating Small Animal Internship, PetCare Veterinary Hospital, Santa Rosa, CA
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CLINICAL APPLICATION OF CONE-BEAM COMPUTED TOMOGRAPHY IN RABBITS: PART 1 NORMAL ANATOMY.  GGC Riggs, DVM, WR Pritchard Veterinary Medical Teaching Hospital; FJM Verstraete, DrMedVet, BVSc (Hons), MMedVet, DAVDC, DECVS, DEVDC, Surgical and Radiological Sciences; D Hatcher, DDS, MSc, DDI imaging Center, Sacramento; DD Cissell, DVM, PhD, Surgical and Radiological Sciences; PH Kass, BS, DVM, MPVM, MS, PhD, Population Health and Reproduction; A Zhen, Surgical and Radiological Sciences; B Arzi, Surgical and Radiological Sciences, School of Veterinary Medicine, University of California, Davis.

Objective—Describe the anatomic features of the dentition and surrounding maxillofacial structures in healthy rabbits by means of cone-beam computed tomography (CBCT) and conventional computed tomography (CT).

Design—Ex vivo study.

Animals—10 rabbit cadaver heads.

Procedures—Cadaver heads were scanned using CBCT and conventional CT. Images were evaluated using Anatomage Invivo5 software.

Results—Gross bony anatomy was more easily identifiable on CBCT images than on conventional CT. The average tooth widths of the R+LmaxI2 and R+LmaxI3 were 1.29 mm and 1.05 mm respectively. Thin teeth can be missed on conventional CT due to relatively large slice thickness (>0.6 mm) and are more visible on CBCT with smaller slice thickness (>0.15 mm). The previously established method of drawing occlusal lines on rabbit skull radiographs, proved useful for evaluation of the location of the dentition in relation to the maxillofacial anatomy on CBCT images. In contrast to previous publications, the R+LmaxP4-M1 germinal centers were found to go above the occlusal line in healthy rabbit skull. When evaluating clarity of the pulp cavity, ability to identify a tooth, and visibility of the germinal centers, CBCT images were significantly superior to conventional CT images (P-value < 0.05).

Conclusions and Clinical Relevance—CBCT is superior to conventional CT when imaging the dentition and bony maxillofacial structures of the rabbit. An overall spatial understanding of the anatomy is better achieved with the ability to manipulate the CT data in tridimensional reconstructions, section views, and panoramic views using the above-mentioned software.
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CLINICAL APPLICATION OF CONE-BEAM COMPUTED TOMOGRAPHY IN RABBITS: PART 2 DENTAL DISEASE. GGC Riggs, DVM, WR Pritchard Veterinary Medical Teaching Hospital; FJM Verstraete, DrMedVet, BVSc (Hons), MMedVet, DAVDC, DECVS, DEVDC, Surgical and Radiological Sciences; D Hatcher, DDS, MSc, DDI Imaging Center, Sacramento; DD Cissell, DVM, PhD, Surgical and Radiological Sciences,; PH Kass, BS, DVM, MPVM, MS, PhD, Population Health and Reproduction; A Zhen, Surgical and Radiological Sciences; B Arzi, Surgical and Radiological Sciences, School of Veterinary Medicine, University of California, Davis.

Objective— Describe the cone-beam computed tomography (CBCT) features of the dentition and maxillofacial structures in rabbits with dental disease.

Design—Prospective case series.

Animals—15 rabbits.

Procedures— Client-owned rabbits had CBCT performed under general anesthesia and were treated accordingly for their dental disease. Images were evaluated using Anatomage Invivo5 and eFilm Workstation 3.4 software.

Results—The previously established method of drawing occlusal lines on rabbit skull radiographs, proved useful for evaluation of coronal and apical tooth elongation and occlusion on CBCT images. The panoramic view can give the clinician an overview of the severity of the dental disease and serve as a guide for the spatial relationship of the teeth and the maxillofacial structures. A variety of dental disorders were observed such as apical and coronal elongation, inflammatory resorption, periapical abscessation, osteomyelitis, incisor, premolar and molar teeth malocclusion, fractured teeth, missing teeth, supernumerary teeth, alveolar bulla destruction, and bony changes to the ventral mandibular border. The combination of all imaging manipulations (panoramic view, tridimensional reconstruction, dorsal, axial, and sagittal sections) allowed for precise evaluation of the teeth.

Conclusions and Clinical Relevance—This study provides the baseline for introducing CBCT for clinical use in rabbits and demonstrates the feasibility and yield of this technology to diagnose and plan treatment in dental disorders in this species.