

American Society for Veterinary Clinical Pathology (ASVCP) 42nd Annual Meeting

In conjunction with the American College of Veterinary Pathologists (ACVP) 58th Annual Meeting

Savannah, Georgia – November 10–14, 2007

Oral Platform Presentations

*Indicates competitors for the ASVCP Young Investigator Award

1

IRON DEFICIENCY IN RACING SLED DOGS. **A. Bohn, C. Kenyon.** Department of Microbiology, Immunology and Pathology, Colorado State University, Fort Collins, CO, USA.

In human athletes, iron deficiency is common and studies show that athletic strength is directly related to iron levels; a strong positive correlation between the intensity of endurance training and degree of iron deficiency is apparent. Determining if iron deficiency is present in animal athletes is important because iron deficiency can have a detrimental impact on animal well-being and performance and is an easily reversible condition. We collected blood from 114 dogs that dropped out of or finished the 2007 Iditarod Trail Sled Dog Race and measured PCV and serum total protein, iron, and ferritin concentrations and total iron binding capacity (TIBC). Serum ceruloplasmin concentration was also measured to help determine the presence of inflammation which can influence iron parameters and only 5 dogs had increased levels. There was a greater decrease in PCV than serum protein when compared with pre-race samples. Ferritin was below the reference interval in 5 dogs, TIBC was elevated in 21 dogs, and iron was decreased in 3 dogs. Only one dog had both decreased ferritin and increased TIBC. This study suggests that iron deficiency may be present at a low incidence in racing sled dogs. Further investigation is warranted to further define the incidence of iron deficiency in racing sled dogs and determine the degree of iron loss, exact mechanisms of iron loss, and effects of iron supplementation.

2

*EVALUATION OF THE PRESENCE OF MYELIN-LIKE MATERIAL IN THE CEREBROSPINAL FLUID OF DOGS: A RETROSPECTIVE STUDY. **S.M. Zabolotzky, K.M. Vernau, P.H. Kass, W. Vernau.** School of Veterinary Medicine, University of California, Davis, CA, USA.

Background: Cerebrospinal fluid (CSF) analysis is an integral part of the evaluation of canine patients with neurologic disease. Myelin-like material is infrequently reported in canine CSF specimens and

has been attributed to demyelinating conditions. However, we have noted myelin-like material frequently in lumbar CSF, apparently unassociated with demyelinating diseases or a poorer outcome. **Objectives:** To evaluate the factors associated with, and the significance of, myelin-like material in CSF specimens from dogs with neurologic disease. **Methods:** Ninety-eight CSF cytology specimens were evaluated retrospectively via light microscopy for the presence of extracellular myelin-like material. CSF slides were examined without knowledge of clinical information or site of collection. A grading system was developed to assess the amount of myelin-like material present on each slide. Patient records were then reviewed for the signalment, body weight, site of collection, clinical diagnosis, and outcome. **Results:** Fifty-one CSF samples were collected from the cerebromedullary cistern and 47 were collected from the lumbar cistern. Myelin-like material was more common in lumbar CSF than cisternal CSF ($p=0.0028$) and in the CSF collected from dogs less than 10 kg ($p=0.0052$). The underlying disease process was not associated with the presence of myelin-like material, but increased amounts of myelin-like material were present in the CSF from dogs with disc disease ($p=0.045$). Outcome was marginally worse in patients with myelin-like material in their CSF ($p=0.013$). **Conclusions:** Identification of myelin-like material in the CSF of dogs is site-dependent (possibly collection method-related) and size-associated, but unassociated with demyelinating disease. There is minimal negative prognostic value in finding myelin-like material extracellularly in the CSF of dogs.

3

*PHENOTYPIC AND FUNCTIONAL CHARACTERIZATION OF CANINE BONE MARROW DERIVED CULTURED MAST CELLS. **T-Y. Lin, L.J. Rush, C.A. London.** Dept. of Veterinary Biosciences Sciences, The Ohio State University, Columbus, OH, USA.

Relatively little is known regarding the basic biologic properties of normal canine mast cells, largely due to the difficulty in reliably purifying large numbers from canine skin. We developed a protocol to generate canine bone marrow-derived cultured mast cells (BMCMCs) from purified CD34+ bone marrow cells. After 5–7 weeks of culture with recombinant canine stem cell factor (rcSCF), over 90% of the cells consisted of mast cells as evidenced by staining with Wright's Giemsa and production of chymase, tryptase, IL-8 and MCP1. These cells expressed Kit, Fc{epsilon}RI, CD44, CD45 and CD18/CD11b, were dependent on rcSCF for survival and

proliferation, and migrated in response to rSCF gradients. Cross-linking of cell surface-bound IgE induced the release of histamine, TNF-alpha, IL-6, MCP-1 and TGF-beta 1. Histamine release was also stimulated by ConA, compound 48/80 and calcium ionophore. Both IL-4 and IL-10 promoted canine BMCMC proliferation, possibly through upregulation of Kit expression, while TGF-beta 1 inhibited proliferation. Canine BMCMCs produced a variety of cytokines and chemokines in response to IgE cross-linking/chemical stimulation including IL-3, IL-4, IL-13, GM-CSF, RANTES, and MIP1-alpha. Interestingly, canine BMCMCs released significantly larger amounts of MCP-1 and tryptase and significantly smaller amounts of IL-6 following chemical stimulation and IgE cross-linking when compared with murine BMCMCs. Lastly, canine BMCMCs produced larger quantities of active MMP9 than their murine counterparts. In summary, canine BMCMCs exhibit unique functional properties that distinguish them from murine BMCMCs and provide insight into the contribution of these cells to mast cell disorders in the dog.

4

USE OF PROTEOMICS TO IDENTIFY NOVEL OR PRACTICAL URINE PROTEINS FOR DETECTING AND MONITORING DECLINING RENAL FUNCTION IN A RAT MODEL OF AUTOSOMAL DOMINANT POLYCYSTIC KIDNEY DISEASE. **C. Wiedmeyer, A. Royal.** Department of Veterinary Pathobiology, College of Veterinary Medicine, University of Missouri at Columbia, Columbia, MO, USA.

Autosomal Dominant Polycystic Kidney Disease (ADPKD) is the most common hereditary renal disease in humans characterized by multi-focal, progressively enlarging, fluid-filled renal cysts. Approximately 50% of patients with ADPKD will eventually develop end-stage renal failure. Techniques for early detection or monitoring the progression of declining renal function associated with the disease are not well defined. Current methods utilize advanced imaging technology (i.e., MRI) and measurement of glomerular filtration rate (GFR). MRI provides a useful visual record of renal cyst progression and has been shown to correlate with renal function. However, this technique requires specialized equipment and expertise. The measurement of GFR, while technically simple, has shown to be insufficient for the assessment of early renal functional changes and may not be adequate for use in all ADPKD patients. The goal of this study was to identify unique or practical urine proteins that may be used to develop assays for characterizing or monitoring renal function in patients with ADPKD. This study was performed using a well established rat model for ADPKD, the Han:SPRD rat, and urine proteomic analysis. Heterozygote (cy/+) Han:SPRD rats have been shown to closely mimic the progression of cyst development and renal failure in humans. Urine was collected from 20-week-old wild type (+/+) and cy/+ rats and pooled for proteomic analysis. Proteomic analysis of the pooled urine revealed several proteins with a minimum of 10-fold increase (e.g., transferrin, Egf protein) or decrease (e.g., uromodulin, urinary protein-2 precursor) in expression in the cy/+ rats compared with the +/+ rats. In addition, the presence of at least one novel protein was found only in the cy/+ rat urine (i.e., vitamin-D binding protein precursor). This study represents the first step in identifying potential urine biomarkers designed specifically for detecting or monitoring the progression of renal failure in ADPKD.

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*DETERMINING FACTORS IN ENGRAFTMENT AND METASTASIS IN T-CELL LYMPHOID NEOPLASIA CAUSED BY HUMAN T-LYMPHOTROPIC TYPE I VIRUS (HTLV-1). **C. Parrula, B. Zimmerman, M. Lairmore, S. Niewiesk.** Department of Veterinary Biosciences, The Ohio State University, Columbus, OH, USA.

HTLV-I is a deltaretrovirus related to Bovine Leukemia Virus (BLV) and the agent of Adult T-cell leukemia/lymphoma (ATLL). We compared the engraftment of C8166-45 and MT-2 cell lines (transformed by HTLV-I in vitro) and MET-1 cells (derived from an ATLL patient) by inoculating 10^7 cells i.p. into three different immunodeficient strains of mice (n=6 per group): NOD/SCID, NOD/SCID/2m(-/-), and NOD/SCID^c(-/-). C8166-45 did not engraft in any of the mouse strains. MT-2 cells engrafted well in NOD/SCID^c(-/-), the most immunodeficient mouse strain, with a pericapsular pattern of invasion, but produced small tumors in the peritoneal cavity of other strains. MET-1 cells engrafted in all mouse strains with tumor cells present in blood and infiltrating several organs. We next analyzed the expression of factors implicated in tumor invasion and metastasis by determining the expression of two integrins (CD11a and CD49d) and four MMPs (MMP-1, -2, -3, -9). All the cell lines except MT-2 expressed CD11a. C8166-45 did not express CD49d, but the other cell lines did. Met-1 cells strongly expressed MMP-1 and -3 in vitro (by Western blotting) and in vivo (by immunohistochemistry [IHC]), while expression by the other cell lines was very weak. MMP-2 and -9 were not detected in vitro in any cell line, but were detected by IHC in Met-1 tumors, suggesting in vivo induction of MMP-2 and -9 in Met-1 cells. We conclude that the factors most likely responsible for the widespread dissemination of Met-1 cells and establishment of leukemia are the simultaneous expression of CD49d and CD11a, the constitutive expression of MMP-1 and -3, and in vivo induction of MMP-2 and -9.

6

HYPERALKALINE PHOSPHATASEMIA IN SCOTTISH TERRIERS CAUSED BY ATYPICAL ADRENAL CORTICAL DISEASE. **K. Zimmerman¹, D. Panciera², R. Panciera³.** ¹Department of Pathobiology and ²Small Animal Medicine, Virginia Tech, Blacksburg, VA, USA; and ³Department of Pathology, Oklahoma State University, Stillwater, OK, USA.

Hyperalkaline phosphatasemia (HALP) without obvious concurrent disease is a frequent occurrence in Scottish Terriers (ST) leading to speculation of benign hyperalkaline phosphatasemia (BHALP) in this breed. This study investigates if BHALP occurs in ST and to identify biomarker patterns for its recognition. The following data were collected from 34 adult, healthy ST: CBC, bile acids, chemistry, ALP isoenzyme, coagulation, pre- and post-ACTH cortisol (Post-Cort) and other adrenal cortical steroids (OACS; androstenedione, estradiol, progesterone, 17-OH progesterone, and aldosterone), urinalysis, and liver histopathology, cytopathology and copper. Unremarkable ALP activity (N-ALP) was found in 17 dogs (mean 63.8 ± 22 U/L, ref. 13-110) and increased ALP activity (I-ALP) was found in 17 dogs (mean 706 ± 1016 U/L). There was a positive correlation ($r=0.356$, $p=0.039$) between ALP activity and steroid-ALP isoenzyme percentage (S-ALP%). Mean S-ALP percents were different (t-test $p<0.001$) between N-ALP dogs ($17.0 \pm 15.8\%$) and I-ALP dogs ($69.0 \pm 20.7\%$). Post-Cort concentration had a positive correlation ($r=0.337$, $p=0.050$) with ALP activity. Mean Post-Cort values were different (t-test $p<0.001$) between N-ALP dogs (115.1 ± 22 ng/ml) and I-ALP dogs (152.2 ± 27.2 ng/ml). Hyperadrenal cortical activity (HACA), defined by Post-Cort above reference interval (RI), was identified in 6/17 I-ALP dogs. HACA, defined by OACS above RI, was identified in 15/17 N-ALP and 17/17 I-ALP dogs. Some degree of vacuolar hepatopathy was found histologically (4/5) and cytologically (5/5) in N-ALP dogs and in 11/11 I-ALP dogs. More severe vacuolar changes were found in I-ALP dogs (Chi-Sq $p<0.001$). These findings suggest atypical adrenal cortical disease with increased OACS production leading to increased S-ALP% and ALP activity might be a more common cause of HALP than BHALP in ST.

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CONCURRENT INFECTIONS WITH VECTOR-BORNE PATHOGENS ASSOCIATED WITH FATAL ANEMIA IN CATTLE: HEMATOLOGY AND BLOOD CHEMISTRY. **B. Riond¹, M.L. Meli¹, U. Braun², P. Deplazes³, H. Lutz¹, R. Hofmann-Lehmann¹.** ¹Clinical Laboratory, ²Department of Farm Animals, and ³Institute of Parasitology, Vetsuisse Faculty, University of Zurich, Zurich, Switzerland.

An outbreak of a fatal hemolytic anemia in a herd of dairy cattle in Switzerland was shown to be associated with infections with 5 vector-borne pathogens, namely *Anaplasma marginale*, *A. phagocytophilum*, *Babesia bigemina*, a *Theileria* spp belonging to the buffeli/sergenti/orientalis-complex, and hemotrophic *Mycoplasma* spp. The latter three had not been documented previously to this outbreak in Switzerland. Hematological and blood chemical studies in 286 cows from the herd of concern revealed regenerative anemia as the main feature of the disease. The blood was characterized by hypochromic and macrocytic red blood cells, reduced packed cell volume, reduced platelet cell concentration and increased total white cell concentration. In addition, increased serum bilirubin, blood aspartate aminotransferase, gamma glutamyltransferase, glutamic dehydrogenase and blood urea nitrogen and decreased magnesium, calcium and albumin levels were found. Most changes could not be attributed to a single infection. *A. marginale* seemed to be important in causing the outbreak, but coinfections may have aggravated the disease development and clinical signs. Thus, when encountering cattle with hemolytic anemia, all of the mentioned pathogens should be included as differential diagnosis.

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CHANGES IN BOVINE HEMATOLOGY REFERENCE INTERVALS FROM 1965 TO 2001. **J.W. George, V.M. Lane, J.N. Snipes.** School of Veterinary Medicine, UC-Davis, Davis, CA, USA.

In 2001, the UC-Davis Clinical Pathology Laboratory developed bovine hematology reference intervals for the Advia 120 Hematology System based on results from clinically healthy, BLV-negative dairy cows in mid-lactation. They came from herds vaccinated for BVD, IBR, PI3 and BRSV. Erythrocyte, platelet and total leukocyte intervals were derived from Advia results; leukocyte differentials were determined manually. Intervals were determined as the middle 95% of population. Before that time, we used bovine reference intervals published in 1965 in *Veterinary Hematology* by O. W. Schalm. The most marked change was an increase in neutrophil reference interval from 600–4000 to 2300–6800/uL. Lymphocyte concentration decreased from 2500–7500 to 1700–5600/uL. Average N:L ratio was 1.1. The high end of the eosinophil interval decreased from 2400 to 1200/uL. The hemoglobin reference interval decreased slightly from 8.0–15.0 g/dL to 8.4–12.2 g/dL. MCV decreased, while MCHC increased. The platelet reference interval tightened from 100,000–800,00 to 230,000–690,000/uL. Veterinary laboratories were surveyed to determine whether similar changes in reference intervals occurred in other areas. Evidently, neutrophil concentration of healthy dairy cattle increased over 35 years. Three other institutions that established bovine reference intervals around 2001 found similar increased neutrophil reference intervals and similar decreased eosinophil intervals. Use of BLV-negative cattle produced lower lymphocyte intervals than from populations not screened for BLV. As of 2007, the Schalm reference intervals are still used extensively by laboratories and cited in textbooks. Their continued use may cause under-identification of neutropenia and eosinophilia, and overcalling neutrophilia. This study shows the importance frequent re-evaluation of reference intervals, not only due to instrumentation changes, but also changes in reference populations.

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*CANCER-RELATED ANEMIA IN DOGS: A RETROSPECTIVE STUDY OF DOGS WITH LYMPHOMA AND OSTEOSARCOMA. **A. Miller¹, A. Avery¹, S. Lana², C. Olver¹.** ¹Department of Microbiology, Immunology and Pathology and ²Department of Clinical Sciences, Colorado State University, Fort Collins, CO, USA.

Anemia is a common complication in human patients with neoplasia and has been associated with decreased survival time and decreased quality of life. We hypothesized that anemia exists in canine cancer patients, affects both survival and remission times, and is more common in dogs with hematopoietic tumors. Medical records were reviewed for 84 dogs with lymphoma and 91 dogs with osteosarcoma that were enrolled in separate studies at Colorado State University. Kaplan-Meier survival and remission time curves for anemic and non-anemic dogs were compared by the Log-rank test at the time of diagnosis of neoplasia, during treatment, and at follow-up. Results confirm that cancer-related anemia occurs in dogs with lymphoma and osteosarcoma in the pre-treatment, treatment, and follow-up periods. Anemic dogs with osteosarcoma did not have decreased survival or remission time. In contrast, pre-treatment anemia was associated with a statistically significant decreased median survival time in dogs with lymphoma. This difference in median survival time was most profound in patients with stages three and four lymphoma and with a packed cell volume of less than thirty-five percent. Decreased remission time for anemic dogs with lymphoma approached statistical significance. Shortened survival and remission time in canine lymphoma patients with pre-treatment anemia has important prognostic significance, and understanding cancer-related anemia in dogs may offer new opportunities to improve quality of life and survival time in these patients.

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MICROCYTIC HYPOCHROMIC ERYTHROCYTES CONTAINING SIDEROtic INCLUSIONS, HEINZ BODIES, AND HEMOGLOBIN CRYSTALS IN A DOG. **J.W. Harvey¹, W.L. Clapp¹, Y. Yao², G.D. EfreMOV³.** ¹University of Florida, Gainesville, FL, USA; ²The Children's Hospital of Philadelphia, Philadelphia, PA, USA; and ³Macedonian Academy of Sciences and Arts, Republic of Macedonia.

We examined blood from a 3-year-old male English bulldog with erythrocyte abnormalities recognized over the previous 20 months. Consistent abnormalities identified during the next 23 months included microcytic (MCV, 52 fL–60 fL) hypochromic (MCHC, 29 g/dL–33 g/dL) erythrocytes, normal hematocrits (39%–45%), and reticulocytosis (257,000/uL–583,000/uL). The reticulocyte stain also revealed Heinz bodies (5%–16%). Wright-Giemsa-stained blood films revealed increased polychromasia, hypochromasia, and poikilocytosis; frequent siderocytes; and occasional hemoglobin crystals. Transmission electron microscopy of erythrocytes revealed electron dense material in reticulocyte mitochondria, believed to represent iron accumulation; hemoglobin crystals; and loose aggregates of material, consistent with precipitated hemoglobin. Erythrocyte glucose-6-phosphate dehydrogenase, 6-phosphogluconate dehydrogenase, glutathione reductase, and cytochrome b5 reductase enzyme activities were increased, consistent with reticulocytosis. Erythrocyte reduced glutathione concentration was normal, but methemoglobin (1.6%–1.9%) was slightly increased. Persistent microcytosis suggested a defect in either heme or globin synthesis. Hemoglobin protein analyses, including in vitro globin chain synthesis, and analyses of erythrocyte membrane proteins were normal. Alpha hemoglobin stabilizing protein (AHSP) gene sequences were normal. A urine porphyrin screen was slightly positive and serum iron was increased. Blood lead and

serum copper, zinc, and ferritin concentrations were normal, as was a screening test for pyridoxine deficiency. Our findings suggest a mitochondrial defect with iron overload and injury to this organelle. We speculate that this results in increased reactive oxygen species that damage hemoglobin and possibly erythrocyte membranes. Further study of this animal could reveal new insights into the mechanisms of mitochondrial iron uptake and metabolism.

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*CLONING AND SEQUENCING OF CANINE THROMBOPOIETIN IN cDNA. **C. Bulla¹, R.K. Takahira², J.P. Araujo, Jr.³, P. Venta⁴, M.A. Scott¹.** ¹Department of Pathobiology and Diagnostic Investigation, Michigan State University, East Lansing, MI, USA; ²Departamento de Clínica Veterinária, Faculdade de Medicina Veterinária e Zootecnia, Unesp at Botucatu, Brazil; ³Departamento de Microbiologia e Imunologia Instituto de Bociências, Unesp at Botucatu, Brazil; and ⁴Department of Small Animal Clinical Sciences, Michigan State University, East Lansing, MI, USA.

Thrombocytopenia is a very common state in dogs. Severe thrombocytopenia is life-threatening and must be managed by treating the underlying condition to achieve transient improvements in hemostasis. Thrombopoietin (TPO) has been shown to increase platelet production and megakaryocyte differentiation, proliferation, and maturation. Human plasma TPO concentrations have been measured as an indicator of platelet production status. The objective of this work was to clone and sequence canine TPO in order to generate recombinant canine TPO for diagnostic assays and therapeutic in vivo use. Canine TPO was amplified by PCR from canine hepatic and renal cDNA libraries, cloned, and sequenced. The primers were obtained by comparison of the TPO sequences from other animals (feline, human, rat, and mouse) to the data bank of the canine genome. The obtained TPO sequence was compared with sequences from the dog genome, and the predicted TPO protein sequence was compared with previously published data. The canine TPO cDNA sequence consisted of 1,059 base pairs. The predicted protein differed from the published one by one amino acid, but the cDNA sequence agreed with the available canine genome sequence and filled in a large gap of 427 bp in the known canine genome. This is the first description of the entire canine TPO coding sequence. Recombinant canine TPO (rcTPO) should be useful for development of a canine TPO immunoassay and clinically as an injectable stimulant of thrombopoiesis in dogs.

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CAVALIER KING CHARLES SPANIELS HAVE A NORMAL PLATELETCRIT. **H. Tvedten, I. Lilliehöök, J. Häggström.** Swedish University of Agricultural Science, Uppsala, Sweden.

About half of Cavalier King Charles spaniels (CKCS) have an autosomal recessive dysplasia causing large platelets (macrothrombocytosis) and a reduced number of platelets/L by most counting methods. How then can one detect true thrombocytopenia in a CKCS? Members of this breed can get DIC, Sertoli cell tumors and other causes of thrombocytopenia. At the time this abstract was written, we had measured platelet quantity in blood of 11 CKCS with different methods. The methods included Sysmex XT 2000 Vi impedance and optical platelet counts, Cell Dyn 3500 impedance counts, IDEXX VetAutoread (QBC) platelet counts, and manual platelet counts. With the use of the QBC, which directly measures platelet volume (plateletcrit) and then calculates platelet counts based on a factor reflecting a normal MPV of canine platelets, all dogs had normal platelet quantity. However with other methods, such as the Cell Dyn impedance count, 7 of 11 had reduced platelet

numbers and 2 of those 7 dogs had only 2 or $4 \times 10^9/L$ platelets. These data indicate that even CKCS with macrothrombocytosis and reduced platelet numbers/L may have a normal plateletcrit and not true thrombocytopenia. If these dogs have a normal platelet mass, then the name of the disorder should not be thrombocytopenia. The best test of true thrombocytopenia in CKCS is thus an accurate test of plateletcrit. The IDEXX VetAutoread (QBC) measures plateletcrit well.

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*THROMBELASTOGRAPHY IN DOGS ADMITTED TO AN INTENSIVE CARE UNIT. **C. Wagg, C. Bedard, S. Boysen.** Departments of Pathology and Microbiology and Clinical Sciences, Faculty of Veterinary Medicine, University of Montreal, Saint-Hyacinthe, Canada.

Our objective was to investigate hemostatic dysfunction in dogs admitted to an intensive care unit (ICU) by using thrombelastography (TEG) and to compare these findings with the standard coagulation tests of coagulation time (PT, aPTT), antithrombin, D-dimer, fibrinogen and platelet concentration. Twenty-nine ICU dogs and 30 control dogs were evaluated. Disease conditions included sepsis, neoplasia, cardiac, neurologic, gastrointestinal and renal disease, anemia, post-surgical complications, hyperadrenocorticism, and splenic torsion. TEG was performed on citrated whole blood initiated with recombinant human tissue factor diluted 1:100; reaction time (R), k time (K), alpha-angle and maximum amplitude (MA) were recorded. Reference intervals were: R, 0.70–2.44 minutes; K, 0.85–5.15 minutes; alpha-angle, 41.73–81.21 degrees; and MA, 38.72–64.28 mm. TEG identified 11 hypercoagulable and 3 hypocoagulable ICU dogs. Hypercoagulable dogs had at least two abnormal standard coagulation parameters including increased D-dimer (10/11), increased fibrinogen (10/11), increased aPTT (7/11), and decreased antithrombin, platelet concentration (3/11) and aPTT (1/11). All hypocoagulable dogs had increased D-dimer and aPTT and decreased platelet counts; two had decreased antithrombin and/or fibrinogen. One dog diagnosed with portal vein thrombosis and 6 other dogs that had 3 or more abnormal standard coagulation parameters had normal TEG tracings. A significant correlation was found between R and PT ($r_s=0.51$, $P=0.003$) and MA and fibrinogen ($r_s=0.76$, $P<0.0001$). These results suggest that TEG may be useful in detecting hemostatic alterations in ICU dogs, but should be used in conjunction with standard coagulation tests.

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HYPERCOAGULABILITY IN CATS WITH CARDIOMYOPATHY. **T. Stokol¹, M. Brooks², H. Erb¹, J. Rush², E. Rozanski², M. Rishniw¹, M. Kraus¹, A. Gelzer¹.** ¹College of Veterinary Medicine, Cornell University, Ithaca, NY, USA; and ²Cummings School of Veterinary Medicine, Tufts University, North Grafton, MA, USA.

Arterial thromboembolism (ATE) is a devastating complication of feline cardiomyopathy; however, the pathogenesis of clot formation is poorly defined. To test the hypothesis that a systemic hypercoagulable state contributes to the thrombotic tendency in ATE, we performed coagulation testing in 3 clinical categories of cardiomyopathic cats: left atrial enlargement only (LAE, n=14); LAE with spontaneous echocardiographic contrast and/or intracardiac thrombi (LAEST, n=20); and signs of acute ATE (ATE, n=18). Hypercoagulability was defined as more than 1 abnormality in coagulation assays reflecting thrombin generation, i.e., high thrombin-antithrombin complexes (TAT) or D-dimer; excess coagulation factors, i.e., high fibrinogen or factor VIII coagulant

(FVIII:C); or anticoagulant deficiency, i.e., low antithrombin (AT). Medians were compared with a Wilcoxon rank-sum test and proportions with a Fisher's exact test. The majority of cats were domestic variety and neutered males, with a median age of 9 years. Most cats had hypertrophic (62%) or unclassified (34%) cardiomyopathy. All had enlarged left atria (median left atrial to aortic ratio: 2.2, range: 1.3–3.8). ATE cats had significantly higher median TAT than LAE cats. Similar proportions of ATE and LAEST cats had high fibrinogen (44–50%), FVIII:C (10–22%), TAT (40–44%), and D-dimer (40–50%). No cats were AT-deficient. Based on the above criteria, significantly more ATE (56%) and LAEST (45%) cats were hypercoagulable than LAE cats (7%). These findings indicate that a subset of cardiomyopathic cats with ATE or LAEST are hypercoagulable. Whether these hemostatic abnormalities are simply indicators of disease severity or independent risk factors for thrombosis in cats with cardiomyopathy is unknown.

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*CHANGES TO LEUKOCYTE AND PLATELET PARAMETERS FOLLOWING LOW-DOSE LIPOPOLYSACCHARIDE ADMINISTRATION IN FIVE DOGS. **B. Flatland, M.M. Fry, C.J. LeBlanc, D.A. Ward.** Departments of Pathobiology and Small Animal Clinical Sciences, College of Veterinary Medicine, University of Tennessee, Knoxville, TN, USA.

Objective: As part of another study on effects of low-dose lipopolysaccharide (LPS) administration in normal dogs, we evaluated clinical signs and effects on total (WBC) and differential leukocyte concentrations and platelet complete blood count (CBC) parameters. **Methods:** Five adult female mixed breed dogs received LPS (0.1 ug/kg IV). Dogs received a saline sham treatment two weeks prior to treatment with LPS. Blood samples were collected 0, 3, 6, and 24 h after both treatments. CBCs were performed using an Advia 120 instrument; blood smears were reviewed blindly to evaluate neutrophil morphology. **Results:** Clinical signs in LPS-treated dogs included vomiting (2/5), trembling (2/5), and lethargy (1/5). WBC, neutrophil, lymphocyte, and monocyte concentrations were significantly decreased at 3 h and significantly increased at 24 h after LPS treatment compared with saline treatment. WBC, lymphocyte, monocyte, and eosinophil concentrations were significantly decreased 3 h post-LPS compared with baseline (0 h) values. Neutrophils were also decreased (mean 5,078/uL at 0 h; 1,772/uL at 3 h), but this change was not statistically significant. WBC, neutrophil, monocyte, and eosinophil concentrations were significantly increased at 24 h compared with baseline. Neutrophils in LPS-treated dogs had mild toxic change and increased bands at 3 and 6 h. Platelet concentration was significantly decreased at 3, 6, and 24 h compared with baseline. Mean platelet component concentration was significantly decreased at 3 h compared with baseline. **Conclusion:** Low-dose LPS administration in dogs causes mild clinical signs and significant changes in leukocyte and platelet parameters. CBC changes are evident within 3 h and persist for at least 24 h.

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*THROMBOCYTOSIS IN DOGS: A RETROSPECTIVE STUDY. **L.A. Snyder, J.A. Neel, C.B. Grindem.** Department of Population Health and Pathobiology, North Carolina State University, College of Veterinary Medicine, Raleigh, NC, USA.

Thrombocytosis is a common clinicopathologic abnormality in hospitalized patients, but currently there are few veterinary studies that investigate this disorder. Two hundred-forty patients with thrombocytosis (platelet concentration greater than 600,000/uL)

were identified in a retrospective study of dogs presenting to the NCSU-VTH over a one-year period. Information was gathered from medical records regarding age, sex, breed, hematologic and coagulation parameters, disease state, previous thrombocytopenic episodes, drug history and occurrence of thrombotic or hemorrhagic complications. Preliminary findings identify neoplasia (25.8%) as the most common disease state associated with thrombocytosis, followed by respiratory disease (9.8%), endocrine disease (9.8%), cardiac disease (9%), infectious disease (7.7%), gastrointestinal disease (7%) and immune mediated disease (6.3%), with other disease states accounting for less than 5% each. Rebound thrombocytosis following thrombocytopenia was observed in 12.4% of patients. Steroids were the most common drug associated with thrombocytosis at 32.3% with 9.1% receiving vincristine and 6.6% receiving both vincristine and steroids. As in humans, carcinoma was the most common neoplasm associated with thrombocytosis. Also similar to human studies, a thromboembolic complication rate of 5.8% was identified and was associated with a high rate of mortality. To the author's knowledge, this is the first retrospective study documenting thromboembolic risk in veterinary patients with thrombocytosis.

Poster Presentations

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CYTOLOGIC EVALUATION OF DEGENERATE DISK MATERIAL IN DOGS. **A. Royal¹, J. Coates², L. Berent¹, C. Vitale², C.C. Wiedmeyer¹.** Departments of ¹Veterinary Pathobiology and ²Veterinary Medicine and Surgery, University of Missouri, Columbia, MO, USA.

Intervertebral disk (IVD) degeneration occurs with senescence in nonchondrodystrophic canine breeds and is markedly accelerated in chondrodystrophic breeds. Compositional changes of the nucleus pulposus and annulus fibrosus are components of disk degeneration and increase the risk of IVD extrusion. Patient history, diagnostic imaging, and gross evaluation at surgery are typically sufficient to yield a definitive diagnosis of disk extrusion, but a minority of cases may be indistinguishable from neoplasia and necessitate histopathologic evaluation of excised tissue. In these cases, intra-operative cytologic examination of impression smears could yield a rapid diagnosis and guide further surgical decisions; however, there is a paucity of literature regarding cytology of disk material. We evaluated impression smears of histologically-confirmed degenerate disks obtained at surgery from 12 dogs. Nine of the 12 samples produced minimally cellular slides consisting of large amounts of free eosinophilic extracellular matrix, small islands of cartilage, and irregular basophilic to non-staining acellular material. Three of the 12 samples contained predominantly pleomorphic mesenchymal cells which displayed significant cytologic criteria for malignancy, including moderate to marked anisocytosis and anisokaryosis, binucleation, and rare trinucleation. These findings suggest that cytology alone is not an effective means of differentiating between degenerate disk material and neoplasia.

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EVALUATION OF A COMMERCIAL EIA FOR RENAL PAPILLARY ANTIGEN-1 IN RAT URINE. **F. Sace, A. John-Baptiste, Q. Zong, A.M. Malamant, B. Jessen.** Pfizer Inc., San Diego, CA, USA.

Measurement of urine renal papillary antigen-1 (RPA-1) in combination with more traditional biomarkers may assist in defining early signs of nephrotoxicity in rats. The use of this sensitive and specific biomarker of injury to the rat renal collecting ducts in combination with glutathione S-transferase (GST) isoenzymes (alpha and GSTYb1) provides a more complete picture of nephron damage. The Biotrin Rat RPA-1® is a qualitative solid phase enzyme immunoassay. The test procedure is based on the sequential addition of urine samples, antibody-enzyme conjugate and substrate to microassay wells coated with anti-rat RPA-1 IgG. The resultant color intensity is proportional to the amount of RPA-1 in the sample. Evaluation criteria require unknown concentrations to fall within the quantification range (i.e., > LLOQ and < ULOQ) and that the %CV between the replicate wells is <25%. The between-run ruggedness tests show an acceptable standard curve range for all points from 3.125 U/L to 100 U/L. The precision ranged from 0.5% to 1.4% CV with analytical recoveries ranging from 97.95% to 99.81%. The lower limit of quantitation (LLOQ) was determined by comparing the back-calculated concentration with the expected concentration for the lowest standard point. The 3.125 U/L standard point back-calculated to give a 97.95% analytical recovery with 1.2% CV. All quality control values were within the assay required ranges. In summary, the Biotrin Rat RPA-1® EIA kit is very precise and accurate in determining rat renal papillary antigen 1 (RPA-1) in urine.

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EXPERIMENTAL ANAPLASMA PHAGOCYTOPHILUM INFECTION OF DOGS BY INTRAVENOUS INOCULATION AND TREATMENT WITH DOXYCYCLINE. **A. Alleman¹, H. Wamsley¹, J. Abbott², R. Velucci¹, A. Lundgren², R. Chandrashekar³, M. Beall³, M. Eberts⁴, A. Barbet².** ¹Department of Physiological Sciences and ²Department of Infectious Diseases and Pathology, University of Florida, Gainesville, FL, USA; ³IDEXX Laboratories, Westbrook, ME, USA; and ⁴Lakeland Veterinary Hospital, Baxter, MN, USA.

Anaplasma phagocytophilum is an intracellular pathogen that invades granulocytes of infected mammalian hosts causing disease in humans, dogs, cats, horses and ruminants. In this trial, four adult, intact male, Sprague Dawley Beagles, confirmed by PCR and/or serology (IFA or IDEXX SNAP 4Dx) to be negative for common arthropod-borne diseases (*A. phagocytophilum*, *A. platys*, *E. canis*, *E. chaffeensis*, *B. burgdorferi*, *Babesia gibsoni*, *Bartonella henselae*, *Dirofilaria immitis*) were inoculated with a human *A. phagocytophilum* isolate (NY18) that had been maintained in tissue culture (two dogs) or parasitemic blood from a naturally infected dog (2 dogs). The dogs were monitored by periodic CBCs and serum biochemical profile. Seroconversion was assessed by the SNAP 4Dx assay, Western immunoblots and rMsp5 ELISA. Nested PCR analysis using peripheral blood was performed to detect circulating parasites. Once chronic infection was confirmed by PCR analysis, the dogs were treated with oral doxycycline at a dose of 10 mg/kg for 14 days (2 dogs) or 28 days (2 dogs). Doxycycline therapy was initiated at day 157 PI (2 dogs) and 247 PI (2 dogs). PCR analysis was performed on whole blood and various tissues collected at necropsy to determine the effectiveness of doxycycline in clearing infection. Seroconversion was observed as early as 8 days post-inoculation. PCR positive results were obtained as early as 2 days PI, but were more consistently positive between days 8 to 35 PI. Whole blood collected post-doxycycline therapy was positive by PCR analysis as were tissue samples collected from heart, kidney, spleen and lungs.

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CLONALITY AND PHENOTYPING OF CANINE LYMPHOSARCOMA USING PCR ON CYTOLOGIC SPECIMENS. **K. Ellis¹, E. Sneed², M. Mayer², M. Jackson¹, B. Kidney¹.** Departments of ¹Veterinary Pathology and ²Small Animal Clinical Sciences, Western College of Veterinary Medicine, University of Saskatchewan, Saskatchewan, Canada.

Background: Diagnosis of canine lymphosarcoma (LSA) is often made on cytologic examination alone; however, distinguishing hyperplastic and neoplastic lymphocyte populations sometimes requires surgical biopsy and histopathology. Prognosis of canine LSA correlates with B- or T-cell phenotype determined by immunohistochemistry (IHC) of formalin-fixed paraffin-embedded (FFPE) tissue. Polymerase chain reaction (PCR) using DNA from cytologic specimens would provide a less invasive method to determine phenotype. **Objectives:** The aims of this study were to evaluate clonality and phenotype of canine LSAs by PCR using DNA from cytology smears, and to determine the accuracy, sensitivity and specificity of this method. **Methods:** DNA was isolated from archival cytology slides from 24 dogs with LSA. Clonality and phenotype were evaluated using PCR. The sensitivity of PCR for the diagnosis of LSA was determined. Phenotype by PCR was compared with phenotype by IHC of FFPE tissues. Specificity was determined using PCR clonality results for 16 cytologically diagnosed hyperplastic lymph nodes. **Results:** Clonal rearrangement was determined by PCR in 20/24 of the LSA samples; sensitivity was 83.3%. In the 20 samples, phenotype by PCR was in 100% agreement with IHC phenotype. None of the hyperplastic tissues produced a clonal result by PCR, indicating 100% specificity. **Conclusions:** PCR is both sensitive and specific for distinguishing between LSA and hyperplasia. LSA phenotype can also be accurately determined using cytologic specimens.

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GENE EXPRESSION PROFILING OF CANINE CD8+ T CELL LEUKEMIA. **M.J. Williams, P. Avery, J. Modiano, A. Hess, R. Burnett, A.C. Avery.** Dept. of Microbiology, Immunology and Pathology, College of Veterinary Medicine and Biomedical Sciences, Colorado State University, Fort Collins, CO, USA.

Canine CD8 T cell lymphoproliferative disease appears to have two different presentations: indolent disease with a long median survival or aggressive disease with a short median survival. Previous studies from our laboratory found that dogs with CD8 T cell lymphoproliferative disease presenting with a peripheral lymphocyte concentration of >30,000 lymphocytes/ul had a worse outcome (median survival time of 131 days) compared with dogs presenting with a lymphocyte concentration of <30,000 lymphocytes/ul (median survival time of 1,098 days, p=0.0013). Our aim was to carry out microarray analysis on canine CD8 T cell lymphoproliferative disease specimens in order to: 1) identify additional markers that may be used to predict prognosis and 2) determine if indolent and aggressive CD8+ T cell leukemias are derived from distinct T cell lineages, or are different stages in the progression of a single disorder. To date, 6 cases of CD8+ T cell leukemia (3 with lymphocyte counts below 30,000/ul and 3 with lymphocyte counts above 30,000/ul) have been analyzed using the Canine Genome 2.0 chip from Affymetrix. Gene expression profiling demonstrated that CD8 T cell leukemias presenting with less than 30,000 lymphocytes/ul ("good" prognosis) expressed markers associated with conventional T cells (T cell receptor alpha and beta chains, CD28, IL-7 receptor), whereas those with lymphocyte concentration greater than 30,000 cells/ul ("poor" prognosis) had significantly lower levels of these markers. These preliminary findings suggest that good and poor prognosis CD8+ T cell

leukemias are derived from distinct lineages and demonstrate the utility of gene array analysis in this disease. Microarray analysis from additional dogs is ongoing to extend these findings.

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REFERENCE INTERVALS FOR ARTERIAL AND VENOUS BLOOD LACTATE IN ADULT DOGS USING TWO PORTABLE LACTATE ANALYZERS. **K. Shafer, T. Ruska, K. Little, K. Hall, L.C. Sharkey.** Department of Veterinary Clinical Sciences, University of Minnesota College of Veterinary Medicine, St. Paul, MN, USA.

A variety of point-of-care lactate analyzers are utilized in veterinary medicine; however, published reference intervals are not widely available. We prospectively evaluated whole blood lactate concentrations in 63 healthy dogs ages 2-8 years weighing over 9 kg using the i-STAT 1 (amperometric methodology) and the Accutrend Portable Lactate Analyzer with BM lactate test strips (enzymatic method with reflectance photometry). Whole blood samples were collected using a standardized protocol designed to minimize the influence of pre-analytical variables. Venous samples were collected first and from the jugular vein in all dogs. Ninety five percent of arterial samples were collected from the dorsopedal artery and 5% from the femoral. After collection, samples were run simultaneously on both instruments. Ninety-five percent reference intervals for arterial samples were 0.3-3.49 mmol/L (median 0.96, range 0.3-3.49, %CV 1.4) for the i-STAT 1 and 0.8-3.0 mmol/L (median 1.5, range 0.8-3.3, %CV 13.8) for the Accutrend. Ninety-five percent reference intervals for venous samples were 0.31-3.80 mmol/L (median 0.84, range 0.3-4.09, %CV 2.4) for the i-STAT 1 and 1.0-3.3 mmol/L (median 1.6, range 1.0-3.3, %CV 7.6) for the Accutrend. These reference intervals have slightly higher upper limits compared with previously published canine reference intervals based on the Nova Stat Plus and Nova Stat Profile and compared with reference intervals developed for humans by the manufacturer of the i-STAT analyzer. Methodology appears to influence reference intervals for whole blood lactate, so reference intervals should be generated for individual instruments. The precision of the i-STAT 1 is superior to that of the Accutrend for lactate analysis.

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REFERENCE INTERVALS FOR ARTERIAL AND VENOUS WHOLE BLOOD GAS ANALYTES USING THE i-STAT 1 CG4+ CARTRIDGE IN DOGS. **T. Ruska, K. Shafer, K. Little, K. Hall, L.C. Sharkey.** Department of Veterinary Clinical Sciences, University of Minnesota College of Veterinary Medicine, St. Paul, MN, USA.

A variety of point-of-care analyzers are utilized in veterinary medicine; however, published reference intervals are not widely available. We prospectively evaluated whole blood in 63 healthy dogs ages 2-8 years weighing over 9 kg using the i-STAT 1 CG4+ cartridges. Whole blood samples were collected using a standardized protocol designed to minimize pre-analytical variables. Venous samples were collected first and from the jugular vein. Ninety-five percent of arterial samples were collected from the dorsopedal artery and 5% from the femoral artery. Ninety-five percent reference intervals for arterial samples were as follows: pH: 7.33-7.50, pCO₂: 24.1-37.3 mmHg, pO₂: 73.7-100.2 mmHg, sO₂: 95-98%, TCO₂: 17.0-26.4 mmol/L, HCO₃: 16.4-25.5 mmol/L, base excess: -9.0-1.8 mmol/L. Ninety-five percent reference intervals for venous samples were as follows: pH: 7.30-7.47, pCO₂: 28.9-44.4 mmHg, pO₂: 27.4-56.0 mmHg, sO₂: 56-90%, TCO₂: 18.6-28.4 mmol/L, HCO₃: 17.8-27.2 mmol/L, base excess: -7.4-2.8 mmol/L.

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CANINE REFERENCE INTERVALS FOR i-STAT 1 CHEM 8 CARTRIDGES AND COMPARISON WITH A REFERENCE CHEMISTRY ANALYZER (OLYMPUS AU400E). **K. Little, K. Shafer, T. Ruska, K. Hall, L.C. Sharkey.** Department of Veterinary Clinical Sciences, University of Minnesota College of Veterinary Medicine, St. Paul, MN, USA.

A variety of point-of-care analyzers are utilized in veterinary medicine; however, published reference intervals are not widely available. We prospectively evaluated jugular venous whole blood samples from 63 healthy dogs ages 2-8 years using the i-STAT 1 (Chem 8 cartridges) for reference interval generation. For appropriate analytes, i-STAT 1 values were compared with Olympus AU400e chemistry analyzer values for clinical equivalence using allowable total error guidelines stated by CLIA-88 proficiency testing criteria for acceptable performance and by statistical equivalence using Deming regression analysis. Clinical equivalence is reported as Pass/Fail and regression analysis includes correlation coefficient, slope, intercept and standard error or estimate. Ninety-five percent reference intervals for the i-STAT Chem 8 cartridges are as follows: sodium 140-150 mmol/L, potassium 3.4-4.9 mmol/L, iCa 5.1-5.9 mg/dl, chloride 112-120 mmol/L, BUN 8-35 mg/dl, glucose 81-125 mg/dl, TCO₂ 17.0-26.0 mmol, anion gap 8-17 mmol/L, creatinine 0.8-1.5 mg/dl, Hct 38-60%, and hemoglobin 12.8-20.3 g/dL. Results suggest that by CLIA-88 standards, data obtained from the i-STAT 1 Chem 8 cartridges are clinically comparable to those from the Olympus analyzer for chloride, creatinine, and sodium, but not for BUN, glucose or potassium. Deming regression analysis suggests correlation for chloride, creatinine, glucose, BUN and potassium is high, but low for sodium.

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THE PFA-100 PLATELET FUNCTION ANALYZER: ENHANCEMENT OF A CANINE CLOSURE TIME REFERENCE INTERVAL, EVALUATION OF IN VITRO HEMODILUTION EFFECTS AND ASSESSMENT IN ILL DOGS. **N. Clancey¹, S. Burton¹, B. Horney¹, A. MacKenzie¹, A. Nicastro².** ¹Department of Pathology & Microbiology, Atlantic Veterinary College, University of Prince Edward Island, Charlottetown, Prince Edward Island, Canada; and ²Veterinary Medical Care, Mt. Pleasant, SC, USA.

The PFA-100 platelet function analyzer is a simple point-of-care instrument that assesses primary hemostasis by mimicking high shear platelet function at a site of endothelial damage. The time until platelet plug formation is measured in seconds and is called the closure time. Artificially prolonged closure times occur with anemic blood samples. Limited information is available using the PFA-100 analyzer to diagnosis primary hemostatic problems in dogs with various illnesses which may alter platelet function. The purpose of this study was to improve the existing Atlantic Veterinary College PFA-100 closure time reference interval for healthy dogs using collagen/adenosine-5'-diphosphate cartridges to define the level of anemia at which the closure time is prolonged using in vitro hemodiluted canine blood samples and to compare platelet function in dogs with various diseases with healthy control dogs using the PFA-100 platelet analyzer. The calculated canine reference interval for closure time ranged from 48-77 seconds, comparable to other reports. Platelet-rich plasma from 21 dogs was added to original citrated samples to achieve platelet concentration greater than 150 × 10⁹/L and hematocrit levels of 0.33 L/L, 0.30 L/L and 0.27 L/L. Compared with the initial closure time, significant differences were found in all hemodilution groups. The usefulness of the PFA-100 as an assessment of primary hemostasis in dogs is limited by anemia defined by hematocrits less than 0.35 L/L. Compared with the control group, dogs with cardiac murmurs had a significantly

prolonged median closure time ($P < 0.00$). The PFA-100 analyzer is useful in detecting primary hemostasis defects in dogs with cardiac disease associated with turbulent blood flow.

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COAGULATION ACTIVATION IN CATS WITH HYPERTROPHIC CARDIOMYOPATHY BASED ON THROMBELASTOGRAPHY.

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Aortic thromboembolism is a common complication of feline cardiac disease. In cats with hypertrophic cardiomyopathy (HCM), increased risk of thrombosis may partly be secondary to blood stasis caused by left atrial dilatation. The purpose of this study was to evaluate hemostatic alterations in cats with HCM by thrombelastography (TEG®) and to evaluate the association between left atrial diameter and TEG variables. TEG was performed on whole blood in 9 control cats and 20 cats newly diagnosed with HCM. Coagulation was initiated using recombinant human tissue factor diluted 1:100. Reaction time (R), K time (K), alpha angle and maximum amplitude (MA) were recorded. Left atrial to proximal aortic diameter ratio (LA:Ao) was determined in cats with HCM by use of m-mode and 2-dimensional imaging. R in cats with HCM (median: 1.15 min) was significantly shorter than in control cats (median: 1.3 min) ($p = 0.03$). A total of 8 cats with HCM had a short R when compared with control cats. K (medians, controls: 1.30 min, HCM: 1.15 min), alpha angle (medians, controls: 70.2 degrees, HCM: 74.8 degrees) and MA (medians, controls: 60.9 mm, HCM: 59.1 mm) were not statistically different between groups ($p > 0.05$). In cats with HCM, MA was significantly correlated with LA:Ao measured using both m-mode ($r_s = 0.59$, $p = 0.003$) and 2-dimensional ($r_s = 0.48$, $p = 0.04$) methods. In conclusion, these results demonstrate that mild coagulation activation is present in HCM cats with short reaction time. Because MA was similar between control and HCM cats, the significance of the association between LA:Ao and MA in cats with HCM remains to be elucidated.

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RETROSPECTIVE EVALUATION OF D-DIMER AS AN INDICATOR OF COAGULATION STATUS IN CATS. **E.A. Spangler¹, C. Samway², E. Nicholds², K.E. Russell².** ¹Dept. of Pathobiology, College of Veterinary Medicine, Auburn University, AL, USA; and ²Dept. of Veterinary Pathobiology, College of Veterinary Medicine and Biomedical Sciences, Texas A&M University, College Station, TX, USA.

Several assays designed for detection of human D-dimer have been validated for use in dogs. Only a few studies have described

measurement of D-dimer concentration in cats, and assay methods that are useful for dogs may not always provide an accurate measurement of feline D-dimer. We previously described validation of a quantitative, immunoturbidimetric method (IL Test® D-Dimer, Instrumentation Laboratories) for measurement of feline D-dimer. The goal of this study was to evaluate plasma D-dimer concentration in cats with diverse underlying diseases in order to assess the utility of D-dimer as an indicator of coagulation status in cats. Laboratory data for cats that underwent coagulation testing at Texas A&M University from June 2004 to September 2005 were reviewed. Only the first day's coagulation test results for each patient were examined, and cats were included if at least 4 of 5 coagulation tests (PT, aPTT, AT, fibrinogen, and platelet concentration) were completed with concurrent measurement of D-dimer. A total of 26 cats were included in the study. Test results were compared between the sick cats and a group of 28 healthy cats. Data from the sick cats were also evaluated to determine if there was any correlation between D-dimer concentration and other coagulation parameters. Although coagulation abnormalities were often present in the sick cats and the D-dimer concentration was above the reference interval in 10 animals, the median D-dimer concentration was not significantly higher than that of healthy cats ($p = 0.784$). No significant correlation was found between D-dimer concentration and any other single coagulation parameter.

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EVALUATION OF THE OXFORD SCIENCE FORCYTE HEMATOLOGY SYSTEM FOR PERFORMING LEUKOCYTE COUNTS ON EQUINE PERITONEAL AND SYNOVIAL FLUIDS. **J. Barton¹, M. Davis¹, K. Tobey¹, E. Carver².** ¹New England Equine Medical & Surgical Center, Dover, NH, USA; and ²Oxford Science, Oxford, CT, USA.

The objective of this study was to determine the accuracy and reproducibility of routine leukocyte counts on equine peritoneal and synovial fluid using a 20 uL sample volume and the FORCYTE Hematology System (Oxford Science, Oxford, CT). One mL of fluid was collected into K3 EDTA tubes from 100 horses during routine and emergency examinations. Leukocyte (WBC) results were compared with reference procedures, which included manual hemacytometer counts using Unopette technique and manual slide review. Instrument linearity for WBC was examined by sequential dilution of a concentrated sample. Reproducibility of the 20 uL microsampling analysis was evaluated by 15 replicate analyses of one sample. Correlation was excellent ($r > 0.9$) for all directly measured values. The FORCYTE provided linear determination of leukocyte concentration to at least $200 \times 10^3 / \text{uL}$. Reproducibility of instrument analysis was very good. In conclusion, the FORCYTE Analyzer provides accurate and reproducible leukocyte counts on equine peritoneal and synovial fluid.