

## **Abstracts 2006 – 2007**

[American Journal of Veterinary Research \(May 06 – Apr 07\)](#)

[Journal of the American Animal Hospital Association \(Apr 06 – Apr 07\)](#)

[Journal of the American Veterinary Medical Association \(Apr 06– Apr 07\)](#)

[Journal of the Feline Medicine and Surgery \(Apr 06– Apr 07\)](#)

[Journal of Comparative Pathology \(Apr 06– Apr 07\)](#)

[Journal of Small Animal Practice \(Apr 06 – Apr 07\)](#)

[Journal of Veterinary Internal Medicine \(Apr 06– Feb 07\)](#)

[Journal of Veterinary Medical Science \(Apr 06 – March 07\)](#)

[Journal of Veterinary Pharmacology and Therapeutics \(Apr 06 – Apr 07\)](#)

[Journal of Veterinary Science \(Apr 06 – March 07\)](#)

[Mammalian Genome \(May 06 – Apr 07\)](#)

[Research in Veterinary Science \(Apr 06 – Apr 07\)](#)

[Veterinary Clinical Pathology \(Apr 06 – March 07\)](#)

[Veterinary Record \(Apr 06 – March 07\)](#)

[Veterinary Research Communications \(Apr 06 – Apr 07\)](#)

[Veterinary Radiology and Ultrasound \(Apr 05 – Apr 06\)](#)

## **American Journal of Veterinary Research (May 06 – Apr 07)**

[Am J Vet Res.](#) 2006 May;67(5):901-8.

**Urodynamic and morphologic changes in the lower portion of the urogenital tract after administration of estriol alone and in combination with phenylpropanolamine in sexually intact and spayed female dogs.**

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**OBJECTIVE:** To compare the urodynamic and morphologic effects of the administration of estriol alone and in combination with phenylpropanolamine on the lower portion of the urogenital tract in female dogs. **ANIMALS:** 3 sexually intact and 3 spayed female Beagles without urinary incontinence. **PROCEDURE:** Dogs received estriol (2 mg, PO) once daily for 7 days followed by estriol (2 mg, PO) and phenylpropanolamine (1.5 mg/kg, PO) once daily for 7 days. Urethral pressure profilometry, diuresis cystometry, and vaginourethrography were performed before treatment (day 0) and at days 7 and 14. The maximum urethral pressure (MUP) and closure pressure (MUCP), urethral functional and anatomic profile lengths, integrated pressure (IP), plateau, distance before MUP, maximum meatus pressure, threshold pressure, threshold volume, compliance, urethral length, and vaginal length and width were measured. **RESULTS:** Before treatment, no urodynamic differences were observed between the 2 groups; however, vaginal length and width were significantly shorter in spayed dogs. Compared with day 0 values, estriol treatment significantly increased MUP, MUCP, and IP values at day 7, but at day 14, this effect decreased despite phenylpropanolamine administration. No morphologic changes from baseline were detected after either treatment in any dog. **CONCLUSIONS AND CLINICAL RELEVANCE:** Data suggest that estriol mainly acts on the urethral sphincter mechanism by increasing urethral resistance in sexually intact and spayed female dogs without urinary incontinence. Administration of estriol and phenylpropanolamine did not increase the urethral resistance more than estriol alone. The urodynamic effects of estriol in female dogs with urinary incontinence remain to be elucidated

[Am J Vet Res.](#) 2006 Jul;67(7):1115-20.

### **Safety of reduced-dosage ketoprofen for long-term oral administration in healthy dogs.**

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**OBJECTIVE:** To evaluate the safety of reduced-dosage ketoprofen (RDKET) for long-term oral administration in healthy dogs. **ANIMALS:** 14 healthy Beagles. **PROCEDURES:** Racemic ketoprofen (0.25 mg/kg, PO) and gelatin capsules, as a drug-free placebo, were each administered to 7 dogs for 30 days. Dogs were periodically monitored via physical examination, blood analyses, endoscopic examinations, fecal occult blood tests (tetramethylbenzidine and guaiac methods), renal function tests (effective renal plasma flow and glomerular filtration rate), urinalyses, urinary enzyme indices (N-acetyl-beta-D-glucosaminidase and gamma-glutamyl-transferase), and hemostatic function tests (buccal mucosa bleeding time, cuticle bleeding time, prothrombin time, activated partial thromboplastin time, and fibrinogen concentration). **RESULTS:** Pyloric antrum lesion grade was significantly higher in the RDKET group on day 28, compared with the pretreatment and control group grades. Fecal occult blood grade measured by use of the tetramethylbenzidine method was significantly higher in the RDKET group on day 30, compared with the

pretreatment grade. No other significant differences were detected between treatment groups. **CONCLUSIONS AND CLINICAL RELEVANCE:** RDKET induced mild to moderate gastric mucosal injuries especially in the pyloric antrum in healthy Beagles, whereas no adverse effects were observed in renal function or hemostasis. Fecal occult blood tests may be useful as screening tests for adverse gastrointestinal effects induced by RDKET in dogs.

[Am J Vet Res.](#) 2006 Jul;67(7):1105-9.

**Serum concentrations of the third component of complement in healthy dogs and dogs with protein-losing nephropathy.**

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**OBJECTIVE:** To develop a method for determining the concentration of the third component of complement (C3) in canine serum, to establish a reference range for C3 in healthy dogs, and to evaluate dogs with protein-losing nephropathy (PLN) to determine whether PLN is associated with decreased serum C3 concentrations. **ANIMALS:** 30 healthy dogs and 49 dogs with PLN. **PROCEDURES:** Serum samples were obtained from healthy dogs at the time of examination, whereas serum samples were obtained from dogs with PLN at the time of diagnosis. All samples were frozen at -70 degrees C until analyzed. Serum C3 concentrations were determined by use of a sandwich ELISA. Concentrations were expressed as the number of dilutions in which C3 could be detected. **RESULTS:** C3 was detectable in healthy control dogs (range, 1,920,000 to 15,400,000 dilutions; median, 9,600,000 dilutions). This represented a range of four 2-fold serum dilutions. In addition, C3 was detectable in dogs with PLN (range, 1,460,000 to 30,070,000 dilutions; median, 7,680,000 dilutions), which represented a range of six 2-fold serum dilutions. There was no significant difference in C3 concentrations between the 2 groups. **CONCLUSIONS AND CLINICAL RELEVANCE:** C3 is a critical part of the immune defense system that has not been extensively examined in veterinary medicine. An ELISA was developed for measuring C3 concentrations, and a reference range for healthy dogs was established. Significant decreases in C3 concentrations were not detected in any dog with PLN. Additional studies will be required to definitively determine the importance of serum C3 concentrations in PLN.

[Am J Vet Res.](#) 2006 Sep;67(9):1628-34.

**Immunohistochemical staining of urokinase plasminogen activator-like and urokinase plasminogen activator receptor-like proteins in the urinary tract of healthy dogs.**

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**OBJECTIVE:** To determine distribution of urokinase plasminogen activator-like protein and urokinase plasminogen activator receptor-like protein in urinary tract tissues of healthy dogs. **ANIMALS:** 11 healthy dogs. **PROCEDURES:** Necropsy specimens from kidney, ureter, bladder, urethra, prostate, and testis were obtained from 4 sexually intact female dogs, 5 sexually intact males, and 2 castrated males; dogs ranged in age from juvenile to adult. Urokinase plasminogen activator-like protein and urokinase plasminogen activator receptor-like protein in tissue lysates from kidney, prostate, and testis were identified by use of SDS-PAGE, western blot analysis, and immunoprecipitation. Urokinase plasminogen activator-like protein and urokinase plasminogen activator receptor-like protein in kidney, ureter, urinary bladder, urethra, prostate, and testis were identified by use of immunohistochemical staining of tissue sections. **RESULTS:** Urokinase plasminogen activator-like protein and urokinase plasminogen activator receptor-like protein in the molecular-weight range published for urokinase and urokinase receptor (53 and 33 kd for urokinase and 60 to 65 kd for urokinase receptor) were identified. Distribution of the proteins identified by use of immunohistochemical staining was comparable with published information for humans and mice for the urinary tract. Staining of these proteins was detected in more tissue types than reported in healthy humans. **CONCLUSIONS AND CLINICAL RELEVANCE:** Urokinase plasminogen activator-like protein and urokinase plasminogen activator receptor-like protein were detected in the urinary tract of healthy dogs. This information is important for further evaluation of the functions of urokinase and urokinase receptor in the canine urinary tract and the pathophysiologic features of urinary tract disease.

[Am J Vet Res.](#) 2006 Dec;67(12):1967-73. **Effects of carprofen on renal function during medetomidine-propofol-isoflurane anesthesia in dogs.**

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**OBJECTIVE:** To investigate effects of carprofen on indices of renal function and results of serum bio-chemical analyses and effects on cardiovascular variables during medetomidine-propofol-isoflurane anesthesia in dogs. **ANIMALS:** 8 healthy male Beagles. **PROCEDURES:** A randomized crossover study was conducted with treatments including saline (0.9% NaCl) solution (0.08 mL/kg) and carprofen (4 mg/kg) administered IV. Saline solution or carprofen was administered 30 minutes before induction of anesthesia and immediately before administration of medetomidine (20 microg/kg, IM). Anesthesia was induced with propofol and maintained with inspired isoflurane in oxygen. Blood gas concentrations and ventilation were measured. Cardiovascular variables were continuously monitored via pulse contour cardiac output (CO) measurement. Renal function was assessed via glomerular filtration rate (GFR), renal blood flow (RBF), scintigraphy, serum biochemical analyses, urinalysis, and continuous CO measurements. Hematologic analysis was performed. **RESULTS:** Values did not differ significantly between the carprofen and saline solution groups. For both treatments, sedation and anesthesia caused changes in results of serum biochemical and hematologic analyses; a transient, significant increase in urine alkaline phosphatase activity; and blood flow diversion to the kidneys. The GFR increased significantly in both groups

despite decreased CO, mean arterial pressure, and absolute RBF variables during anesthesia. **CONCLUSIONS AND CLINICAL RELEVANCE:** Carprofen administered IV before anesthesia did not cause detectable, significant adverse effects on renal function during medetomidine-propofol-isoflurane anesthesia in healthy Beagles.

[Am J Vet Res.](#) 2007 Jan;68(1):107-11.

**Effect of strenuous exercise on urine concentrations of homovanillic acid, cortisol, and vanillylmandelic acid in sled dogs.**

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**OBJECTIVE:** To determine whether prolonged exercise by conditioned sled dogs affects urine concentrations of homovanillic acid (a metabolite of dopamine), vanillylmandelic acid (a metabolite of norepinephrine and epinephrine), and cortisol. **ANIMALS:** 24 conditioned Alaskan sled dogs (2 to 8.5 years old) that were in training for a multiday endurance race. **PROCEDURES:** Voided urine samples were collected from 4 groups of dogs (randomly selected from 54 dogs) after no exercise (control group; n = 6 dogs), completion of a 160km run (group A; 3), completion of a 420-km run (group B; 7), and completion of a 560-km run (group C; 6). Urine cortisol concentrations were determined by use of an immunoassay technique; urine vanillylmandelic acid and homovanillic acid concentrations were measured via high-performance liquid chromatography. **RESULTS:** Compared with the control group, urine cortisol concentration in groups A, B, and C was significantly different ( $5.33 \times 10(4) \pm 2.62 \times 10(4)$  microg/dL vs  $1.04 \times 10(4) \pm 2.31 \times 10(5)$  microg/dL,  $8.88 \times 10(4) \pm 5.49 \times 10(4)$  microg/dL, and  $6.31 \times 10(4) \pm 5.09 \times 10(4)$  microg/dL, respectively). Urine homovanillic acid concentration did not differ among the 4 groups. Vanillylmandelic acid was not detected in any urine samples. **CONCLUSIONS AND CLINICAL RELEVANCE:** Results indicated that prolonged exercise by sled dogs did not affect urine homovanillic acid concentration but did increase urinary cortisol secretion, which is indicative of adrenocortical stimulation. The apparent lack of vanillylmandelic acid in voided urine samples requires further investigation.

[Am J Vet Res.](#) 2007 Mar;68(3):297-304.

**Single-slice dynamic computed tomographic determination of glomerular filtration rate by use of Patlak plot analysis in anesthetized pigs.**

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**OBJECTIVE:** To compare glomerular filtration rate (GFR) as estimated from Patlak plot analysis by use of single-slice computed tomography (CT) with that obtained from clearance of plasma inulin in pigs. **ANIMALS:** 8 healthy anesthetized juvenile pigs. **PROCEDURES:** All pigs underwent precontrast, whole-kidney, helical CT; postcontrast single-slice dynamic CT; and postcontrast, whole-kidney CT for volume determination. On dynamic images, corrected Hounsfield unit values were determined for each kidney and the aorta. A Patlak plot for each kidney was generated, and plasma clearance per unit volume was multiplied by renal volume to obtain whole-animal contrast clearance. Mean GFR determined via inulin clearance (Inu-GFR) was measured from each kidney and correlated to mean GFR determined via CT (CT-GFR) for the left kidney, right kidney, and both kidneys by use of linear regression and Bland-Altman analyses. **RESULTS:** CT-GFR results from 7 pigs were valid. Total and right kidney Inu-GFR were correlated with total and right kidney CT-GFR (total,  $R(2) = 0.85$ ; right kidney,  $R(2) = 0.86$ ). However, left kidney CT-GFR was poorly correlated with left kidney Inu-GFR ( $R(2) = 0.47$ ). Bland-Altman analysis revealed no significant bias between Inu-GFR and CT-GFR for the left kidney, right kidney, or both kidneys. **CONCLUSIONS AND CLINICAL RELEVANCE:** CT-GFR as determined by use of a single-slice acquisition technique, low-dose of iohexol, and Patlak plot analysis correlated without bias with Inu-GFR for the right kidney and both kidneys (combined). This technique has promise as an accurate CT-GFR method that can be combined with renal morphologic evaluation.

[Am J Vet Res.](#) 2007 Feb;68(2):203-7.

### **In vivo evaluation of alpha(2)-adrenoceptors in cats with idiopathic cystitis.**

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**OBJECTIVE:** To evaluate the in vivo response of alpha(2)-adrenoceptors to medetomidine administration in cats with feline idiopathic cystitis (FIC) during periods of stress and after environmental enrichment. **ANIMALS:** 13 cats with FIC and 12 healthy cats. **Procedures-**Cats were subjected to an acute-onset moderate stressor for 8 days. After stress, 20 microg of medetomidine/kg was administered IM on days 1, 3, and 8. Heart rate, blood pressure, pupil diameter, respiratory rate, and level of sedation were evaluated before and after administration of the drug. After day 8, cats were moved to an enriched environment, and tests were repeated on day 35. **RESULTS:** Heart rate decreased and pupil diameter increased significantly after medetomidine administration in healthy cats, compared with cats with FIC. Cats with FIC had significantly lower respiratory rates. No significant differences in blood pressure or sedation level were found. **CONCLUSIONS AND CLINICAL RELEVANCE:** Increased plasma catecholamine concentrations during the enrichment phase, which have been reported elsewhere, may have contributed to the differences in alpha(2)-adrenoceptor responses detected in cats with FIC.

[Am J Vet Res.](#) 2007 Apr;68(4):423-7.

## **Effects of urine alkalization and activated charcoal on the pharmacokinetics of orally administered carprofen in dogs.**

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**Objective-**To investigate the effects of oral administration of activated charcoal (AC) and urine alkalization via oral administration of sodium bicarbonate on the pharmacokinetics of orally administered carprofen in dogs. **Animals-**6 neutered male Beagles. **Procedures-**Each dog underwent 3 experiments (6-week interval between experiments). The dogs received a single dose of carprofen (16 mg/kg) orally at the beginning of each experiment; after 30 minutes, sodium bicarbonate (40 mg/kg, PO), AC solution (2.5 g/kg, PO), or no other treatments were administered. Plasma concentrations of unchanged carprofen were determined via high-performance liquid chromatography at intervals until 48 hours after carprofen administration. Data were analyzed by use of a Student paired t test or Wilcoxon matched-pairs rank test. **Results-**Compared with the control treatment, administration of AC decreased plasma carprofen concentrations (mean  $\pm$  SD maximum concentration was 85.9  $\pm$  11.9 mg/L and 58.1  $\pm$  17.6 mg/L, and area under the time-concentration curve was 960  $\pm$  233 mg/L\*h and 373  $\pm$  133 mg/L\*h after control and AC treatment, respectively). The elimination half-life remained constant. Administration of sodium bicarbonate had no effect on plasma drug concentrations. **Conclusions and Clinical Relevance-**After oral administration of carprofen in dogs, administration of AC effectively decreased maximum plasma carprofen concentration, compared with the control treatment, probably by decreasing carprofen absorption. Results suggest that AC can be used to reduce systemic carprofen absorption in dogs receiving an overdose of carprofen. Oral administration of 1 dose of sodium bicarbonate had no apparent impact on carprofen kinetics in dogs.

[Am J Vet Res.](#) 2007 Apr;68(4):349-53.

## **Urinary biomarkers to assess exposure of cats to environmental tobacco smoke.**

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**Objective-**To evaluate the use of urinary biomarkers to assess exposure of cats to environmental tobacco smoke (ETS). **Animals-**61 healthy client-owned cats (19 from households in which smoking was reported and 42 from households in which there was no smoking). **Procedures-**Urine samples were obtained from each cat and assayed for total nicotine (nicotine plus nicotine glucuronide) and total cotinine (cotinine plus cotinine glucuronide) content by use of gas chromatography-mass spectrometry. In addition, total urinary content of 4-(methylnitrosamino)-1-(3-pyridyl)-1-butanol (NNAL), a major metabolite of the tobacco-specific nitrosamine 4-(methylnitrosamino)-1-(3-pyridyl)-1-butanone, was

measured by use of gas chromatography with nitrosamine-selective detection. Results-Cats from households in which smoking was reported had significantly higher concentrations of total nicotine (70.4 ng/mL), total cotinine (8.53 ng/mL), and total NNAL (0.0562 pmol/mL) in urine, compared with concentrations for cats that lived in households in which there was no smoking (4.89 ng/mL, 0.74 ng/mL, and 0.0182 pmol/mL, respectively). Conclusions and Clinical Relevance-Analysis of these data provided biochemical evidence of exposure to ETS and uptake of tobacco-specific carcinogens by cats that live in households with smokers. Biomarkers could facilitate investigation of the health effects of ETS in cats and other species.

## **Journal of the American Animal Hospital Association (Apr 06 – Apr 07)**

[J Am Anim Hosp Assoc.](#) 2006 Mar-Apr;42(2):136-46.

### **Prognostic factors for successful outcome following urethral rupture in dogs and cats.**

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Twenty dogs and 29 cats were identified with urethral rupture. Males predominated in both groups. The most common cause of urethral rupture in dogs was vehicular trauma, and in cats it was trauma associated with urethral obstruction and catheterization. Clinicopathological findings, type of surgical correction, time to surgery, type of urinary diversion, and duration of urinary diversion were not statistically associated with the outcome. In this study, the presence of multiple traumatic injuries was associated with a poor outcome.

[J Am Anim Hosp Assoc.](#) 2006 May-Jun;42(3):218-22.

### **Surgical revision of the urethral stoma following perineal urethrostomy in 11 cats: (1998-2004).**

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Allegheny Veterinary Emergency Trauma and Specialty, 19 Railroad Street, New Kensington, Pennsylvania 15068.

Eleven cats required urethral stoma revision because of urethral stricture following perineal urethrostomy. At surgery, eight cats had evidence of inadequate dissection to the bulbourethral glands, and three cats had evidence of urine extravasation into the subcutaneous tissues. Following revision of the stoma, long-term follow-up was obtained in



nine cases. For eight cats, owners reported no complications after the revision. Failure to dissect beyond the bulbourethral glands and inadequate mucosa-to-skin apposition resulted in postoperative stricture formation. Stoma revisions were performed a median of 71 days following the initial perineal urethrostomy, indicating that long-term evaluation of cases is necessary.

[J Am Anim Hosp Assoc.](#) 2006 Nov-Dec;42(6):462-6.

#### **Double ureters with ureteral ectopia in a domestic shorthair cat.**

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A 5-month-old domestic shorthair cat was presented for evaluation of urinary incontinence since birth. Excretory urography revealed dilated double ectopic ureters draining a hydronephrotic right kidney. Urine culture yielded a pure culture of *Klebsiella pneumoniae*. The cat was treated initially with bactericidal antibiotics, followed by right-sided nephroureterectomy. The surgery and antibiotic therapy led to complete resolution of urinary incontinence and urinary tract infection. Ureteral duplication is an unusual congenital anomaly that has not been previously reported in the cat.

[J Am Anim Hosp Assoc.](#) 2006 Sep-Oct;42(5):395-400.

#### **Ectopic ureterocele in a male dog: a case report and review of surgical management.**

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A 16-week-old, male border terrier was presented for urinary incontinence. Intravenous urography demonstrated a right-sided, extravescical ectopic ureterocele. Neoureterocystostomy and ureterocele omentalization were performed. Urinary incontinence persisted after surgery. Retrograde urethrography revealed communication between the ureterocele and urethra. Urinary incontinence resolved following partial ureterocelelectomy and reconstruction of the proximal urethra.

[J Am Anim Hosp Assoc.](#) 2007 Jan-Feb;43(1):61-4.

#### **Antibiotic-resistant *Corynebacterium jeikeium* urinary tract infection in a cat.**

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A 10-year-old, castrated male, domestic longhaired cat with a history of urinary tract disease and perineal urethrostomy was presented for evaluation of persistent urinary tract inflammation. Prior to referral, diphtheroid organisms had been cultured from a urine sample obtained by cystocentesis, and they were interpreted as sample contamination. Subsequent urine culture and gene sequencing identified *Corynebacterium jeikeium*, which was resistant to antibiotics and appeared to be the cause of the urinary tract infection.

**Journal of the American Veterinary Medical Association (Apr 06 – Apr 07)**

[J Am Vet Med Assoc.](#) 2006 Mar 15;228(6):876-80.

**Evaluation of adverse effects of long-term orally administered carprofen in dogs.**

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**OBJECTIVE:** To evaluate the adverse effects of carprofen in dogs after oral administration for 2 months. **DESIGN:** Prospective, randomized, blinded, placebo-controlled clinical trial. **ANIMALS:** 22 dogs with osteoarthritis in the hip or elbow joint. **PROCEDURE:** 13 dogs received orally administered carprofen daily for 2 months, and 9 dogs received a placebo for 2 months. Dogs were weighed, and serum and urine samples were collected before initiation of treatment and 4 and 8 weeks after initiation of treatment. Serum concentrations of total protein, albumin, urea, and creatinine and serum activities of alkaline phosphatase (ALP) and alanine aminotransferase (ALT) were measured. Urinary ALP-to-creatinine, gamma-glutamyltransferase (GGT)-to-creatinine, and protein-to-creatinine ratios were calculated. Dogs were observed by owners for adverse effects. **RESULTS:** Serum protein and albumin concentrations were lower in treated dogs than in those that received placebo at 4 weeks, but not at 8 weeks. No changes were observed in serum urea or creatinine concentrations; ALP or ALT activity; or urinary ALP-to-creatinine, GGT-to-creatinine, or protein-to-creatinine ratios. Dogs' weights did not change. Severity of vomiting, diarrhea, and skin reactions did not differ between groups, but appetite was better in dogs receiving carprofen than in dogs in the placebo group. **CONCLUSIONS AND CLINICAL RELEVANCE:** It is possible that the transient decreases in serum protein and albumin concentrations in dogs that received carprofen were caused by altered mucosal permeability of the gastrointestinal tract because no indications of renal or hepatic toxicity were observed. Carprofen appeared to be well tolerated by dogs after 2 months of administration.

[J Am Vet Med Assoc.](#) 2006 Apr 1;228(7):1033-7.

## **Effect of age on reference intervals of serum biochemical values in kittens.**

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**OBJECTIVE:** To determine the effect of age on reference intervals of serum biochemical values in kittens. **DESIGN:** Prospective clinical trial. **ANIMALS:** 55 kittens from 12 specific-pathogen-free queens. **PROCEDURE:** Kittens were allocated at birth into colostrum-fed (n = 27) and colostrum-deprived (28) groups. Blood was collected at birth and on days 1, 2, 4, 7, 14, 28, and 56. Serum samples were analyzed for activities of alkaline phosphatase, alanine aminotransferase, aspartate aminotransferase, creatine kinase, lactate dehydrogenase, gamma-glutamyltransferase, amylase, and lipase and for concentrations of albumin, total protein, bilirubin, urea nitrogen, creatinine, cholesterol, glucose, calcium, phosphorus, and triglycerides by use of an automated analyzer. Total serum solids concentrations were determined by use of refractometry. Serum IgG concentrations were quantified by use of radial immunodiffusion. **RESULTS:** For several analytes, reference intervals changed rapidly, most notably during the first few days of life. Reference intervals for alkaline phosphatase, creatine kinase, lactate dehydrogenase, and triglycerides were higher from birth to 8 weeks than adult reference intervals. Aspartate aminotransferase, bilirubin, urea nitrogen, and creatinine were higher than in adults at birth but were similar to or lower than adult reference intervals by 8 weeks. Compared with adult reference intervals, reference intervals for calcium and phosphorus concentrations were higher and for albumin and total protein concentrations were lower throughout the study period. **CONCLUSIONS AND CLINICAL RELEVANCE:** Important differences exist between reference intervals for serum biochemical values of neonatal and adult cats. Age-appropriate reference intervals should be used for accurate assessment of serum biochemical test results in cats.

[J Am Vet Med Assoc.](#) 2006 Jul 15;229(2):226-34.

## **Evaluation of palliative stenting for management of malignant urethral obstructions in dogs.**

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Section of Small Animal Surgery, Department of Clinical Studies-Philadelphia, University of Pennsylvania, 19104-6010, USA.

**OBJECTIVE:** To evaluate use of balloon-expandable and self-expanding metallic stents in management of malignant urethral obstructions in dogs. **DESIGN:** Original study. **ANIMALS:** 12 dogs with malignant urethral obstructions. **PROCEDURES:** The extent and location of urethral obstructions and the diameter of adjacent unaffected luminal segments were determined by use of fluoroscopically guided wires and measuring catheters. Stents were chosen to extend approximately 1 cm proximal and distal to the obstruction. Stent diameters were chosen to be approximately 10% greater than the diameter of healthy portions of the urethra to prevent displacement. Stents were placed in the urethra under

fluoroscopic guidance to restore luminal patency. RESULTS: 3 dogs received balloon-expandable metallic stents, and 9 dogs received self-expanding metallic stents. The placement procedures were rapid, safe, and effective at restoring luminal patency and were not associated with major complications. Complications included recurrent urethral obstruction secondary to blood clot formation and urethral edema in 1 dog and stent dislodgement into the urinary bladder in 1 dog. All dogs were able to urinate immediately after the procedure. Nine dogs (3/4 females and 6/8 males) were continent or mildly incontinent after stent placement. Of the remaining 3 dogs, 2 developed severe incontinence and 1 had an atonic bladder. Seven dogs were considered to have good to excellent outcome, 3 had fair outcome, and 2 had poor outcome. CONCLUSIONS AND CLINICAL RELEVANCE: Transurethral placement of metallic stents was a safe and effective palliative treatment option for dogs with malignant urethral obstructions.

[J Am Vet Med Assoc.](#) 2006 Aug 1;229(3):389-93

**Comparison of two surgical techniques for management of intramural ureteral ectopia in dogs: 36 cases (1994-2004).**

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OBJECTIVE: To determine outcome associated with intramural ureteral ectopia treated with 1 of 2 surgical techniques (neoureterostomy with ligation of the distal ureteral segment vs neoureterostomy with resection of the distal ureteral segment) and compare results of these 2 techniques in dogs. DESIGN: Multicenter retrospective case series. ANIMALS: 36 dogs (15 treated with the ligation technique and 21 treated with the resection technique). PROCEDURES: Information was obtained from medical records. Long-term follow-up information was obtained by owner questionnaire. RESULTS: 15 of 21 (71%) dogs in the resection group and 7 of 14 (50%) dogs in the ligation group still had urinary incontinence after surgery. Three of 20 (15%) dogs in the resection group and 4 of 14 (29%) dogs in the ligation group reportedly had multiple episodes of urinary tract infection following surgery. The outcome of surgery was judged to be excellent by the owners of 10 of 18 (56%) dogs in the resection group and 9 of 14 (64%) dogs in the ligation group. No significant differences were found between surgery treatment groups. CONCLUSIONS AND CLINICAL RELEVANCE: Results of the present study suggest that although most owners of dogs that undergo surgery for treatment of intramural ureteral ectopia consider the outcome of surgery to be excellent, substantial proportions of dogs will continue to have urinary incontinence and recurrent urinary tract infections after surgery. Findings do not provide any support to the hypothesis that the resection technique is superior to the ligation technique for management of dogs with intramural ureteral ectopia.

[J Am Vet Med Assoc.](#) 2006 Sep 15;229(6):958-63.

**Evaluation of the association between microalbuminuria and the urine albumin-creatinine ratio and systemic disease in dogs.**

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**OBJECTIVE:** To evaluate semiquantitative and quantitative assays for microalbuminuria and determination of the urine albumin-creatinine (UAC) ratio in detection of systemic disease in dogs without overt proteinuria. **DESIGN:** Prospective study. **ANIMALS:** 408 dogs.

**PROCEDURES:** Urine samples that had been obtained from dogs for which a complete medical record was available and in which results of a dipstick test for urine protein were negative were evaluated. Urine protein-creatinine ratios (cutoff values, 0.5 and 0.1), semiquantitative and quantitative microalbuminuria values (cutoff value, 1 mg/dL), and UAC ratios (cutoff values, 100 and 200 mg/g) were determined. Clinical diagnoses rendered within 3 months of enrollment in the study were recorded. Sensitivity and specificity were determined with disease status serving as the standard. Associations with clinical diagnosis, sex, age, BUN and serum creatinine concentrations, blood pressure, results of bacterial culture of urine, temperature, pyuria, hematuria, and bacteriuria were evaluated by use of logistic regression analysis. **RESULTS:** 48 dogs were healthy, and 360 had at least 1 disease. Significant associations were detected between age, presence of disease, presence of neoplastic disease, BUN and serum creatinine concentrations, and hematuria and results of 1 or both of the microalbuminuria assays. **CONCLUSIONS AND CLINICAL RELEVANCE:** Microalbuminuria was associated with underlying disease. The sensitivity and specificity of the semiquantitative microalbuminuria test for detection of systemic disease were superior to those of other tests. Microalbuminuria testing in conjunction with other screening procedures may increase diagnosis of subclinical disease, but a prospective study in which the predictive values of screening tests are evaluated, with and without microalbuminuria determination, is needed.

[J Am Vet Med Assoc.](#) 2006 Jul 15;229(2):235-9.

**Colonic seromuscular augmentation cystoplasty following subtotal cystectomy for treatment of bladder necrosis caused by bladder torsion in a dog.**

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**CASE DESCRIPTION:** A 5-year-old Labrador Retriever was evaluated because of a 3-day history of lethargy, anorexia, vomiting, stranguria, and anuria after routine ovariohysterectomy. **CLINICAL FINDINGS:** On initial examination, signs of abdominal pain and enlargement of the urinary bladder were detected. Clinicopathologic abnormalities included leukocytosis, azotemia, and hyperkalemia. Radiography and surgical exploration of the abdomen revealed urinary bladder torsion at the level of the trigone; histologically, there

was necrosis of 90% of the organ. TREATMENT AND OUTCOME: After excision of the necrotic wall of the urinary bladder (approx 0.5 cm cranial to the ureteral orifices), the remaining bladder stump was closed with a colonic seromuscular patch. Eleven weeks later, cystoscopy revealed an intramural ureteral stricture, for which treatment included a mucosal apposition neoureterocystostomy. Thirteen months after the first surgery, the dog developed pyelonephritis, which was successfully treated. By 3 months after subtotal cystectomy, the dog's urinary bladder was almost normal in size. Frequency of urination decreased from 3 to 4 urinations/h immediately after surgery to once every 3 hours after 2 months; approximately 4 months after the subtotal cystectomy, urination frequency was considered close to normal. CLINICAL RELEVANCE: Urinary bladder torsion is a surgical emergency in dogs. Ischemia of the urinary bladder wall may result from strangulation of the arterial and venous blood supply and from overdistension. Subtotal resection of the urinary bladder, preserving only the trigone area and the ureteral openings, and colonic seromuscular augmentation can be used to successfully treat urinary bladder torsion in dogs.

[J Am Vet Med Assoc.](#) 2006 Oct 1;229(7):1118-21.

#### **Spontaneous retrograde movement of ureteroliths in two dogs and five cats.**

Dalby AM, Adams LG, Salisbury SK, Blevins WE.

Department of Veterinary Clinical Sciences, School of Veterinary Medicine, Purdue University, West Lafayette, IN 47907-2026, USA.

CASE DESCRIPTION: 2 dogs and 5 cats were evaluated for treatment of ureteroliths. CLINICAL FINDINGS: Spontaneous retrograde movement of 1 or more ureteroliths was detected by radiography, ultrasonography, fluoroscopy, and a combination of fluoroscopy and ultrasonography. The ureteroliths moved retrograde up to 4 centimeters. Retrograde movement of ureteroliths into the renal pelvis resulted in improved renal function in some patients but made complete surgical removal of all uroliths more difficult. TREATMENT AND OUTCOME: Medical management was not successful, and ureteroliths were surgically removed. Surgical management of ureteroliths was complicated by retrograde movement of ureteroliths in the perioperative period. CLINICAL RELEVANCE: Ureteroliths can move retrograde within the ureter and even back into the renal pelvis. Retrograde movement of ureteroliths may make surgical planning more difficult.

[J Am Vet Med Assoc.](#) 2006 Sep 15;229(6):949-57.

#### **Clinical evaluation of dietary modification for treatment of spontaneous chronic kidney disease in cats.**

Ross SJ, Osborne CA, Kirk CA, Lowry SR, Koehler LA, Polzin DJ.

Department of Veterinary Clinical Sciences, College of Veterinary Medicine, University of Minnesota, Saint Paul, MN 55108, USA.

**Objective-**To determine whether a renal diet modified in protein, phosphorus, sodium, and lipid content was superior to an adult maintenance diet in minimizing uremic episodes and mortality rate in cats with stage 2 or 3 chronic kidney disease (CKD). **Design-**Double-masked, randomized, controlled clinical trial. **Animals-**45 client-owned cats with spontaneous stage 2 or 3 CKD. **Procedures-**Cats were randomly assigned to an adult maintenance diet (n = 23 cats) or a renal diet (22) and evaluated trimonthly for up to 24 months. Efficacy of the renal diet, compared with the maintenance diet, in minimizing uremia, renal-related deaths, and all causes of death was evaluated. **Results-**Serum urea nitrogen concentrations were significantly lower and blood bicarbonate concentrations were significantly higher in the renal diet group at baseline and during the 12- and 24-month intervals. Significant differences were not detected in body weight; Hct; urine protein-to-creatinine ratio; and serum creatinine, potassium, calcium, and parathyroid hormone concentrations. A significantly greater percentage of cats fed the maintenance diet had uremic episodes (26%), compared with cats fed the renal diet (0%). A significant reduction in renal-related deaths but not all causes of death was detected in cats fed the renal diet. **Conclusions and Clinical Relevance-**The renal diet evaluated in this study was superior to an adult maintenance diet in minimizing uremic episodes and renal-related deaths in cats with spontaneous stage 2 or 3 CKD.

[J Am Vet Med Assoc.](#) 2006 Oct 15;229(8):1260-5.

### **Detection of *Borrelia burgdorferi* DNA in tissues from dogs with presumptive Lyme borreliosis.**

Chou J, Wunschmann A, Hodzic E, Borjesson DL.

Department of Veterinary Population Medicine, College of Veterinary Medicine, University of Minnesota, Saint Paul, MN 55108, USA.

**OBJECTIVE:** To develop a quantitative PCR assay for detection of *Borrelia burgdorferi* DNA in formalin-fixed, paraffin-embedded tissues; compare results of this assay with results of immunohistochemical staining of tissues from seropositive dogs; and determine whether *B burgdorferi* DNA could be detected in renal tissues from dogs with presumptive Lyme nephritis. **DESIGN:** Cohort study. **SAMPLE POPULATION:** Archived tissue samples from 58 dogs. **PROCEDURES:** A quantitative PCR assay was performed on formalin-fixed, paraffin-embedded tissue sections from the dogs. Results were compared with results of immunohistochemical staining, *B burgdorferi* serostatus, clinical signs, and necropsy findings. **RESULTS:** 38 dogs were classified as having positive or equivocal results for Lyme borreliosis, and 20 were classified as having negative results on the basis of clinical signs, serologic findings, and pathologic abnormalities. *Borrelia burgdorferi* DNA was amplified from tissue samples from only 4 (7%) dogs, all of which had been classified as having positive or equivocal results for Lyme borreliosis and had signs of presumptive Lyme nephritis. Results of PCR assays of renal tissue were positive for only 1 dog, and there was no agreement between results of immunohistochemical staining (ie, detection of *B burgdorferi* antigen) and results of the PCR assay (ie, detection of *B burgdorferi* DNA) for renal tissues. **CONCLUSIONS AND CLINICAL RELEVANCE:** Results indicated that detection of *B burgdorferi* DNA in formalin-fixed, paraffin-embedded tissues is feasible, but that intact *B burgdorferi*

DNA is rarely found in tissues from naturally infected dogs, even tissues from dogs with presumptive Lyme borreliosis. Further, findings support the contention that Lyme nephritis may be a sterile, immune complex disease.

[J Am Vet Med Assoc.](#) 2006 Nov 15;229(10):1584-90.

**Evaluation of catheter-associated urinary tract infections and multi-drug-resistant Escherichia coli isolates from the urine of dogs with indwelling urinary catheters.**

Ogeer-Gyles J, Mathews K, Weese JS, Prescott JF, Boerlin P.

Department of Clinical Studies, Ontario Veterinary College, University of Guelph, Guelph, ON N1G 2W1, Canada.

**OBJECTIVE:** To determine the frequency of urinary tract infections (UTIs) in dogs with indwelling urinary catheters in an intensive care unit (ICU) and the frequency of multi-drug-resistant (MDR) Escherichia coli UTIs in those dogs. **DESIGN:** Prospective study. **ANIMALS:** All dogs in the ICU with an indwelling urinary catheter from January 2003 through December 2003. **PROCEDURES:** Urine samples and rectal swab specimens were collected at admission and every 3 days until discharge from the hospital. Escherichia coli isolates from urine samples and rectal swab specimens and those from dogs that were temporally or spatially associated with dogs with MDR E coli UTIs underwent antimicrobial susceptibility testing. Pulsed-field gel electrophoresis was performed on MDR isolates from urine and rectal swab specimens. **RESULTS:** Urinary catheters were placed in 137 dogs. Twenty-six UTIs were diagnosed, 15 on the day of admission and 11 after 3 or more days of catheterization. Of 12 dogs with E coli UTIs, 6 were infected at admission and 6 acquired the infection in the ICU. Two MDR E coli UTIs were detected, 1 of which was acquired in the ICU. One MDR E coli urinary isolate had an electrophoresis pattern similar to that of rectal isolates from the same dog. Urinary E coli isolates were most frequently resistant to ampicillin and cephalothin. **CONCLUSIONS AND CLINICAL RELEVANCE:** The ICU-acquired MDR E coli UTI likely originated from the dog's intestinal flora during hospitalization. Dogs that have been referred from a community practice may have MDR E coli UTIs at the time of admission.

[J Am Vet Med Assoc.](#) 2006 Dec 15;229(12):1887-8.

**What is your diagnosis? Renal disease resulting in aortic metastatic mineralization.**

Olah GA.

Smith Veterinary Hospital, 600 Alta Vista Avenue, Santa Fe, NM 87505, USA.

[J Am Vet Med Assoc.](#) 2007 Feb 1;230(3):375-7.



### **Subtotal penile amputation and preputial urethrostomy in a dog.**

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Department of Surgery, Angell Animal Medical Center, 350 S Huntington Ave, Boston, MA 02130, USA.

**CASE DESCRIPTION:** A 6-year-old castrated male Shih Tzu was evaluated because of intermittent bleeding during urination. **CLINICAL FINDINGS:** Necrosis of the cranial portion of the penile shaft extended distally from the preputial fornix. Penile necrosis secondary to strangulation from paraphimosis was diagnosed. **TREATMENT AND OUTCOME:** A midline preputiotomy incision was used to expose the penile shaft; amputation was performed caudal to the preputial fornix. The terminal portion of the urethra was anastomosed to the preputial mucosa, which allowed the dog to urinate through the preputial orifice. **CLINICAL RELEVANCE:** Unlike the more conventional urethrostomy procedures performed in dogs, preputial urethrostomy eliminates the potential for local skin irritation during urination. Preputial urethrostomy is also easier to perform in those dogs in which penile amputation is required adjacent to the preputial fornix. A release incision cranial to the prepuce can be used to facilitate caudal displacement of the preputial mucosa, which facilitates urethral anastomosis to this structure. A midline preputiotomy incision provided excellent exposure of the penile shaft for this surgical procedure.

[J Am Vet Med Assoc.](#) 2007 Feb 1;230(3):364-9.

### **Evaluation of the reproducibility and accuracy of pH-determining devices used to measure urine pH in dogs.**

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Minnesota Urolith Center, Department of Veterinary Clinical Sciences, College of Veterinary Medicine, University of Minnesota, Saint Paul, MN 55108, USA.

**OBJECTIVE:** To evaluate the reproducibility and accuracy of 4 portable pH meters, a reagent strip, and pH paper for measuring urine pH in dogs. **DESIGN:** Prospective masked randomized study. **SAMPLE POPULATION:** 201 free-catch urine samples from 114 hospitalized dogs. **PROCEDURES:** Urine samples were divided into 2-mL aliquots. Measurements of urine pH were obtained by use of a laboratory benchtop pH meter, 4 portable pH meters, a urine reagent strip, and pH paper. The pH of each aliquot was measured within 4 hours of collection by an evaluator unaware of the aliquot's origin. To assess reproducibility, the coefficient of variation for each pH measurement device was calculated. To determine which device was most accurate, the degree of agreement among the different devices was assessed in comparison with the benchtop pH meter, which was considered the reference method. **RESULTS:** 3 of the 4 portable pH meters had nearly perfect agreement with the reference method. The reagent strip and pH paper had moderate to poor agreement with the reference method. **CONCLUSIONS AND CLINICAL RELEVANCE:** Urine pH measurements should be made by use of a portable or benchtop pH meter when accurate measurements are crucial for diagnosis or treatment. Reagent strips

and pH papers are useful in obtaining pH approximations but are not recommended when accurate measurements of urine pH are required.

[J Am Vet Med Assoc.](#) 2007 Mar 15;230(6):880-4.

**Incidence of and risk factors for diabetes mellitus in cats that have undergone renal transplantation: 187 cases (1986-2005).**

Case JB, Kyles AE, Nelson RW, Aronson L, Kass PH, Klose TC, Bailiff NL, Gregory CR.

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**OBJECTIVE:** To compare incidence of diabetes mellitus in cats that had undergone renal transplantation with incidence in cats with chronic renal failure, compare mortality rates in cats that underwent renal transplantation and did or did not develop diabetes mellitus, and identify potential risk factors for development of posttransplantation diabetes mellitus (PTDM) in cats. **DESIGN:** Retrospective case series. **ANIMALS:** 187 cats that underwent renal transplantation. **PROCEDURES:** Medical records were reviewed. **RESULTS:** 26 of the 187 (13.9%) cats developed PTDM, with the incidence of PTDM being 66 cases/1,000 cat years at risk. By contrast, the incidence of diabetes mellitus among a comparison population of 178 cats with chronic renal failure that did not undergo renal transplantation was 17.9 cases/1,000 cat years at risk, and cats that underwent renal transplantation were 5.45 times as likely to develop diabetes mellitus as were control cats with chronic renal failure. The mortality rate among cats with PTDM was 2.38 times the rate among cats that underwent renal transplantation but did not develop PTDM. Age, sex, body weight, and percentage change in body weight were not found to be significantly associated with development of PTDM. **CONCLUSIONS AND CLINICAL RELEVANCE:** Results suggest that cats that undergo renal transplantation have an increased risk of developing diabetes mellitus, compared with cats with chronic renal failure, and that mortality rate is higher for cats that develop PTDM than for cats that do not.

**Journal of the Feline Medicine and Surgery (Apr 06– Apr 07)**

[J Feline Med Surg.](#) 2006 Oct;8(5):353-6. Epub 2006 May 19.

**Interstitial nephritis in cats inoculated with Crandell Rees feline kidney cell lysates.**

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Parenteral administration of Crandell Rees feline kidney (CRFK) cell lysates or feline herpesvirus 1, calicivirus, and panleukopenia virus-containing vaccines (FVRCP) grown on CRFK cells induces antibodies against CRFK cells. These antibodies also react with feline renal cell extracts. The purpose of this study was to determine whether interstitial nephritis would be detected in cats that were immunologically sensitized with CRFK lysates, boosted with CRFK lysates, and then biopsied 2 weeks after the booster. Cats (2 per group) were immunologically sensitized against CRFK lysates by administering 10 microg, 50 microg, or 50 microg plus alum 13 times (12 times in the first 50 weeks) over 2 years. Two cats were inoculated three times, 4 weeks apart with an FVRCP vaccine for intranasal administration as kittens, boosted 50 and 102 weeks later, and then renal biopsies taken 2 weeks after the last booster. Neither of the cats vaccinated with the FVRCP for intranasal administration had detectable renal inflammation. One cat in each of the three CRFK lysate sensitization groups had lymphocytic-plasmacytic interstitial nephritis.

[J Feline Med Surg.](#) 2006 Aug;8(4):261-8. Epub 2006 Apr 17

### **Clinical evaluation of multimodal environmental modification (MEMO) in the management of cats with idiopathic cystitis.**

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This prospective observational study evaluated client-reported recurrence of lower urinary tract signs (LUTS) and other signs of abnormalities in cats with idiopathic cystitis after institution of multimodal environmental modification (MEMO). Forty-six client-owned indoor-housed cats with idiopathic cystitis, diagnosed based on a history of recurrent LUTS and evidence of absence of urolithiasis or bacterial urinary tract infection were studied. In addition to their usual care, clients were offered recommendations for MEMO based on a detailed environmental history. Cases were followed for 10 months by client contact to determine the effect of MEMO on LUTS and other signs. Significant ( $P < 0.05$ ) reductions in LUTS, fearfulness, nervousness, signs referable to the respiratory tract, and a trend ( $P < 0.1$ ) toward reduced aggressive behavior and signs referable to the lower intestinal tract were identified. These results suggest that MEMO is a promising adjunctive therapy for indoor-housed cats with LUTS, and should be followed up with prospective controlled clinical trials.

[J Feline Med Surg.](#) 2005 Dec;7(6):357-61.

### **Feline primary hyperoxaluria.**

Sewell AC.

[J Feline Med Surg](#). 2006 Dec;8(6):420-3. Epub 2006 Jul 18.

**Proximal ureteral ectopia causing hydronephrosis in a kitten.**

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A 2-month-old, female cat was presented for abdomen dilation. The patient was undernourished, and severe left hydronephrosis was diagnosed after clinical, ultrasonographical and radiographical examination. Although pyelography was performed in order to visualise the ureteral course, surgery was necessary to reach a final aetiological diagnosis and treatment. At gross examination, the left ureter crossed the renal capsula at the level of the caudal renal pole, and the subcapsular ureteral segment was markedly dilated. Distal to the renal capsula, the left ureter was very thin when compared to the right. The parenchyma of the left kidney, as suggested by ultrasonographical evaluation, was extremely reduced in thickness. An ureteronephrectomy was performed. Histopathological evaluation revealed glomerular sclerosis and diffuse parenchymal fibrosis. Severe hydronephrosis derived from an altered renal pelvic anatomy and abnormal ureteral course determining functional stenosis. Diagnosis of congenital anomaly before development of complications such as hydronephrosis could have allowed a surgical renal capsulectomy and obstruction relief. To the author's knowledge, this is the first report of severe hydronephrosis associated to altered renal pelvic anatomy and proximal ureteral ectopia in cat.

[J Feline Med Surg](#). 2006 Aug;8(4):269-78. Epub 2006 Jun 15.

**Evaluation of a commercial in-house test kit for the semi-quantitative assessment of microalbuminuria in cats.**

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Proteinuria was assessed in 100 randomly selected sick cats and 22 healthy cats by means of the urine protein:creatinine ratio, a traditional urine "dipstick" and a commercial ELISA-based dipstick designed to detect microalbuminuria (MA) semi-quantitatively. In addition the repeatability and reproducibility of the MA test was assessed by comparing results of five replicate tests of 26 urine samples, interpreted by two different readers. Discrepancies existed in the replicate test result in 23 and 27% of the samples examined by reader 1 and 2, respectively, and on several occasions this discrepancy was between whether the sample was "positive" or "negative" for MA. The inter-reader agreement was good ( $\kappa=0.75$ ), but again discrepancies were noted and part of the reason for these problems appeared to be the necessary subjectivity in the interpretation of colour changes when reading test results. Proteinuria was significantly ( $P < 0.014$ ) more prevalent in the sick than the

healthy cats with 36 and 9%, respectively, having detectable MA, 34 and 5%, respectively, having a urine protein to creatinine (UPC) ratio >0.5, and 84 and 9%, respectively, having positive urine protein dipstick analysis. There was a moderate significant correlation between UPC ratio and MA concentrations ( $r(s)=0.68$ ,  $P<0.0001$ ). While 13/87 cats with a UPC ratio < or =0.5 had positive MA results, 10/84 cats with negative MA results had a UPC ratio >0.5, and none of these had evidence of lower urinary tract disease. This study confirmed that MA and proteinuria are commonly seen in cats with a variety of diseases, but they are not necessarily both elevated, and the UPC ratio can be elevated without an increase in MA results. Furthermore, some repeatability problems were demonstrated with the semi-quantitative MA test. These findings demonstrate that the semi-quantitative MA test should not be relied on as the sole determinant of proteinuria.

[J Feline Med Surg.](#) 2006 Oct;8(5):357-60. Epub 2006 Jun 13.

### **Lack of genetic association among coat colors, progressive retinal atrophy and polycystic kidney disease in Persian cats.**

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An inherited form of progressive retinal atrophy (PRA) is recognized in Persian cats; however, the prevalence of PRA in the breed has not been determined. Breeders suggest that cats from only brown ('chocolate') or Himalayan ('pointed') lines are at risk for PRA, suggesting the disease is not widespread. This study was designed to evaluate whether PRA in Persian cats is associated with three coat colors, including chocolate, or with a highly prevalent inherited disease in this breed--polycystic kidney disease (PKD). Sixty related cats were evaluated for PRA by ophthalmic examination and genetically typed for PKD and the mutations that cause coat color variants in agouti, brown and color (producing the pointed coloration in Himalayan). No associations were identified among any of the traits, including between PRA and chocolate. These data suggest that PRA is not limited to cats with chocolate coat coloration and breeders and veterinarians should be aware that the prevalence of the disease may be higher than currently claimed.

[J Feline Med Surg.](#) 2006 Dec;8(6):361-2.

### **The aging feline kidney: a model mortality antagonist?**

Lawler DF, Evans RH, Chase K, Ellersieck M, Li Q, Larson BT, Satyaraj E, Heining K.

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Traditional thinking views apparently non-programmed disruptions of aging, which medical science calls geriatric diseases, as separate from 'less harmful' morphological and physiological aging phenotypes that are more universally expected with passage of time (loss of skin elasticity, graying of hair coat, weight gain, increased sleep time, behavioral changes, etc). Late-life disease phenotypes, especially those involving chronic processes, frequently are complex and very energy-expensive. A non-programmed process of homeostatic disruption leading into a death trajectory seems inconsistent with energy intensive processes. That is, evolutionary mechanisms do not favor complex and prolonged energy investment in death. Taking a different view, the naturally occurring feline (*Felis silvestris catus*) renal model suggests that at least some diseases of late life represent only the point of failure in essentially survival-driven adaptive processes. In the feline renal model, individuals that succumbed to failure most frequently displayed progressive tubular deletion and peritubular interstitial fibrosis, but had longer mean life span than cats that died from other causes. Additionally, among cats that died from non-renal causes, those that had degrees of renal tubular deletion and peritubular interstitial fibrosis also had longer mean life span than those cats with no changes, even though causes of death differed minimally between these latter two groups. The data indicate that selective tubular deletion very frequently begins early in adult life, without a clear initiating phase or event. The observations support a hypothesis that this prolonged process may be intrinsic and protective prior to an ultimate point of failure. Moreover, given the genetic complexity and the interplay with associated risk factors, existing data also do not support the ideas that these changes are simple compensatory responses and that breed- or strain-based 'default' diseases are inevitable results of increasing individual longevity. Emerging molecular technology offers the future potential to further evaluate and refine these observations. At present, the existence of plastic and adaptive aging programming is suggested by these findings.

[J Feline Med Surg](#). 2007 Apr;9(2):124-32. Epub 2006 Nov 7.

### **Urinary tract infections in cats with hyperthyroidism, diabetes mellitus and chronic kidney disease.**

**Mayer-Roenne B, Goldstein RE, Erb HN.**

Cornell University Hospital for Animals, College of Veterinary Medicine, Cornell University, Ithaca 14853, New York.

The prevalence of urinary tract infections (UTIs) in cats with hyperthyroidism (n=90), diabetes mellitus (DM) (n=57) and chronic kidney disease (CKD) (n=77) was evaluated retrospectively. It was found to be 12% in cats with hyperthyroidism and DM, respectively, and 22% in cats with CKD. Associations between UTIs and clinical signs, biochemical markers in serum and urinalyses were investigated. Many of the cats with UTIs had no clinical signs of lower urinary tract disease or changes in their laboratory values indicative of infection. Therefore, a urinalysis alone should not be used to exclude UTIs in these cats. UTIs are relatively common in cats with hyperthyroidism, DM and CKD, and urine cultures are recommended as part of the basic diagnostic plan for cats suspected of suffering from these conditions.

[J Feline Med Surg.](#) 2007 Apr;9(2):89-96. Epub 2006 Oct 16.

### **Disposition of plasma creatinine in non-azotaemic and moderately azotaemic cats.**

Le Garreres A, Laroute V, De La Farge F, Boudet KG, Lefebvre HP.

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The objectives of this study were to compare assay methods for plasma creatinine (PI-creat) in cats and to describe the disposition of creatinine and iohexol in 12 healthy and moderately azotaemic cats. Exogenous creatinine and iohexol were injected simultaneously by intravenous bolus, and repeated blood samples were taken to determine the pharmacokinetic parameters of each marker. PI-creat was assayed by high-performance liquid chromatography (HPLC), Jaffe and enzymatic methods. The enzymatic method was shown to be more reliable than the Jaffe method. Two stereoisomers, exo- and endo-iohexol were identified. The plasma clearance of creatinine ( $2.3 \pm 0.66$  ml/min/kg) was significantly higher ( $P < 0.001$ ) than that of exo-iohexol ( $1.7 \pm 0.40$  ml/min/kg). The volume of distribution ( $447 \pm 97$  ml/kg) and elimination half-life ( $181 \pm 77$  min) of creatinine were also higher ( $P < 0.001$ ) than those of exo- and endo-iohexol. The estimated daily endogenous production of creatinine was  $65 \pm 23$  mg/kg. None of the pharmacokinetic parameters was changed by the azotaemic status of the animals.

## **Journal of Comparative Pathology (Apr 06– Apr 07)**

[J Comp Pathol.](#) 2006 Nov;135(4):157-75.

### **Endotoxin and mammalian host responses during experimental disease.**

Hodgson JC.

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Endotoxin is an integral component of the outer membrane of Gram-negative bacteria and a prime example of unique and highly conserved bacterial surface molecules that engage with the innate immune system of the mammalian host via pattern recognition receptors on a range of host cells. The results of this interaction, which may be beneficial or detrimental to the development and welfare of the host, are reviewed, focusing on the different sensitivities and consequences in a range of hosts of experimental exposure to endotoxin, the disease outcomes and recent developments in our understanding of the mechanisms involved.

[J Comp Pathol.](#) 2006 Nov;135(4):190-9. Epub 2006 Oct 18.

**Classification of canine urinary bladder urothelial tumours based on the World Health Organization/International Society of Urological Pathology consensus classification.**

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One hundred canine urinary bladder urothelial (transitional cell) tumours, including roughly equal numbers of benign and malignant forms, were retrospectively categorized in accordance with the newly described human consensus classification of the World Health Organization/International Society of Urological Pathology (WHO/ISUP). The tumours were reviewed and classified by three veterinary pathologists from Michigan State University and two human pathologists from the Armed Forces Institute of Pathology (AFIP). The current human WHO/ISUP classification system was considered to be readily applicable to the dog. Canine tumours, however, differed from human tumours in that the great majority showed extensive glandular differentiation (or metaplasia) and hyperplastic lesions tended to be more florid than those seen in human beings. The various diagnoses and grades assigned to the tumours were highly consistent between all reviewing pathologists. This paper presents the salient features of the new WHO and ISUP consensus classification and provides illustrations of the various tumour types that were directly applicable to the dog.

## **Journal of Small Animal Practice (Apr 06 – Apr 07)**

[J Small Anim Pract.](#) 2006 Aug;47(8):446-50. *Comment in:* [J Small Anim Pract.](#) 2006 Aug;47(8):430-1.

**Association of laboratory data and death within one month in cats with chronic renal failure.**

Kuwahara Y, Ohba Y, Kitoh K, Kuwahara N, Kitagawa H.

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**OBJECTIVES:** To retrospectively compare the data taken at the first visit of 34 cats with chronic renal failure surviving more than one month (surviving group) and 16 cats dying within one month (non-surviving group). **METHODS:** Records were collected on cats with chronic renal failure presented to a private veterinary practice in Nagoya, Japan, from March 1996 to March 2005. All cats with chronic renal failure diagnosed on the basis of case histories, clinical signs (such as, lethargy, anorexia, loss of bodyweight and vomiting) and a high plasma creatinine (>180 micromol/l) were included in the study. **RESULTS:** Plasma creatinine, urea nitrogen, inorganic phosphate, packed cell volume and urine protein/creatinine ratio were significantly different between cats of the surviving and non-surviving groups. In the surviving group, survival statuses were recorded, and laboratory



data was obtained within one month before death in 13 cats. In the 13 cats, plasma creatinine, packed cell volume and urine protein/creatinine ratio showed significant differences between the data taken within one month before death and that taken at first visit, and only urine protein/creatinine ratio exhibited a consistent alteration (increase) in relation to first visit data. **CLINICAL SIGNIFICANCE:** These results indicated that plasma creatinine, urea nitrogen, inorganic phosphate, packed cell volume and urine protein/creatinine ratio were associated with death within one month and urine protein/creatinine ratio was most likely to be associated with mortality in cats with chronic renal failure.

[J Small Anim Pract.](#) 2006 Jul;47(7):409-12.

### **Ureteral fibroepithelial polyp in a dog.**

Farrell M, Philbey AW, Ramsey I.

Hospital for Small Animals and Division of Pathological Sciences, Glasgow University Veterinary School, Bearsden, UK.

Haematuria in a dog occurred secondarily to a unilateral ureteral fibroepithelial polyp. The diagnostic techniques, gross pathology and histopathological findings of this unusual benign tumour are reported. Complete resolution of clinical signs occurred following ureteronephrectomy.

[J Small Anim Pract.](#) 2006 Jul;47(7):396-9.

### **Lymphocytic-plasmacytic thyroiditis and glomerulonephritis in a boxer.**

Mansfield CS, Mooney CT.

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An 18-month-old boxer was presented for investigation of profound lethargy, and primary hypothyroidism was diagnosed. A strong antithyroglobulin antibody titre was also present, indicating lymphocytic (immune-mediated) thyroiditis as the cause of hypothyroidism. A concurrent protein-losing glomerulonephropathy was also detected, although the aetiology could not be determined at initial presentation. Thyroid replacement and dietary therapy were prescribed. The dog improved clinically for approximately 12 months when it was re-presented with poorly controlled hypothyroidism and renal failure. Postmortem examination confirmed the presence of lymphocytic-plasmacytic thyroiditis, in conjunction with membranoproliferative glomerulonephritis and renal failure.

[J Small Anim Pract.](#) 2006 Sep;47(9):504-11.

**Clinical approach to renal neoplasia in budgerigars (*Melopsittacus undulatus*).**

Simova-Curd S, Nitzl D, Mayer J, Hatt JM.

Division of Zoo Animals, Exotic Pets and Wildlife, Vetsuisse Faculty, University of Zurich, Winterthurerstrasse 260, 8057 Zurich, Switzerland.

Renal neoplasia in budgerigars (*Melopsittacus undulatus*) is seen regularly in general practice and is of interest to many practicing veterinary surgeons. This review article provides an overview of the current knowledge and the most recent reports in avian literature regarding renal tumours in budgerigars, with the emphasis on clinical diagnosis and treatment. The high prevalence of renal neoplasia in budgerigar is discussed, with notes on the most commonly diagnosed tumours, possibility of metastases, sex and age predisposition. The possibility of ultrasonography and radiography in the diagnosis of this pathological condition are compared as well as the possible role of blood and urine analyses. Two studies are described, both of which investigate the possible involvement of a retrovirus as the aetiological agent.

[J Small Anim Pract.](#) 2006 Dec;47(12):737-40.

**Traumatic bilateral ureteric rupture in two dogs.**

Hamilton MH, Sissener TR, Baines SJ.

The Queen's Veterinary School Hospital, University of Cambridge, Madingley Road, Cambridge CB3 0ES.

Two cases of bilateral ureteric rupture in dogs are reported. Both dogs were presented following road traffic accidents with signs of depression and abdominal distension. Both animals were azotaemic and abdominal fluid analysis was consistent with uroabdomen. In case 1, the injuries affected the proximal portion of both ureters and the dog was euthanased. In case 2, the ruptures were located more distally and a ureteroneocystostomy was performed, with contralateral ureteronephrectomy. This dog is clinically normal 16 months postoperatively.

[J Small Anim Pract.](#) 2006 Dec;47(12):727-32.

**Comparison of three techniques for the diagnosis of urinary tract infections in dogs with urolithiasis.**

Gatoria IS, Saini NS, Rai TS, Dwivedi PN.

Department of Veterinary Surgery and Radiology, and Department of Veterinary Microbiology, Guru Angad Dev and Veterinary and Animal Sciences University, Ludhiana 141004, Punjab, India.

**OBJECTIVES:** To identify an appropriate sampling technique(s) to accurately detect the bacteria causing urinary tract infections in dogs with urolithiasis. **METHODS:** Twenty-one dogs with urolithiasis were included in the study. Three types of samples were taken from each dog. Urine was collected by cystocentesis, and a urinary bladder mucosal biopsy and urolith were retrieved during cystotomy. The samples were then cultured on blood agar and MacConkey's agar to identify the bacteria associated with urinary tract infections. **RESULTS:** Bacterial urinary tract infection was found in 16 cases (76.19 per cent). The most prevalent bacteria found to cause urinary tract infection were *Escherichia coli* (n=7), followed by coagulase-positive *Staphylococcus* species (n=4), *Klebsiella pneumoniae* (n=2), *Pseudomonas aeruginosa* (n=2) and *Proteus mirabilis* (n=1). In the case of a positive urine culture, the same bacteria were also cultured from the urinary bladder mucosal biopsy alone or from both the urinary bladder mucosal biopsy and urolith. However, in the case of a negative urine culture, bacteria were found to be present in the urinary bladder mucosal biopsy or urolith cultures in 23.81 per cent of dogs. The uroliths that gave positive culture results were either infection-induced uroliths composed of struvite and calcium carbonate phosphate, ammonium acid urate only or metabolic uroliths composed of calcium oxalate and calcium phosphate, or calcium phosphate only. All the uroliths that gave negative culture results were metabolic uroliths composed of calcium oxalate and/or calcium phosphate, and uric acid and calcium phosphate. **CLINICAL SIGNIFICANCE:** When the culture from the urine obtained by cystocentesis is negative, cultures of urinary bladder mucosal biopsy and urolith are recommended in dogs with urolithiasis in order to accurately assess the microbiological status of the urinary tract.

[J Small Anim Pract.](#) 2007 Apr;48(4):202-8.

### **Measurement of aldosterone in feline, canine and human urine.**

Syme HM, Fletcher MG, Bailey SR, Elliott J.

Department of Veterinary Clinical Sciences, The Royal Veterinary College, University of London, Royal College Street, London NW1 0TU.

**Background:** Systemic hypertension is an important problem in older cats associated with kidney disease and hypokalaemia, suggesting that excessive activity of the renin-angiotensin-aldosterone system might contribute to the hypertensive state. Fluctuations in plasma renin activity and plasma aldosterone concentrations complicate the interpretation of these assays. **Objectives:** The aim of this study was to determine whether measurement of urinary aldosterone excretion in cats aided the investigation of hypertension. **Methods:** Urine concentrations of free (ethyl acetate extract) and 18-glucuronidated aldosterone (acid hydrolysis before extraction) were measured by radioimmunoassay in normal, normotensive and hypertensive azotaemic cats (n=11 per group). Urine samples from 11 healthy human volunteers and eight normal dogs were also analysed for comparison. Urinary aldosterone concentration was corrected for the urinary creatinine concentration. **Results:** Cats excreted

7.3 times less free aldosterone than human beings, and no free aldosterone was detected in dog urine. Acid hydrolysis led to large increases in aldosterone recovery from both human beings and dog but not feline urine. No significant effect of hypertension or azotaemia on feline urinary aldosterone concentration was found. Clinical Significance: Measurement of aldosterone in feline urine using the available methodology has limited or no utility in investigating feline hypertension.

[J Small Anim Pract.](#) 2007 Mar;48(3):139-44.

### **Efficacy and safety of cefovecin (Convenia) for the treatment of urinary tract infections in dogs.**

Passmore CA, Sherington J, Stegemann MR.

Pfizer Animal Health, Pfizer Ltd, Ramsgate Road, Sandwich, Kent CT13 9NJ, UK.

**OBJECTIVES:** To determine the efficacy and safety of cefovecin (Convenia); Pfizer Animal Health) in the treatment of urinary tract infections in dogs. **METHODS:** A multi-centre, blinded, randomised study was conducted in 129 dogs with urinary tract infections. Cephalexin (Rilexine) administered twice daily at 15 mg/kg bodyweight orally for 14 days was compared with a single, subcutaneous injection of cefovecin (Convenia) in dogs. The primary efficacy parameter assessed was bacterial elimination of the pretreatment uropathogen. **RESULTS:** One hundred and twenty-nine dogs were included in efficacy assessments. Escherichia coli was eliminated in 90.5 per cent of cefovecin-treated dogs compared with 52.9 per cent of cephalexin-treated dogs (P=0.0004). Overall cure rates for dogs with Escherichia coli infections were 79.1 per cent for cefovecin and 36.4 per cent for cephalexin-treated dogs (P=0.0003). There were no suspected adverse drug reactions attributed to treatment with cefovecin or cephalexin. **CLINICAL SIGNIFICANCE:** Cefovecin was shown to be an effective and safe treatment

## **Journal of Veterinary Internal Medicine (Apr 06– Feb 07)**

[J Vet Intern Med.](#) 2006 May-Jun;20(3):544-6.

### **Comparison of glomerular filtration rate between greyhounds and non-Greyhound dogs.**

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Greyhounds have significantly higher serum creatinine (SCr) concentration than do non-Greyhound dogs that may be attributable to differences in glomerular filtration rate (GFR).

By means of plasma clearance of technetium Tc 99m diethylenetriaminepentaacetic acid, GFR was measured in 10 Greyhounds and 10 non-Greyhound dogs with normal findings of physical examination, CBC, serum biochemical analysis, and urinalysis. Dogs were fed the same diet for a minimum of 6 weeks before GFR data collection. Greyhounds had significantly higher mean +/- SD GFR (3.0 +/- 0.1 vs 2.5 +/- 0.2 ml/min/ kg; P = .01) and SCr concentration (1.8 +/- 0.1 vs 1.5 +/- 0.1 mg/dL; P = .03) than did non-Greyhound dogs, but the serum urea nitrogen (SUN) concentration was not significantly different (18 +/- 1 vs 18 +/- 2 mg/dL; P = .8). Therefore, the higher SCr concentration in Greyhounds is not attributable to decreased GFR, and may be associated with the high muscle mass in the breed. Healthy Greyhounds have higher GFR than do non-Greyhound dogs.

[J Vet Intern Med.](#) 2006 May-Jun;20(3):528-35.

### **Survival of cats with naturally occurring chronic renal failure is related to severity of proteinuria.**

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**BACKGROUND:** Tubulointerstitial kidney disease is a common cause of illness and death in pet cats and is typically not associated with overt proteinuria. **HYPOTHESIS:** Proteinuria would be independently related to survival in cats with renal failure, with or without hypertension. **ANIMALS:** The study included 136 client-owned cats; 28 apparently normal, 14 hypertensive but not azotemic, 66 azotemic but not hypertensive, and 28 both hypertensive and azotemic. **METHODS:** Cox's proportional hazards model was used to determine the influence of initial plasma creatinine concentration, proteinuria (urine protein-to-creatinine ratio or albumin-to-creatinine ratio), age, and systemic hypertension on the risk of death or euthanasia during the follow-up period. Multivariable linear regression was used to determine the relation between severity of proteinuria and predictive variables, including age, plasma creatinine concentration, systolic blood pressure, sex, and urine specific gravity. **RESULTS:** Plasma creatinine concentration and proteinuria were very highly related to survival. The hazard ratio (95% confidence intervals) for death or euthanasia was 2.9 (1.4-6.3) and 4.0 (2.0-8.0) for urine protein-to-creatinine ratio 0.2-0.4 and >0.4, respectively, compared with the baseline group with a urine protein-to-creatinine ratio of <0.2 and were 2.4 (1.2-4.8) and 4.9 (2.3-10.2) for an albumin-to-creatinine ratio of 30-82 mg/g and <82 mg/g, respectively, compared with a baseline group with albumin-to-creatinine ratio of <30 mg/g. Treated hypertensive cats did not have reduced survival, although systolic blood pressure, together with plasma creatinine concentration was positively related to the magnitude of proteinuria. **CONCLUSIONS AND CLINICAL IMPORTANCE:** Despite the relatively low concentrations of proteinuria typical of chronic renal disease in cats, this measurement is of prognostic significance.

[J Vet Intern Med.](#) 2006 May-Jun;20(3):499-507.

## **Pharmacokinetic and pharmacodynamic parameters of ramipril and ramiprilat in healthy dogs and dogs with reduced glomerular filtration rate.**

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Ramipril, an angiotensin-converting enzyme (ACE) inhibitor for use in dogs, is converted in vivo to its active form, ramiprilat, which is eliminated in the bile and urine in the dog. The objective of this study was to assess the effect of renal impairment on the pharmacokinetics (PKs) and pharmacodynamics (PDs) of ramipril and ramiprilat. Ten adult Beagle dogs were used. PK/PD studies were performed before and after the induction of subclinical renal impairment. Ramiprilat was given at 0.25 mg/kg by a single IV bolus. After a 2-week washout period, ramipril was administered PO at 0.25 mg/kg once daily for 8 days. Ramipril and ramiprilat PKs were studied by using a physiologically based model. The relationship between free plasma ramiprilat concentration and ACE activity was described by using the fractional Hill model. Glomerular filtration rate was decreased by 58%. No biologically relevant changes in usual plasma variables were observed between the 1st and the 8th day of oral treatment with ramipril under either condition. After an IV bolus of ramiprilat, the only changes in renal-impaired dogs were a 14 and 49% decrease in clearance of the free fraction of ramiprilat ( $P < .01$ ) and free plasma concentration required to produce 50% of the maximal effect ( $P < .05$ ), respectively. After repeated PO administration of ramipril, there were no alterations in any of the PK and PD parameters in healthy or renal-impaired dogs. No adjustment of the recommended PO dosage of ramipril is needed in dogs with moderate renal impairment.

[J Vet Intern Med.](#) 2006 May-Jun;20(3):495-8.

## **Dynamics of Leishmania-specific immunoglobulin isotypes in dogs with clinical leishmaniasis before and after treatment.**

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Concentrations of Leishmania-specific immunoglobulin G (IgG), immunoglobulin M (IgM), and immunoglobulin A (IgA) isotypes were analyzed by enzyme-linked immunosorbent assay (ELISA) in 23 dogs naturally infected with *Leishmania infantum* before and 1 year after initiating drug therapy. Results showed a high expression and prevalence of Leishmania-specific IgG (176.4 +/- 89 ELISA units [EU]), IgM (105.3 +/- 95.5 EU), and IgA (153.6 +/- 98 EU) in dogs before treatment (median +/- interquartile range EU). One year after treatment was started, dogs were classified as responsive dogs (RDs; n = 13) or unresponsive dogs (UDs; n = 10) based on clinicopathologic findings. Both groups of dogs experienced a statistically significant decrease ( $P < .05$ ) in Leishmania-specific IgG (RDs = 27%, UD = 41%), IgM (RDs = 42%, UD = 29%), and IgA (RDs = 56%, UD = 46%). Concentrations of specific IgG and IgM

were not different at diagnosis or after treatment between the 2 groups. However, the median value for Leishmania-specific IgA 1 year after treatment was significantly lower ( $P < .05$ ) in RDs (60.8 +/- 67 EU) than in UD's (117 +/- 54 EU). Examination of our data indicates that both the IgA isotype, which is mostly produced by mucosal plasma cells, and the IgM isotype are increased in infected symptomatic dogs, as previously reported for IgG. These 3 isotypes decreased significantly 1 year after initiation of medical treatment

[J Vet Intern Med.](#) 2006 May-Jun;20(3):489-94.

### **Influence of infecting serogroup on clinical features of leptospirosis in dogs.**

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The purpose of this study was to review recent cases of leptospirosis seen at referral centers in New York State and to identify differences in clinical or clinicopathologic aspects of the disease among different suspected infecting serogroups. Medical records at the Cornell University Hospital for Animals and the Animal Medical Center in New York City were reviewed to identify dogs diagnosed with leptospirosis from September 1996 to August 2002. Records of 55 dogs met the inclusion criteria for the study. The suspected infecting serogroups included 21 occurrences of Grippotyphosa, 12 of Pomona, 6 of Autumnalis, 5 of Bratislava, 2 of Hardjo, and 1 of Canicola. Five dogs had equal titers to serogroups Grippotyphosa and Pomona, and 3 had equal titers to 2 other serogroups. Common clinical signs included lethargy, anorexia, and vomiting. Common clinicopathologic findings included anemia, thrombocytopenia, azotemia, hyperphosphatemia, high liver enzyme activity, and hyperbilirubinemia. Forty-three of 55 dogs were discharged from the hospital. Serogroup-specific analysis indicated that dogs with suspected serogroup Pomona infection were more likely to suffer from vomiting ( $P = .01$ ), thrombocytopenia ( $P = .009$ ), severe azotemia ( $P = .04$ ), and hyperphosphatemia ( $P = .006$ ) than dogs with other serogroups and were less likely to be discharged alive from the hospital ( $P = .03$ ). This study suggests that only minor clinically relevant differences exist among serogroups. Leptospira serogroup Pomona caused more severe renal disease and was associated with a worse outcome compared with disease caused by other serogroups.

[J Vet Intern Med.](#) 2006 Jul-Aug;20(4):850-5. **Frequency and risk factors for urinary tract infection in cats with diabetes mellitus.**

Bailiff NL, Nelson RW, Feldman EC, Westropp JL, Ling GV, Jang SS, Kass PH.

Department of Medicine and Epidemiology, Veterinary Medical Teaching Hospital School of Veterinary Medicine, University of California, Davis 95616, USA.

**BACKGROUND:** Identification and control of infections are important in the management of diabetic cats. Urinary tract infections have not been well characterized in diabetic cats. This retrospective study was performed to review and characterize urinary tract infections in diabetic cats. **HYPOTHESIS:** Urinary tract infections are common in diabetic cats. **ANIMALS:** A review was made of the medical records of 141 diabetic cats that had had urine obtained for culture by antepubic cystocentesis and that had not been treated with antibiotics, undergone urinary tract catheterization or urinary tract surgery within 2 weeks of urine collection or had urethral obstruction at the time of urine collection. **METHODS:** A review of medical records. **RESULTS:** Urinary tract infection was identified in 18 of 141 diabetic cats. *Escherichia coli* was the most common isolate (67%). Female cats were at increased risk (prevalence odds ratios [POR], 3.7; 95% confidence interval [CI], 1.3 to 10.2;  $P = .013$ ). Clinical signs of lower urinary tract disease and findings on urine sediment examination were good predictors of positive urine cultures. **CONCLUSIONS AND CLINICAL IMPORTANCE:** Urinary tract infections are common in diabetic cats regardless of status of diabetic control, suggesting routine monitoring with urine sediment exams or urine culture is warranted.

[J Vet Intern Med.](#) 2006 Jul-Aug;20(4):828-34

### **Dried solidified blood calculi in the urinary tract of cats.**

Westropp JL, Ruby AL, Bailiff NL, Kyles AE, Ling GV.

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We have noted an increased number of calculi submitted to the Gerald V. Ling Urinary Stone Analysis Laboratory, University of California, Davis, that do not contain crystalline material but appear to be composed of dried solidified blood (DSB). Canine and feline laboratory records from 1986-2003 were reviewed for samples composed of >99% DSB. No calculi from dogs were found, but specimens from 49 cats were composed of >99% DSB, of which almost half ( $n = 22$ ) had been submitted after 2001. The DSB calculi had been removed surgically or by postmortem examination from all areas of the upper and lower urinary tract. All samples were well formed and could be divided in half with Rongeur forceps. Detailed case information was available for 12 cats. Urinalyses were available for 9 of the 12 cats, and the mean specific gravity was 1.017 (range, 1.009-1.032). Red blood cells were reported in the sediment of all cats, with most containing >100 RBC/hpf. Ureteral obstructions but no radio-opaque calculi were visible by radiography, including radiographic contrast studies. Reports of ultrasound examinations were available for 10 cats, and discrete calculi were not recorded. In addition to polarized light microscopy, infrared spectroscopy and electron probe microanalysis were performed on a subset ( $n = 6$ , DSB calculi;  $n = 3$ , control calculi) of samples. Significantly more carbon, nitrogen, and sulfur ( $P = .012$ ,  $P = .02$ , and  $P = .012$ , respectively) were present in the elemental analysis of the DSB calculi than in the control calculi, suggesting that the DSB calculi are primarily formed from organic material. At this time, we are uncertain why these DSB calculi become solidified, and we recommend that samples be submitted both in formalin and preservative free to further



[J Vet Intern Med.](#) 2006 Jul-Aug;20(4):941-7.

### **Systemic hypertension in dogs with leishmaniasis: prevalence and clinical consequences.**

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A prospective study was performed (November 1998 to December 2003) to determine the prevalence of systemic hypertension (SH) in dogs with glomerular disease secondary to leishmaniasis. One hundred and five dogs with leishmaniasis were screened and staged for the presence of renal disease (RD) and SH. For the purpose of the study, RD was defined as serum creatinine concentration  $\geq$  1.4 mg/dL, a urine protein/creatinine ratio  $\geq$  0.5, or both. SH was defined as a systolic blood pressure (SBP)  $\geq$  180 mm Hg or an SBP between 150 and 179 mm Hg in the presence of clinical manifestations of SH. Fifty-two (49.5%) of the dogs had some degree of RD, and 32 (61.5%) of these dogs were diagnosed with SH. Moreover, SH also was diagnosed in 3 dogs without RD. Left ventricular hypertrophy (LVH), estimated by echocardiography, was the most frequently observed systemic consequence of hypertension, being present in 32 (91.4%) of the hypertensive dogs. Echocardiographic abnormalities were not detected in any of the 33 dogs with leishmaniasis without RD, which were used as controls. Ocular consequences of SH were observed in only 2 (5.7%) of the dogs with hypertension. We conclude that SH is prevalent in dogs with RD secondary to leishmaniasis, not only in the more severe stages but also in the early course of the illness before azotemia becomes apparent. Canine leishmaniasis may be a useful natural model to study SH secondary to glomerular disease.

[J Vet Intern Med.](#) 2006 Sep-Oct;20(5):1155-60.

### **Primary renal neoplasia of dogs.**

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**BACKGROUND:** Primary renal tumors are diagnosed uncommonly in dogs. **HYPOTHESIS:** Signs and survival will differ among different categories of primary renal tumors. **ANIMALS:** Data were collected from the medical records of 82 dogs with primary renal tumors diagnosed by examination of tissue obtained by ultrasound-guided biopsy, needle aspiration, surgery, or at postmortem examination. **METHODS:** This was a multi-institutional, retrospective study. **RESULTS:** Forty-nine dogs had carcinomas, 28 had sarcomas, and 5 had nephroblastomas. The dogs were geriatric (mean 8.1 years; range: 1-17) with a weight of 24.9 kg (range: 4.5-80). Tumors occurred with equal frequency in each kidney with 4% occurring bilaterally. Initial signs included one or more of hematuria, inappetance, lethargy, weight loss, or a palpable abdominal mass. Pain was reported more frequently in dogs with sarcomas (5/28). The most common hematologic abnormalities were neutrophilia (22/63), anemia (21/64),

and thrombocytopenia (6/68). Polycythemia was present in 3 dogs and resolved with treatment. Hematuria (28/49), pyuria (26/49), proteinuria (24/50), and isosthenuria (20/56) were the most frequently observed abnormalities on urinalysis. Pulmonary metastases were noted on thoracic radiographs in 16% of dogs at diagnosis. Seventy-seven percent of dogs had metastatic disease at the time of death. Median survival for dogs with carcinomas was 16 months (range 0-59 months), for dogs with sarcomas 9 months (range 0-70 months), and for dogs with nephroblastomas 6 months (range 0-6 months). **CONCLUSIONS AND CLINICAL IMPORTANCE:** Primary renal tumors in dogs are generally highly malignant with surgery being the only treatment that improves survival.

[J Vet Intern Med.](#) 2006 Sep-Oct;20(5):1074-9.

### **Evaluation of the clinical efficacy of benazepril in the treatment of chronic renal insufficiency in cats.**

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**BACKGROUND:** Chronic renal insufficiency (CRI) is a common disease in cats. Angiotensin-converting enzyme inhibitors (ACEI) have beneficial effects in humans with CRI by reducing the loss of protein in the urine and increasing life expectancy. **HYPOTHESIS:** The ACEI benazepril has beneficial effects on survival, clinical variables, or both as compared with placebo in cats with CRI. **ANIMALS:** 61 cats with naturally occurring CRI. **METHODS:** The cats were enrolled into a prospective, randomized, double-blind, placebo-controlled clinical trial. Cats received placebo or 0.5-1 mg/kg benazepril once daily for up to 6 months. **RESULTS:** Urine protein/urine creatinine ratios were significantly ( $P < .05$ ) lower with benazepril as compared with placebo at days 120 and 180. Three cats with placebo and 1 cat with benazepril were removed prematurely from the study because of deterioration of CRI or death. Cats were classified into 4 stages of CRI according to the International Renal Interest Society (IRIS) classification scheme. Incidence rates of cats with IRIS classification stage 2 or stage 3 that remained in stage 2 or 3 without progressing to stage 4 were higher with benazepril (93 +/- 5%) as compared with placebo (73 +/- 13%). **CLINICAL IMPORTANCE:** These results suggest a potential for benazepril to delay the progression of disease, extend survival time, or both in cats with CRI.

[J Vet Intern Med.](#) 2006 Sep-Oct;20(5):1065-73.

### **Vestibular, vaginal, and urethral relations in spayed dogs with and without lower urinary tract signs.**

Wang KY, Samii VF, Chew DJ, McLoughlin MA, DiBartola SP, Mastly J, Lehman AM.

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The purpose of this study was to evaluate the urogenital anatomy in female spayed dogs with and without signs of lower urinary tract disease by using conventional vaginourethrography, computed tomography (CT) vaginourethrography, and uroendoscopy. Nineteen dogs with lower urinary tract disease and 12 normal dogs were evaluated prospectively. Measurements made included vaginal length, vaginal height, vaginal width, vestibule length, vestibule height, vestibule width, vestibulovaginal ratios, cingulum height, cingulum width, cingulum area, urethral length, urethral height, urethral width, angle of urethra to vestibule, and angle of vaginal to vestibule. Group comparisons were made between dogs with and without lower urinary tract disease. Comparisons between conventional vaginourethrography and CT vaginourethrography were made when the same anatomical measurement was made by the 2 imaging modalities. There was no significant difference in all of the measurements ( $P > .01$ ), including vestibulovaginal ratios and cingulum areas, between dogs with and without lower urinary tract disease. There was a larger proportion of dogs with a vestibulovaginal ratio  $<0.33$  in normal dogs (8 of 12) compared with the clinical dogs (8 of 16). A significant difference between vestibulovaginal ratios or cingulum areas between dogs with and without lower urinary tract disease could not be identified. This suggests that a vestibulovaginal ratio of  $<0.33$  may only be an incidental finding and the term "vestibulovaginal stenosis" may need to be redefined.

[J Vet Intern Med.](#) 2006 Sep-Oct;20(5):1054-64. Comment in: [J Vet Intern Med.](#) 2006 Sep-Oct;20(5):1052-3.

### **Tolerability and efficacy of benazepril in cats with chronic kidney disease.**

King JN, Gunn-Moore DA, Tasker S, Gleadhill A, Strehlau G;

Benazepril in Renal Insufficiency in Cats Study Group.

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The objective of the study was to test the effect of the angiotensin-converting enzyme inhibitor (ACEI) benazepril in cats with chronic kidney disease (CKD). A total of 192 cats with CKD with an initial plasma creatinine concentration  $\geq 2$  mg/dL ( $\geq 177$  micromol/L) and urine specific gravity  $\leq 1.025$  were recruited into a double-blind, parallel-group, prospective, randomized clinical trial. Cats received daily (q24h) PO placebo ( $n = 96$ ) or benazepril x HCl at a dosage of 0.5-1.0 mg/kg ( $n = 96$ ) for up to 1,119 days. Most cats were fed exclusively a diet containing low amounts of phosphate, protein, and sodium. Benazepril produced a significant reduction in proteinuria, assessed by the urine protein-to-creatinine ratio (UPC,  $P = .005$ ). This effect of benazepril was present in all subgroups tested, including cats with UPC  $<0.2$ , although the effect was largest in cats with higher UPCs. Plasma protein was maintained at higher concentrations with benazepril as compared with placebo during treatment in cats with initial UPC  $<1$  ( $P = .038$  versus  $P = .079$  for all cats). There was no difference in renal survival time between the 2 groups when all 192 cats were compared. Mean  $\pm$  SD renal survival times were 637  $\pm$  480 days with benazepril and 520  $\pm$  323 days

with placebo ( $P = .47$ ). Mean  $\pm$  SD renal survival times in the 13 cats with initial UPC  $\geq 1$  were 402  $\pm$  202 days with benazepril and 149  $\pm$  90 days with placebo ( $P = .27$ ). Cats with initial UPC  $\geq 1$  treated with benazepril had better appetite ( $P = .017$ ) as compared with those treated with placebo. Benazepril was well tolerated. In conclusion, benazepril decreased proteinuria in cats with CKD.

[J Vet Intern Med.](#) 2006 Nov-Dec;20(6):1307-13.

**Comparison of the effects of daily and intermittent-dose calcitriol on serum parathyroid hormone and ionized calcium concentrations in normal cats and cats with chronic renal failure.**

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**BACKGROUND:** Chronic renal failure is complicated by secondary hyperparathyroidism, which traditionally has been controlled by dietary restriction of phosphorus and administration of phosphorus binders. Early treatment of patients with chronic renal failure with calcitriol may be indicated because once established, parathyroid gland hyperplasia does not readily resolve with therapy. **HYPOTHESIS:** Daily and intermittent dosing of calcitriol will decrease plasma parathyroid hormone concentration in normal cats and cats with chronic renal failure without causing ionized hypercalcemia. **ANIMALS:** Ten normal cats; 10 cats with chronic renal failure. **METHODS:** Phase 1 was daily calcitriol administration (2.5 ng/kg PO q24h) for 14 days. Phase 2 was intermittent calcitriol administration (8.75 ng/kg PO q84h) for 14 days. A 7-day washout period separated phases 1 and 2. Before each phase, calcitriol, parathyroid hormone, and ionized calcium concentrations were measured. On days 1, 2, and 3 of both phases, serum ionized calcium concentrations were measured. On the last day of both phases, calcitriol, parathyroid hormone, and ionized calcium concentrations were measured 0, 2, 4, and 6 hours after calcitriol administration. **RESULTS:** Overall, serum parathyroid hormone concentrations were significantly higher in cats with chronic renal failure than in normal cats ( $P = .022$ ), but serum parathyroid hormone concentrations for both normal cats and cats with chronic renal failure were not significantly different before and after 14 days of treatment with calcitriol, regardless of whether calcitriol was administered daily or intermittently. Adverse effects of calcitriol administration (specifically ionized hypercalcemia) were not seen in either feline group during either phase of the study over the 3-day evaluation after calcitriol administration was initiated. **CONCLUSIONS AND CLINICAL IMPORTANCE:** At the dosages used, calcitriol treatment did not result in significant differences in serum parathyroid hormone concentrations before and after treatment in both normal cats and cats with chronic renal failure. With these dosages, adverse effects of calcitriol administration were not seen. Potential reasons for lack of apparent effect include small sample size, insufficient duration of study, insufficient dosage of calcitriol, problems with formulation or administration of calcitriol, and variable gastrointestinal absorption of calcitriol.

[J Vet Intern Med.](#) 2007 Jan-Feb;21(1):3-10

**Clinicopathologic features and outcome predictors of *Leptospira interrogans Australis* serogroup infection in dogs: a retrospective study of 20 cases (2001-2004).**

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**BACKGROUND AND HYPOTHESIS:** We retrospectively evaluated the clinicopathologic findings and outcome predictors in dogs with *Leptospira interrogans Australis* serogroup infections. **ANIMALS AND METHODS:** The medical records of 159 dogs that had a leptospiral microscopic agglutination test (MAT) performed between 2001 and 2004 were reviewed. **RESULTS:** Twenty dogs met serologic criteria for either symptomatic (16 dogs) or asymptomatic (4 dogs) infection caused by *Leptospira interrogans Australis* serogroup. Seven of 16 symptomatic dogs died or were euthanized and 9/16 recovered. Systemic inflammatory response syndrome (SIRS) was observed in 9/16 dogs. The presence of SIRS did not affect prognosis ( $P = .357$ ). C-reactive protein (CRP) and haptoglobin (Hpt) concentrations were altered in all symptomatic dogs, but results did not differ significantly between survivors and nonsurvivors ( $P = .08$  and  $P = .055$ , respectively). Conversely, the CRP to Hpt ratio (CRP/Hpt) was significantly increased in nonsurvivors. Disseminated intravascular coagulation (DIC) was diagnosed in 7/16 dogs. DIC did not significantly affect outcome ( $P = .126$ ). Multiple organ involvement was present with renal failure in 16/16, liver damage in 12/16, cardiac damage in 11/16, and muscular damage in 8/16 dogs. **CONCLUSIONS AND CLINICAL IMPORTANCE:** Among the evaluated clinicopathologic biomarkers, serum albumin, cardiac troponin I, CRP/Hpt, urinary albumin, and urinary total protein to creatinine ratio were found to predict outcome and warrant evaluation in larger prospective studies.

[J Vet Intern Med.](#) 2007 Jan-Feb;21(1):47-53.

**Effect of phenylpropanolamine and pseudoephedrine on the urethral pressure profile and continence scores of incontinent female dogs.**

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**BACKGROUND:** Traditionally, treatment of urinary incontinence in spayed female dogs has been to increase urethral sphincter tone with estrogen compounds or alpha-agonists. Phenylpropanolamine (PPA) is the most frequently used alpha-agonist for this condition, but increased cost and decreased availability of PPA as an over-the-counter medication have prompted interest in alternative therapies that may provide the same degree of efficacy. Pseudoephedrine (PD), an alpha-agonist and stereoisomer of ephedrine, is more cost-effective and available without a prescription. **HYPOTHESIS:** PD will not differ from PPA in its

effects on urodynamic variables and owner-reported continence scores or in observed adverse effects. ANIMALS: Nine spayed female dogs with a history of urinary incontinence drawn from the clinical patient population at the Veterinary Teaching Hospital at The Ohio State University. METHODS: A randomized, double-blind crossover study evaluating changes in urodynamic variables, owner-reported continence score, and adverse effects in dogs treated with 1.5 mg/kg PO q8h PPA or PD. RESULTS: Changes in maximum urethral closure pressure and functional area after PPA therapy were significantly higher than after PD therapy. There was no change in the functional profile length after either treatment. There was a significant increase in the continence score after PPA therapy, but not after PD therapy. More adverse effects were observed in dogs treated with PD than with PPA. CONCLUSIONS AND CLINICAL IMPORTANCE: Although some dogs clinically improved, lack of statistically significant changes in urodynamic variables and owner perception of continence as well as the increased incidence of adverse effects make PD a less satisfactory alternative to PPA for the treatment of urinary incontinence in female dogs.

## **Journal of Veterinary Medical Science (Apr 06 – March 07)**

[J Vet Med Sci](#). 2006 May;68(5):439-45.

### **Rodent renal structure differs among species.**

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In the present study, we histologically and morphometrically investigated species differences in renal structure using laboratory rodents (mice, gerbils, hamsters, rats, and guinea pigs). Morphometric parameters were as follows, 1) diameter of the cortical renal corpuscles, 2) diameter of the juxtamedullary renal corpuscles, 3) percentage of the renal corpuscles with a cuboidal parietal layer, 4) number of nuclei in proximal convoluted tubules (PCTs) per unit area of cortex, 5) semi-quantitative score of the periodic acid-Schiff (PAS) -positive granules in PCTs, and 6) semi-quantitative score of the PAS-positive granules in proximal straight tubules (PSTs). Significant species differences were detected for each parameter, and particularly severe differences were observed in the PAS-positive granules of PCTs and PSTs. Granular scores varied among species and sexes. Vacuolar structures that did not stain with PAS or hematoxylin-eosin were observed in the renal proximal tubules. The appearance and localization of these vacuolar structures differed remarkably between species and sexes.

[J Vet Med Sci](#). 2006 Aug;68(8):827-32.

### **Systolic blood pressure of clinically normal and conscious cats determined by an indirect Doppler method in a clinical setting.**

Lin CH, Yan CJ, Lien YH, Huang HP.

Department of Veterinary Medicine, National Taiwan University, Taipei, Taiwan.

The purposes of the present study were to determine the systolic blood pressure (SBP) of clinically normal and conscious cats, and to set up reference values of feline SBP for subsequent clinical application. SBPs were measured in 53 healthy cats using an ultrasonic Doppler device. The mean SBP was 133.6 +/- 16.0 mmHg (range, 110.0-180.0 mmHg). The distribution of SBP values was not significantly affected by factors such as breed, body condition score, or age ( $P>0.05$ ), but SBP values of female cats were significantly lower and more variable than those of males (t test,  $P=0.004$ ; F test,  $P<0.001$ ). Feline SBP between 114.3 mmHg and 149.5 mmHg was considered indicative of normotension. SBP values higher than 159.3 mmHg were defined as hypertension, and those less than 104.5 mmHg were determined as hypotension.

[J Vet Med Sci.](#) 2006 Sep;68(9):967-72.

### **Hemodynamic characteristics of vasopressin in dogs with severe hemorrhagic shock.**

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The effect of vasopressin was compared with that of the established vasopressor epinephrine in experimentally induced hemorrhagic shock. After rapid crystalloid resuscitation in a ratio of three volumes of 0.9% saline to one volume of blood (3:1 crystalloid resuscitation), six dogs were given 0.4 IU/kg vasopressin and another six dogs were given 0.1 mg/kg epinephrine. Five dogs in the control group were given fluid resuscitation in the same manner as above without administration of any drugs. Administration of vasopressin increased diastolic arterial pressure (DAP) from 45.0 +/- 4.9 to 91.2 +/- 9.6 mmHg within 5 min, compared with epinephrine from 46 +/- 4.0 to 51.8 +/- 7.7, and control from 47.3 +/- 7.5 to 46.3 +/- 7.3. Systolic arterial pressure (SAP) did not increase significantly following vasopressin compared with epinephrine and control group. Results of DAP and systemic vascular resistance index (SVRI) suggested that vasopressin administration was vasoconstrictive after fluid resuscitation in decompensatory hemorrhagic shock in dogs, whereas epinephrine did not compared with control. In addition, epinephrine did not affect the cardiac index (CI) and SVRI, while a significant decrease in CI and increase in SVRI were observed in vasopressin group. The pressor effect of epinephrine in the vascular system was abrupt and only lasted a short period of time (within 5 min), while that of vasopressin was steady and lasted for more than 1 hr, especially regard to in DAP. When compared with epinephrine, vasopressin can be a more effective and safer choice in patients with severe hemorrhagic shock.

[J Vet Med Sci.](#) 2007 Jan;69(1):31-5.

## **Fluid and electrolyte shifts during and after Agility competitions in dogs.**

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This research assesses the relative contribution of splenic contraction and fluid shifts out of the vascular compartment to the increases in packed cell volume associated with Agility exercises. It also aims to evaluate the changes in the concentrations of electrolytes and markers of hydration state. Fifteen dogs of both sexes were subjected to an Agility exercise of an approximate duration of 100 s. Blood samples were obtained within the first 30 s after competition and at 5, 15, and 30 min of recuperation. Resting values were established previously. The following parameters were determined: packed cell volume (PCV), plasma lactate (LA), total plasma protein (TPP), albumin (ALB), urea (BUN), creatinine (CREA), chloride (Cl), calcium (Ca), phosphorus (P), sodium (Na) and potassium (K). Changes in plasma volume (PV), total RBC volume (V(RBC)) and blood volume (BV) were calculated immediately after exercise and at 30 minutes of recovery. It was found that during Agility competition, BV, V(RBC) and PV increased 12, 21 and 4% respectively, indicating that the spleen contraction was the main determinant on the increase of BV. In comparison with resting values, BV decreased after recuperation (-5%), due to the recapture of erythrocytes by the splenic reserve (V(RBC), -12%). Additionally, Agility exercise induced increases in plasma Cl and LA, with significant reductions of ALB, Ca and P and absence of modifications in Na, K, BUN and CREA concentrations.

[J Vet Med Sci.](#) 2007 Feb;69(2):209-12.

## **Hypertrophic osteopathy associated with disseminated metastases of renal cell carcinoma in the dog: a case report.**

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A 6-year-old, mixed breed, intact male dog showed signs of left carpal joint swelling and weakness of the forelimbs one month before presentation. The symptoms gradually progressed to bilateral carpal and tarsal joint swelling and tetraparalysis. There were a number of radiographically identified lytic-proliferative bone lesions noted on the axial skeleton. Hypertrophic osteopathy of the metacarpi and all distal long bones was also evident. Because of the deteriorating quality of life and guarded prognosis, the patient was euthanized and a complete necropsy was performed. Renal cell carcinoma, with metastasis to the lung, thoracic vertebrae, ribs, and the right adrenal gland, was diagnosed. To our knowledge, renal cell carcinoma with bone metastases and hypertrophic osteopathy has not been reported in dogs.



## Journal of Veterinary Science (Apr 06 – March 07)

[J Vet Sci.](#) 2006 Dec;7(4):375-9.

### **Attenuation of ischemia-reperfusion injury by ascorbic acid in the canine renal transplantation.**

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This study examined the effects of ascorbic acid on the attenuation of an ischemia-reperfusion (I/R) injury after a canine renal transplantation. Eight beagle dogs were subjected to a renal auto-transplantation followed by the administration of ascorbic acid (treatment group) and the same amount of vehicle (physiological saline, control group). Blood samples were collected from these dogs to perform the kidney function tests and the invasive blood pressure was measured in the renal artery at pre- and post-anastomosis. The antioxidant enzymes of level 72 h after the transplant were measured. The kidneys were taken for a histopathology evaluation at day 21. The kidney function tests showed a significant difference between the control and treatment group. The invasive blood pressure in the renal artery was similar in the groups. The activity of the antioxidant enzymes in the blood plasma was significant lower in the control group than in the treatment group. The histopathology findings revealed the treatment group to have less damage than the control group. The results of this study suggest that ascorbic acid alone might play a role in attenuating I/R injury and assist in the recovery of the renal function in a renal transplantation model.

[J Vet Sci.](#) 2006 Dec;7(4):355-9.

### **In vitro susceptibilities of *Leptospira* spp. and *Borrelia burgdorferi* isolates to amoxicillin, tilmicosin, and enrofloxacin.**

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Antimicrobial susceptibility testing was conducted with 6 different spirochetal strains (4 strains of *Leptospira* spp. and 2 strains of *Borrelia burgdorferi*) against 3 antimicrobial agents, commonly used in equine and bovine practice. The ranges of MIC and MBC of amoxicillin against *Leptospira* spp. were 0.05 - 6.25 microgram/ml and 6.25 - 25.0 microgram/ml, respectively. And the ranges of minimal inhibitory concentration (MIC) and minimal bactericidal concentration (MBC) of amoxicillin against *B. burgdorferi* were 0.05 - 0.39 microgram/ml and 0.20 - 0.78 microgram/ml, respectively. The ranges of MIC and MBC of enrofloxacin against *Leptospira* spp. were 0.05 - 0.39 microgram/ml and 0.05 - 0.39

microgram/ml, respectively. Two strains of *B. burgdorferi* were resistant to enrofloxacin at the highest concentration tested for MBC ( $\geq 100$  microgram/ml). Therefore, the potential role of tilmicosin in the treatment of leptospirosis and borreliosis should be further evaluated in animal models to understand whether the in vivo studies will confirm in vitro results. All spirochetal isolates were inhibited (MIC) and were killed (MBC) by tilmicosin at concentrations below the limit of testing ( $\leq 0.01$  microgram/ml).

[J Vet Sci.](#) 2006 Sep;7(3):299-301.

### **Canine renal failure syndrome in three dogs.**

Jeong WI, Do SH, Jeong da H, Chung JY, Yang HJ, Yuan DW, Hong IH, Park JK, Goo MJ, Jeong KS.

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Three dead dogs were brought to the College of Veterinary Medicine, Kyungpook National University for study. Clinically, all the dogs showed emaciation, anorexia, depression, hemorrhagic vomiting and diarrhea for 7-10 days before death. All the clinical signs were first noted for about one month after feeding the dogs with commercial diets. At necropsy, all 3 dogs had severe renal damage with the same green-yellowish colored nephroliths in the renal pelvis. They also showed systemic hemorrhage and calcification of several organs, which might have been induced by uremia. Microscopically, necrosis, calcification and calculi were detected in the renal tubules, and especially in the proximal convoluted tubules and collecting ducts of the kidney. These findings were supportive of a mycotoxic effect, and especially on their kidneys. However, the precise cause of the toxic effect in these cases of canine renal failure could not be determined.

## **Mammalian Genome (May 06 – Apr 07)**

[Mamm Genome.](#) 2006 Jul;17(7):769-76. Epub 2006 Jul 14.

### **SLC7A9 cDNA cloning and mutational analysis of SLC3A1 and SLC7A9 in canine cystinuria.**

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Cystinuria is a genetic disorder in the domestic dog that leads to recurrent urolith formation. The genetic basis of the disorder is best characterized in humans and is caused by mutations in one of the amino acid transporter genes SLC3A1 or SLC7A9, which results in

hyperexcretion of cystine and the dibasic amino acids in the urine and subsequent precipitation of cystine due to its low solubility in urine. In this study we describe the cloning of the canine SLC7A9 cDNA and present a thorough mutation analysis of the coding SLC3A1 and SLC7A9 regions in cystinuric dogs of different breeds. Mutation analysis of the two cystinuria disease genes revealed one SLC7A9 mutation (A217T) and two SLC3A1 mutations (I192V and S698G) in French and English Bulldogs that affect nonconserved amino acid residues, arguing against functional impact on the proteins. The absence of deleterious mutations linked to cystinuria in the remainder of our panel of cystinuric dogs is surprising because SLC3A1 or SLC7A9 mutations explain approximately 70% of all human cystinuria cases studied. The present study, along with previous investigations of canine and human cystinuria, implies that regulatory parts of the SLC3A1 and SLC7A9 genes as well as other unknown genes may harbor mutations causing cystinuria.

## **Research in Veterinary Science (Apr 06 – Apr 07)**

[Res Vet Sci](#). 2006 Aug;81(1):68-75. Epub 2005 Nov 8.

### **Parasite density and impaired biochemical/hematological status are associated with severe clinical aspects of canine visceral leishmaniasis.**

Reis AB, Martins-Filho OA, Teixeira-Carvalho A, Carvalho MG, Mayrink W, Franca-Silva JC, Giunchetti RC, Genaro O, Correa-Oliveira R.

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We have performed a detailed investigation in 40 dogs naturally infected with *Leishmania infantum* (syn. *chagasi*), subdivided into three groups: asymptomatic (AD = 12), oligosymptomatic (OD = 12) and symptomatic (SD = 16), based on their clinical features. Twenty non-infected dogs (CD) were included as control group. Serological analysis, performed by IFAT and ELISA, demonstrated higher antibodies titers in SD in comparison to the AD. A positive correlation was found between parasite density in the spleen and skin smears as well as the bone marrow parasitism with clinical status of the infection. We observed that the progression of the disease from asymptomatic to symptomatic clinical form was accompanied by intense parasitism in the bone marrow. It is likely that this led to the impaired biochemical/hematological status observed. Finally, we believe that the follow-up of these parameters could be a relevant approach to be used as markers during therapeutic and vaccine evaluations.

[Res Vet Sci](#). 2007 Feb;82(1):76-9. Epub 2006 Aug 21.

**Tubulointerstitial nephritis causes decreased renal expression and urinary excretion of cauxin, a major urinary protein of the domestic cat.**

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Cauxin, a member of mammalian carboxylesterases (EC 3.1.1.1), is excreted as a major urinary protein in the domestic cat. Urinary cauxin is derived from the kidney proximal straight tubules. Here, we report changes in the renal expression and urinary excretion of cauxin in cats with tubulointerstitial nephritis (TIN). Immunohistochemistry using anti-cauxin antibody showed fewer cauxin-positive tubules in 15 TIN cases than in normal animals. In areas with tubulointerstitial damage, fibroblasts and inflammatory cells replaced renal tubules, and cauxin-positive tubules consequently disappeared. Urine was analysed in six of the 15 cases. In the two cases with mild tubulointerstitial changes, urinary cauxin was detected using SDS-PAGE with Coomassie staining. In the four cases with severe tubulointerstitial changes, urinary cauxin was below the detection limit using Western blotting. These results indicate that the renal expression and urinary excretion of cauxin decrease with the progression of TIN in cats.

[Res Vet Sci.](#) 2007 Apr;82(2):195-201. Epub 2006 Sep 29.

**Influence of aging on adrenal responsiveness in a population of eleven healthy beagles.**

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The present study aimed at investigating the effects of aging on the adrenal cortex response of cortisol and aldosterone in dogs. A population of healthy adult Beagles was evaluated twice at a five-year interval. At each evaluation, plasma basal cortisol and aldosterone, cortisol and aldosterone following ACTH-stimulation, sodium, and potassium concentrations and arterial blood pressure were measured. We observed significantly ( $p < 0.05$ ) greater sodium, urea and creatinine concentrations with aging. Nevertheless urea and creatinine remained within our laboratory reference ranges. This study showed a highly significant age-related elevation of basal cortisol ( $p < 0.01$ ). Inversely, both aldosterone following ACTH-stimulation levels and difference between aldosterone following ACTH-stimulation and basal aldosterone values plummeted significantly ( $p < 0.01$ ) with aging. In conclusion, the evaluation of the adrenal cortex function in dogs should take in consideration the age of the individuals.

[Res Vet Sci.](#) 2007 Feb 19; [Epub ahead of print]

## **Expression of cyclooxygenase-2, P-glycoprotein and multi-drug resistance-associated protein in canine transitional cell carcinoma.**

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Cyclooxygenase-2 (COX-2), P-glycoprotein (P-gp) and multi-drug resistance-associated protein (MRP) are considered important tumor-associated proteins in humans and dogs. In the present study, we immunohistochemically evaluated the expression of these proteins in canine patients with transitional cell carcinoma (TCC). Of 52 cases, 30 (57.7%) were positive for COX-2, 40 (76.9%) for P-gp, and only 10 (19.2%) for MRP. In addition, 27 samples (27/52, 51.9%) were positive for two markers, while 3 (5.7%) and 5 (9.6%) cases were positive and negative, respectively, for all three markers. No significant correlations were seen for COX-2 and P-gp on Fisher's exact test and Mann-Whitney's test, but a significance was seen on Spearman's rank correlation analysis using the IHC scoring system ( $P=0.043$ ). These results suggest that P-gp expression is induced by overexpression of COX-2 in canine patients with TCC.

## **Veterinary Clinical Pathology (Apr 06 – March 07)**

[Vet Clin Pathol.](#) 2006 Dec;35(4):441-5.

### **Serum ionized calcium in dogs with chronic renal failure and metabolic acidosis.**

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**BACKGROUND:** Chronic renal failure (CRF) is a common disease in dogs, and many metabolic disorders can be observed, including metabolic acidosis and calcium and phosphorus disturbances. Acidosis may change the ionized calcium (i-Ca) fraction, usually increasing its concentration. **OBJECTIVE:** In this study we evaluated the influence of acidosis on the serum concentration of i-Ca in dogs with CRF and metabolic acidosis. **METHODS:** Dogs were studied in 2 groups: group I (control group = 40 clinically normal dogs) and group II (25 dogs with CRF and metabolic acidosis). Serum i-Ca was measured by an ion-selective electrode method; other biochemical analytes were measured using routine methods. **RESULTS:** The i-Ca concentration was significantly lower in dogs in group II than in group I; 56% of the dogs in group II were hypocalcemic. Hypocalcemia was observed in only 8% of dogs in group II when based on total calcium (t-Ca) concentration. No correlation between pH and i-Ca concentration was observed. A slight but significant correlation was detected between i-Ca and serum phosphorus concentration ( $r = -.284$ ;  $P = .022$ ), as well as between serum t-Ca

and i-Ca concentration ( $r = .497$ ;  $P < .0001$ ). CONCLUSION: The i-Ca concentration in dogs with CRF and metabolic acidosis varied widely from that of t-Ca, showing the importance of determining the biologically active form of calcium. Metabolic acidosis did not influence the increase in i-Ca concentration, so other factors besides acidosis in CRF might alter the i-Ca fraction, such as hyperphosphatemia and other compounds that may form complexes with calcium.

[Vet Clin Pathol.](#) 2006 Dec;35(4):397-404.

### **Subgroups of canine antinuclear antibodies in relation to laboratory and clinical findings in immune-mediated disease.**

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BACKGROUND: Autoimmune system diseases in dogs are commonly referred to as systemic lupus erythematosus (SLE), with a positive antinuclear antibody (ANA) test as a hallmark. In human patients, other systemic ANA-positive diseases with overlapping diagnostic features, referred to as SLE-related diseases, are described. OBJECTIVES: The objective of this study was to investigate whether different patterns of ANA reactivity represent different systemic autoimmune diseases in dogs. METHODS: Dogs with serum positive for ANA by indirect immunofluorescence (IIF-ANA, titer  $\geq 1:100$ ) ( $n = 56$ ) were identified retrospectively from the patient population at the Department of Small Animal Clinical Sciences, Swedish University of Agricultural Sciences. Dogs were grouped on the basis of ANA staining patterns, and the results of immunodiffusion tests. Clinical, hematologic, serum biochemical, radiologic, and pathologic examinations were described for each group. RESULTS: Dogs with a chromosomal-positive, homogeneous ANA staining pattern ( $n = 14$ ) had clinical signs involving multiple organ systems; 8 dogs were anemic. Dogs with a speckled IIF-ANA staining pattern ( $n = 42$ ) primarily had clinical signs of musculoskeletal disorders, fatigue and fever. Precipitating antibodies by immunodiffusion were found only in dogs with a speckled IIF-ANA staining pattern and comprised 4 different subgroups based on antigen specificity. CONCLUSIONS: In dogs with homogeneous IIF-ANA staining, SLE is a probable diagnosis because of the diversity of clinical manifestations and autoantibody reactivity against chromosomal antigens. Dogs with a speckled IIF-ANA pattern may have SLE-related diseases, which, in turn, may be correlated with different immunodiffusion subgroups. These syndromes had overlapping clinicopathologic features, as described for human patients.

### **Veterinary Record (Apr 06 – March 07)**

[Vet Rec.](#) 2006 May 20;158(20):690-4.

### **Pathological changes in the bone marrow of dogs with leishmaniosis.**

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Bone marrow aspiration smears from 15 dogs naturally infected with leishmania were evaluated. Three of the dogs showed no clinical signs, six had up to three clinical signs and six had more than three. The most common pathological features of the bone marrow were megakaryocytic dysplasia in 10 of the dogs, erythrophagocytosis in eight, erythroid dysplasia in two and emperipolesis in two. The megakaryocytic and erythroid dysplasia were probably related to an increased number of marrow macrophages producing high levels of tumour necrosis factor alpha and interferon gamma. Six of the dogs with clinical signs showed bone marrow dysplastic features and erythrophagocytosis, suggesting that leishmaniosis could be the unique cause of both conditions.

[Vet Rec.](#) 2006 Dec 9;159(24):807-11.

### **Experimental study of urodynamic changes after ovariectomy in 10 dogs.**

Salomon JF, Gouriou M, Dutot E, Borenstein N, Combrisson H.

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The urodynamic changes in 10 bitches up to 18 months after they had undergone ovariectomy were investigated. There were significant decreases in the maximum urethral closure pressure, the functional urethral length and the total integrated pressure profile 18 months after spaying, resulting in a caudal shift of the urethral profile, and a deterioration of urethral closure function. Each urethral pressure profile was divided into three equal sections; the mean cranial and middle integrated pressure decreased significantly and consistently over the 18-month observation period whereas the caudal integrated pressure increased.

[Vet Rec.](#) 2007 Feb 10;160(6):186-8.

### **Recombinant antigen-based dipstick ELISA for the diagnosis of leptospirosis in dogs.**

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Division of Veterinary Biotechnology, Indian Veterinary Research Institute, Izatnagar, Bareilly, 243 122, India.

A recombinant LipL 32 antigen-based dipstick ELISA was developed as a screening test for the detection of leptospiral antibodies in serum samples from dogs. The antibodies were detected by a change in the colour of the substrate solution when the recombinant antigen-coated dipsticks were dipped into it. The relative sensitivity, specificity and accuracy of the test, compared with the standard microscopic agglutination test, were 95.9 per cent, 93.8 per cent and 94.8 per cent, respectively.

[Vet Rec.](#) 2007 Mar 24;160(12):393-7.

**Alopecia in pomeranians and miniature poodles in association with high urinary corticoid:creatinine ratios and resistance to glucocorticoid feedback.**

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The adrenocortical function of pomeranians and miniature poodles with alopecia was tested by serial measurements of the urinary corticoid:creatinine ratio (uCCR) and by an oral low-dose dexamethasone suppression test (LDDST) and uCCR measurements. In most of the dogs there was day-to-day variation in the uCCRs of the 10 sequential urine samples, often with values above or below the upper limit of the range of healthy control dogs. In 22 alopecic pomeranians the basal uCCRs were significantly higher than in 18 non-allopecic pomeranians, and the values of both groups were significantly higher than those of 88 healthy pet dogs. The uCCRs of 12 alopecic miniature poodles were significantly higher than those of healthy dogs. In 12 alopecic pomeranians and eight alopecic miniature poodles the oral LDDST revealed increased resistance to dexamethasone. In six non-allopecic pomeranians the uCCRs after the administration of dexamethasone were not significantly different from those in seven healthy dogs at the same time. In an oral high-dose dexamethasone suppression test, using 0.1 mg dexamethasone/kg bodyweight, the uCCRs of seven alopecic pomeranians and five alopecic miniature poodles decreased to low levels.

[Vet Rec.](#) 2007 Mar 3;160(9):293-6.

**Treatment of spontaneous pyometra in 22 bitches with a combination of cabergoline and cloprostenol.**

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Twenty-two bitches with ultrasonographically diagnosed spontaneous pyometra were treated with a combination of 5 microg/kg cabergoline per day and 5 mug/kg cloprostenol every third day, and potentiated sulphonamide twice a day. Bitches with either open-cervix



or closed-cervix pyometra showed a rapid clinical improvement, associated with a reduction in plasma progesterone concentration, increased vulval discharge and a reduction in the diameter of the uterus. The haematological profiles of 21 of the bitches returned to normal within six days of treatment, and their biochemical profiles returned to normal within nine days; 19 of the bitches were managed successfully by a 10-day period of treatment. Two bitches required a further three days of treatment, and in one bitch with a partial uterine torsion the treatment was not successful. Adverse effects of the treatment were limited to the 60 minutes immediately after the administration of prostaglandin, and included retching, vomiting, mild abdominal straining, diarrhoea and panting. The incidence of adverse effects was reduced after each successive dose of prostaglandin. Eleven of the 21 successfully treated bitches were mated at the next oestrus, and seven became pregnant; their litters were smaller than the published breed averages. In four of the bitches the pyometra recurred after the next oestrus.

## **Veterinary Research Communications (Apr 06 – Apr 07)**

[Vet Res Commun.](#) 2007 Apr;31(3):323-34. Epub 2006 Dec 28.

### **Effects of brimonidine ingestion on cardiovascular responses and renal function in conscious dogs.**

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The effects of brimonidine, an alpha(2)-adrenoceptor agonist, on blood pressure, heart rate, respiratory rate, renal function and some blood parameters were investigated in 10 dogs. Dogs were divided into two groups, low dose (LD; 0.2 mg/kg) and high dose (HD; 0.5 mg/kg) of brimonidine given orally. The alpha(2)-adrenergic antagonist yohimbine hydrochloride was injected to dogs at a dose of 0.1 mg/kg in both groups at the fifth hour after brimonidine administration. The results demonstrated that after administration of brimonidine, mean arterial blood pressure decreased dramatically at 2 h by 23% and 20% in LD and HD groups, respectively. Heart rate was decreased in a similar manner and both remained low at 5 h after brimonidine administration. Respiratory rate was decreased by 50%, while the electrocardiogram showed prolongation of the PR interval. Glomerular filtration rate (GFR) and effective renal blood flow were reduced when measured at 4 h after brimonidine ingestion in both groups, but the effect was more pronounced in the LD group. Brimonidine caused natriuresis and kaliuresis in both LD and HD groups. The packed cell volume was decreased and hyperglycaemia was detected. Most of the effects can be reversed completely after administration of yohimbine. However, yohimbine can restore GFR only partially. These data suggest that brimonidine caused cardiovascular and respiratory depression. The adverse effects of this drug can be antagonized by yohimbine, suggesting that these effects were mediated via the alpha(2)-adrenoceptor.

[Vet Res Commun.](#) 2007 Apr;31(3):245-57. Epub 2006 Dec 20.

**Relationships between degree of azotaemia and blood pressure, urinary protein:creatinine ratio and fractional excretion of electrolytes in dogs with renal azotaemia.**

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Blood pressure (BP) was measured in 31 renal azotaemic dogs by oscillometric measurement at the posterior tibia artery, and urine and blood samples were collected. Haematology, blood chemistry and urinalysis were performed and urinary protein:creatinine ratio (UPC) and fractional excretions of electrolytes (FE(e)) were calculated. The results showed that only 19% of dogs with renal azotaemia were hypertensive, whereas almost all of them had high urinary protein and electrolyte excretions. There was no association between BP, UPC and FE(e). A positive correlation was found between all pairs of electrolyte fractional excretions. When the severity of renal impairment was observed using plasma creatinine concentration, neither BP nor UPC was correlated. Only the FE( e ) was associated with the degree of azotaemia. The results suggest that dogs with renal azotaemia do not necessarily have hypertension. The fractional urinary excretion of electrolytes may be a good indicator for severity of renal dysfunction in azotaemic dogs.

[Vet Res Commun.](#) 2006 May;30(4):403-13.

**Dietary supplements of vitamins E and C and beta-carotene reduce oxidative stress in cats with renal insufficiency.**

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Oxidative stress may contribute to the progression of chronic renal failure. In this study, cats with spontaneous renal insufficiency were fed a dry cat food supplemented with the antioxidants vitamins E and C, and beta-carotene for 4 weeks. When compared with healthy cats, cats with renal insufficiency had a tendency to oxidative stress. The antioxidant supplements significantly reduced DNA damage in cats with renal insufficiency as evidenced by reduced serum 8-OHdG and comet assay parameters. Therefore, supplements of vitamins E and C and beta-carotene as antioxidants may be beneficial to cats with renal disease.

## **Veterinary Radiology and Ultrasound (Apr 05 – Apr 06)**

[Vet Radiol Ultrasound](#). 2007 Jan-Feb;48(1):69-73.

### **Doppler ultrasonographic estimation of renal and ocular resistive and pulsatility indices in normal dogs and cats.**

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Resistive index (RI) and pulsatility index (PI) are indirect measurements of blood flow resistance that may be used to evaluate vascular changes in renal and ophthalmologic diseases. To our knowledge, no reports are available describing values for renal and ocular PI index in the unsedated dog and ocular RI and PI indices in the unsedated cat. The purpose of this study was to measure normal values for both intrarenal and ocular RI and PI within the same subject in unsedated clinically normal dogs and cats. Twenty-seven dogs and 10 cats were considered healthy by means of physical examination, CBC, biochemical profile, urinalysis, and ultrasonography. Systolic blood pressure was measured by Doppler ultrasonography. Intrarenal and ocular arteries were scanned by pulsed Doppler ultrasonography to calculate RI and PI. No significant differences were noted between the values obtained for the right vs. the left kidney and eye. The upper values of these indices were calculated as mean + 2 standard deviations resulting in 0.72 and 1.52 for dog renal RI and PI; 0.7 and 1.29 for cat renal RI and PI; 0.76 and 1.68 for dog ocular RI and PI; and 0.72 and 1.02 for cat ocular RI and PI.

[Vet Radiol Ultrasound](#). 2006 Oct-Nov;47(6):602-8.

### **Diuretic renal scintigraphy in normal dogs.**

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Diuretic renal scintigraphy is commonly used in human medicine to differentiate obstructive from nonobstructive pyelectasia. In order to determine normal parameters, <sup>99m</sup>Tc-DTPA renal scintigraphy was performed twice in 20 healthy adult Mongrel dogs. Each dog was injected with either 3.0 mg/kg furosemide or an equivalent volume of saline 4.5 min following injection of the radiopharmaceutical. The following parameters were evaluated: (1) global and individual glomerular filtration rate (GFR); (2) time of peak (TOP) of the time-activity curve (TAC); (3) shape of the TAC; (4) individual kidney excretion half-time (T<sub>1/2</sub>); (5) proportion of maximum activity measured at end of study (8 min); (6) time of onset; and (7)

duration of the effect of the diuretic. Most TAC in the diuretic renography group showed a steep drop in the curve following administration of the diuretic compared with a gradual slope in the saline control group. There was a statistically significant difference in T1/2 between the control renograms (median 10.25 min, range 4.41-18.07 min) and the diuretic renograms (median 4.16 min, range 3.62-5.90 min). There was a statistically significant difference in percentage maximum activity between the control renograms (median 65.25%, range 48.27-93.68%) and the diuretic renograms (median 48.54%, range 35.64-58.76%). Median time of onset of the diuretic effect was 1.10 min (0.20-2.40 min), and median duration was 0.83 min (0.30-2.35 min).

[Vet Radiol Ultrasound](#). 2006 Oct-Nov;47(6):597-601.

### **Imaging diagnosis--urinary obstruction secondary to prostatic lymphoma in a young dog.**

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A 3-year old, intact male Doberman pinscher was examined at the Foster Hospital for Small Animals at Tufts University for a 2-week history of stranguria, dyschezia, and weight loss. Ultrasonographically, there was bilateral hydronephrosis, right-sided hydroureter, hepatosplenomegaly, symmetric mild prostatomegaly, and a distended urinary bladder. Fine needle aspirates and biopsies of the prostate yielded a diagnosis of lymphoma. Lymphoma is a rare cause of prostatomegaly in the dog. Sonographic findings are nonspecific; fine needle aspirates or biopsies are needed to ascertain the diagnosis.

[Vet Radiol Ultrasound](#). 2006 Oct-Nov;47(6):592-6.

### **Lymphoma affecting the urinary bladder in three dogs and a cat.**

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Three dogs and one cat with lymphoma affecting the urinary bladder are reported and the findings on abdominal radiographs and ultrasound are described. Mural lesions representing lymphoma affecting the urinary bladder were identified ultrasonographically in all animals. The most common complications associated with urinary bladder lymphoma were hydronephrosis and hydroureter. In two patients contrast radiography was necessary to detect leakage of urine in the peritoneal and retroperitoneal space. The radiographic and ultrasonographic signs were similar to those reported with other urinary bladder neoplasms; hence urinary bladder lymphoma could not be distinguished from the more common urinary bladder neoplasms, such as transitional cell carcinoma. It is important to include lymphoma

in the differential diagnosis of urinary bladder wall thickening and mural mass in dogs and cats.

[Vet Radiol Ultrasound](#). 2006 Jul-Aug;47(4):376-83.

### **Ultrasonography of the liver, spleen, and urinary tract of the cheetah (*Acinonyx jubatus*).**

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Diseases of the abdomen of the cheetah (*Acinonyx jubatus*) include those affecting the liver, spleen, and urinary tract. The most common diseases of captive-bred cheetah are gastritis, gastric ulceration, glomerulosclerosis, and hepatic veno-occlusive disease, and are the most frequent causes of mortality in these animals. The purpose of this study was to describe the ultrasonographic anatomy of the normal liver, spleen, kidney, and urinary bladder of the anesthetized captive-bred cheetah. Twenty-one cheetahs were examined. Eight of the 21 animals had subclinical evidence of either gastritis or chronic renal disease. The ultrasonographic appearances of the liver, gall bladder, common bile duct, and spleen were evaluated and various measurements made. Statistical analyses of the measurements were performed on all the healthy and subclinically ill animals taking sex, age, mass, and anesthetic protocol into account. There were no significant differences in any parameters between the healthy and subclinically ill animals ( $P > 0.25$ ) and data were combined for statistical analyses. The mean mass was 41.1 kg ( $\pm 8.8$ ) and the mean age was 5.0 years ( $\pm 2.2$ ). The mean thickness of the liver medial to the gall bladder was 67.0 mm ( $\pm 14.8$ ) and the liver was within the left costal arch in 75% of animals, extended caudal to the right costal arch in 50% of animals for an average of 30 mm, and extended caudal to the sternum in 63% of animals for an average of 32.5 mm. The maximum mean hepatic vein diameter at the entrance to the caudal vena cava was 8.6  $\pm$  2.8 mm; the mean diameters of the portal vein at the hilus and that of the caudal vena cava as it entered the liver were 7.5  $\pm$  1.6 and 9.9  $\pm$  4.1 mm, respectively. The mean diameter of the caudal vena cava was significantly affected by the type of anesthetic used ( $P < 0.10$ ). The mass of the animals was significant in explaining the variance in maximum portal vein diameters ( $P < 0.10$ ). The mean maximum velocity of the hepatic vein flow at the entrance to the caudal vena cava was 25.3  $\pm$  2.8 cm/s ( $n=4$ ), the hilar portal vein was 11.7  $\pm$  3.3 cm/s ( $n=7$ ), and the caudal vena cava was 33.8  $\pm$  19.8 cm/s ( $n=5$ ). The mean maximum gall bladder length and width, and the mean common bile duct diameters were 44.6 mm ( $\pm 10.4$ ), 23.3 mm ( $\pm 5.0$ ), and 8.1 mm ( $\pm 2.4$ ), respectively. Age was significant in explaining the variance in gall bladder lengths ( $P < 0.10$ ). Urinary tract ultrasonography was performed only in animals that had normal urea and creatinine levels ( $n=13$ ). Renal cortico-medullary distinction was present in all kidneys and a cortico-medullary rim sign was seen in 21 of 26 kidneys. Mean kidney length, height, and width was 63.9  $\pm$  5.7, 38.1  $\pm$  5.2, and 42.1  $\pm$  5 mm, respectively. The average resistivity index was 0.58 ( $n=5$ ). Mean urinary bladder length, height, and width were 57.0, 19.2, and 34.9 mm, respectively.