Abstracts 2003-2004

American Journal of Veterinary Research (Apr 03- Feb 04)

Am J Vet Res. 2004 Feb;65(2):138-42

Evaluation of effects of dietary carbohydrate on formation of struvite crystals in urine and macromineral balance in clinically normal cats.

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OBJECTIVE: To evaluate effects of dietary carbohydrate on urine volume; struvite crystal formation; and calcium, phosphorus, and magnesium balance in clinically normal cats. ANIMALS: 21 healthy adult cats (15 sexually intact males and 6 sexually intact females). PROCEDURE: Diets containing no carbohydrate source (control diet), control plus starch, or control plus fiber were given in a 3 X 3 Latin-square design. The diets were available ad libitum in study 1 (n = 12) and given under restrictions in study 2 (9) to equalize daily intakes of crude protein among the 3 groups. Formation of struvite crystals and balance of calcium, phosphorus, and magnesium were measured. RESULTS: Urine volume was lower in the starch group and fiber group in study 1, whereas no differences were detected among the groups in study 2. Urinary pH and struvite activity product were higher in the starch group in both studies, and the fiber group also had higher struvite activity product in study 2. In both studies, urinary concentrations of HCl-insoluble sediment were higher in the starch group and fiber group. In the fiber group, a net loss of body calcium, phosphorus, and magnesium was detected in study 2. CONCLUSIONS AND CLINICAL RELEVANCE: Starch and fiber in diets potentially stimulate formation of struvite crystals. Hence, reducing dietary carbohydrate is desirable to prevent struvite urolith formation. In addition, a net loss of body calcium, phosphorus, and magnesium during feeding of the fiber diet suggests that dietary inclusion of insoluble fiber could increase macromineral requirements of cats.

Am J Vet Res. 2003 Oct;64(10):1288-92

Comparison of the effect of propofol and sevoflurane on the urethral pressure profile in healthy female dogs.

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OBJECTIVE: To compare the effects of propofol and sevoflurane on the urethral pressure profile in female dogs. ANIMALS: 10 healthy female dogs. PROCEDURE: Urethral pressure profilometry was performed in awake dogs, during anesthesia with sevoflurane at 1.5, 2.0, and 3.0% end-tidal concentration, and during infusion of propofol at rates of 0.4, 0.8, and 1.2 mg/kg/min. A consistent plane of anesthesia was maintained for each anesthetic protocol. Maximum urethral pressure, maximum urethral closure pressure, functional profile length, and functional area were measured. RESULTS: Mean maximum urethral closure pressure of awake dogs was not significantly different than that of dogs anesthetized with propofol at all infusion rates or with sevoflurane at 1.5 and 2.0% end-tidal concentration. Functional area in awake dogs was significantly higher than in anesthetized dogs. Functional area of dogs during anesthesia with sevoflurane at 3.0% end-tidal concentration was significantly lower than functional area for other anesthetic protocols. Individual differences in the magnitude of effects of propofol and sevoflurane on urethral pressures were observed. CONCLUSIONS AND CLINICAL RELEVANCE: Sevoflurane is an alternative to propofol for anesthesia in female dogs undergoing urethral pressure profilometry. Use of these anesthetics at appropriate administration rates should reliably distinguish normal from abnormal maximum urethral

closure pressures and functional areas. Titration of anesthetic depth is a critical component of urodynamic testing.

Am J Vet Res. 2003 Oct;64(10):1248-54.

Evaluation of erythropoiesis and changes in serum erythropoietin concentration in cats after renal transplantation.

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OBJECTIVE: To investigate the clinicopathologic patterns of the erythropoietic response after renal transplantation in cats with chronic renal failure (CRF). ANIMALS: 14 cats with CRF undergoing renal transplantation. PROCEDURE: Before and at intervals during a 6-month period after transplantation, serum creatinine and erythropoietin concentrations, Hct, erythrocyte indices, aggregate reticulocyte percentage, and iron variables were measured. Additionally, the number of transfusions administered to and any complications that developed in each cat were recorded. RESULTS: In all cats, preoperative azotemia resolved within 6 days after renal transplantation. Two cats had a temporary increase in serum creatinine concentration secondary to an acute graft rejection episode. Anemia (defined as Hct < 28%) resolved in 10 cats 3 to 49 days after surgery. Resolution of anemia was delayed in 2 cats that had acute rejection episodes. Serum erythropoietin concentration and reticulocyte percentage were low preoperatively; values after surgery were highly variable. Compared with preoperative values, serum erythropoietin concentration increased 1 to 4 days after surgery in 11 cats; between days 5 and 58, another increase was detected in 9 cats. Serum iron concentrations were generally low before and 14 days after transplantation. CONCLUSION AND CLINICAL RELEVANCE: The erythropoietic response was highly variable in cats after renal transplantation, but anemia typically resolved within 1 month after surgery. A delay in resolution of anemia in cats may indicate poor graft function and inadequate iron stores, suggesting the need for further evaluation for concurrent illness.

Am J Vet Res. 2003 Sep;64(9):1181-4

Determination of calcium fractionation in dogs with chronic renal failure.

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OBJECTIVE: To determine concentrations of calcium (total [tCa], ionized [iCa], protein-bound [pCa], and complexed [cCa]) in dogs with chronic renal failure (CRF). ANIMALS: 23 dogs with CRF. PROCEDURE: Serum calcium was fractionated by use of a micropartition system. Total

calcium and iCa concentrations and pH were measured in unfractionated serum, and tCa concentration was measured in the ultrafiltrate. The pCa fraction was calculated by subtracting tCa of the ultrafiltrate from tCa concentration of unfractionated serum. The iCa concentration in unfractionated serum was subtracted from tCa concentration in the ultrafiltrate to determine the concentration of cCa. RESULTS: Concentrations of tCa, iCa, pCa, and cCa had wide ranges among dogs with CRF Dogs with significantly low tCa concentration (770 +/- 1.73 mg/dL) had cCa concentration (0.76 +/- 0.38 mg/dL) within reference range, whereas dogs with reference range to high tCa concentration (10.85 +/- 1.13 mg/dL) had significantly high cCa concentration (2.62 +/- 1.04 mg/dL). There was no significant difference in iCa or pCa concentrations between groups. CONCLUSIONS AND CLINICAL RELEVANCE: Concentrations of tCa, iCa, cCa, and pCa varied widely in dogs with CRF Overall, cCa concentration was high, although subpopulations differed in cCa and tCa concentrations. Differences in tCa concentration were primarily attributable to differences in cCa fraction.

Am J Vet Res. 2003 Sep;64(9):1161-6

Serum concentrations of 1,25-dihydroxycholecalciferol and 25-hydroxycholecalciferol in clinically normal dogs and dogs with acute and chronic renal failure.

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OBJECTIVE: To compare serum concentrations of 1,25-dihydroxycholecalciferol (1,25-[OH]2D3) and 25-hydroxycholecalciferol (25-[OH]D3) in healthy control dogs and dogs with naturally occurring acute renal failure (ARF) and chronic renal failure (CRF). ANIMALS: 24 control dogs, 10 dogs with ARF, and 40 dogs with CRF. PROCEDURE: Serum concentrations of 1,25-(OH)2D3 were measured by use of a quantitative radioimmunoassay, and serum concentrations of 25-(OH)D3 were measured by use of a protein-binding assay. RESULTS: Mean +/- SD serum concentration of 1,25-(OH)2D3 was 153 +/- 50 pmol/L in control dogs, 75 +/- 25 pmol/L in dogs with ARF, and 93 +/- 67 pmol/L in dogs with CRF. The concentration of 1,25-(OH)2D3 did not differ significantly between dogs with ARF and those with CRF and was in the reference range in most dogs; however, the concentration was significantly lower in dogs with ARF or CRF, compared with the concentration in control dogs. Mean +/- SD concentration of 25-(OH)D3 was 267 +/- 97 nmol/L in control dogs, 130 +/- 82 nmol/L in dogs with ARF, and 84 +/- 60 nmol/L in dogs with CRF. The concentration of 25-(OH)D3 was significantly lower in dogs with ARF or CRF, compared with the concentration in control dogs. CONCLUSIONS AND CLINICAL RELEVANCE: The concentration of 1,25-(OH)2D3 was within the reference range in most dogs with renal failure. Increased serum concentrations of parathyroid hormone indicated a relative deficiency of 1,25-(OH)2D3. A decrease in the serum concentration of 25-(OH)D3 in dogs with CRF appeared to be attributable to reduced intake and increased urinary loss.

Am J Vet Res. 2003 Sep;64(9):1076-80

Determination of extrarenal plasma clearance and hepatic uptake of technetium-99m-mercaptoacetyltriglycine in cats.

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OBJECTIVE: To determine maximum extrarenal plasma clearance of technetium-99m-mercaptoacetyltriglycine (99mTc-MAG3) and maximum extrarenal hepatic uptake of 99mTc-MAG3 in cats. ANIMALS: 6 clinically normal adult cats. PROCEDURES: Simultaneously, baseline plasma clearance and camera-based uptake of 99mTc-MAG3 were determined in anesthetized cats. Double exponential curves were fitted to plasma clearance data. Injected dose was divided by area under the curve and body weight to determine 99mTc-MAG3 clearance. Regions of interest were drawn around kidneys and liver, and percentage dose uptake was determined 1 to 3 minutes after injection. After bilateral nephrectomy, simultaneous extrarenal plasma clearance and camera-based hepatic uptake of 99mTc-MAG3 were evaluated in each cat. RESULTS: Mean +/- SD baseline plasma clearance and extrarenal clearance were 5.29 +/- 0.77 and 0.84 +/- 0.47 mL/min/kg, respectively. Mean extrarenal clearance (as a percentage of baseline plasma clearance) was 16.06 +/- 7.64%. For right, left, and both kidneys, mean percentage dose uptake was 9.42 +/- 2.58, 9.37 +/- 0.86, and 18.79 +/- 2.47%, respectively. Mean hepatic percentage dose uptake before and after nephrectomy was 12.95 +/- 0.93 and 21.47 +/- 2.00%, respectively. Mean percentage change of hepatic uptake after nephrectomy was 166.89 +/- 23.19%. CONCLUSIONS AND CLINICAL RELEVANCE: In cats, extrarenal clearance of 99mTc-MAG3 is higher than that of other species; therefore, 99mTc-MAG3 is not useful for estimation of renal function in felids. Evaluation of renal function in cats may be more accurate via camera-based versus plasma clearance-based methods because camera-based studies can discriminate specific organs.

Am J Vet Res. 2003 Aug;64(8):1059-64

Effects of a high-protein diet versus dietary supplementation with ammonium chloride on struvite crystal formation in urine of clinically normal cats.

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OBJECTIVE: To evaluate the effects of a high-protein diet versus dietary supplementation with ammonium chloride (NH4Cl) on struvite crystal formation in the urine of clinically normal cats by measuring the urine concentration of hydrochloric acid (HCl)-insoluble

sediment, urine pH, struvite activity product (SAP), number of struvite crystals in urine, and urine volume. ANIMALS: 23 healthy adult cats. PROCEDURE: Urine was fractionated by centrifugation with subsequent extraction of the sediment with 1 N HCl (study 1). Diets containing either 29% crude protein or 55% crude protein were fed to cats in a crossover trial of 3 weeks/period (study 2). Diets supplemented with either sodium chloride (NaCl) or NH4Cl were fed, by use of a 3 x 3 Latin-square design with 3 wk/period (study 3). In studies 2 and 3, urine samples were collected for the last 7 days of each period. RESULTS: The HCl-insoluble sediment contained Tamm-Horsfall glycoprotein (THP; study 1). The high-protein diet (study 2) and dietary supplementation with NH4Cl (study 3) resulted in a decrease in urine pH, SAP, and the number of struvite crystals in urine. However, the high-protein diet decreased urine concentrations of HCl-insoluble sediment containing THP (study 2), in contrast to the NH4Cl supplementation that increased urine volume without a significant effect on the urine concentration of the HCl-insoluble sediment (study 3). CONCLUSIONS AND CLINICAL RELEVANCE: Our results indicate that compared with dietary supplementation with NH4Cl, the high-protein diet is preferable as a urine acidifier for the prevention of struvite crystal formation in clinically normal cats.

Am J Vet Res. 2003 Aug;64(8):1021-6

Serum concentrations of acute-phase proteins in dogs with leishmaniosis during short-term treatment.

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OBJECTIVE: To evaluate changes in serum concentrations of acute-phase proteins in dogs with leishmaniosis during short-term therapy in accordance with 2 treatment protocols and determine whether concentrations of acute-phase proteins could be used to monitor the initial response of dogs to treatment. ANIMALS: 12 dogs naturally infected with Leishmania infantum. PROCEDURE: Dogs were allocated into 2 groups. Dogs of group 1 were treated by use of meglumine antimonate (100 mg/kg, SC, q 24 h) administered concurrently with allopurinol (15 mg/kg, PO, q 12 h) for 20 days and then with allopurinol alone at the same dosage for the subsequent 30 days. Dogs of group 2 were treated by administration of allopurinol alone (15 mg/kg, PO, q 12 h) for 60 days). Blood samples were obtained before and during treatment for measurement of serum concentrations of acute-phase proteins and determination of CBC counts, serum biochemical analyses, and electropherograms. RESULTS: All dogs evaluated in the study had increased concentrations of C-reactive protein, haptoglobin, and ceruloplasmin at the time of diagnosis of leishmaniosis. Mean concentration of serum amyloid A before treatment was also increased, but some of the dogs had concentrations of serum amyloid A that were within the reference range. Concentrations of C-reactive protein and ceruloplasmin decreased significantly in all dogs at the end of the study period. CONCLUSIONS AND CLINICAL RELEVANCE: Measurement of concentrations of selected acute-phase proteins, such as C-reactive protein or

ceruloplasmin, could be used to evaluate the initial response of dogs with leishmaniosis to treatment.

Am J Vet Res. 2003 Aug;64(8):1017-20

Evaluation of a bladder tumor antigen test as a screening test for transitional cell carcinoma of the lower urinary tract in dogs.

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OBJECTIVE: To evaluate the veterinary version of the bladder tumor antigen (V-BTA) test as a screening test for transitional cell carcinoma (TCC) of the lower urinary tract of dogs. ANIMALS: 229 client-owned dogs. PROCEDURE: Urine samples from dogs were shipped overnight to a single laboratory to facilitate testing within 48 hours of collection by use of the V-BTA rapid latex agglutination urine dipstick test. Groups of dogs included the following: 1) dogs with TCC of the lower urinary tract, 2) healthy control dogs, 3) unhealthy control dogs with non-TCC urinary tract disease, and 4) unhealthy control dogs without urinary tract disease. Test sensitivity and specificity were calculated by use of standard methods. Logistic models were developed to assess the effect of disease status, test conditions, urine composition, and signalment on the performance of the V-BTA test. RESULTS: A total of 229 urine samples were analyzed, including 48 from dogs with suspected (n = 3) or confirmed (45) TCC. Test sensitivities were 88, 87, and 85% for all dogs with (suspected and confirmed) TCC, dogs with confirmed TCC at any site, and dogs with confirmed TCC of the urinary bladder, respectively. Test specificities were 84, 41, and 86% for healthy control dogs, unhealthy control dogs with non-TCC urinary tract disease, and unhealthy control dogs without urinary tract disease, respectively. The test performed slightly better on centrifuged urine samples than on uncentrifuged urine samples. CONCLUSIONS AND CLINICAL RELEVANCE: Our results indicate that the V-BTA test is useful in screening for urinary tract TCC in dogs.

Characterization of the bacterial population of the genital tract of adult cats.

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OBJECTIVE: To characterize the bacteria of the genital tract in adult cats; assess the effect of estrus, mating, and administration of progestins on those microorganisms in females; and evaluate whether results of bacteriologic culture of vaginal swabs are affected by cleansing of the vulva prior to sampling or by repeated sampling. ANIMALS: 66 female and 29 male

cats undergoing routine ovariohysterectomy or castration. PROCEDURE: Specimens were obtained from vaginal and uterine or preputial mucosae with swabs moistened with sterile saline (0.9% NaCl) solution. In 9 cats, vaginal specimens were obtained before and after cleansing of the vulva with ethanol; in 7 female cats, 2 vaginal speci mens were obtained in immediate succession. RESULTS: Aerobic bacteria were most commonly isolated from cats' vaginas and prepuces; anaerobic bacteria were isolated frequently from males (41%) but rarely from females (5%). Generally, culture results were not affected by cleansing of the vulva or repeated vaginal sampling. The bacterial population of the vaginas of cats was influenced by stage of the estrous cycle but not by mating or administration of progestins. Bacteria were not isolated from the uterus of any cat. CONCLUSIONS AND CLINICAL RELEVANCE: In cats, bacteria of the genital tract in females are predominantly aerobic; in males, aerobic and anaerobic bacteria are found. The bacterial population of the vagina is affected by stage of the estrous cycle. Pure growth of bacteria in culture of genital tract specimens is a normal finding; antimicrobials should only be administered if clinical signs of genital infection are present.

Am J Vet Res. 2003 Jul;64(7):926-34

Pharmacokinetics of tacrolimus after multidose oral administration and efficacy in the prevention of allograft rejection in cats with renal transplants.

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OBJECTIVE: To describe pharmacokinetics of multi-dose oral administration of tacrolimus in healthy cats and evaluate the efficacy of tacrolimus in the prevention of allograft rejection in cats with renal transplants. ANIMALS: 6 healthy research cats. PROCEDURE: Cats received tacrolimus (0.375 mg/kg, PO, q 12 h) for 14 days. Blood tacrolimus concentrations were measured by a high performance liquid chromatography-mass spectrometry assay. Each cat received an immunogenically mismatched renal allograft and native kidney nephrectomy. Tacrolimus dosage was modified to maintain a target blood concentration of 5 to 10 ng/mL. Cats were euthanatized if plasma creatinine concentration exceeded 7 mg/dL, body weight loss exceeded 20%, or on day 50 after surgery. Kaplan-Meier survival curves were plotted for 6 cats treated with tacrolimus and for 8 cats with renal transplants that did not receive immunosuppressive treatment. RESULTS: Mean (+/- SD) values of elimination half-life, time to maximum concentration, maximum blood concentration, and area under the concentration versus time curve from the last dose of tacrolimus to 12 hours later were 20.5 +/- 9.8 hours, 0.77 +/- 0.37 hours, 27.5 +/- 31.8 ng/mL, and 161 +/- 168 hours x ng/mL, respectively. Tacrolimus treated cats survived longer (median, 44 days; range, 24 to 52 days) than untreated cats (median, 23 days; range, 8 to 34 days). On histologic evaluation, 3 cats had evidence of acute-active rejection, 1 cat had necrotizing vasculitis, and 2 cats euthanatized at study termination had normal appearing allografts. CONCLUSIONS AND

CLINICAL RELEVANCE: Tacrolimus may be an effective immunosuppressive agent for renal transplantation in cats.

Am J Vet Res. 2003 Jul;64(7):874-9

Effects of chronic renal disease on the transport of vitamin A in plasma and urine of dogs.

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OBJECTIVE: To determine plasma and urine concentrations of retinol, retinyl esters, retinol-binding protein (RBP), and Tamm-Horsfall protein (THP) in dogs with chronic renal disease (CRD). ANIMALS: 17 dogs with naturally developing CRD and 21 healthy control dogs. PROCEDURE: A diagnosis of CRD was established on the basis of clinical signs, plasma concentrations of creatinine and urea, and results of urinalysis. Concentrations of retinol and retinyl esters were measured by use of reverse-phase high-performance liquid chromatography. Concentrations of RBP and THP were measured by use of sensitive ELISA systems. RESULTS: Dogs with CRD had higher plasma concentrations of retinol, which were not paralleled by differences in plasma concentrations of RBP. Calculated ratio of urinary total vitamin A (sum of concentrations of retinol and retinyl esters to creatinine concentration) and ratio of the concentration of urinary retinyl esters to creatinine concentration did not differ between groups. However, we detected a significantly higher retinol-to-creatinine ratio in the urine of dogs with CRD, which was paralleled by a higher urinary RBP-to-creatinine ratio. Thus, in dogs with CRD, the estimated fractional clearance of total vitamin A, retinol, and RBP was increased. Furthermore, dogs with CRD had a reduced urinary THP-to-creatinine ratio. CONCLUSIONS AND CLINICAL RELEVANCE: Results of this study documented that CRD affects the concentrations of retinol in plasma and urine of dogs. Analysis of the data indicates that measurement of urinary RBP and urinary THP concentrations provides valuable information that can be helpful in follow-up monitoring of dogs with CRD.

Am J Vet Res. 2003 May;64(5):590-8

Effects of acepromazine on renal function in anesthetized dogs.

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OBJECTIVE: To investigate the effects of IM administration of acepromazine on indices of relative renal blood flow and glomerular filtration rate (GFR) by means of scintigraphy, as well as the effects on physiologic, hematologic, and serum biochemical variables in anesthetized dogs, compared with effects of administration of saline. ANIMAL: 6 healthy Beagles. PROCEDURE: Acepromazine (0.1 mg/kg) or physiologic saline (0.9 NaCl) solution

was administered IM 30 minutes prior to induction of anesthesia with thiopentone; anesthesia was maintained with inspired isoflurane for 2.25 hours. Blood gases and circulatory and ventilatory variables were monitored. Renal function was evaluated by scintigraphic measurements of GFR and relative renal blood flow and analyses of serum and urine. Statistical analyses used ANOVA or Friedman ANOVA. RESULTS: Values of relative renal blood flow and GFR remained high despite low blood pressures. After administration of acepromazine, mean +/- SD arterial blood pressure was 66 +/- 8 mm Hg during anesthesia; this value was below the threshold (80 mm Hg) for renal autoregulation of GFR. In comparison, mean arterial blood pressure after administration of saline was significantly higher (87 +/- 13 mm Hg). However, between treatments, there were no significant differences in GFR, relative renal blood flow, or other indices of renal function. CONCLUSIONS AND CLINICAL RELEVANCE: Measurements of renal function and blood flow in dogs during anesthesia with thiopentone and isoflurane did not differ significantly between treatments, which suggested that acepromazine protects renal function despite inducing reduction in blood pressure, compared with effects of administration of saline.

Am J Vet Res. 2003 May;64(5):558-61

Glomerular lesions in dogs infected with Leishmania organisms.

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OBJECTIVE: To histologically identify glomerular lesions in dogs infected with Leishmania organisms. ANIMALS: 41 dogs (17 sexually intact males and 14 sexually intact and 10 ovariohysterectomized females) that had positive results when tested for leishmaniosis as determined by use of serologic evaluation (indirect fluorescent antibody test, titers of 1:80 to 1:640) and direct microscopic identification of the protozoal organisms. PROCEDURE: Urine samples were collected by use of cystocentesis and examined by qualitative SDS-agarose gel electrophoresis (AGE). All dogs had non-selective (glomerular) or mixed (glomerular and tubular) proteinemia. Specimens were obtained from each dog during ultrasound-assisted renal biopsy and used for histologic examination. Each specimen was stained with H&E, periodic acid-Schiff, Goldner's trichrome, methenamine silver, and Congo Red stains. Specimens were adequate for evaluation when they contained at least 5 glomeruli/section, except for specimens stained with Congo Red in which 1 glomerulus/section was adequate. RESULTS: Examination of renal biopsy specimens revealed various glomerular lesions in all dogs and interstitial or tubular (or both) lesions in 23 of 41 (55%) dogs. CONCLUSIONS AND CLINICAL RELEVANCE: Glomerular lesions that develop in dogs during infection with Leishmania organisms can be classified histologically as mesangial glomerulonephritis, membranous glomerulonephritis, membranoproliferative glomerulonephritis, and focal segmental glomerulonephritis. Tubulointerstitial histopathologic conditions were not observed as the primary lesion, despite being evident in 23 of 41 (55%) dogs. Use of SDS-AGE for qualitative evaluation of proteinuria and successive collection of specimens during renal biopsies following diagnosis of nonselective glomerular proteinuria provides the possibility for early identification of renal lesions.

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J Am Vet Med Assoc. 2003 Oct 15;223(8):1156-8, 1129

Intravesicular administration of clotrimazole for treatment of candiduria in a cat with diabetes mellitus.

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A 12-year-old spayed female domestic longhair cat developed fungal cystitis (Candida sp). The cat had a history of chronic diabetes mellitus, hyperadrenocorticism, and bacterial cystitis caused by Escherichia coli. Antifungal agents (itraconazole and fluconazole) were administered orally without noticeable effect on the candiduria. Because of the ineffectiveness of these treatments, intravesicular administration of 1% clotrimazole solution was performed weekly for 3 treatments. Complete resolution of urinary candidiasis was detected after the third infusion. Intravesicular administration of clotrimazole solution appears to be a safe and effective treatment of fungal cystitis in cats.

J Am Vet Med Assoc. 2003 Sep 15;223(6):821-4, 810

Systemic candidiasis in a dog.

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Candida albicans is a common cause of nosocomial infections in humans, but there are few reports of systemic candidiasis in dogs. This report describes an 11-year-old spayed female Scottish Terrier with systemic candidiasis. The diagnosis was made on the basis of results of microbiologic culture of specimens from urine and venous catheters and histologic examination of tissues obtained post mortem. Factors that predisposed the dog of this report to systemic candidiasis included diabetes mellitus, corticosteroid and broad-spectrum antimicrobial administration, venous and urinary catheterization, and administration of nutrition parenterally. The development of pyrexia and leukocytosis in dogs with risk factors that predispose to Candida spp infections warrants evaluation via microbial culture of specimens from urine and vascular catheters used in those dogs.

J Am Anim Hosp Assoc. 2004 Jan-Feb;40(1):82-5

Ureteral mast cell tumor in a dog.

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A 6-year-old, castrated male, mixed-breed dog was diagnosed with partial unilateral ureteral obstruction secondary to a ureteral mass. The ureteral mass was surgically resected, and an ureteroneocystostomy was performed. Histopathology of the ureteral mass was consistent with a poorly differentiated mast cell tumor (MCT). The patient recovered well but was euthanized 5 months postoperatively for central nervous system signs. A choroid plexus tumor was diagnosed during necropsy examination. There was no evidence of recurrence or dissemination of the ureteral MCT. Extracutaneous MCTs are rare in dogs, and primary MCT associated with the urinary tract has not previously been reported in the veterinary literature.

J Am Anim Hosp Assoc. 2004 Jan-Feb;40(1):64-8

Intravesical instillation of dilute formalin for the treatment of severe hemorrhagic emphysematous cystitis in a diabetic dog.

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Intravesical formalin is a known treatment for control of hemorrhagic cystitis caused by multiple etiologies in humans and dogs. This case report documents the successful use of intravesical formalin for the treatment of severe hemorrhagic cystitis that occurred secondary to emphysematous cystitis in a diabetic dog. In addition, a review of emphysematous cystitis and the use of intravesical formalin in human and veterinary medicine is discussed. Formalin instillation into the urinary bladder is an option for life-threatening, refractory cases of hemorrhagic cystitis; but clinicians must be familiar with the proper technique and be aware of potential complications prior to its use.

J Am Anim Hosp Assoc. 2003 Sep-Oct;39(5):506-8

Neodymium:Yttrium-aluminum-Garnet (Nd:YAG) laser ablation of an obstructive urethral polyp in a dog.

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A miniature schnauzer presented for evaluation of a persistent lower urinary tract obstruction. Further examination revealed that the dog had developed an obstructive, inflammatory polyp secondary to a long-standing urinary tract infection. The polyp was located within the proximal urethra and interfered with normal voiding. The polyp was visualized using flexible endoscopy and then was successfully ablated using the neodymium:yttrium-aluminum-garnet (Nd:YAG) laser. The Nd:YAG laser is a potentially useful tool for treating various lesions of the lower urinary tract.

J Am Anim Hosp Assoc. 2003 Jul-Aug;39(4):403-5

The use of a low-profile cystostomy tube to relieve urethral obstruction in a dog.

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A 10-year-old, spayed female Dalmatian was diagnosed with granulomatous urethritis causing urethral obstruction. Due to the extensive involvement of the urethra, a urethrostomy was not possible. A commercially available, silicone, low-profile gastrostomy tube was placed as a prepubic cystostomy tube to achieve urinary diversion. This tube is easy to use, has a one-way valve, and lies flush with the skin margin, thereby decreasing the likelihood of inadvertent removal. This tube should be considered to achieve long-term urinary diversion when urethral involvement is extensive.

J Am Anim Hosp Assoc. 2003 Jul-Aug;39(4):369-78

Qualitative urinalyses in puppies 0 to 24 weeks of age.

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Suggestions for interpreting qualitative urinalyses from puppies have been based on limited results obtained in the laboratory setting. Proteinuria, glucosuria, and decreased concentration of urine have been considered normal in puppies <8 weeks of age due to immature renal function. In this study, the authors reviewed 149 voided urine samples from 118 different, apparently healthy, random-source puppies. The primary finding was that mean urine specific gravity (USG) was significantly lower in 0- to 3-week-old puppies when compared to puppies 4 to 24 weeks old. Mean USG in all other age groups was >1.030. There was no difference in the frequency of positive protein or occult blood dipstick results among

age groups, and there were no positive glucose, ketone, bilirubin, or urobilinogen reactions in any samples analyzed. Urine sediment results are reported for 41 samples. Epithelial cells and white blood cells were the most common sediment findings in these 41 voided samples, observed in 34 (83%) and 18 (44%) samples, respectively. Crystals were observed in 15 (37%) samples, whereas casts, bacteria, and red blood cells were observed less commonly.

J Am Anim Hosp Assoc. 2003 May-Jun;39(3):263-70

Candida spp. urinary tract infections in 13 dogs and seven cats: predisposing factors, treatment, and outcome.

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Records from 20 animals (13 dogs, seven cats) with Candida spp. urinary tract infections were reviewed. Six Candida spp. were isolated; Candida albicans was the most common isolate. Concurrent diseases or nonantifungal drugs administered within 1 month of isolation included antibiotics (n=16), corticosteroids (n=6), diabetes mellitus (n=4), nonurogenital neoplasia (n=3), and noncandidal urogenital disease (n=14). All animals had sources of local or systemic immune compromise that likely predisposed to infection. Of five animals with resolution of infection, three did not receive specific antifungal treatment. The authors conclude that correction of predisposing conditions is likely critical for management of Candida spp. urinary tract infection.

J Am Anim Hosp Assoc. 2003 Mar-Apr;39(2):151-9

Ultrasound-guided percutaneous drainage as the primary treatment for prostatic abscesses and cysts in dogs.

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Thirteen dogs with prostatic abscesses and cysts were treated using percutaneous ultrasound-guided drainage. Eight dogs were diagnosed with prostatic abscesses and five with cysts on the basis of cytopathological examination and bacterial culture of the prostatic fluid. Antibiotic therapy, based on culture and sensitivity results, was administered for a minimum of 4 weeks. Intact dogs were castrated after initial drainage. Repeat ultrasonography of the prostate was performed every 1 to 6 weeks, and any residual cavitary lesions were drained and fluid analysis repeated. The median number of drainage procedures required to completely resolve the lesions was two (range, one to four). No complications were observed after drainage, and clinical signs resolved in all dogs. None of

the dogs developed clinical signs of recurrent abscesses or cysts in the follow-up period (median, 36 months; range, 10 to 50 months). Ultrasound-guided, percutaneous drainage of prostatic abscesses and cysts appears to be a useful alternative to surgical treatment in select dogs.

J Am Anim Hosp Assoc. 2003 Jan-Feb;39(1):80-5

Extradural spinal, bone marrow, and renal nephroblastoma.

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A 1-year-old, female intact Shetland sheepdog presented with acute onset of neurological signs. Physical examination revealed a large abdominal mass. Neurological examination revealed multifocal disease with neck pain, short-strided forelimbs, and hind-limb paresis with loss of tail and anal tone. Blood work, imaging techniques, cytopathology, and histopathology led to a diagnosis of renal, bone-marrow, and extradural spinal nephroblastoma. This report documents potential clinical and pathological manifestations of canine nephroblastoma that have not been previously reported.

J Am Anim Hosp Assoc. 2003 Jan-Feb;39(1):76-9

Treatment of renal nephroblastoma in an adult dog.

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An 8-year-old Labrador retriever was diagnosed with a unilateral malignant nephroblastoma and hypertrophic osteopathy. The histopathologically malignant tumor was confined to the renal capsule, but the sarcomatous component was anaplastic, resulting in its classification as a Stage I tumor with unfavorable histopathology. The dog was treated with unilateral nephrectomy, vincristine, and doxorubicin. This dog has remained disease free for >25 months. Reported treatments of renal nephroblastoma in the dog have not described disease-free intervals of >8 months.

Journal of the American Veterinary Medical Association (Feb 03 – March 04)

J Am Vet Med Assoc. 2004 Feb 1;224(3):380-7

Long-term risks and benefits of early-age gonadectomy in dogs.

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OBJECTIVE: To evaluate the long-term risks and benefits of early-age gonadectomy, compared with traditional-age gonadectomy, among dogs adopted from a large animal shelter. DESIGN: Retrospective cohort study. ANIMALS: 1,842 dogs. PROCEDURE: Dogs underwent gonadectomy and were adopted from an animal shelter before 1 year of age; follow-up was available for as long as 11 years after surgery. Adopters completed a questionnaire about their dogs' behavior and medical history. When possible, the dogs' veterinary records were reviewed. Associations between the occurrence of 56 medical and behavioral conditions and dogs' age at gonadectomy were evaluated. RESULTS: Among female dogs, early-age gonadectomy was associated with increased rate of cystitis and decreasing age at gonadectomy was associated with increased rate of urinary incontinence. Among male and female dogs with early-age gonadectomy, hip dysplasia, noise phobias, and sexual behaviors were increased, whereas obesity, separation anxiety, escaping behaviors, inappropriate elimination when frightened, and relinquishment for any reason were decreased. CONCLUSIONS AND CLINICAL RELEVANCE: Because early-age gonadectomy appears to offer more benefits than risks for male dogs, animal shelters can safely gonadectomize male dogs at a young age and veterinary practitioners should consider recommending routine gonadectomy for client-owned male dogs before the traditional age of 6 to 8 months. For female dogs, however, increased urinary incontinence suggests that delaying gonadectomy until at least 3 months of age may be beneficial.

J Am Vet Med Assoc. 2004 Feb 1;224(3):372-9

Long-term risks and benefits of early-age gonadectomy in cats.

Spain CV, Scarlett JM, Houpt KA.

Department of Population Medicine and Diagnostic Science, College of Veterinary Medicine, Cornell University, Ithaca, NY 14853, USA.

OBJECTIVE: To evaluate the long-term risks and benefits of early-age gonadectomy, compared with traditional-age gonadectomy, among cats adopted from a large animal shelter. DESIGN: Retrospective cohort study. ANIMALS: 1,660 cats. PROCEDURE: Cats underwent gonadectomy and were adopted from an animal shelter before 1 year of age; follow-up was available for as long as 11 years after surgery (median follow-up time, 3.9 years). Adopters completed a questionnaire about their cats' behavior and medical history.

When possible, the cats' veterinary records were reviewed. Statistical analyses were conducted to identify any associations between the occurrence of 47 medical and behavioral conditions and the cats' age at gonadectomy. RESULTS: Among male cats that underwent early-age gonadectomy (< 5.5 months of age), the occurrence of abscesses, aggression toward veterinarians, sexual behaviors, and urine spraying was decreased, whereas hiding was increased, compared with cats that underwent gonadectomy at an older age. Among male and female cats that underwent early-age gonadectomy, asthma, gingivitis, and hyperactivity were decreased, whereas shyness was increased. CONCLUSIONS AND CLINICAL RELEVANCE: Gonadectomy before 5.5 months of age was not associated with increased rates of death or relinquishment or occurrence of any serious medical or behavioral condition and may provide certain important long-term benefits, especially for male cats. Animal shelters can safely gonadectomize cats at a young age, and veterinarians should consider recommending routine gonadectomy for client-owned cats before the traditional age of 6 to 8 months.

J Am Vet Med Assoc. 2003 Dec 15;223(12):1780-2, 1778

Glomerulocystic kidney disease in a kitten.

Harkin KR, Biller DS, Balentine HL.

Department of Clinical Sciences, College of Veterinary Medicine, Kansas State University, Manhattan, KS 66506-5701, USA.

A 4-month-old 1-kg female Siamese-Manx cross kitten was evaluated because of renomegaly and renal failure. Ultrasonography and cytologic examination of a renal aspirate failed to provide an antemortem diagnosis. Histologic lesions included diffuse cystic dilatation of all tubules and Bowman's spaces in the renal cortex and occasional small glomerular tufts; the lesions were similar to those of glomerulocystic kidney disease of humans. Glomerulocystic kidney disease is a rare cause of early-onset renal failure, but should be considered when renomegaly is detected, cysts are not detected in the kidney by ultrasonography, and cytologic examination of a renal aspirate is nondiagnostic.

J Am Vet Med Assoc. 2003 Nov 15;223(10):1436-42

Age-related variations in hematologic and plasma biochemical test results in Beagles and Labrador Retrievers.

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OBJECTIVE: To investigate age-related variations in results of hematologic and plasma biochemical tests performed on dogs of 2 common breeds. DESIGN: Prospective cohort

study. ANIMALS: 34 Beagles and 44 Labrador Retrievers. PROCEDURE: Blood samples were collected throughout the dogs' lives; 589 samples were collected from the Beagles and 964 samples were collected from the Labrador Retrievers (age at the time of sample collection ranged from 22 days to 15 years). White blood cell and RBC counts; hemoglobin concentration; Hct; mean cell volume; mean cell hemoglobin concentration; alkaline phosphatase, alanine aminotransferase, and aspartate aminotransferase activities; and calcium, phosphorus, cholesterol, urea, protein, and albumin concentrations were measured. RESULTS: For all tests, there were significant effects of age on test results. There was a significant interaction between age and breed for all tests except hemoglobin, albumin, and phosphorus concentrations. CONCLUSIONS AND CLINICAL RELEVANCE: Results suggested that there were age-related changes in hematologic and plasma biochemical test results in these 2 breeds of dogs. Changes were most evident during the first year of life, reflecting growth and maturation of the puppies. In some instances, values for puppies diverged markedly from those for adults, necessitating the use of age-specific reference ranges for the interpretation of clinical data.

J Am Vet Med Assoc. 2003 Dec 15;223(12):1780-2, 1778.

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Department of Clinical Sciences, College of Veterinary Medicine, Kansas State University, Manhattan, KS 66506-5701, USA.

A 4-month-old 1-kg female Siamese-Manx cross kitten was evaluated because of renomegaly and renal failure. Ultrasonography and cytologic examination of a renal aspirate failed to provide an antemortem diagnosis. Histologic lesions included diffuse cystic dilatation of all tubules and Bowman's spaces in the renal cortex and occasional small glomerular tufts; the lesions were similar to those of glomerulocystic kidney disease of humans. Glomerulocystic kidney disease is a rare cause of early-onset renal failure, but should be considered when renomegaly is detected, cysts are not detected in the kidney by ultrasonography, and cytologic examination of a renal aspirate is nondiagnostic.

J Am Vet Med Assoc. 2003 Dec 15;223(12):1783-7, 1778.

Lobar holoprosencephaly in a Miniature Schnauzer with hypodipsic hypernatremia.

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A 9-month-old male Miniature Schnauzer was examined because of a lifelong history of

behavioral abnormalities, including hypodipsia. Diagnostic evaluation revealed marked hypernatremia and a single forebrain ventricle. The behavioral abnormalities did not resolve with correction of the hypernatremia, and the dog was euthanatized. At necropsy, midline forebrain structures were absent or reduced in size, and normally paired forebrain structures were incompletely separated. Findings were diagnostic for holoprosencephaly, a potentially genetic disorder and the likely cause of the hypodipsia. Similar evaluation of affected Miniature Schnauzer dogs may reveal whether holoprosencephaly routinely underlies the thirst deficiency that may be seen in dogs of this breed.

J Am Vet Med Assoc. 2003 Sep 15;223(6):817-20, 810

Bilateral ectopic ureters in a male dog with unilateral renal agenesis.

Taney KG, Moore KW, Carro T, Spencer C.

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A 1-year-old neutered male mixed-breed dog was evaluated because of signs of urinary incontinence. Retrograde positive contrast urethrocystography and excretory urography with pneumocystography revealed bilateral intramural ectopic ureters and absence of the right kidney. During abdominal exploratory surgery, only the left kidney was located. The left intramural ectopic ureter was repaired by neoureterostomy (creation of a new opening for the ureter to enable urine to empty into the bladder). The right ectopic ureter was ligated at its entrance into the urinary bladder serosa. Results of excretory urography (performed immediately after surgery and repeated 8 weeks later) revealed successful correction of the left intramural ectopic ureter. Twelve weeks after surgery, the dog remained continent. To the authors' knowledge, there are few reports of ectopic ureters in male dogs; furthermore, the urinary tract abnormalities detected concurrently in this dog are also unusual.

J Am Vet Med Assoc. 2003 Sep 15;223(6):815-6, 810

Medical management of urethral and colonic perforation associated with urinary catheterization in a kitten.

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A 6-week-old male kitten was evaluated because of stranguria and possible urethral blockage; a urinary catheter placed during general anesthesia penetrated the urethral and colonic walls and entered the colon. Treatment was conservative, with fluids administered i.v., administration of piperacillin, and supportive care. The kitten never became febrile or clinically ill and continued to thrive. There was no development of clinical signs consistent with stricture, diverticulum, or fistula formation. Complications from urethral perforation include infection and urethral stricture. Reconstructive surgery is considered the treatment

of choice for traumatic urethral-colonic perforation. However, surgery may not be feasible or may be cost-prohibitive in certain situations. In such instances, medical management may provide a reasonable alternative to euthanasia.

J Am Vet Med Assoc. 2003 Aug 15;223(4):475-81

Evaluation of transurethral cystoscopy and excretory urography for diagnosis of ectopic ureters in female dogs: 25 cases (1992-2000).

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Department of Veterinary Clinical Sciences, College of Veterinary Medicine, The Ohio State University, Columbus, OH 43210, USA.

OBJECTIVE: To evaluate transurethral cystoscopy and excretory urography for diagnosis of ectopic ureter in female dogs and identify concurrent urogenital abnormalities. DESIGN: Retrospective study. ANIMALS: 25 female dogs. PROCEDURE: Medical records of female dogs that underwent transurethral cystoscopy, excretory urography, and ventral cystotomy were reviewed for signalment, history, physical examination findings, results of bacteriologic culture of urine, and surgical findings. Videotapes of transurethral cystoscopy and radiographic studies were reviewed systematically without knowledge of surgical findings. RESULTS: Ectopic ureters were diagnosed in 24 of 25 (96%) of the dogs, bilaterally in 22 of 24 (91.6%) dogs. Cystoscopic evaluation yielded a correct diagnosis in all dogs when results of ventral cystotomy were used as the diagnostic standard. Cystoscopic evaluation identified a terminal ureteral opening for all ureters. Urethral fenestrations, troughs, striping, and tenting were identified. Abnormalities of the vestibule were identified in all examinations available for review (24/25). The paramesonephric septal remnant and its association with ectopic ureters were identified and characterized by cystoscopy. Radiographic findings were discordant with surgical findings and correctly identified 36 of 46 (78.2%) ectopic ureters and 2 of 4 normal ureters. Hydroureter and renal abnormalities were associated with distal urethral ectopic ureters on radiographic evaluations. CONCLUSIONS AND CLINICAL RELEVANCE: Transurethral cystoscopy was accurate and minimally invasive for identification and classification of ectopic ureters in dogs. Contrast radiography had limitations in diagnosis of ectopic ureters. Cystoscopic findings and associated vaginal and vestibular abnormalities support abnormal embryologic development in the pathogenesis of ectopic ureters.

J Am Vet Med Assoc. 2003 Aug 15;223(4):457-61. Comment in: J Am Vet Med Assoc. 2003 Oct 15;223(8):1111-2; author reply 1112.

Evaluation of the role of lower urinary tract disease in cats with urine-marking behavior.

Tynes VV, Hart BL, Pryor PA, Bain MJ, Messam LL.

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University of California Davis, CA 95616, USA.

OBJECTIVE: To determine whether findings of urinalyses could be used to reliably distinguish gonadectomized cats with urine-marking behavior from those with no problem urination. DESIGN: Case control study. ANIMALS: 58 gonadectomized cats (47 males and 11 females) with urine-marking behavior (ie, marking of vertical surfaces) and 39 (26 males and 13 females) without problem urination or urinary tract-associated conditions. PROCEDURE: Urine was collected by cystocentesis from all cats. Findings of urinalyses of cats with urine-marking behavior were analyzed statistically for sex-related differences and differences between cats that marked vertical surfaces only and those that marked both vertical and horizontal surfaces; findings of urinalyses of control cats were compared between sexes. Subsequently, results of urinalyses of cats with urine-marking behavior were compared with those of control cats. RESULTS: With regard to variables measured via urinalysis, there were no differences between male and female cats within either group. Among cats with urine-marking behavior, there were no differences between those that only marked vertically and those that marked vertically and horizontally. Analyses of data from all cats with urine-marking behavior and control cats revealed no differences that could be associated with urine marking. CONCLUSIONS AND CLINICAL RELEVANCE: These data suggest that urine-marking behavior by gonadectomized cats is an aspect of normal behavior. Clinicians are advised to focus on behavioral history of house-soiling cats to differentiate between urine-marking behavior and inappropriate urination; for the latter, urinalysis is appropriate to rule out lower urinary tract disorders.

J Am Vet Med Assoc. 2003 Aug 1;223(3):325-9, 309-10

Clinical use of low-profile cystostomy tubes in four dogs and a cat.

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Department of Small Animal Medicine and Surgery, College of Veterinary Medicine, University of Georgia, Athens, GA 30602-7390, USA.

Traditional cystostomy tubes (used for temporary or permanent diversion of urine in dogs and cats) are long (> or = 22 cm) and cumbersome to stabilize, requiring sutures or bandages to hold the tube against the body. Use of a low-profile gastrostomy port system as a low-profile cystostomy tube (LPCT) in 4 dogs and a cat was investigated; owner satisfaction with the device was assessed. Technical difficulty associated with placement and management of LPCTs was similar to that for traditional cystostomy tubes; with LPCTs, activity and mobility of pets was not compromised, and bandaging was not required. Complications included lower urinary tract infection, mild peristomal leakage of urine and leakage from components of the system, and subcutaneous peristomal infection. Four of 5 owners considered the tube to be easy to use; all owners said they would be comfortable repeating their decision to use the LPCT in their pet.

J Am Vet Med Assoc. 2003 Aug 1;223(3):317-21

Diagnostic quality of percutaneous kidney biopsy specimens obtained with laparoscopy versus ultrasound guidance in dogs.

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OBJECTIVE: To compare diagnostic quality of percutaneous kidney biopsy specimens obtained with laparoscopy versus ultrasound guidance in dogs and compare diagnostic quality of specimens obtained with 14- versus 18-gauge biopsy needles. DESIGN: Prospective study. ANIMALS: 10 healthy dogs. PROCEDURE: In each dog, 2 biopsy specimens were obtained from each kidney, 1 with a 14-gauge biopsy needle and 1 with an 18-gauge biopsy needle. Biopsy specimens were obtained from 1 kidney by means of ultrasound guidance and from the contralateral kidney by means of direct viewing during laparoscopy. Number of glomeruli, quality of the biopsy specimen, proportion of specimens that contained muscle tissue, and proportion of specimens with fragmentation or crushing were determined. RESULTS: Mean +/- SD number of glomeruli (32.6 +/- 11.0) in laparoscopic, 14-gauge biopsy specimens was significantly higher than mean number of glomeruli in ultrasound-guided, 14-gauge specimens; mean number of glomeruli in ultrasound-guided, 18-gauge specimens; and mean number of glomeruli in laparoscopic, 18-gauge specimens. All 10 laparoscopic, 14-gauge biopsy specimens were classified as excellent. The proportion of 18-gauge biopsy specimens with crushing or fragmentation was significantly higher than the proportion of 14-gauge specimens. One of the kidneys biopsied with ultrasound guidance had a large amount of hemorrhage. Hemorrhage was modest and transient following laparoscopic biopsy. CONCLUSIONS AND CLINICAL RELEVANCE: Results suggest that excellent-quality renal biopsy specimens with large numbers of glomeruli can be obtained with 14-gauge, double-spring-activated biopsy needles during laparoscopy. Renal biopsy specimens obtained with 18-gauge biopsy needles frequently had few glomeruli and often were crushed or fragmented, increasing the difficulty in making an accurate diagnosis.

J Am Vet Med Assoc. 2003 Jun 15;222(12):1717-21, 1706

Treatment with a combined cystopexy-colopexy for dysuria and rectal prolapse after bilateral perineal herniorrhaphy in a dog.

Gilley RS, Caywood DD, Lulich JP, Bowersox TS.

Department of Small Animal Clinical Sciences, College of Veterinary Medicine, University of Minnesota, St. Paul, MN 55208, USA.

A 9-year-old castrated male Yorkshire Terrier was evaluated for dysuria and rectal prolapse 2 weeks after bilateral perineal herniorrhaphy. Dysuria was secondary to caudal displacement of the bladder, rather than retroflexion of the bladder. Dysuria and rectal prolapse were

associated with disruption of supporting ligaments of the urinary bladder and colon, which may have been caused by tenesmus. Combined cystopexy and colopexy were used successfully to treat the dysuria and rectal prolapse.

J Am Vet Med Assoc. 2003 Jun 1;222(11):1576-81

Antegrade pyelography for suspected ureteral obstruction in cats: 11 cases (1995-2001).

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OBJECTIVE: o determine sensitivity and specificity of radiography, ultrasonography, and antegrade pyelography for detection of ureteral obstructions in cats. DESIGN: Retrospective study. ANIMALS: 11 cats. PROCEDURE: Medical records of cats that had radiography, ultrasonography, and antegrade pyelography performed for suspected ureteral obstructions were examined. Ultrasound-guided pyelocentesis and fluoroscopic-assisted antegrade pyelography were performed on 18 kidneys in 11 cats. Obstructive ureteral lesions were confirmed in all cats by surgical or necropsy examination. Sensitivity and specificity of survey radiography, ultrasonography, and antegrade pyelography for identification of ureteral obstructions were calculated. Surgical or necropsy findings were used as the standard for comparison. RESULTS: All cats were azotemic. Mean +/- SD serum creatinine and BUN concentrations were 10.2 +/- 6.1 and 149 +/- 82 mg/dL, respectively. Fifteen of 18 ureters were found to be obstructed at surgery or necropsy. Sensitivity and specificity were 60 and 100% for radiography and 100 and 33% for ultrasonography, respectively, in identification of ureteral obstructions. Leakage of contrast material developed in 8 of 18 kidneys during antegrade pyelography and prevented diagnostic interpretation in 5 of 18 studies. For the 13 diagnostic studies, specificity and sensitivity were 100% by use of the antegrade pyelography technique. Correct identification of the anatomic location of the ureteral obstruction was obtained in 100% of diagnostic antegrade pyelography studies and in 60% of radiography or ultrasonography studies. CONCLUSIONS AND CLINICAL RELEVANCE: Antegrade pyelography can be a useful alternative in the diagnosis and localization of ureteral obstructions in azotemic cats, although leakage of contrast material may prevent interpretation of the study.

J Am Vet Med Assoc. 2003 May 15;222(10):1388-93

Risk factors for sterile hemorrhagic cystitis in dogs with lymphoma receiving cyclophosphamide with or without concurrent administration of furosemide: 216 cases (1990-1996).

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E 62nd St, New York, NY 10021, USA.

OBJECTIVES: To determine incidence and identify predisposing factors for sterile hemorrhagic cystitis (SHC) in dogs with lymphoma that were treated with cyclophosphamide and to evaluate whether furosemide administered i.v. concurrently with cyclophosphamide decreased the incidence of SHC. DESIGN: Retrospective study. ANIMALS: 216 dogs with lymphoma. PROCEDURE: Medical records of dogs with lymphoma that received cyclophosphamide chemotherapy in accordance with 1 of 2 protocols, with or without concurrent i.v. administration of furosemide, were examined. Data for the 2 groups were analyzed to determine the incidence and predisposing factors (age, breed, sex, weight, previous or preexisting disease, previous or preexisting urinary tract infection, neutropenia, azotemia, dose, and number of cyclophosphamide treatments) for cyclophosphamide-associated SHC. RESULTS: Cyclophosphamide-associated SHC developed in 12 of 133 (9%) dogs that had not received concurrent administration of furosemide and cyclophosphamide treatments; of the 83 dogs that had received furosemide, only 1 (1.2%) developed SHC. Dogs receiving cyclophosphamide and furosemide concurrently were significantly less likely to develop SHC than dogs that did not receive furosemide. Dogs with previous or preexisting immune-mediated disease were significantly more likely to develop cyclophosphamide-associated SHC. CONCLUSIONS AND CLINICAL RELEVANCE: Analysis of results suggested an association between i.v. administration of furosemide concurrently with cyclophosphamide and decreased incidence of cyclophosphamide-associated SHC. Incidence of cyclophosphamide-associated SHC was similar in treated dogs that did not receive concurrent furosemide to that observed for other studies in which cyclophosphamide was administered orally. Cyclophosphamide-associated SHC appeared to develop early during the course of chemotherapy when furosemide was not administered concurrently with cyclophosphamide.

J Am Vet Med Assoc. 2003 May 1;222(9):1230-3. Comment in: J Am Vet Med Assoc. 2003 Jul 15;223(2):178; author reply 178-9.

Comparison of polymerase chain reaction assay, bacteriologic culture, and serologic testing in assessment of prevalence of urinary shedding of leptospires in dogs.

Harkin KR, Roshto YM, Sullivan JT, Purvis TJ, Chengappa MM.

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OBJECTIVE: To compare results of polymerase chain reaction (PCR) testing of urine samples, serologic testing, and bacteriologic culture of urine to determine prevalence of urinary shedding of leptospires in dogs. DESIGN: Serial case study. ANIMALS: 500 dogs evaluated serially without regard to health status. PROCEDURE: Urine samples were examined via PCR assay and bacteriologic culture for leptospires. Blood samples were analyzed for antibodies against serovars canicola, bratislava, pomona, icterohemorrhagiae, grippotyphosa, and hardjo. RESULTS: Titers > or = 1:100 against at least 1 serovar were detected in 104 (20.8%) dogs, and titers > or = 1:400 were detected in 41 (8.2%) dogs. High titers were detected most

commonly to serovar grippotyphosa, followed by icterohemorrhagiae, canicola, pomona, bratislava, and hardjo. High titers to > 1 serovar were detected in 14 dogs. A positive PCR assay result was obtained in 41 (8.2%) dogs, only 9 of which had a titer > or = 1:100. Leptospires were not cultured from the urine of any dog. Only 4 dogs had clinical leptospirosis. Overall disease prevalence was 0.8% for the 6-month evaluation period. Compared with PCR assay, serologic testing for predicting shedding had a sensitivity of 22%, specificity of 79%, positive predictive value of 9%, and negative predictive value of 92%. CONCLUSIONS AND CLINICAL RELEVANCE: Irrespective of health status, 8.2% of dogs were shedding pathogenic leptospires. Serologic testing was a poor predictor of urinary shedding. Clinically normal dogs that shed leptospires may pose a zoonotic risk to their owners.

J Am Vet Med Assoc. 2003 May 1;222(9):1224-9. Comment in: J Am Vet Med Assoc. 2003 Jul 15;223(2):178; author reply 178-9.

Clinical application of a polymerase chain reaction assay for diagnosis of leptospirosis in dogs.

Harkin KR, Roshto YM, Sullivan JT.

Department of Clinical Sciences, College of Veterinary Medicine, Kansas State University, Manhattan, KS 66506-5701, USA.

OBJECTIVE: To evaluate the use of a polymerase chain reaction (PCR) assay on urine samples for diagnosis of leptospirosis in dogs. DESIGN: Prospective case study. ANIMALS: 132 dogs with clinical signs suggestive of leptospirosis and 13 healthy dogs. PROCEDURE: PCR testing was performed on urine samples to detect leptospiral DNA; results were compared with results of conventional criteria for the diagnosis of leptospirosis. RESULTS: Leptospirosis was diagnosed in 8 dogs via established criteria; all these dogs had positive results of PCR assay, including 1 dog with positive results before seroconversion developed. A positive PCR assay result was also obtained in 16 dogs that did not have a confirmed diagnosis of leptospirosis. In the 8 dogs that had a confirmed diagnosis of leptospirosis, serovars pomona (n = 3 dogs), grippotyphosa (2), canicola (2), and bratislava (1) were identified serologically. The remaining 121 dogs all had a diagnosis other than leptospirosis or were healthy. For PCR testing on urine, sensitivity was 100%, specificity was 88.3%, positive predictive value was 33%, and negative predictive value was 100%. CONCLUSIONS AND CLINICAL RELEVANCE: Positive PCR test results prior to seroconversion may have value in establishing an early diagnosis. Positive results in dogs that had signs consistent with leptospirosis despite failing to meet established criteria for leptospirosis raise questions regarding the sensitivity of serologic testing in diagnosis of leptospirosis. Serovars pomona, grippotyphosa, and canicola were most common.

J Am Vet Med Assoc. 2003 Apr 15;222(8):1097-101, 1077-8.

Disseminated Mycobacterium avium complex infection following renal transplantation in a cat.

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An 11-year-old cat with a history of renal transplantation and treatment with cyclosporine and prednisolone was examined because of vomiting, diarrhea, inappetence, lethargy, and weight loss. Abdominal ultrasonography revealed 2 large heteroechoic masses thought to be mesenteric lymph nodes. Ultrasound-guided biopsy was performed, and histologic examination of biopsy specimens revealed granulomatous inflammation of presumptive lymph node tissue. Examination of sections stained with acid-fast stains revealed innumerable acid-fast bacilli within histiocytes, and a presumptive diagnosis of mycobacteriosis was made. The cat's clinical condition deteriorated, and euthanasia was elected. At necropsy, granulomatous inflammation was present within the mesenteric lymph nodes, spleen, liver, small and large intestines, lungs, and bone marrow. Bacterial culture yielded Mycobacterium avium, a slow-growing, opportunistic, saprophytic mycobacterium that can cause tuberculous lesions that are clinically indistinguishable from those associated with classic tuberculosis. It is a rare cause of disseminated mycobacteriosis in human transplant recipients. To our knowledge, this is the first report of disseminated M avium complex infection in a feline transplant recipient.

J Am Vet Med Assoc. 2002 Jan 1;220(1):49-52, 36

Acute renal failure caused by lily ingestion in six cats.

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Acute renal failure was diagnosed in 6 cats that had ingested Easter lily or tiger lily plants. All 6 were treated medically; 2 underwent hemodialysis. Three cats survived the acute episode, and although they had chronic renal failure, they survived for more than 1.5 years. Two cats died despite aggressive medical management, including hemodialysis. One cat was euthanatized shortly after the diagnosis was made. Three of the cats were oliguric or anuric at the time of initial examination, and all 3 died. None of the 3 cats that survived had oliguria or anuria. Various members of the lily family (Liliaceae) can cause nephrotoxicosis in cats, but the toxic principle is not known. Although the prognosis for full recovery of cats with lily toxicosis is poor, long-term survival is possible with supportive care. The prognosis appears to be better for cats with nonoliguric renal failure.

J Am Vet Med Assoc. 2003 Mar 15;222(6):759-61, 737

Use of laparoscopic-assisted cystoscopy for removal of urinary calculi in dogs.

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Urinary calculi were removed by means of laparoscopic-assisted cystoscopy in 3 dogs. Two small abdominal incisions were made--1 for a laparoscope and 1 for placement of a Babcock forceps to aid in grasping and lifting the urinary bladder to the abdominal wall. A cystoscope and instruments for calculi removal were passed through a small cystotomy. Biopsy of the urinary bladder or other abdominal organs could also be performed by use of this technique. Laparoscopic-assisted cystoscopy was minimally invasive and provided clear images of the mucosal surface of the urinary bladder and proximal portion of the urethra for easy retrieval of urinary calculi. An imaging procedure should be performed to ensure complete removal of calculi

J Am Vet Med Assoc. 2003 Mar 15;222(6):749-58

Randomized controlled trial of the efficacy of short-term amitriptyline administration for treatment of acute, nonobstructive, idiopathic lower urinary tract disease in cats.

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OBJECTIVE: To determine whether short-term amitriptyline administration would be efficacious in the treatment of acute, nonobstructive, idiopathic lower urinary tract disease in cats. DESIGN: Randomized controlled trial. ANIMALS: 31 untreated male and female cats with acute, nonobstructive, idiopathic lower urinary tract disease. PROCEDURES: Cats were treated with amitriptyline (5 mg/d; n = 16) or a placebo (15) for 7 days and monitored for pollakiuria, hematuria, and adverse events. Cats were reexamined 1 month after treatment, and owners were interviewed by telephone 6, 12, and 24 months after treatment. RESULTS: 2 amitriptyline-treated cats were excluded from analyses because of acquired urinary tract infection. Clinical signs resolved by day 8 in 8 amitriptyline-treated and 10 control cats. There were no apparent differences in likelihood or rate of recovery from pollakiuria or hematuria between groups. Overall, clinical signs recurred significantly faster and more frequently in amitriptyline-treated than control cats. However, after excluding recurrences within 21 days of treatment, risk of recurrence was similar in both groups. Increasing age was significantly associated with increased likelihood and rate of recovery from hematuria and with decreased risk of recurrence of signs. CONCLUSIONS AND CLINICAL RELEVANCE: Results suggest that short-term amitriptyline treatment has no benefit in terms of resolution of pollakiuria and hematuria in cats with idiopathic lower urinary tract disease and may be associated with an increased risk of recurrence.

J Am Vet Med Assoc. 2003 Mar 1;222(5):603-6. Comment in: J Am Vet Med Assoc. 2003 Jun 1;222(11):1502; author reply 1502. J Am Vet Med Assoc. 2003 May 15;222(10):1346; author reply 1346.

Seroprevalence of antibodies against Leishmania spp among dogs in the United States.

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OBJECTIVE: To determine seroprevalence of antibodies against Leishmania spp among dogs other than Foxhounds in the United States. DESIGN: Cross-sectional study. SAMPLE POPULATION: 957 serum samples from dogs throughout the United States submitted between January 2000 and August 2001 to the Diagnostic Center for Population and Animal Health at Michigan State University for serologic testing for tick-borne diseases. PROCEDURE: Samples were tested for antibodies against Leishmania spp with an immunofluorescent antibody (IFA) assay. Samples with positive results were submitted to the Centers for Disease Control and Prevention for confirmatory testing. RESULTS: Results of the IFA assay were negative for 939 of 957 samples. For 16 samples, titers were from 1:16 to 1:64, and titers in these dogs were considered likely to be a result of cross-reactivity with antibodies directed against other organisms. For the remaining 2 samples, the titers were > or = 1:128. One of these samples was from a blood donor dog that had never had any clinical signs of leishmaniasis. Follow-up samples from both dogs also had Leishmania IFA titers > or = 1:128. Both dogs had antibodies against Trypanosoma cruzi, as determined with a radioimmunoprecipitation assay. CONCLUSIONS AND CLINICAL RELEVANCE: Results suggested that the seroprevalence of antibodies against Leishmania spp in dogs in the United States was low. However, results further suggested that leishmaniasis may not be limited to Foxhounds in the United States.

J Am Vet Med Assoc. 2003 Feb 1;222(3):322-9

Association between initial systolic blood pressure and risk of developing a uremic crisis or of dying in dogs with chronic renal failure.

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OBJECTIVE: To determine whether high systolic blood pressure (SBP) at the time of initial diagnosis of chronic renal failure in dogs was associated with increased risk of uremic crisis, risk of dying, or rate of decline in renal function. DESIGN: Prospective cohort study. ANIMALS: 45 dogs with spontaneous chronic renal failure. PROCEDURE: Dogs were assigned to 1 of 3 groups on the basis of initial SBP (high, intermediate, low); Kaplan-Meier and Cox proportional hazards methods were used to estimate the association between SBP and development of a uremic crisis and death. The reciprocal of serum creatinine concentration

was used as an estimate of renal function. RESULTS: Dogs in the high SBP group were more likely to develop a uremic crisis and to die than were dogs in the other groups, and the risks of developing a uremic crisis and of dying increased significantly as SBP increased. A greater decrease in renal function was observed in dogs in the high SBP group. Retinopathy and hypertensive encephalopathy were detected in 3 of 14 dogs with SBP > or = 180 mm Hg. Systolic blood pressure remained high in 10 of 11 dogs treated with antihypertensive drugs. CONCLUSIONS AND CLINICAL RELEVANCE: Results suggested that initial high SBP in dogs with chronic renal failure was associated with increased risk of developing a uremic crisis and of dying. Further studies are required to determine whether there is a cause-and-effect relationship between high SBP and progressive renal injury and to identify the risks and benefits of antihypertensive drug treatment.

Journal of Comparative Pathology (Apr 03 – Feb 04)

J Comp Pathol. 2003 Aug-Oct;129(2-3):169-78

Characterization of renal damage in canine leptospirosis by sodium dodecyl sulphate-polyacrylamide gel electrophoresis (SDS-PAGE) and Western blotting of the urinary proteins.

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Canine leptospirosis is a zoonotic disease that can cause interstitial nephritis. As a consequence of the renal damage, proteinuria may occur. To determine the urine protein pattern in the disease we performed sodium dodecyl sulphate-polyacrylamide gel electrophoresis (SDS-PAGE) on the urine from 10 dogs with leptospirosis and 20 healthy dogs. Western blotting analysis of the urine samples with antibodies against canine IgG and IgA was also performed to identify these immunoglobulins in the urine. Urine electrophoresis showed three new bands in the dogs suffering from leptospirosis. Only two of the dogs with leptospirosis showed detectable concentrations of IgG and IgA in urine, while a third animal showed IgG alone. The study showed a 36.7% increase in the excretion of low molecular weight proteins in dogs with leptospirosis but almost no change in the high molecular weight protein pattern. These results, together with the low number of animal with detectable concentrations of IgG and IgA in the urine, support the view that canine leptospirosis is characterized by interstitial nephritis.

J Comp Pathol. 2003 Jul;129(1):78-84

Cytokeratin and vimentin expression in normal and neoplastic canine prostate.

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Intermediate filament expression in the canine prostate, unlike that in human prostate, is represented in the literature by only a few reports. In this study, the expression of cytokeratin (CK) and vimentin was examined in three normal canine prostates and 11 canine prostatic carcinomas. Monoclonal antibodies directed against vimentin, CK AE1/AE3, CK 18-8 (for luminal epithelial cells), CK 5, CK clone 8.12 and CK 14 (for basal cells) were employed. As in man, normal canine prostatic luminal cells were positive for CK 8-18. Basal cells were positive for CK 5 and CK clone 8.12 but, in contrast to findings in man, were negative for CK 14. Luminal cells were vimentin-negative, whereas in man they have been reported as vimentin-positive. The majority of carcinomas showed an undifferentiated histological pattern and all were positive for CK AE1/AE3 and for vimentin. Ten tumours were positive for CK 8-12, but six of them showed many cells co-expressing CK 14. Moreover, in two of these six cases a large number of neoplastic cells also reacted with CK clone 8.12 antibody, and in one of them co-expression of CK 5 was detectable. This co-expression, of luminal and basal cytokeratins, suggests a possible origin of the tumours from prostatic epithelial stem cells. Vimentin expression is an inconstant finding in human prostatic carcinomas; its almost uniform occurrence in canine carcinomas suggests a lesser degree of differentiation than in the human neoplasm.

J Comp Pathol. 2003 Feb-Apr;128(2-3):99-106

Uterine oestrogen and progesterone receptor expression in experimental pyometra in the bitch.

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Pyometra was induced in five bitches by the intraluminal inoculation of a ligated uterine horn in metoestrus with an Escherichia coli suspension, the other horn serving as an uninoculated control. Histologically, the inoculated horns resembled those with naturally occurring pyometra, while the uninoculated horns had an inactive appearance instead of the normal metoestrus appearance. Immunohistochemically, the expression of sex hormone receptors in the inoculated horns corresponded with that in natural cases of pyometra. In the uninoculated horns, virtually no expression of sex hormone receptors was observed, in contrast to such expression in normal metoestrus. Bacteria-associated ovario-uterine interactions may have been responsible for the hyperplastic (inoculated horn) and inactive (uninoculated horn) uterine changes observed in this experiment.

Journal of Small Animal Practice (Dec 02 - Feb 04)

J Small Anim Pract. 2004 Feb;45(2):108-12

Extensive caudal vena cava thrombosis secondary to unilateral renal tubular cell carcinoma in a dog.

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A nine-year-old German shorthaired pointer cross was admitted because of partial anorexia, exercise intolerance and haematuria. On clinical examination, subcutaneous oedema, purpura and ascites were detected along with a palpable mass in the right craniodorsal abdomen. Laboratory findings included regenerative anaemia, leucocytosis, thrombocytopenia, azotaemia, increased blood serum alkaline phosphatase and proteinuria. Radiographic and ultrasonographic examinations revealed a large neoplasm involving the right kidney. Computed tomography further showed that the neoplastic tissue had spread into the lymph nodes, the wall of the caudal vena cava, the liver and lungs. The right renal vein, caudal vena cava and iliac veins appeared enlarged and secondarily thrombosed. A diagnosis was made of renal tubular cell carcinoma with secondary venous thrombosis. Gross postmortem examination confirmed the imaging findings, while light and electron microscopic examination revealed that the neoplasm was a solid carcinoma originating from the proximal convoluted renal tubules.

J Small Anim Pract. 2003 Nov;44(11):491-6

Risk factor analysis and relative supersaturation as tools for identifying calcium oxalate stone-forming dogs.

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Twenty-four hour urine samples were collected from 17 calcium oxalate (CaOx) stone-forming (SF) dogs and 17 normal (N), age-, breed- and sex-matched dogs. Urinary CaOx relative supersaturation (RSS) was calculated and found to be significantly higher in the SF group than the N group. RSS measurement is not readily applicable to veterinary practice; thus, alternatives were explored. Discriminant analysis failed to identify key factors differentiating most SF from N dogs. Urinary calcium, oxalate and uric acid, which differed

between the SF and N animals, were combined into a measure of relative probability of CaOx stone formation (PSF) to establish whether this approach could be used to assess the risk of CaOx stone formation in dogs. Although there was good correlation between the techniques, RSS more clearly discriminated between SF and N dogs. These data suggest that neither PSF nor discriminant analysis is preferable to RSS for assessing the risk of CaOx stone formation in dogs.

J Small Anim Pract. 2003 Jun;44(6):280-4

A potential causal association between gastrointestinal disease and primary polydipsia in three dogs.

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Polydipsia, defined as a water intake of over 100 ml/kg/day, is a common presenting medical complaint in dogs. Polydipsia can be secondary (eg, to central or nephrogenic diabetes insipidus) or primary in origin, where increased water intake cannot be explained as a response to obligatory water loss. Primary polydipsia is confirmed by ruling out other known causes of polydipsia and demonstrating that renal concentrating ability is intact. The causes and associations of primary polydipsia in dogs are poorly defined. This report describes three dogs presented with signs of gastrointestinal disease with concurrent polydipsia. Investigations (including water deprivation testing) showed normal renal urinary concentrating ability and indicated primary polydipsia. Treatment of the gastrointestinal signs resulted in resolution of the polydipsia in each case. This is the first description of a possible association between gastrointestinal disease and primary polydipsia in the dog, the pathophysiology of which remains obscure.

J Small Anim Pract. 2003 Jun;44(6):261-8

Acid-base balance of cats with chronic renal failure: effect of deterioration in renal function.

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In a previous cross-sectional study of feline chronic renal failure (CRF), metabolic acidosis was identified in 52.6 per cent of animals with severe renal failure (plasma creatinine concentration >400 micromol/litre). The aim of this longitudinal study was to determine whether metabolic acidosis preceded or accompanied a deterioration in renal function in cats with CRF. Data were analysed from 55 cats with CRF that had been followed longitudinally for at least four months. Twenty-one cases showed deterioration in renal function over the period of the study, as evidenced by significant rises in their plasma

creatinine concentrations and decreases in bodyweight. In five of the 21 cases, acidaemia accompanied the deterioration in renal function. Only one of these cats had evidence of metabolic acidosis before renal function deterioration. One other case developed metabolic acidosis without a rise in plasma creatinine concentration. These data suggest that biochemical evidence of metabolic acidosis does not generally occur until late in the course of feline CRF.

J Small Anim Pract. 2003 Apr;44(4):169-71

Two chondrosarcomas in the urethra of a German shepherd dog.

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An eight-year-old, male castrated German shepherd dog was presented with signs consistent with urinary obstruction. Cystoscopy and contrast radiography showed two distinct urethral masses. Penile amputation and perineal urethrostomy were performed to alleviate the clinical signs. Histopathology of the masses revealed two low-grade chondrosarcomas. At the time of writing, 18 months after surgery, the dog remained disease free.

J Small Anim Pract. 2003 Mar;44(3):135-8

Surgical treatment of right-sided renal lymphoma with invasion of the caudal vena cava.

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An eight-year-old, male castrated basset hound presenting with a three-month history of lethargy was examined. Diagnostic tests including radiography and ultrasonography showed a right-sided renal mass. A 99mTc diethylenetriamine penta-acetic acid scan demonstrated that this kidney was non-functional. At surgery, invasion of the caudal vena cava was found, and the renal segment of the vena cava and the right kidney were resected. The left renal vein was anastomosed to the more proximal vena cava using a polytetrafluoroethylene graft, and the dog recovered well. Two days postsurgery, the dog suffered an acute episode of aspiration pneumonia and was euthanased. The renal mass was diagnosed as lymphoma on histopathology.

J Small Anim Pract. 2003 Feb;44(2):65-70

Assessment of acid-base status of cats with naturally occurring chronic renal failure.

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Metabolic acidosis is reported to be a common complication of feline chronic renal failure (CRF) but acid-base status of feline patients with this disease is rarely assessed by general practitioners. A cross-sectional study involving 59 cases of naturally occurring feline CRF was conducted to determine the prevalence of acid-base disturbances. Cases were categorised on the basis of their plasma creatinine concentrations as mild, moderate or severe. A group of 27 clinically healthy, age-matched cats was assessed for comparison. A low venous blood pH (<7.270) was found in 10 of the 19 severe cases (52.6 per cent), three of the 20 moderate cases (15 per cent) and none of the 20 mild cases. Acidaemia was associated with an increased anion gap contributed to by both low plasma bicarbonate and low chloride ion concentrations. Biochemical analysis of urine samples showed urine pH to decrease with increasing severity of renal failure. Urinary loss of bicarbonate was not associated with the occurrence of acidaemia and there was a tendency for urinary ammonium ion excretion to decrease as the severity of renal failure increased. Cats with naturally occurring CRF do not show plasma biochemical evidence of acid-base disturbances until the disease is advanced.

J Small Anim Pract. 2003 Jan;44(1):13-6

Renal abscess in a dog with transient diabetes mellitus.

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A nine-year-old, intact female dalmatian with diabetes mellitus and a renal abscess is described. The renal abscess was treated surgically by nephrectomy, and the diabetes mellitus resolved with ovariohysterectomy. Abdominal ultrasound and ultrasound-guided aspiration of the abscess were helpful in establishing a diagnosis. To the authors' knowledge, this is the first report of a renal abscess in a dog with diabetes mellitus.

Journal of Veterinary Internal Medicine (Dec 02 – March 04)

J Vet Intern Med. 2004 Jan-Feb;18(1):81-91

Clinical efficacy and safety of recombinant canine erythropoietin in dogs with anemia of chronic renal failure and dogs with recombinant human erythropoietin-induced red cell

aplasia.

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The efficacy and safety of recombinant canine erythropoietin (rcEPO) therapy was evaluated in 19 dogs with anemia of chronic renal failure (group 1) and 6 dogs with chronic renal failure and recombinant human erythropoietin (rhEPO)-induced red cell aplasia (group 2). Hematocrit (Hct) and absolute reticulocyte count (ARC) were monitored weekly for the first 8 weeks, CBC (including ARC) and serum iron profiles were evaluated monthly, and serum biochemical analyses were performed every 2 months for 6 (group 2) to 12 (group 1) months. For group 1 dogs, median Hct and ARC increased significantly during the 1st week of rcEPO treatment, and median Hct was sustained at >35% after week 5. In contrast, median Hct and ARC for group 2 did not change significantly with rcEPO treatment, even with doses greater than those used in group 1. Nevertheless, 2 (33%) of the 6 dogs in group 2 developed erythroid hyperplasia, reticulocytosis, and increases in Hct with rcEPO treatment. Although median systolic blood pressure did not change significantly in either group, 5 dogs developed systolic blood pressures > or = 180 mm Hg during the study. Appetite and energy level improved in most group 1 dogs with increases in Hct. Recombinant cEPO stimulated erythrocyte production in dogs with nonregenerative anemia secondary to chronic renal failure without causing the profound erythroid hypoplasia that can occur in rhEPO-treated dogs. Unfortunately, rcEPO was not as effective in restoring erythrocyte production in dogs that had previously developed rhEPO-induced red cell aplasia.

J Vet Intern Med. 2004 Jan-Feb;18(1):52-5

The effects of exercise on urinary albumin excretion in dogs.

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Persistent microalbuminuria has been shown to be an indicator of glomerular damage associated with early progressive renal disease in people and dogs. In people, transient or reversible microalbuminuria has been shown to occur with exercise. A semi-quantitative test to measure microalbuminuria in the dog recently has become available. The purpose of this study was to determine if mild-to-moderate exercise induced microalbuminuria in the dog. Twenty-six dogs were included in the study after undergoing tests to rule out hyperglycemia, urinary tract infection, azotemia, and a urine protein:creatinine ratio >1. Exercise consisted of 20 minutes of flat treadmill running. Urine samples were collected on 2 separate days before exercise, the morning of exercise, 3 hours postexercise, 7-9 hours postexercise, and each of the 2 mornings after exercise. For 24 of 26 dogs, this procedure was repeated after a minimum 7-day interval between exercise sessions. The canine E.R.D. (early renal disease)-

Screen Urine Test (E.R.D.-Screen test) was used to determine semiquantitative urine albumin concentrations. Microalbuminuria-positive samples, as determined by the E.R.D.-Screen test, were further analyzed to determine quantitative albumin concentrations. Four (15%) dogs were microalbuminuria positive. In each of these dogs, microalbuminuria was present both before and after exercise with no quantitative increase in urine albumin concentration postexercise. Twenty-two (85%) dogs were microalbuminuria negative throughout the study and did not develop microalbuminuria at any time after exercise. On a 95% confidence interval, the proportion of dogs that might be expected to develop microalbuminuria after exercise is between 0 and 15%.

J Vet Intern Med. 2003 Nov-Dec;17(6):817-23

Changes in proportion of canine urinary calculi composed of calcium oxalate or struvite in specimens analyzed from 1981 through 2001.

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The objective of this report was to characterize 20-year changes in proportion of calcium oxalate (CaOx) calculi and struvite calculi in dogs, and associations with breed, age, and sex. In this retrospective study, results of analysis of urinary calculi from dogs were reviewed for specimens received between July 1, 1981, and December 31, 2001. Breed, sex, age, year of submission of the specimen, and mineral type(s) were analyzed statistically. CaOx or Struvite or both were contained in 18,966 of 20,884 (91%) specimens. For both sexes, a 20-year statistically significant increase was observed in the proportion of calculus specimens that contained CaOx. The increase in this proportion was greater in females (1% to 31%) than in males (18% to 82%). From 1998 to 2001, when proportions may have plateaued, the odds of specimens containing CaOx were markedly higher in 18 breeds, markedly lower in 5 breeds, and not significantly different in 13 breeds compared with crossbreds. For both sexes, a 20-year statistically significant decrease was observed in the proportion of calculus specimens that contained struvite. This decrease in proportion was greater for males (79-16%) than for females (97-68%). From 1998 to 2001, when proportions plateaued, the odds of calculi containing struvite were markedly lower in 20 breeds, markedly higher in 1 breed, and not significantly different in 15 breeds when compared with crossbreds. Breed, age, and sex were associated statistically with CaOx or struvite urolithiasis. In conclusion, there appears to have been a long-term increase in the proportion of specimens of canine urinary calculi that contain CaOx as well as a long-term decrease in the proportion of specimens of calculi that contain struvite for both male and female dogs. The rate of change appeared to begin leveling off in the period 1998 to 2001. The recent proportion of dogs with either CaOx- or struvite-associated urolithiasis may depend on breed, age, and sex, and on interactions among these 3 factors.

J Vet Intern Med. 2003 Sep-Oct;17(5):647-52

Clinical findings in 40 dogs with hypersensitivity associated with administration of potentiated sulfonamides.

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The purpose of this study was to summarize the clinical findings in 40 dogs with systemic hypersensitivity reactions associated with the administration of potentiated sulfonamides. Dogs ranged from 6 months to 14 years of age, with a mean of 5.7 +/- 3.2 years. Spayed female dogs were overrepresented (24 of 40, or 60% of the dogs), as were Samoyeds (3 of 40; 8%) and Miniature Schnauzers (5 of 40; 13%). Mean dosages of potentiated sulfonamides were 47.0 +/- 14.9 mg/kg/d (range, 23.4-81.4 mg/kg/d). The time from the 1st administration of the drug to the onset of the clinical signs of hypersensitivity ranged from 5 to 36 days, with a mean of 12.1 +/- 5.9 days. There was no relationship between either the dosage or type of sulfonamide given and the time to the onset of the clinical signs. Fever was the most common clinical sign observed (55% of the dogs); thrombocytopenia was 2nd (54%), and hepatopathy (28%) was 3rd. Neutropenia, keratoconjunctivitis sicca (KCS), hemolytic anemia. arthropathy, uveitis, skin and mucocutaneous lesions, proteinuria, facial palsy, suspected meningitis, hypothyroidism, pancreatitis, facial edema, and pneumonitis were also observed in some patients. Of 39 dogs with adequate follow-up, 30 (77%) recovered, whereas 8 (21%) either died or were euthanized, and 1 recovered clinically but had persistent increases in alanine aminotransferase (ALT) activity. Dogs with hepatopathy generally had a poorer prognosis (46% recovery) than dogs without hepatopathy (89% recovery; P = .0035). Sixty-three percent of the dogs with thrombocytopenia recovered, compared to 90% of the dogs without thrombocytopenia (P = .042). Recovery was not associated with sex, age, breed, or type of sulfonamide administered.

J Vet Intern Med. 2003 Sep-Oct;17(5):622-31

Persistent urinary tract infections and reinfections in 100 dogs (1989-1999).

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A retrospective study was performed of 100 dogs with persistent urinary tract infections (UTIs) or reinfections presenting to the North Carolina State University (Raleigh, NC) Veterinary Teaching Hospital between 1989 and 1999. Criteria for selection included > or = 2 positive urine cultures within a 6-month period. Signalment, presence of predisposing disorders, urinalysis and urine culture results, and treatment strategies were extracted from the medical records. Dogs were a median age of 7 years when the UTI was 1st diagnosed. Dogs younger than 3 and older than 10 years were at increased and decreased risks,

respectively, for reinfections or persistent UTIs. Spayed females were more common in the UTI population. More than half of the dogs were asymptomatic for a UTI at 1st presentation. Urine sediment examinations identified hematuria, pyuria, and bacteriuria in 47, 72, and 85% of the samples, respectively. The most commonly isolated organisms were Escherichia coli and Streptococcus/Enterococcus spp.; multiple isolates also were common. Of the isolates, 29.5% were resistant to achievable serum concentrations of all antibiotics commonly prescribed for PO administration. Dogs with abnormal micturition were more likely to have infections by organisms resistant to commonly prescribed antibiotics. Potentially predisposing disorders were identified in 71 dogs. A correction of these disorders was accomplished in 35% of these 71 dogs. Dogs given standard antibiotic therapy without addressing predisposing disorders experienced poor control of their UTIs; 74.5% of these dogs had an apparent disease-free interval (ADFI) of < 8 weeks. By comparison, dogs in which predisposing disorders were corrected or those that were treated with low-dose, long-term antibiotic regimens subjectively had better control.

J Vet Intern Med. 2003 Jul-Aug;17(4):551-6.

L-2-Hydroxyglutaric aciduria in Staffordshire Bull Terriers.

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L-2-Hydroxyglutaric aciduria is an inborn error of metabolism, which has been recognized in humans since 1980. The metabolic defect responsible for the disease is unknown, but the disorder can be diagnosed in humans by elevations of the organic acid, L-2-hydroxyglutaric acid in the cerebrospinal fluid (CSF), plasma, and urine of affected patients. The disorder produces a variety of clinical neurological defects in humans including psychomotor retardation, seizures, and ataxia. There have previously been no recognized animal models of the disease. However, 6 Staffordshire Bull Terriers were recently identified with the disorder. The animals presented with a variety of clinical signs, most notably seizures, ataxia, dementia, and tremors. They were all screened for organic acid abnormalities in urine, and CSF and plasma (when available). Levels of L-2-hydroxyglutaric acid were elevated in all body fluids evaluated. The clinical, clinicopathologic, and magnetic resonance imaging (MRI) characteristics associated with L-2-hydroxyglutaric acid in Stafforshire Bull Terriers is reported herein and represents the first veterinary model of this inborn error of metabolism.

J Vet Intern Med. 2003 Jul-Aug;17(4):499-509.

Polypoid cystitis in 17 dogs (1978-2001).

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Polypoid cystitis is a rare disease of the urinary bladder in dogs characterized by inflammation, epithelial proliferation, and development of a polypoid mass or masses without histopathologic evidence of neoplasia. Medical records of 17 dogs with polypoid cystitis were reviewed to determine the clinical and laboratory features of this disorder and to assess treatment and outcome. Most affected dogs (15/17) were female and presented for evaluation of hematuria or recurrent urinary tract infection (UTI). Proteus spp were the most common bacterial isolates (12/52 or 23.1%) identified when all urine samples obtained for culture at any time during the course study were considered. Other commonly isolated organisms included Escherichia coli , Staphylococcus spp, and Enterococcus spp. Several dogs (7/17) also had cystic calculi at some time during the course of their disease. Most of the masses (11/14) were located cranioventrally in the bladder as opposed to transitional cell carcinoma, which has a predilection for the bladder neck or trigone area. It is unknown whether persistent or recurrent UTI predisposes to polyp formation or if polyps predispose to UTI. Surgery and removal of all polyps was the most efficacious treatment in dogs of this study. The question of whether or not polyps represent preneoplastic lesions remains unanswered and constitutes an area for future investigation.

J Vet Intern Med. 2003 Mar-Apr;17(2):158-62

Effect of intravenous mannitol upon the resistive index in complete unilateral renal obstruction in dogs.

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Some studies have shown that relative to baseline, the renal resistive index (RI) remains unchanged in nonobstructed kidneys and increases in obstructed kidneys after administration of furosemide. To our knowledge, the effect of mannitol administration on the renal RI of dogs has not been reported. We evaluated the renal RI in 16 kidneys in 8 young adult dogs after administration of mannitol. The mean RI decreased significantly from baseline ($P < .01$). Additionally, left complete ureteral obstruction wasinduced in 5 dogs. Evaluation by Doppler ultrasonography was performed for 5 days. On the 5th day, Doppler examination was repeated at 30 and 60 minutes after administration of mannitol to obstructed dogs. After induction of left ureteral obstruction, the RI of the left kidney increased significantly over 5 consecutive days. Administration of mannitol decreased the RI in the nonobstructed contralateral kidneys, and thus the RI difference between obstructed and nonobstructed kidneys was increased above normal ($P < .001$). In conclusion, administration of mannitol may be useful as another diuretic agent to identify unilateral ureteral obstruction on Doppler sonographic examination.

J Vet Intern Med. 2003 Mar-Apr;17(2):136-44

Canine transitional cell carcinoma.

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Transitional cell carcinoma (TCC) of the urinary bladder, the most common malignancy of the urinary tract in dogs, is challenging to both diagnose and treat effectively. The prevalence of this disease may be increasing. The etiology of canine TCC is likely multifactorial. Epidemiological studies of TCC in the dog have revealed a number of risk factors, including breed and female gender, as well as environmental factors, such as insecticide exposure. This tumor is difficult to remove surgically and responds poorly to chemotherapy. The efficacy of radiotherapy and other treatment modalities needs further investigation. Cyclooxygenase-inhibiting drugs have some activity against TCC, and studies to further define these effects are ongoing. Use of the tumor/node/ metastasis (TNM) classification scheme for bladder cancer has allowed for the identification of prognostic factors. Urinary tract obstruction and metastatic disease remain challenges to treat. Work with canine TCC has demonstrated how closely this disease resembles human invasive urinary bladder cancer. Therefore, future research has the potential to benefit both dogs and humans with TCC.

J Vet Intern Med. 2003 Jan-Feb;17(1):21-7

Increased mean arterial pressure and aldosterone-to-renin ratio in Persian cats with polycystic kidney disease.

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Polycystic kidney disease (PKD) in Persian cats has been increasingly reported and compared to human autosomal dominant polycystic kidney disease (ADPKD) in the last decade. In cats, however, few studies have dealt with the occurrence and hormonal determinants of hypertension, one of the most common extrarenal manifestations of ADPKD in humans. The purpose of this study was to compare Persian cats >4 years old with PKD to unaffected control cats with regard to blood pressure (BP), plasma renin activity (PRA), serum aldosterone concentration, plasma atrial natriuretic peptide (ANP) concentration, and aldosterone-to-renin ratio (ARR). Three gender- and age-matched groups were studied, each consisting of 7 cats: (1) a control group without cysts, (2) a group with mild PKD, and (3) a group with severe PKD (multiple cysts and renal enlargement). Mild renal insufficiency was found in only 1 of 14 cats with PKD. Cats with PKD had a higher mean arterial pressure ($P = .04$) and more often had a high ARR ($P = .047$) than did control cats. Tendencies toward higher diastolic and systolic arterial pressures (DAPs and SAPs, respectively) and lower PRAs were observed in cats with PKD compared to controls ($.05 < P < \text{or} = .1$). No significant

differences were found between the groups in serum aldosterone and plasma ANP concentrations. None of the cats had echocardiographic evidence of cardiac hypertrophy. In conclusion, cats with PKD had a minor increase in mean arterial pressure compared to control cats, and half of the cats had a high ARR.

Journal of Veterinary Medical Science (Jan 03 - 04)

J Vet Med Sci. 2004 Jan;66(1):103-5

Decreased apoptotic polymorphonuclear leukocyte rate in dogs with pyometra.

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Polymorphonuclear neutrophil (PMN) apoptosis was examined in three dogs with pyometra by TUNEL assay in a 24-hr incubation period and compared with that in healthy control dogs (n=5). The incidence of apoptotic PMNs in dogs with pyometra was 26.4 +/- 5% and that in healthy dogs was 54.3 +/- 7%. The results indicated that apoptotic PMN rates in dogs with pyometra were significantly lower than those in control dogs ($p<0.05$), suggesting the prolongation of PMN survival.

J Vet Med Sci. 2004 Jan;66(1):53-7

Role of nitric oxide in hemodialysis-related hypotension in an experimental renal dysfunction dog model.

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To clarify the role of nitric oxide (NO) in hemodialysis (HD)-related hypotension, the relationship between plasma NO metabolites (NOx) and blood pressure changes, and the effect of N(G)-monomethyl-L-arginine (L-NMMA), a NO synthase inhibitor, on changes in blood pressure were evaluated in an experimental renal dysfunctional dog model. In order to create a renal dysfunction model, gentamicin was administered to male beagles in which 7 of 8 renal artery branches had been ligated. Normal renal functional and dysfunctional dogs underwent 3 hr of HD per day for 3 days. HD induced a transient decrease in mean blood pressure in the normal renal functional dogs. In renal dysfunctional dogs, a continuous hypotension occurred with a gradual increase in the plasma NOx concentration during HD.

Although L-NMMA prevented the fall in blood pressure, it did not significantly change the plasma NOx concentration during HD. These results suggest that NO contributes to HD-related hypotension in renal dysfunctional dogs but the plasma NOx concentration does not reflect the change in blood pressure.

J Vet Med Sci. 2003 Oct;65(10):1057-61

The effects of the loop diuretics furosemide and torasemide on diuresis in dogs and cats.

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Torasemide is a new loop diuretic that combines the effects of furosemide and spironolactone. There are no reports on the effects of torasemide in cats and dogs. This study compared the diuretic effects of furosemide and torasemide in cats and dogs. Cats with pressure overload cardiac hypertrophy were given oral placebo, torasemide 0.3 mg/kg, or furosemide 1 mg/kg or 3 mg/kg. Control and mitral regurgitation dogs were given oral placebo, torasemide 0.2 mg/kg, and furosemide 2 mg/kg for 7 days. Urine samples were obtained at baseline and 1, 2, 3, 4, 5, 6, 8, 12, and 24 hr after each drug dose. Urine volume and urine Na(+) and K(+) were measured. Both furosemide and torasemide increased urine volume 1 hr after administration. Furosemide caused a dose-dependent increase in urine volume that peaked at 2-3 hr in cats and dogs. The diuretic effect of furosemide disappeared 6 hr after administration, while that of torasemide peaked 2-4 hr after administration and persisted for 12 hr in cats and dogs. In MR dogs, torasemide for 7 days significantly decreased urine potassium excretion. Plasma aldosterone increased with torasemide, whereas there was no change with furosemide. In conclusion, about 1/10 concentration of torasemide was as potent as furosemide and had a longer diuretic effect in cats and dogs. These data suggest that torasemide is useful for treating congestive heart failure or edema in cats and dogs.

Journal of Veterinary Medicine A and B (Nov 02 - March 04)

J Vet Med A Physiol Pathol Clin Med. 2003 Sep;50(7):380-2

Levels of retinol and retinyl esters in plasma and urine of dogs with urolithiasis.

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Vitamin A (VA) deficiency and Tamm-Horsfall glycoprotein (THP), a protein that binds retinol and retinyl esters in canine urine, might be involved in the pathogenesis of urolithiasis in dogs. In the present study, we assessed levels of retinol, retinyl esters, retinol-binding protein (RBP) and THP in plasma and urine of dogs with a history of urolithiasis (n = 25) compared with clinically healthy controls (n = 18). Plasma retinol concentrations were higher in dogs with uroliths of struvit ($P < 0.01$), calcium oxalate ($P < 0.05$), urate ($P < 0.01$) and cysteine, but there were no differences in the concentrations of plasma RBP and retinyl esters. Excretion of urinary retinol and retinyl esters were tentatively, but not significantly higher in the stone-forming groups, which was accompanied by increased levels of urinary RBP ($P < 0.01$) and lower excretions in THP ($P < 0.01$). The results show that VA deficiency may be excluded as a potential cause for canine urolithiasis. However, the occurrence of RBP and a concomitant reduction of THP in urine indicates a disturbed kidney function as cause or consequence of stone formation in dogs.

J Vet Med A Physiol Pathol Clin Med. 2003 Sep;50(7):375-9

Follow-up examinations of bitches after conservative treatment of pyometra with the antigestagen aglepristone.

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The aim of this study was to determine the therapeutic success of the medical treatment of canine pyometra with the antigestagen aglepristone and to document the recurrence rate in relation to the time interval after treatment with antigestagens. In 48 (92.8%) of the 52 treated bitches, healing could be achieved within the first 3 weeks after the treatment had been started. One bitch died as a result of renal insufficiency; in three bitches there was no emptying of the uterus, so ovariohysterectomy became necessary. In these three patients, ovarian and endometrial cysts were present. Forty-one bitches could be followed up for 3 months. Four animals developed a recurrence (9.8%). In three bitches ovarian cysts and cystic endometrial hyperlasia could be found intra operationem. The development of 37 bitches could be followed for at least 1 year. Seven animals developed a pyometra again (18.9%). Two received a repeated treatment with aglepristone and have been free from recurrence for over 12 months. In 37 animals data on the subsequent sex cycles are available. In 22 bitches next heat started at the expected time, in seven animals heat started too early. In eight bitches the period of anoestrus was prolonged. Five of the six bred bitches delivered at least one litter. The presented data show that treatment of pyometra by aglepristone results in a high healing rate. The recurrence rate can be minimized by the selection of bitches without ovarian cysts and cystic endometrial hyperplasia.

J Vet Med A Physiol Pathol Clin Med. 2003 Sep;50(7):366-9

Leiomyosarcoma of the kidney in a dog.

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A leiomyosarcoma that occurred in the right kidney of a dog (7-year-old female Labrador retriever) was studied pathologically. On histological examination, tumour cells were spindle-shaped, the cell density was high, and complex fasciculated tumour cells showing longitudinal and transverse cross-sections were observed. Both ends of the nuclei were rounded, the nucleoli were clear and many images of nuclear division were observed. Immunohistochemically, tumour cells reacted intensely with anti-vimentin antibody and anti-actin smooth muscle antibody, and mildly with anti-desmin antibody. On electron microscopy, the nuclei of tumour cells were rounded at both ends and elongated elliptically, and a large number of microfibrils with focal density and dense patches were observed in the cytoplasm. This is a case report of a very rare leiomyosarcoma of the dog kidney.

J Vet Med B Infect Dis Vet Public Health. 2003 Oct;50(8):396-8

Emphysematous cystitis due to Escherichia coli associated with prolonged chemotherapy in a non-diabetic dog.

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An 11-year-old male Labrador retriever dog with chronic recurrent complicated urinary tract infection due to Escherichia coli and a history of prolonged multi-drug chemotherapeutic protocol due to lymphoma was diagnosed with emphysematous cystitis. Diagnosis was based on ultrasonographic and radiographic findings. The immunosuppressive effects of the long glucocorticoid treatment were probably the main underlying mechanism involved in the pathogenesis, however, chemotherapy and/or the presence of lymphoma might have also been involved.

J Vet Med A Physiol Pathol Clin Med. 2003 Aug;50(6):322-5

Comparison of the techniques of evaluation of urine dilution/concentration in the dog.

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The objective of this study was to evaluate the quality of the measurement of dog urine dilution/concentration by comparing osmolality with three methods of specific gravity (USG) measurement, i.e. weighing, refractometry and test strips. In unselected urine samples from 182 dogs there was a better agreement between osmolality and USG determination by refractometry (r = 0.92) than by weighing (r = 0.82) or by test strips (r = 0.27). There was an almost linear relationship between osmolality and USG: osmolality (mOsm/kg) = 36646(34318/38974) x (USGref - 1) + 25(-39/88); calculated osmolality differed from measured osmolality by more than 500 mOsm/kg in only 8 of 181 samples. There was a good agreement between USG determination by weighing and refractometry: USGref = 1.000(0.905/1.095) x USGweighing - 0.0004(-0.0019/0.0027), with a moderate bias. Only 12% of the differences between the two methods exceeded 0.010. Test strip assessment of USG was unreliable because of systematic underestimation and should not be used for dog urine. Refractometry is the best technique for routine evaluation of urine concentration/dilution when osmometry is not available.

J Vet Med A Physiol Pathol Clin Med. 2003 Aug;50(6):307-12

Effects of hyperosmolar ionic and low osmolar non-ionic contrast media on coagulation times and some blood parameters in dogs: an in vivo study.

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The purpose of this study is to evaluate the effects of hyperosmolar ionic contrast media (CM) (diatrizoate) and low osmolar non-ionic CM (iohexol and ioxilan) on coagulation time and some blood parameters in dogs in vivo. The animals were divided into three groups in equal numbers. The dogs in groups I, II and III received diatrizoate, iohexol and ioxilan at the dose of 700 mgI/kg intravenously (IV) as a bolus, respectively. Administration of contrast media and blood samples were collected from vena cephalica antebrachii prior to CM administration and thereafter at 3, 15, 30, 60, 90 and 180 min and 24 h to measure the coagulation factors [activated partial thromboplastin time (APTT), prothorombin time (PT), fibrinogen and fibrinogen degradation products] and some other blood parameters [red blood cells, platelet, white blood cells, haematocrit (Ht) and haemoglobin (Hb)]. While a statistically significant decrease was observed on APTT at 15 min in group III, no significant differences were found in groups I and II. All the groups had insignificant alterations for PT, fibrinogen and fibrinogen degradation product, following CM administration. Significant decreases were observed for platelet at 3 min in all groups. This decrease was also significant at 15- and 30- min intervals in group I. There were significant decreases for erythrocytes, Ht and Hb measurements within 30 min, and no significant alterations were observed for leucocytes within 60 min in all groups compared with baseline values. No differences were observed with regard to coagulation times and some blood parameters as far as long-lasting and major effects of each CM are concerned.

J Vet Med A Physiol Pathol Clin Med. 2003 Feb;50(1):37-41

Day-to-day variability in glomerular filtration rate in normal dogs by scintigraphic technique.

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The sources of variability in variability of scintigraphic measurements of glomerular filtration rate (GFR) have not been determined. The day to day variability of GFR was studied in 18 healthy beagle dogs. The renal uptake of 99mTc-diethylenetriaminepentaacetic acid (DTPA) of each dog was measured using a scintigraphic technique three times at intervals of 5-26 days. GFR was calculated from a regression equation relating uptake to plasma clearance, derived in our laboratory. The mean GFR was 3.97 +/- 0.72 (SD) ml/min/kg with values from 2.66 to 5.67 ml/min/kg. Analysis of variance (ANOVA) using a linear mixed model showed that most variability is a result of the dogs, less because of day to day variability and very little to the measurement variability. The repeatability coefficients for the day to day variability and measurement variability were 1.06 and 0.21 ml/min/kg respectively. The day to day variability can be caused by physiological homeostatic adjustments by the kidneys needed because of fluctuations in food and fluid intake, each dog's individual capacity to adjust, and to intrinsic errors in the measurement method. These results should be considered when using the scintigraphic method for clinical evaluation and research.

J Vet Med A Physiol Pathol Clin Med. 2002 Nov;49(9):470-2

Haemolytic-uraemic syndrome in a dog.

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An 11-year-old female German Shepherd dog presented with lethargy and anorexia, which progressed to haemorrhagic vomiting, diarrhoea and seizures. Serum biochemistry and haematology results showed azotaemia and mild thrombocytopaenia. Euthanasia was elected and the dog was submitted for necropsy examination. There were widespread serosal and mucosal petechial and ecchymotic haemorrhages within the abdomen, with ascites and multiple renal infarcts. The renal infarcts were associated with fibrinoid necrosis and thrombosis of inter-lobular arteries and arterioles. These arterial lesions and clinical signs are consistent with haemolytic-uraemic syndrome, which has not previously been reported in dogs in Europe.

Journal of Veterinary Pharmacology and Therapeutics (Dec 02 – March 03)

J Vet Pharmacol Ther. 2004 Feb;27(1):21-5

Multiple once-daily dose pharmacokinetics and renal safety of gentamicin in dogs.

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In this study the pharmacokinetics and renal safety of gentamicin in healthy dogs was investigated after multiple dosing. Six adult male dogs received once-daily gentamicin (6 mg/kg) intramuscularly for 5 days. Serial blood samples were taken on days 1 and 5 of treatment, and at predose, 1 and 6 h on days 2, 3 and 4. Urinalysis, hematology and serum biochemistry evaluation were carried out before, 7 and 14 days after the first gentamicin administration. Mean value of the main pharmacokinetic parameters were: AUC (microg.h/mL), 97.4 and 100.2; terminal half-life (harmonic mean), 0.76 and 1.01 h; ClB/F (mL/min.kg), 1.24 and 1.10; VD(area)/F (L/kg), 0.084 and 0.10; MRT (h), 1.48 and 1.77; Cmax (microg/mL), 54.5 and 49.2; tmax (h), 0.40 and 0.48 for the first and last dose, respectively. Accumulation was determined as R1 = 0.97 and R2 = 1.22. Mean trough gentamicin serum concentrations were 0.06, 0.07, 0.09, 0.1 and 0.1 microg/mL for the first, second, third, fourth and fifth dose, respectively. Statistically significant increases ($P < 0.05$) were found for last dose MRT and fourth and fifth trough gentamicin serum concentrations. Laboratory tests detected a slight increase in serum creatinine and urea nitrogen concentrations (one dog), decreased specific urine gravity (one dog) and presence of few granular casts (two dogs). It is concluded that once-daily administration of gentamicin may provide adequate serum levels to treat most susceptible gram-negative infections with little or no nephrotoxicity in dogs.

J Vet Pharmacol Ther. 2003 Aug;26(4):283-90

Pharmacologic identification of putative D1 dopamine receptors in feline kidneys.

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The presence of dopamine (DA) receptors in feline kidneys is a matter of contention. Radioligand binding and Western blotting studies were employed to determine whether DA receptors are present in feline kidneys. The pharmacologic profile of the selective D1-receptor antagonist [3H]-SCH 23390 was studied in renal cortical membrane preparations from cats by conducting saturation binding isotherm and competitive binding experiments.

[3H]-SCH 23390 bound to feline renal cortical membranes in a manner consistent with labeling of a D1-like receptor. The binding profile revealed a single site D1-like or D1 receptor in the feline renal cortex with a Kd = 7.8 +/- 1.0 nmol/L and Bmax = 76.5 +/- 19.5 fmol/mg. Competitive binding studies for [3H]-SCH 23390 against unlabeled agonists yielded the following Ki values and rank order of competition: SKF38393 (Ki = 0.47 +/- 0.26 micro m) > fenoldopam (Ki = 3.12 +/- 1.1 micro m) > DA (Ki = 933.1 +/- 1.6 micro m). Competitive binding studies for [3H]-SCH-23390 against unlabeled antagonists yielded the following rank order of competition: SCH 23390 (Ki = 1.97 +/- 0.81 micro m) > spiperone (Ki = 3.79 +/- 0.79) > metoclopramide (Ki = 4.26 +/- 2.4 micro m). Western blot analysis with anti-DA D1 receptor antibodies detected a single band with Mr of 74 kDa corresponding to a D1 DA receptor. These results suggest that a putative D1-like or D1 receptor exists in feline kidneys different from those previously identified in rat, dog or human kidneys.

Research in Veterinary Science (Feb 03 – March 04)

Res Vet Sci. 2003 Aug;75(1):55-9

Pharmacokinetics of oestriol after repeated oral administration to dogs.

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The aim of the present study was to investigate the pharmacokinetics of oestriol in plasma in the dog after repeated oral administration of oestriol tablets, a preparation intended for the treatment of urinary incontinence in the bitch. The study was performed in six healthy, entire, adult female beagle dogs. The bitches were treated once daily with two tablets, containing 1 mg oestriol per tablet, for seven consecutive days (days 1-7). Blood samples were taken from the jugular vein before treatment, frequently on days 1, 3 and 7 of the treatment period and daily just before (C(trough)) and 1 h after dosing (C(t=1h)). During the washout period samples were taken at a 24 h interval up to four days post-treatment. Oestriol concentrations were determined in plasma by radioimmunoassay. Pharmacokinetic parameters, AUC, C(max) and t(max), were determined from the plasma concentration-time curves using non-compartmental methods. The between animal variation in C(max) and the AUC was high. Individual values of the C(max) varied from 206 pg/ml (day 1) to 1128 pg/ml (day 7) and the AUC(0-24h) from 789 pg x h/ml (day 1) to 5718 pg x h/ml (day 7). t(max) occurred within 1 h. The mean C(trough) value was slightly above the pre-treatment level (38+/-2 pg/ml vs. 18+/-5 pg/ml). Within 48 h after the last treatment the concentrations had returned to the pre-treatment values. C(max) and C(trough) did not increase during the treatment period, indicating that no accumulation occurred. A shoulder in the concentration-time curve around 8-12 h after treatment strongly suggested the existence of enterohepatic recirculation (EHR). The average relative contribution of the EHR to the AUC(0-24h) was estimated to be 22%, 38% and 44% on days 1, 3 and 7, respectively. These

mean values were calculated from five animals per time point, because one dog failed to show EHR on days 1 and 3 and was therefore excluded from the calculations.

Res Vet Sci. 2003 Aug;75(1):33-41

The relative effects of supplemental dietary calcium and oxalate on urine composition and calcium oxalate relative supersaturation in healthy adult dogs.

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The aim of this study was to establish the relative effects of dietary calcium and oxalate (in the form of oxalic acid) on the composition of urine produced by healthy adult Cairn Terriers and Miniature Schnauzers. A nutritionally complete dry dog food was fed to 7 dogs (4 Cairn terriers and 3 Miniature schnauzers) for 24 weeks. The dogs were fed the diet alone, or supplemented with six different combinations of dietary calcium (as carbonate and sulphate) and oxalate (as oxalic acid) commonly found in dry commercially prepared dog foods. Urine pH, volume, specific gravity, and concentrations of 12 analytes were measured for each dog; urinary relative supersaturation (RSS) with calcium oxalate (CaOx) was calculated from these values. The effects of supplemental calcium and oxalate were established using two-way analysis of variance and multiple range tests (least significant difference); $P<0.05$ was considered significant. The lowest level of dietary calcium and oxalate resulted in the lowest CaOx RSS. The high calcium, low oxalate diet resulted in the highest CaOx RSS, a low calcium diet with increased dietary oxalate also tended to increase CaOx RSS although results were highly variable. Urinary calcium concentration increased significantly with dietary calcium; urinary oxalate increased, although inconsistently, with dietary oxalic acid only when dietary calcium was low. Measures to reduce both calcium and oxalate should be considered when implementing dietary changes to reduce the risk of calcium oxalate formation in dogs. A reduction in dietary calcium without a concomitant decrease in dietary oxalate may increase the risk of CaOx crystallisation in susceptible dogs.

Res Vet Sci. 2003 Apr;74(2):179-82

Absence of urinary tract infection in dogs with experimentally induced hyperadrenocorticism.

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Objectives of this study were to determine occurrence of urinary tract infection and describe

results of urine analysis and urine culture in dogs with experimentally induced hyperadrenocorticism. Dogs were randomly assigned to receive either hydrocortisone (nine dogs) or placebo (eight dogs) for 49 consecutive days. Before and on day 49 of treatment, evaluation of dogs included physical examination, abdominal ultrasound, urine culture, urinalysis, adrenal function testing, and measurement of urine protein and creatinine and activity of serum alkaline phosphatase. All dogs in the experimental group had clinical and laboratory findings of hyperadrenocorticism. Urine specific gravity was significantly decreased and urine protein-to-creatinine ratio was significantly increased in dogs with hyperadrenocorticism. Urinary tract infection did not occur in any dogs. We conclude that administration of hydrocortisone created a model of hyperadrenocorticism; however, urinary tract infection did not occur. Additional evaluation is needed to determine association between urinary tract infection and hyperadrenocorticism.

Res Vet Sci. 2003 Apr;74(2):145-51

Effect of dietary moisture and sodium content on urine composition and calcium oxalate relative supersaturation in healthy miniature schnauzers and labrador retrievers.

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The aim of this series of studies was to evaluate two possible feeding strategies as methods for reducing the risk of calcium oxalate (CaOx) formation in two breeds of healthy dog. The studies compared the effect of dietary moisture (Study 1) and dietary sodium (Na), (Study 2) on urine composition of labrador retrievers (LR) and miniature schnauzers (MS). A nutritionally complete dry dog food was fed to 16 dogs (eight LR, eight MS; Study 1) and 15 dogs (seven LR, eight MS; Study 2) for 24 days (Study 1), or 36 days (Study 2). The dogs were fed the diet alone (7% moisture, 0.06 g Na/100 kcal), or supplemented with deionised water to 73% moisture (Study 1), or dietary Na, to deliver 0.20 or 0.30 g Na per 100 kcal (Study 2). Urine pH, volume, specific gravity, and concentrations of 12 analytes were measured for each dog. Urinary relative supersaturations (RSS) with CaOx were calculated from these values. The effects of supplemental Na or water were established using t tests (Study 1) or analysis of variance, and multiple range tests (least significant difference) (Study 2); $P<0.05$ was considered significant. Increasing dietary moisture significantly increased total moisture intake ($P=0.001$), and reduced urine specific gravity ($P=0.003$), urinary oxalate concentration ($P=0.04$), and CaOx relative supersaturation ($P=0.04$) in the MS. Urinary parameters remained unchanged in the LR, indicating that feeding a high moisture diet may reduce the risk of CaOx formation in high-risk breeds. Increasing dietary Na led to production of urine with a significantly lower CaOx RSS in both breeds, indicating that sodium supplementation to dry diet formats may reduce the risk of CaOx formation. These feeding strategies should be considered when evaluating methods for preventing CaOx formation within high-risk groups.

Res Vet Sci. 2003 Apr;74(2):137-44

Assessing the severity of canine pancreatitis.

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The objective of this study was to determine whether laboratory testing currently available is able to provide prognostic information in canine pancreatitis. A prospective study of dogs with naturally occurring pancreatitis was undertaken. Twenty-two cases with histologically confirmed pancreatic inflammation were included in the study. Each dog had routine haematology parameters, serum biochemistry (including lipase and amylase), serum trypsin-like immunoreactivity and trypsinogen activation peptides (TAP) in urine and plasma measured. Twelve of the dogs were classified as having severe disease. These dogs had statistically significant increases in urinary TAP-creatinine ratio (UTCR) measurement, serum lipase, serum phosphate and serum creatinine concentrations. Additionally dogs with severe pancreatitis had significantly decreased urine specific gravity levels. The most sensitive and specific test to assess the severity of pancreatitis was the measurement of UTCR.

Veterinary Clinical Pathology (Apr 03 - March 04)

Vet Clin Pathol. 2003;32(4):199-201

A protocol to guide development of a sensitive ELISA for canine erythropoietin.

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BACKGROUND: The determination of canine erythropoietin (EPO) concentration is crucial for monitoring the effect of human recombinant (hr) EPO therapy in dogs with chronic renal failure. Current assays are not specific for canine EPO and not sensitive enough to detect physiologic EPO levels in dogs. OBJECTIVE: The objective of this study was to develop a simple and sensitive ELISA for canine EPO that could serve as a starting point for developing a commercially available assay. METHODS: The ELISA was based on a mouse monoclonal antibody (mAb) and a rabbit polyclonal antibody (pAb) using 2 different immunization techniques: gene electrotransfer (GET) to generate the pAb and multiple antigen peptides (MAPs) to generate the mAb. The ELISA was performed using both EPO obtained from HeLa cells transfected with an expression plasmid encoding canine EPO and canine plasma with known concentrations of EPO. RESULTS: The ELISA standard curve was linear for canine EPO concentrations of 7-66 mU/ml. Coefficients of variation were about 10%. No cross-reactivity

between canine EPO and hrEPO was detected. CONCLUSIONS: Using novel GET and MAP technology, we developed a sensitive and specific ELISA for canine EPO that can be used to guide future clinical applications for EPO detection and monitoring in dogs.

Veterinary Record (Apr 03 – Feb04)

Vet Rec. 2003 Aug 23;153(8):231-5

Mycoplasma canis and urogenital disease in dogs in Norway.

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Mycoplasmas identified as Mycoplasma canis were isolated from nine dogs with clinical signs of urogenital disease in Norway over a period of 20 months. Some of the dogs had been treated unsuccessfully with antibiotics, and three were euthanased as a result of severe persistent disease. Seven of the dogs had a urinary tract infection, one had chronic purulent epididymitis and one had chronic prostatitis. Overt haematuria was frequently observed among the dogs with cystitis. M canis was isolated in pure culture from seven of the dogs and in mixed culture from the other two. In three cases the mycoplasma was cultivated only from urinary sediment, and it was typically obtained in smaller numbers than would be considered indicative of a urinary tract infection. In contrast with most mycoplasmas, the M canis isolated from all the dogs grew on ordinary blood agar plates used for routine bacteriological cultivation. Specific mycoplasma media were not used and the presence of other Mycoplasma or Ureaplasma species cannot be excluded.

Vet Rec. 2003 Aug 9;153(6):165-9.

Comparison of the efficacy of three commercial bacterins in preventing canine leptospirosis.

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Twenty-four specific pathogen-free beagles were randomly allocated into four groups (three vaccinated groups and one control group) and inoculated at nine and 12 weeks of age with one of three commercial inactivated Leptospira vaccines: A (Vanguard 7; Pfizer Sante Animale), B (Dohyvac 7L; Fort Dodge), and C (Nobivac DHPPi + Lepto; Intervet International);

the control group received Nobivac DHPPi (Intervet International). Seven weeks after the second vaccination all the dogs were challenged with Leptospira interrogans serogroup canicola. All the vaccinated dogs developed a mild serological response (microscopic agglutination titres) after the booster vaccination. A significant serological response after the challenge was observed, particularly in the controls. The challenge induced fever and clinical disorders in the control group, whereas in the vaccinated groups the clinical signs were mild. Blood cultures became positive in all control dogs, and in one of six dogs vaccinated with vaccine A and two of four dogs vaccinated with vaccine B; none of the six dogs vaccinated with vaccine C was leptospiraemic at any stage of the experiment. Urine cultures were positive in all the control dogs two weeks after the challenge. One of six dogs vaccinated with vaccine A and two of four dogs vaccinated with vaccine B shed bacteria in their urine after the challenge, but none of the dogs vaccinated with vaccine C shed bacteria in their urine at any time during the experiment.

Vet Rec. 2003 May 17;152(20):625-8

Analysis of feline urinary calculi and urethral plugs by infrared spectroscopy and scanning electron microscopy.

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The chemical constituents of 34 feline urinary calculi and five urethral plugs were analysed by infrared spectroscopy. The analysis revealed that 18 (52.9 per cent) of the calculi contained magnesium ammonium phosphate hexahydrate (struvite) as the major component; 10 (29.4 per cent) contained complex ammonium urates (three of them also containing calcium phosphate, mainly on the surface); three were composed of calcium phosphates and three were composed mainly of calcium oxalate mono and dihydrates. The urethral plugs were composed primarily of struvite, but also contained large amounts of organic matter. The examination of 16 selected samples by scanning electron microscopy and electron dispersive x-ray analysis revealed that their crystalline structures were similar to those of canine stones.

Veterinary Research Communications (Dec 02 - 04)

Vet Res Commun. 2003 Feb;27(2):125-35

Immunochemical localization of megalin, retinol-binding protein and Tamm-Horsfall glycoprotein in the kidneys of dogs.

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Megalin, retinol-binding protein (RBP) and Tamm-Horsfall glycoprotein (THP) are involved in the renal metabolism of vitamin A in canine species. The presence of megalin, RBP and THP in the kidneys of dogs was investigated using immunohistochemical methods Megalin was highly expressed in the apical membrane of the proximal convoluted and straight tubule cells. Immunoreactive RBP was detected below the apical plasma membrane, as well as in basolateral granules of the proximal convoluted tubule cells. THP immunoreactivity was seen in the epithelial cells lining the thick ascending limb of the loop of Henle. Furthermore, THP was displayed in a scattered pattern within the distal convoluted tubules. The co-localization of megalin and RBP coincides with biochemical studies that have shown megalin to be responsible for renal RBP absorption in the proximal convoluted tubules after filtration through the renal glomerulus. The presence of THP, the carrier for vitamin A in canine urine, showed that vitamin A excretion in the urine of dogs is not merely a filtration process but also seems to be a pathway located in the distal part of the nephron.

Veterinary Radiology and Ultrasound (Apr 03)

Vet Radiol Ultrasound. 2004 Jan-Feb;45(1):62-9

Effects of serial ultrasound-guided renal biopsies on kidneys of healthy adolescent dogs.

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Ten healthy mixed-breed dogs were used to evaluate the functional and structural effects of serial ultrasound-guided renal biopsies obtained with an automated biopsy needle. In each dog, one lateral renal cortex was biopsied at 2, 4, and 6 months of age; the other kidney was the control. Five dogs had two tissue cores and five dogs had four tissue cores taken on each biopsy occasion, and one core was examined microscopically. One week before each biopsy and a month after the final biopsy, the glomerular filtration rate (GFR) was determined by renal scintigraphy. Dogs were then euthanized for evaluation of gross and microscopic lesions attributable to the biopsies. There was no difference between GFR values for biopsied kidneys and those of control kidneys ($P > 0.05$). Microscopic lesions were not identified in biopsies taken at 2 and 4 months, but focal lesions were found in three of 10 specimens taken at 6 months of age. At necropsy, six of 10 biopsied kidneys had small visible capsular scars, and linear tracts < 2 mm wide were observed on cut surfaces in six of 10 biopsied kidneys cut transversely into slices 5 mm thick. Discrete light microscopic lesions were observed in 25 of 452 (5.5%) of randomly selected 6-mm-diameter sections of renal

cortex from biopsied kidneys. We conclude that serial renal cortical biopsies can be obtained by our method from healthy adolescent dogs with minimal risk of inducing changes that might be confused with those of a progressive renal disease.

Vet Radiol Ultrasound. 2003 Nov-Dec;44(6):707-13

Sonographic and scintigraphic evaluation of acute renal allograft rejection in cats.

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The sonographic features of acute renal allograft rejection in humans and dogs are manifested by increase in renal cross-sectional area and reduction in renal cortical blood flow. These changes have not been investigated in cats. The objectives of this study were to evaluate sonographic and scintigraphic changes during acute renal allograft rejection in cats. Eight SPF, intact, adult, male cats received heterotopic renal allotransplantations. Immunosuppressive doses of cyclosporine and prednisolone were administered for 14 days and then discontinued to allow acute allograft rejection to occur. Serial measurements of renal cross-sectional area, resistive index (RI), echogenicity, and glomerular filtration rate (GFR) were performed to evaluate changes during acute rejection. Upon sonographic confirmation of absent diastolic blood flow or a 20% increase in cross-sectional area of the allograft, a nephrectomy and histopathologic evaluation were performed. Acute allograft rejection was confirmed histologically in all cats. Significant increases in renal cross-sectional area ($P < 0.001$) occurred postoperatively and during rejection. There were no significant changes in RI ($P = 0.43$) at any time. A subjective increase in medullary echogenicity and a decrease in corticomedullary demarcation were observed in the rejection period. While GFR decreased significantly in the immediate postoperative period ($P < 0.001$), no further change occurred during rejection ($P = 0.42$). Changes in RI and GFR do not appear to be sensitive indicators of acute renal allograft rejection in cats. Serial measurements of renal cross-sectional area appear to be a sensitive method for the early diagnosis of allograft rejection in feline renal transplant recipients.

Vet Radiol Ultrasound. 2003 Sep-Oct;44(5):537-41

Imaging of a spinal nephroblastoma in a dog.

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An 8-month-old German Shepherd dog was presented for investigation of pelvic limb gait

abnormality. Neurolocalization indicated a T3-L3 spinal cord lesion. The myelographic appearance was of an intramedullary lesion at T9/10, but upon subsequent magnetic resonance imaging it was determined that the mass was extramedullary. A diagnosis of nephroblastoma was made on histological examination. The imaging features of this rare tumor and the differentiation of intradural-extramedullary and intramedullary masses are discussed.

Vet Radiol Ultrasound. 2003 Jul-Aug;44(4):433-7

Ureteral fibroepithelial polyps in four dogs.

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Four dogs with ureteral fibroepithelial polyps, ranging from 9-12 years of age, are presented in this report. The patients presented with urinary incontinence, urinary tract infection, and/or polydypsia and pollakiuria. All dogs were intact at the time of diagnosis or for the majority of their lives and three were male. Various diagnostic procedures were performed including ultrasonography, contrast radiography, and nuclear scintigraphy. Not all procedures were performed in all patients. Findings included ureteral dilation proximal to the level of an intraluminal mass and ipsilateral hydronephrosis. Unilateral ureteronephrectomy was performed in three dogs with masses in the proximal ureter; ureteral resection and anastamosis was performed in the remaining patient with a mass located in the distal ureter. The same pathologist (RAP) reviewed all four lesions. The lesions appeared polypoid and were attached to the ureteral wall by a thin stalk. Histopathologically, they contained a superficial layer of well-differentiated transitional epithelial cells overlying a prominent fibrovascular stroma with a mild (three dogs) or marked (one dog) degree of lymphoplasmacytic inflammation. This disease may represent a benign neoplasm or a chronic inflammatory reaction and has a good prognosis with surgical removal. Its histopathological characteristics, higher incidence in males, and location more commonly within the upper third of the ureter is remarkably similar to the disease in humans.