

Abstracts 2004-2005

[American Journal of Veterinary Research \(Jan 04 – Feb 05\)](#)

[Journal of the American Animal Hospital Association \(Aug 03 - Feb 05\)](#)

[Journal of the American Veterinary Medical Association \(March 04 – Feb 05\)](#)

[Journal of Comparative Pathology \(Apr 04 – Apr 05\)](#)

[Journal of Small Animal Practice \(Feb 04 - March 05\)](#)

[Journal of Veterinary Internal Medicine \(March 04 – March 05\)](#)

[Journal of Veterinary Medical Science \(Jan 04 – March 05\)](#)

[Journal of Veterinary Pharmacology and Therapeutics \(March 03 – April 05\)](#)

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[Veterinary Radiology and Ultrasound \(Feb 04 – April 05\)](#)

American Journal of Veterinary Research (Jan 04 – Feb 05)

Am J Vet Res. 2005 Jan;66(1):87-92

Evaluation of the use of technetium Tc 99m diethylenetriamine pentaacetic acid and technetium Tc 99m dimercaptosuccinic acid for scintigraphic imaging of the kidneys in green iguanas (*Iguana iguana*).

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OBJECTIVE: To evaluate the use of scintigraphy involving technetium Tc 99m diethylenetriamine pentaacetic acid ((99m)Tc-DTPA) or technetium Tc 99m dimercaptosuccinic acid ((99m)Tc-DMSA) for the determination of kidney morphology and

function in green iguanas (*Iguana iguana*). ANIMALS: 10 healthy iguanas weighing >1.6 kg. PROCEDURE: Renal scintigraphy was performed by use of (99m)Tc-DTPA in 6 of the iguanas and by use of (99m)Tc-DMSA in all 10 iguanas. After the injection of (99m)Tc-DMSA, scans were performed for each iguana at intervals during a 20-hour period. Renal biopsies were performed in all 10 iguanas after the final scintigraphic evaluation. RESULTS: In iguanas, the use of (99m)Tc-DTPA for renal scintigraphy was nondiagnostic because of serum protein binding and poor renal uptake of the isotope; mean +/- SD (99m)Tc-DTPA bound to serum proteins was 48.9 +/- 9.9%. Renal uptake of (99m)Tc-DMSA produced distinct visualization of both kidneys. Renal uptake and soft tissue clearance of (99m)Tc-DMSA increased over the 20-hour imaging period; mean +/- SD renal uptake of (99m)Tc-DMSA was 11.31 +/- 3.06% at 20 hours. In each of the 10 iguanas, ultrasonographic and histologic examinations of biopsy specimens from both kidneys revealed no abnormalities. CONCLUSIONS AND CLINICAL RELEVANCE: Results indicate that the kidneys of iguanas can be evaluated scintigraphically by use of (99m)Tc-DMSA; this technique may be potentially useful for the diagnosis of renal failure in iguanas.

Am J Vet Res. 2004 Dec;65(12):1708-13

Effects of dietary fat and energy on body weight and composition after gonadectomy in cats.

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OBJECTIVE: To evaluate the effect of dietary fat and energy density on body weight gain, body composition, and total energy expenditure (TEE) in neutered and sexually intact cats. ANIMALS: 12 male and 12 female cats PROCEDURE: Male cats were castrated (castrated male [CM]) or underwent no surgical procedure (sexually intact male [IM]). Female cats underwent ovariectomy (spayed female [SF]) or laparotomy and ligation of both uterine tubes without ovary removal (sexually intact female [IF]). Cats were fed either the low-fat (LF) or high-fat (HF) diet for 26 weeks, with the final allocation consisting of 8 groups: IF-LF IF-HF SF-LF, SF-HF IM-LF, IM-HF, CM-LF, and CM-HF. Mean food intake for each group was recorded daily, and body weight was monitored weekly throughout the study. Body composition and TEE were measured before surgery in week 0 and at the end of the study (week 26) by isotope dilution (double-labelled water). RESULTS: Neutered cats gained significantly more body fat and body weight (53.80 +/- 5.79%) than sexually intact cats (27.11 +/- 5.79%) during the study. Body weight gain of neutered cats fed the HF diet was greater than those fed the LF diet. Following correction for body composition, TEE was similar in all groups and no pattern towards increased food intake was evident. CONCLUSIONS AND CLINICAL RELEVANCE: Weight gain in neutered cats was decreased by feeding an LF, low energy-dense diet. To prevent weight gain in cats after neutering, a suitable LF diet should be fed in carefully controlled meals rather than ad libitum.

Am J Vet Res. 2004 Nov;65(11):1502-7

Effect of glomerular filtration rate on clearance and myelotoxicity of carboplatin in cats with tumors.

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OBJECTIVE: To characterize the pharmacokinetic disposition of carboplatin and determine whether glomerular filtration rate (GFR) could be used to predict carboplatin clearance and myelotoxic effects in cats with tumors. **ANIMALS:** 10 cats with tumors. **PROCEDURE:** Glomerular filtration rate was assessed in each cat by monitoring plasma clearance of technetium Tc 99m-labeled diethylenetriaminepentaacetic acid (99mTc-DTPA). Each cat received carboplatin (200 mg/m² of body surface area) administered as an IV bolus. Plasma platinum concentrations were measured via atomic absorption spectrophotometry, and pharmacokinetic analysis was performed. A CBC was performed weekly for each cat, and the correlation between the area under the concentration-versus-time curve (AUC) and the severity of myelosuppression was calculated. Least squares regression analysis was performed to determine whether GFR could be used to predict plasma platinum clearance (CI_{Pt}). **RESULTS:** For all cats, AUC measurements ranged from 0.99 to 4.30 min x mg x mL⁻¹. Neutrophil concentration nadirs were detected 1 to 3 weeks after treatment and ranged from 200 to 8,000 cells/microl. The absolute neutrophil concentration at the nadir was inversely correlated with AUC. The CI_{Pt} was predicted by use of GFR measurements (CI_{Pt} = 2.60 x GFR). A carboplatin dose prescription model was derived involving AUC, estimated CI_{Pt}, and body weight in kilograms (BW_{kg}), in which dose = AUC x 2.60(GFR) x BW_{kg}. **CONCLUSIONS AND CLINICAL RELEVANCE:** In cats, an individualized prescription strategy for carboplatin administration based on a targeted AUC and determination of GFR might more uniformly predict myelosuppression than that predicted by conventional dosing based on body surface area.

Am J Vet Res. 2004 Oct;65(10):1384-90

Effect of meloxicam and carprofen on renal function when administered to healthy dogs prior to anesthesia and painful stimulation.

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OBJECTIVE: To determine whether administration of the nonsteroidal anti-inflammatory drugs meloxicam or carprofen to healthy dogs that were subsequently anesthetized and

subjected to painful electrical stimulation has adverse effects on renal function as measured by glomerular filtration rate (GFR) and evaluation of serum concentrations of urea and creatinine. ANIMALS: 6 male and 6 female healthy young-adult Beagles. PROCEDURE: A study was conducted in accordance with a randomized crossover Latin-square design. One of 3 treatments (saline [0.9% NaCl] solution, 0.2 mg of meloxicam/kg, or 4.0 mg of carprofen/kg) was administered i.v. 1 hour before anesthesia was induced by use of drugs in accordance with a standard anesthetic protocol (butorphanol tartrate and acepromazine maleate as preanesthetic medications, ketamine hydrochloride and diazepam for induction, and maintenance with isoflurane). Anesthetized dogs were subjected to intermittent electrical stimulation for 30 minutes. Direct, mean arterial blood pressure; heart rate; and respiratory rate were monitored. End-tidal isoflurane concentration was maintained at 1.5 times the minimum alveolar concentration. The GFR, as measured by plasma clearance of ^{99m}Tc-diethylenetriaminepentaacetic acid, and serum concentrations of serum urea and creatinine were determined 24 hours after induction of anesthesia. RESULTS: Neither meloxicam nor carprofen significantly affected GFR or serum concentrations of urea and creatinine, compared with values for the saline treatment. CONCLUSIONS AND CLINICAL RELEVANCE: When administered 1 hour before onset of anesthesia and painful electrical stimulation, meloxicam or carprofen did not cause clinically important alterations of renal function in young healthy dogs.

Am J Vet Res. 2004 Oct;65(10):1355-66. Erratum in: Am J Vet Res. 2004 Nov;65(11):1572.

Expression, bioactivity, and clinical assessment of recombinant feline erythropoietin.

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OBJECTIVE: To determine the activity of recombinant feline erythropoietin (rfEPO) in murine bioassays and evaluate its efficacy and safety in cats with erythropoietin-dependent nonregenerative anemia. ANIMALS: 26 cats (group 1, 19 cats with anemia attributed to chronic kidney disease [CKD]; group 2, 7 cats with CKD and recombinant human erythropoietin [rhEPO]-induced red cell aplasia [RCA]). PROCEDURE: The rfEPO was synthesized by use of Chinese hamster ovary (CHO) cells transfected with feline erythropoietin complementary DNA. Preclinical assessments of rfEPO included an erythroid cell proliferation assay and measurements of reticulocytosis in Balb/C mice. Clinical assessments of cats included hematologic, biochemical, and clinical examinations during 12 (group 1) or 6 (group 2) months of rfEPO treatment. RESULTS: Biological activity of rfEPO was broadly equivalent to rhEPO in preclinical murine bioassays. Median Hct and absolute reticulocyte count in cats increased significantly during the first 3 weeks of rfEPO treatment, and median Hct generally could be maintained within a target range of 30% to 40% with periodic adjustments of rfEPO doses. Unexpectedly, 5 cats in group 1 and 3 cats in group 2 that initially responded to rfEPO treatment again developed anemia that was refractory to additional rfEPO treatments, even at higher doses. CONCLUSIONS AND CLINICAL RELEVANCE: Treatment with rfEPO can reestablish active erythropoiesis in most cats with

CKD, even those with anemia attributable to rhEPO-induced RCA. Unfortunately, development of RCA during treatment with CHO cell-derived recombinant erythropoietin proteins was not eliminated as a serious safety concern, even for this feline-specific preparation.

Am J Vet Res. 2004 Aug;65(8):1100-7

Clinical and pathologic comparison of acute leptospirosis in dogs caused by two strains of *Leptospira kirschneri* serovar grippotyphosa.

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OBJECTIVE: To develop a method for inducing acute leptospirosis in dogs. **ANIMALS:** 31 nine-week-old female Beagles. **PROCEDURE:** Beagles were randomly assigned to 2 inoculation groups or a control group. Dogs were inoculated on 3 successive days by conjunctival instillation of 5×10^7 cells of *Leptospira kirschneri* serovar grippotyphosa strain 82 (12 dogs) or strain RM 52 (14 dogs). Control dogs ($n = 5$) were similarly inoculated with sterile leptospiral culture media. Clinical signs, clinicopathologic variables, anti-leptospiral antibody titers, and evidence of leptospires in tissues and body fluids were evaluated. Dogs were euthanatized and necropsied on days 7, 14, 22, or 28 after inoculation or as required because of severe illness. **RESULTS:** Clinical signs in infected dogs included conjunctivitis, lethargy, diarrhea, dehydration, vomiting, and icterus. Consistent clinicopathologic alterations included azotemia, hyperphosphatemia, increased anion gap, hyperbilirubinemia, and an increase in alkaline phosphatase activity. Leptospires were cultured from the kidneys (11/12), urine (6/9), aqueous humor (9/12), blood (12/12), and liver (12/12) of dogs inoculated with strain 82. Only 3 of 14 dogs became infected after inoculation with strain RM 52. Histopathologic lesions in infected dogs included interstitial nephritis, renal tubular degeneration and necrosis, pulmonary hemorrhage, and hepatic edema and perivasculitis. **CONCLUSIONS AND CLINICAL RELEVANCE:** Conjunctival exposure to *L. kirschneri* serovar grippotyphosa strain 82 resulted in acute leptospirosis in all inoculated dogs, but only 3 of 14 dogs inoculated with strain RM 52 became infected. This method of infection by serovar grippotyphosa can be used to study the pathogenesis and prevention of leptospirosis in dogs.

Am J Vet Res. 2004 Jul;65(7):1006-13.

Evaluation of a technique of inducing hypertensive renal insufficiency in cats.

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OBJECTIVE: To compare 2 techniques of inducing combined renal insufficiency and systemic hypertension in cats. **ANIMALS:** 22 cats 6 to 12 months of age. **PROCEDURES:** Cats were randomly assigned to 1 of 3 groups. Control (C) group cats had 2 intact kidneys, remnant kidney (RK) group cats underwent unilateral partial renal infarction and contralateral nephrectomy, and remnant-wrap (W) group cats underwent unilateral partial renal infarction and partial ablation and wrapping of the contralateral kidney. Systemic arterial blood pressure (BP) was measured continuously by use of implanted radiotelemetric devices. Renal function was assessed via determination of glomerular filtration rate, measurement of serum creatinine and BUN concentrations, and determination of urine protein-to-creatinine ratio (UP/C). Serum aldosterone concentration and plasma renin activity were measured on day 75. **RESULTS:** Systolic BP was significantly higher in groups RK and W than in group C, and systolic BP was significantly higher in group W than in group RK. Serum aldosterone concentration and plasma renin activity were significantly higher in group W, compared with groups C and RK. Glomerular filtration rate was significantly lower in groups RK and W, compared with group C. Histologic indices of renal injury and UP/C were significantly higher in group W, compared with groups C and RK. **CONCLUSIONS AND CLINICAL RELEVANCE:** Hypertensive renal insufficiency in group W was characterized by marked sustained systemic hypertension, decreased renal function, proteinuria, activation of the renin-angiotensin-aldosterone axis, and renal structural injury. Results support the hypothesis that marked systemic hypertension, activation of the renin-angiotensin-aldosterone axis, and proteinuria may damage the kidney of cats with preexisting renal insufficiency.

Am J Vet Res. 2004 Jul;65(7):964-71

Diagnostic relevance of qualitative proteinuria evaluated by use of sodium dodecyl sulfate-agarose gel electrophoresis and comparison with renal histologic findings in dogs.

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OBJECTIVE: To evaluate results of SDS-agarose gel electrophoresis (AGE) of urinary proteins for use in defining glomerular and tubulointerstitial derangements, investigate patterns of high-molecular-weight (HMW) proteins for differentiating among glomerular disorders, and assess low-molecular-weight (LMW) proteins as markers of severity of tubulointerstitial disease in dogs. **ANIMALS:** 49 dogs with increased serum creatinine concentrations or abnormal renal protein loss. **PROCEDURE:** Urinary proteins were examined by use of SDS-AGE and differentiated on the basis of molecular weight. The HMW proteins ($>$ or $=$ 69 kd) were considered indicative of glomerular origin, whereas LMW proteins ($<$ 69 kd) were of tubular origin. Renal specimens were examined by use of light microscopy. Glomerular and tubulointerstitial lesions were differentiated by use of the classification for the World Health Organization and semiquantitative grading, respectively. **RESULTS:** Sensitivity of SDS-AGE

was 100% for detection of glomerular lesions and 92.6% for tubulointerstitial lesions; specificity was 40% and 62.5%, respectively. Although HMW urinary proteins were not significantly associated with the type of glomerular lesion, LMW urinary proteins were significantly associated with the grade of tubulointerstitial damage. Detection of 12- or 15-kd proteins or both was highly indicative of a severe tubulointerstitial lesion. **CONCLUSIONS AND CLINICAL RELEVANCE:** SDS-AGE of urinary proteins in dogs represents a noninvasive test with high sensitivity for identifying glomerular and tubulointerstitial damage, but low specificity limits its validity as a stand-alone test to differentiate between glomerular and tubulointerstitial lesions. The test is particularly useful for identifying dogs with advanced tubulointerstitial disease but cannot be used to characterize glomerular disorders.

Am J Vet Res. 2004 Jun;65(6):847-53. Erratum in: Am J Vet Res.2004 Jul;65(7):1020.

Evaluation of the tensile strengths of four monofilament absorbable suture materials after immersion in canine urine with or without bacteria.

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OBJECTIVE: To evaluate the tensile strength, elongation, and degradation of 4 monofilament absorbable suture materials that undergo degradation by hydrolysis in specimens of canine urine with various physical characteristics. **SAMPLE POPULATION:** 4 monofilament absorbable sutures (polydioxanone, poliglecaprone 25, polyglyconate, and glycomer 631). **PROCEDURE:** Voided urine was collected from 6 healthy dogs, pooled, filter-sterilized, and prepared to provide 5 media: sterile neutral (pH, 7.0), sterile acidic (pH, 6.2), sterile basic (pH, 8.8), *Escherichia coli*-inoculated, and *Proteus mirabilis*-inoculated urine. Ten strands of each suture material were immersed in each of the media for 0 to 28 days. Tensile strength and elongation of each suture material were evaluated by use of a texture analyzer on days 0, 1, 3, 7, 10, 14, 21, and 28. **RESULTS:** Reduction in tensile strength was detected for all materials in all urine specimens over time. Polyglyconate and polydioxanone had superior tensile strengths in sterile neutral and *E. coli*-inoculated urine, and polydioxanone retained the greatest tensile strength throughout the study period. All suture materials disintegrated before day 7 in *P. mirabilis*-inoculated urine. **CONCLUSIONS AND CLINICAL RELEVANCE:** Polydioxanone, polyglyconate, and glycomer 631 may be acceptable for urinary bladder closure in the presence of sterile neutral and *E. coli*-contaminated urine. Tensile strength of poliglecaprone 25 in urine may be unacceptable by the critical healing time for bladder tissue (14 to 21 days). During bladder surgery, exposure of suture material that degrades via hydrolysis to urine containing *Proteus* spp should be minimized.

Am J Vet Res. 2004 Jun;65(6):810-8

Determination of expression of cyclooxygenase-1 and -2 isozymes in canine tissues and their differential sensitivity to nonsteroidal anti-inflammatory drugs.

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OBJECTIVE: To evaluate cyclooxygenase isozyme distribution in tissues from dogs and determine the differential sensitivity of canine cyclooxygenase (COX)-1 and -2 isozymes to nonsteroidal anti-inflammatory drugs (NSAIDs). **SAMPLE POPULATION:** Canine tissue samples (stomach, duodenum, ileum, jejunum, colon, spleen, cerebral cortex, lung, ovary, kidney, and liver) were obtained from 2 dogs for northern and western blot analyses, and blood for whole blood COX assays was obtained from 15 dogs. **PROCEDURE:** 11 NSAIDs were evaluated to determine their COX-2 selectivity in whole blood assays. The concentrations of the drug needed to inhibit 50% of enzyme activity (IC₅₀) were then calculated for comparison. Expression and tissue distribution of COX isozymes were determined by northern and western blot analysis. **RESULTS:** Aspirin, diclofenac, indomethacin, ketoprofen, meclofenamic acid, and piroxicam had little selectivity toward COX isozymes, whereas NS398, carprofen, tolfenamic acid, nimesulide, and etodolac had more than 5 times greater preference for inhibiting COX-2 than COX-1. All canine tissues examined, including those from the gastrointestinal tract, coexpressed COX-1 and -2 mRNA, although protein expression was observed only for COX-1. **CONCLUSIONS AND CLINICAL RELEVANCE:** Canine COX-2 was selectively inhibited by etodolac, nimesulide, and NS398; tolfenamic acid and carprofen also appeared to be preferential COX-2 inhibitors in dogs. The roles of COX-1 as a constitutive housekeeping enzyme and COX-2 as a proinflammatory inducible enzyme (as determined in humans) appear to apply to dogs; therefore, COX-2-selective inhibitors should prove useful in reducing the adverse effects associated with nonselective NSAIDs.

Am J Vet Res. 2004 May;65(5):620-7

Effects of dietary sodium chloride intake on renal function and blood pressure in cats with normal and reduced renal function.

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OBJECTIVE: To determine effects of variations in dietary intake of sodium chloride (NaCl) on systemic arterial blood pressure (ABP) in cats with normal and reduced renal function. **ANIMALS:** 21 adult cats (7 with intact kidneys [control cats; group C], 7 with unilateral renal infarction with contralateral nephrectomy [remnant-kidney model; group RK], and 7 with unilateral renal infarction and contralateral renal wrapping and concurrent oral administration of amlodipine [remnant-wrap model; group WA]). **PROCEDURE:** All cats were sequentially fed 3 diets that differed only in NaCl content (50, 100, or 200 mg of Na/kg); each diet was fed for 7 days. The ABP was recorded continuously by radiotelemetry, and renal function (glomerular filtration rate [GFR]) was determined on the sixth day of each feeding period. **RESULTS:** Dietary supplementation with NaCl did not affect ABP, but it increased GFR

in groups C and WA. The renin-angiotensin-aldosterone axis was activated in groups RK and WA at the lowest NaCl intake, but supplementation with NaCl suppressed this activation in group WA. The lowest NaCl intake was associated with hypokalemia and a high fractional excretion of potassium that decreased in response to supplementation with NaCl. Arterial baroreceptor resetting was evident after chronic hypertension but was not modified by dietary supplementation with NaCl. **CONCLUSIONS AND CLINICAL RELEVANCE:** Low NaCl intake was associated with inappropriate kaliuresis, reduced GFR, and activation of the renin-angiotensin-aldosterone axis without evidence of a beneficial effect on ABP. Therefore, this common dietary maneuver could contribute to hypokalemic nephropathy and progressive renal injury in cats.

Am J Vet Res. 2004 Apr;65(4):404-8

Vasopressin secretion in response to osmotic stimulation and effects of desmopressin on urinary concentrating capacity in dogs with pyometra.

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OBJECTIVE: To determine vasopressin (VP) secretory capacity during osmotic stimulation and the response to desmopressin treatment in dogs with pyometra and control dogs. **ANIMALS:** 6 dogs with pyometra before and after ovariohysterectomy and 6 control dogs. **PROCEDURE:** Urine osmolality (Uosm) was measured during 12 hours. Values measured on the first day defined the basal Uosm pattern. On the second day, dogs were given desmopressin to induce a desmopressin-stimulated Uosm pattern. On day 3, the VP response to osmotic stimulation was examined. **RESULTS:** Median Uosm on day 1 was 340 mOsm/kg (range, 104 to 1,273 mOsm/kg) and 807 mOsm/kg (range, 362 to 1,688 mOsm/kg) in dogs with pyometra before and after surgery, respectively, and 1,511 mOsm/kg (range, 830 to 1,674 mOsm/kg) in control dogs. Median Uosm during desmopressin treatment was 431 mOsm/kg (range, 168 to 1,491 mOsm/kg) and 1,051 mOsm/kg (range, 489 to 1,051 mOsm/kg) in dogs with pyometra before and after surgery, respectively, and 1,563 mOsm/kg (range, 1,390 to 2,351) in control dogs. In dogs with pyometra, threshold for VP secretion was lower before surgery (median, 340 mOsm/kg; range, 331 to 366 mOsm/kg) than after surgery (median, 358 mOsm/kg; range, 343 to 439 mOsm/kg) or in control dogs (median, 347 mOsm/kg; range, 334 to 360 mOsm/kg). Highest maximum plasma VP values were found in dogs with pyometra. **CONCLUSIONS AND CLINICAL RELEVANCE:** Dogs with pyometra had increased urine concentration in response to desmopressin but not to the degree of control dogs, whereas VP secretory ability was not reduced.

Am J Vet Res. 2004 Mar;65(3):283-8

Urodynamic effects of a percutaneously controlled static hydraulic urethral sphincter in canine cadavers.

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OBJECTIVE: To describe a percutaneously controlled static hydraulic urethral sphincter (SHUS) and evaluate urodynamic effects of the SHUS in canine cadavers. **SAMPLE POPULATION:** Cadavers of 6 adult female dogs. **PROCEDURE:** Cadavers were obtained immediately after dogs were euthanatized. Baseline maximal urethral closure pressure (MUCP) and cystourethral leak point pressure (CLPP) were measured by use of a urethral pressure profilometer. An SHUS system was constructed by use of a silicone vascular occluder and subcutaneous infusion port. The SHUS system was then placed around the pelvic urethra in each cadaver. Measurements of MUCP and CLPP were repeated after varying occlusion of the SHUS (0%, 25%, and 50% occlusion). Baseline MUCP and CLPP values were compared with values obtained at 0%, 25%, and 50% occlusion of the SHUS by use of repeated-measures ANOVA. **RESULTS:** Mean \pm SD MUCP for canine cadavers was 7 \pm 1.3 cm H₂O at baseline, which increased to 127 \pm 53 cm H₂O after 50% occlusion of the SHUS. Mean CLPP was 11 \pm 8.6 cm H₂O at baseline, which increased to 73 \pm 38 cm H₂O after 50% occlusion of the SHUS. Mean MUCP and CLPP were significantly associated with the amount of occlusion. **CONCLUSIONS AND CLINICAL RELEVANCE:** The SHUS had positive effects on MUCP and CLPP in canine cadavers. Therefore, additional evaluation of the SHUS in live dogs is warranted.

Am J Vet Res. 2004 Feb;65(2):245-52.

Blood pressure assessment in healthy cats and cats with hypertensive retinopathy.

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OBJECTIVE: To determine whether there was an association between hypertensive retinopathy and high systolic, diastolic, and mean arterial blood pressures in cats. **ANIMALS:** 181 cats. **PROCEDURE:** Systolic, diastolic, and mean arterial blood pressures were measured by use of a noninvasive oscillometric technique. The range of blood pressure measurements in healthy cats from various age groups was determined. Associations among systolic, diastolic, and mean arterial blood pressure; hypertensive retinopathy; hyperthyroidism; left ventricular cardiac hypertrophy; chronic renal failure; and serum biochemical abnormalities were determined. **RESULTS:** All blood pressure measurements increased with age in healthy cats. The frequency of hypertensive retinopathy also increased with age and with blood pressure, and hypertensive retinopathy was particularly found in cats with systolic blood pressures > 168 mm Hg. There was an increased risk for hypertensive retinopathy in cats that were female, > 10 years old, and neutered. The risk of chronic renal failure also increased as blood pressure, particularly systolic blood pressure, increased. **CONCLUSIONS**

AND CLINICAL RELEVANCE: Hypertensive retinopathy was common in cats ≥ 10 years of age and was associated with systolic blood pressures > 168 mm Hg when measured by the noninvasive oscillometric technique.

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.

Journal of the American Animal Hospital Association (Aug 03 - Feb 05)

J Am Anim Hosp Assoc. 2005 Jan-Feb;41(1):39-46.

Trends in the frequency of calcium oxalate uroliths in the upper urinary tract of cats.

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Medical records from cats diagnosed with uroliths at nine United States veterinary teaching hospitals from 1980 to 1999, and records of cats with uroliths submitted for analyses to the Minnesota Urolith Center from 1981 to 2000, were evaluated. A 10-fold increase in frequency of upper tract uroliths occurred in cats during the 20-year interval at the nine veterinary teaching hospitals. Calcium oxalate emerged as the predominant mineral type in upper tract uroliths, having increased more than 50-fold during the study period. These results emphasize the need for increased awareness of the occurrence of upper urinary tract uroliths in cats.

J Am Anim Hosp Assoc. 2005 Jan-Feb;41(1):3-11.

Effects of clomipramine on cats presented for urine marking.

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Twenty-five cats exhibiting at least four episodes of vertical urine marking per week were assessed. Following a medical workup, a 4-week clomipramine trial was instituted, using a mean dose of 0.54 mg/kg per os q 24 hours. No concurrent behavioral or environmental modifications were applied. There was a statistically significant ($P < 0.0001$) decrease in urine spraying when the cats were on clomipramine, with 20 of 25 cats having a $\geq 75\%$ reduction in spraying within 4 weeks. Side effects were mild. Twenty cats were followed for an additional 5 months. Fifteen cats required medication to control the spraying, often at a reduced dose.

J Am Anim Hosp Assoc. 2004 Nov-Dec;40(6):479-83 J Am Anim Hosp Assoc. 2004 Nov-Dec;40(6):479-83

A simple continuous pattern using absorbable suture for perineal urethrostomy in the cat: 18 cases (2000-2002).

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Closure with a simple continuous pattern using absorbable suture was evaluated in 18 cats that underwent perineal urethrostomy from 2000 to 2002. The perineal urethrostomy was

performed in a similar manner in all the cats, and either 4-0 or 5-0 polydioxanone was used for closure. Cats were evaluated 2 weeks postoperatively, and long-term follow-up information was reviewed. In all cats, the perineal urethrostomy site was healed within 2 weeks. None of the cats developed a stricture postoperatively. Complications were not significantly different ($P>0.50$) from those found in a comparison group of 21 cats operated between 1997 and 2002, in which perineal urethrostomies were performed using nonabsorbable sutures that were removed postoperatively.

J Am Anim Hosp Assoc. 2004 Sep-Oct;40(5):391-9

C-reactive Protein in the Differentiation of Pyometra From Cystic Endometrial Hyperplasia/Mucometra in Dogs.

Fransson BA, Karlstam E, Bergstrom A, Lagerstedt AS, Park JS, Evans MA, Ragle CA.

Departments of Veterinary Clinical Sciences, Washington State University, Pullman, Washington 99164-7060.

Hematological parameters, plasma C-reactive protein (CRP), and tumor necrosis factor alpha were analyzed in 64 dogs with a presumptive diagnosis of pyometra. Final diagnosis (i.e., pyometra or cystic endometrial hyperplasia [CEH]) was determined by histopathology. As a single test, the percentage of band neutrophils had the highest sensitivity in the prediction of pyometra (sensitivity, 94%). The combination of percentage of bands and CRP had the highest sensitivity (97.7%; specificity, 75%) in predicting the presence of pyometra. The most common clinical signs noted in the study were vaginal discharge, polyuria, polydipsia, lethargy, and gastrointestinal signs. A combination of three or more of these clinical signs was significantly associated with pyometra.

J Am Anim Hosp Assoc. 2004 May-Jun;40(3):185-91

Effects of diet on urine composition of cats with calcium oxalate urolithiasis.

Lulich JP, Osborne CA, Lekcharoensuk C, Kirk CA, Bartges JW.

Minnesota Urolith Center, College of Veterinary Medicine, University of Minnesota, Saint Paul, Minnesota 55108; Hill's Science and Technology Center, Topeka, Kansas 66601.

Ten client-owned cats with calcium oxalate (CaOx) urolithiasis were evaluated to determine the effect of diet on urine CaOx saturation. Two dietary treatments were evaluated in each cat: the diet consumed just prior to urolith detection and a canned diet formulated to prevent CaOx uroliths. This study revealed that hypercalciuria is a consistent abnormality in cats with CaOx urolith formation. When urolith-forming cats consumed a diet formulated to prevent urolith formation, activity product ratios for CaOx (which estimate the degree to which urine is saturated with CaOx) were significantly lower. These results suggest that

consumption of an appropriately formulated urolith-prevention diet will reduce recurrence of CaOx urolithiasis.

J Am Anim Hosp Assoc. 2004 Mar-Apr;40(2):157-61

Unusual urethral calculi in two male dogs.

Reimer SB, Kyles AE, Schulz KS, Bernsteen L, Wooldridge JD, Ling GV.

Veterinary Medical Teaching Hospital, School of Veterinary Medicine, University of California, Davis, California 95616.

The clinical presentation and advanced size of the two calculi described in this report are both atypical and noteworthy. Both dogs were presented initially with signs of hematuria, stranguria, and perineal discomfort. Each calculus was visible on survey abdominal radiographs and was present in the region of the ischial arch. Both dogs underwent a perineal urethrotomy to retrieve the calculus. Resolution of clinical signs was obtained in one case, which was referred within 2 months of the onset of clinical signs. The second dog was medically managed for approximately 2.5 years before referral. Surgical intervention failed to restore urinary continence in this second dog. Early detection of similar cases may be important in optimizing clinical outcome following appropriate treatment.

J Am Anim Hosp Assoc. 2004 Mar-Apr;40(2):152-6

Urinary obstruction secondary to an ossifying fibroma of the os penis in a dog.

Mirkovic TK, Shmon CL, Allen AL.

Departments of Small Animal Clinical Sciences, Western College of Veterinary Medicine, University of Saskatchewan, Saskatoon, Saskatchewan, Canada S7N 5B4.

A 13-year-old, 25-kg, castrated male border collie was referred for evaluation of pollakiuria, stranguria, and a decreased urine stream. A calcified periurethral mass near the caudal aspect of the os penis was identified on survey abdominal radiographs. A retrograde contrast urethrocytogram demonstrated that the mass was compressing the penile urethra. The mass was surgically resected. A histopathological diagnosis of an ossifying fibroma of the os penis was made. This report describes an atypical presentation of a rare tumor, an ossifying fibroma, that caused a urinary obstruction in a male dog. A review of the incidence, histopathological features, and behavior of ossifying fibromas is included.

J Am Anim Hosp Assoc. 2004 Mar-Apr;40(2):131-6

Piroxicam, mitoxantrone, and coarse fraction radiotherapy for the treatment of transitional cell carcinoma of the bladder in 10 dogs: a pilot study.

Poirier VJ, Forrest LJ, Adams WM, Vail DM.

School of Veterinary Medicine and the Comprehensive Cancer Center, University of Wisconsin-Madison, 2015 Linden Drive, Madison, Wisconsin 53706.

Ten dogs with transitional cell carcinoma (TCC) of the bladder were treated with a combination of once-weekly coarse fraction radiation therapy (six weekly fractions of 5.75 Gray [Gy]), mitoxantrone chemotherapy, and piroxicam. All dogs completed the radiation therapy protocol, and only minimal side effects were observed. Only two (22%) dogs achieved a measurable partial response; however, 90% of the dogs had amelioration of their urinary clinical signs. The median survival time for all dogs was 326 days. While this treatment protocol was well tolerated, the response rate and overall survival duration was not superior to reports using mitoxantrone and piroxicam without radiation therapy in dogs with TCC.

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

Ureteral mast cell tumor in a dog.

Steffey M, Rassnick KM, Porter B, Njaa BL.

Departments of Clinical Sciences, College of Veterinary Medicine, Cornell University, Ithaca, New York 14853.

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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Veterinary Medical Teaching Hospital, Kansas State University, Mosier Hall, Manhattan, Kansas 66506.

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.

Elwick KE, Melendez LD, Higbee RG, Blaik MA, Ritchey JW, Lucroy MD.

Department of Veterinary Clinical Sciences, College of Veterinary Medicine, 001 BVMTH, Oklahoma State University, Stillwater, Oklahoma 74078, USA.

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.

Salinardi BJ, Marks SL, Davidson JR, Senior DF.

Department of Clinical Sciences, School of Veterinary Medicine, Louisiana State University, Baton Rouge, Louisiana 70803-8410, USA.

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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Department of Small Animal Clinical Sciences, College of Veterinary Medicine, The University of Tennessee, 2407 River Drive, Knoxville, Tennessee 37996-4554, USA.

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.

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

Pressler BM, Vaden SL, Lane IF, Cowgill LD, Dye JA.

Department of Clinical Sciences, College of Veterinary Medicine, North Carolina State University, 4700 Hillsborough Street, Raleigh, North Carolina 27606, USA.

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.

Boland LE, Hardie RJ, Gregory SP, Lamb CR.

Department of Small Animal Medicine and Surgery, The Royal Veterinary College, Hawkshead Lane, North Mymms, Hatfield, Hertfordshire, AL9 7TA, United Kingdom.

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 cavitory 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.

Journal of the American Veterinary Medical Association (March 04 – Feb 05)

J Am Vet Med Assoc. 2005 Feb 1;226(3):393-400

Evaluation of the association between initial proteinuria and morbidity rate or death in dogs with naturally occurring chronic renal failure.

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

OBJECTIVE: To determine whether urine protein-to-creatinine ratio (UP:C) \geq 1.0 at initial diagnosis of chronic renal failure (CRF) is associated with greater risk of development of uremic crises, death, and progression of renal failure in dogs. **DESIGN:** Prospective cohort study. **ANIMALS:** 45 dogs with CRF **PROCEDURE:** Dogs were prospectively assigned to 2 groups on the basis of initial UP:C $<$ 1.0 or \geq 1.0. The association between magnitude of proteinuria and development of uremic crises and death was determined before and after dogs with initial UP:C \geq 1.0 were assigned to 3 subgroups and compared with dogs with

initial UP:C < 1.0. Changes in reciprocal serum creatinine concentration were used to estimate decrease in renal function. RESULTS: Initially, dogs had similar clinical characteristics with the exception of systolic blood pressure and UP:C. Relative risks of development of uremic crises and death were approximately 3 times higher in dogs with UP:C > or =1.0, compared with dogs with UP:C < 1.0. Relative risk of adverse outcome was approximately 1.5 times higher for every 1-unit increment in UP:C. The decrease in renal function was of greater magnitude in dogs with UP:C > or =1.0, compared with dogs with UP:C < 1.0. CONCLUSIONS AND CLINICAL RELEVANCE: Initial UP:C > or =1.0 in dogs with CRF was associated with greater risk of development of uremic crises and death, compared with dogs with UP:C < 1.0. Initial determinations of UP:C in dogs with naturally occurring CRF may be of value in refining prognoses.

J Am Vet Med Assoc. 2005 Feb 1;226(3):383-6

Prevalence and radiologic and histologic appearance of vesicourachal diverticula in dogs without clinical signs of urinary tract disease.

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OBJECTIVE: To determine prevalence and radiologic and histologic appearance of vesicourachal diverticula in dogs without clinical signs of urinary tract disease. DESIGN: Original study. ANIMALS: 50 dogs between 4 months and 17 years old representing 22 breeds that had been euthanatized for unrelated reasons; none of the dogs had a history or clinical signs of urinary tract disease. PROCEDURE: Retrograde positive-contrast radiography was performed, and radiographs were examined for macroscopic diverticula. Necropsy specimens from the urinary bladder vertex were examined by means of light microscopy for diverticula and signs of inflammation. RESULTS: 17 of the 50 (34%) dogs had vesicourachal diverticula, and 1 additional dog had a urachal cyst. Fifteen of the 17 diverticula were macroscopic; surface area of the diverticulum could be measured radiographically in 13 of these dogs and ranged from 1 to 90 mm². The remaining 2 diverticula were microscopic. Sixteen diverticula were intramural and 1 was extramural. Light microscopic signs of bladder wall inflammation could be detected in 5 dogs, 4 of which had macroscopic diverticula. CONCLUSIONS AND CLINICAL RELEVANCE: Results suggest that a high percentage of dogs without clinical signs of urinary tract disease may have vesicourethral diverticula. Further studies are needed to determine the clinical relevance of vesicourethral diverticula in dogs.

J Am Vet Med Assoc. 2005 Feb 1;226(3):378-82

Control of urine marking by use of long-term treatment with fluoxetine or clomipramine in cats.

Hart BL, Cliff KD, Tynes VV, Bergman L.

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OBJECTIVES: To determine whether clomipramine differs from fluoxetine in reducing feline urine marking; whether reduction of marking continues in cats treated >8 weeks; whether recurrence of marking, after abrupt drug withdrawal, is less in cats treated >8 weeks; and whether cats that are successfully treated but resume marking after drug withdrawal can be successfully treated again with the same drug regimen. **DESIGN:** Positive-controlled, double-masked clinical trial. **ANIMALS:** 22 neutered cats (2 females, 20 males) > or =1 year old with objectionable urine marking. **PROCEDURE:** Cats that marked vertically > or =3 times/wk were treated with fluoxetine (1 mg/kg [0.45 mg/lb], q 24 h, PO) or clomipramine (0.5 mg/kg [0.23 mg/lb], q 24 h, PO) for 16 weeks, and efficacy was compared. Recurrence of marking was determined after abrupt withdrawal of fluoxetine at 16 or 32 weeks. Reduction in marking in cats treated with fluoxetine for 8 weeks after returning to marking following drug withdrawal was compared with the initial 8 weeks of successful treatment. **RESULTS:** Efficacy of fluoxetine and clomipramine was similar. Treatment >8 weeks revealed increasing efficacy in reduction of marking. Return of marking after termination of fluoxetine administration occurred in most cats. Cats successfully treated initially with fluoxetine responded similarly to repeated treatment. **CONCLUSIONS AND CLINICAL RELEVANCE:** Clomipramine and fluoxetine were equivalent in treating urine marking. Longer treatment increased efficacy. Most cats return to marking after abrupt drug withdrawal. A second course of treatment can be expected to be as effective as the first.

J Am Vet Med Assoc. 2005 Jan 1;226(1):73-6

Evaluation of long-term effects of endoscopic injection of collagen into the urethral submucosa for treatment of urethral sphincter incompetence in female dogs: 40 cases (1993-2000).

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Section of Small Animal Reproduction, Department of Small Animals, Faculty of Veterinary Medicine, Zurich University, Winterthurerstrasse 260, 8057 Zurich, Switzerland.

OBJECTIVE: To evaluate long-term success of endoscopic injection of collagen into the urethral submucosa in female dogs with urinary incontinence caused by urethral sphincter incompetence. **DESIGN:** Retrospective study. **ANIMALS:** 40 incontinent female dogs. **PROCEDURE:** Medical records were reviewed for outcome and other results for dogs in which a cystoscope was passed into the urethra for deposition of 3 collagen deposits into the submucosa. **RESULTS:** 27 (68%) dogs were continent for 1 to 64 months (mean, 17 months) after the collagen injection. In another 10 dogs, incontinence improved and in 6 of these dogs, full continence was regained with administration of additional medication. In 3 dogs, incontinence was unchanged. As long as 12 months after injection, there was a deterioration in the initial result in 16 dogs, after which their condition stabilized. Mild and transient adverse effects developed in 6 (15%) dogs. **CONCLUSIONS AND CLINICAL**

RELEVANCE: Long-term success of endoscopic injection of collagen was satisfactory. Relapse of incontinence might be caused by flattening of the collagen deposits rather than resorption of the collagen.

J Am Vet Med Assoc. 2004 Sep 15;225(6):881-7

Determination of the dosage of clomipramine for the treatment of urine spraying in cats.

King JN, Steffan J, Heath SE, Simpson BS, Crowell-Davis SL, Harrington LJ, Weiss AB, Seewald W; CLOFUS Study Group.

Novartis Animal Health Inc, Postfach CH-4002, Basel, Switzerland.

OBJECTIVE: To determine the optimal dosage of clomipramine for the treatment of urine spraying in cats. DESIGN: Randomized controlled multicenter clinical trial. ANIMALS: 67 neutered cats. PROCEDURE: Cats with a minimum 1-month history of spraying urine against vertical surfaces at least twice per week were randomly assigned to be treated with a placebo or with clomipramine at a dosage of 0.125 to 0.25 mg/kg (0.057 to 0.11 mg/lb), 0.25 to 0.5 mg/kg (0.11 to 0.23 mg/lb), or 0.5 to 1 mg/kg (0.23 to 0.45 mg/lb), p.o., every 24 hours for up to 12 weeks. Owners of all cats were given information on behavioral treatment and environmental modification. RESULTS: Prior to treatment, mean number of urine spraying events ranged from 0.9 to 1.3 urine spraying events/d for the 4 groups, and mean percentage of days with urine spraying events ranged from 62% to 69%. All 3 dosages of clomipramine were associated with significant reductions in frequency of urine spraying. Sedation was the most common adverse effect and was identified in 27 of the 50 cats treated with clomipramine; however, treatment was not discontinued in any cat because of sedation. CONCLUSIONS AND CLINICAL RELEVANCE: Results of the present study suggest that compared with a placebo, clomipramine significantly reduces the frequency of urine spraying in cats in terms of the number of urine spraying events per day and the number of days with urine spraying events. For cats with urine spraying, the recommended initial dosage of clomipramine is 0.25 to 0.5 mg/kg, p.o., every 24 hours

J Am Vet Med Assoc. 2004 Aug 1;225(3):389-94

Topical flea and tick pesticides and the risk of transitional cell carcinoma of the urinary bladder in Scottish Terriers.

Raghavan M, Knapp DW, Dawson MH, Bonney PL, Glickman LT.

Department of Veterinary Pathobiology, School of Veterinary Medicine, Purdue University, West Lafayette, IN 47907-2027, USA.

OBJECTIVE: To determine whether use of topical flea and tick products increases the risk of transitional cell carcinoma (TCC) of the urinary bladder in Scottish Terriers. DESIGN: Case-control study. ANIMALS: 87 adult Scottish Terriers with TCC (cases) and 83 adult Scottish

Terriers with other health-related conditions (controls). PROCEDURE: Owners of study dogs were recruited through private veterinary practices and the Scottish Terrier Club of America. History of exposure to flea and tick products 1 year prior to diagnosis of TCC for case dogs and during a comparable period for control dogs was obtained through a questionnaire. Risk of TCC associated with exposure to flea and tick products was determined by means of univariate and multiple logistic regression analysis. RESULTS: After adjustment for host factors, Scottish Terriers treated with topical spot-on flea and tick products containing fipronil or imidacloprid did not have an increased risk of TCC, compared with Scottish Terriers that had never been exposed to any flea and tick products. The risk of TCC associated with use of older topical flea and tick products such as shampoos, dips, powders, sprays, and collars could not be evaluated because of the low number of owners in the study population that had used such products. CONCLUSIONS AND CLINICAL RELEVANCE: Results suggest that use of topical spot-on flea and tick products does not increase the risk of TCC in Scottish Terriers.

J Am Vet Med Assoc. 2004 Aug 1;225(3):368-73

Antimicrobial resistance of Escherichia coli strains isolated from urine of women with cystitis or pyelonephritis and feces of dogs and healthy humans.

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Medical Service, Minneapolis Veterans Affairs Medical Center, Minneapolis, MN 55417, USA.

OBJECTIVE: To assess the prevalence and patterns of antimicrobial resistance among Escherichia coli strains isolated from the urine of women with cystitis or pyelonephritis and from fecal samples from dogs and healthy humans. DESIGN: Cross-sectional survey. SAMPLE POPULATION: Escherichia coli isolates from 82 women with cystitis, 170 women with pyelonephritis, 45 dogs, and 76 healthy human volunteers. PROCEDURE: Susceptibility to 12 antimicrobial agents was determined by means of disk diffusion testing as specified by the NCCLS. RESULTS: Overall, the 4 most common antimicrobial resistance patterns were resistance to ampicillin, sulfisoxazole, trimethoprim, and trimethoprim-sulfamethoxazole (n = 45 [12% of all isolates]); ampicillin alone (33 [9%]); ampicillin and sulfisoxazole (29 [8%]); and sulfisoxazole alone (14 [4%]). None of the isolates were resistant to ceftazidime, ciprofloxacin, nitrofurantoin, or piperacillin-tazobactam. Resistance was significantly more common and extensive among isolates from women with cystitis or pyelonephritis than among isolates from healthy humans or dogs. Resistance was least common among isolates from dogs. The only resistance phenotype that was more common among canine isolates than human isolates was resistance to sulfisoxazole alone. CONCLUSIONS AND CLINICAL RELEVANCE: Results suggest that dogs are unlikely to be an important external reservoir of antimicrobial-resistant E. coli strains causing infections in humans. On the contrary the data suggest that dogs conceivably could acquire resistant E. coli strains from humans.

J Am Vet Med Assoc. 2004 Jul 1;225(1):72-7

Evaluation of environmental risk factors for leptospirosis in dogs: 36 cases (1997-2002).

Ward MP, Guptill LF, Wu CC.

Department of Veterinary Pathobiology, School of Veterinary Medicine, Purdue University, West Lafayette, IN 47907-2027, USA.

OBJECTIVE: To identify environmental risk factors for leptospirosis. **DESIGN:** Retrospective study. **ANIMALS:** 36 dogs with leptospirosis and 138 dogs seronegative for leptospirosis as determined by microscopic agglutination test for antibodies against *Leptospira* spp. **PROCEDURES:** Medical records of dogs evaluated for leptospirosis from 1997 through 2002 were identified. Owner address was used to geocode locations of dogs, and location-specific environmental risk factor data were obtained by use of a geographic information system. Risk of leptospirosis was estimated by odds ratios, controlling for potential confounding by dog age, sex, and breed. **RESULTS:** Leptospirosis in 19 of the 30 dogs in which an infecting *Leptospira* serovar could be identified was associated with *Leptospira kirschneri* serovar grippotyphosa infection. Dogs in which a diagnosis of leptospirosis was made, and dogs with leptospirosis caused by *L. kirschneri* serovar grippotyphosa, were more likely to have addresses located in areas classified as rural in 1990 but urban in 2000. By use of information on recent urbanization and a logistic regression model, the status of 81.6% and 89.8% of dogs with leptospirosis and leptospirosis caused by serovar grippotyphosa, respectively, were correctly classified. Other environmental variables (proximity to streams, recreational areas, farmland, wetlands, areas subject to flooding, and areas with poor drainage; annual rainfall; and county cattle or pig population) did not significantly improve accuracy of classification. **CONCLUSIONS AND CLINICAL RELEVANCE:** Dogs in periurban areas are at greater risk of leptospirosis. Vaccination of dogs in these areas to protect against leptospirosis should be considered.

J Am Vet Med Assoc. 2004 Jun 15;224(12):1958-63

Serovar-specific prevalence and risk factors for leptospirosis among dogs: 90 cases (1997-2002).

Ward MP, Guptill LF, Prah A, Wu CC.

Department of Veterinary Pathobiology, School of Veterinary Medicine, Purdue University, West Lafayette, IN 47907-2027, USA.

OBJECTIVE: To estimate serovar-specific prevalence of leptospirosis by use of veterinary teaching hospital and laboratory submission data; describe annual and seasonal patterns of leptospirosis; and identify risk factors for age, sex, and breed. **DESIGN:** Retrospective study. **ANIMALS:** 90 dogs with leptospirosis. **PROCEDURES:** Hospital records of dogs examined at Purdue University Veterinary Teaching Hospital with a diagnosis of leptospirosis and laboratory records of dogs from which sera were tested for antibodies against *Leptospira* spp at Purdue University Animal Disease Diagnostic Laboratory from 1997 through 2002 were reviewed. The likely infecting *Leptospira* serovar was identified. Seasonal and annual

prevalences were calculated by use of hospital population at risk (hospital cases) or serologic testing submissions (diagnostic laboratory cases). Age-, sex-, and breed-specific risk factors for hospital cases were estimated by odds ratios. RESULTS: Of the 39 hospitalized dogs identified, 34 had been serologically tested, and 22 of those were infected with *Leptospira kirschneri* serovar grippotyphosa. Of the 51 diagnostic laboratory cases, 59% had a reciprocal titer ≥ 800 against serovar grippotyphosa. Diagnostic laboratory cases were more common in summer, whereas hospital cases of leptospirosis were more common in fall. Male dogs were at significantly greater risk of leptospirosis than female dogs; and dogs 4 to 6.9 years old were at significantly greater risk than dogs < 1 year old. CONCLUSIONS AND CLINICAL RELEVANCE: *L. kirschneri* serovar grippotyphosa infection was associated with most cases of leptospirosis in dogs. Use of an effective vaccine that includes this serovar is advisable for dogs at risk of leptospirosis.

J Am Vet Med Assoc. 2004 Jun 15;224(12):1936-40

Incidence of catheter-associated urinary tract infection among dogs in a small animal intensive care unit.

Smarick SD, Haskins SC, Aldrich J, Foley JE, Kass PH, Fudge M, Ling GV.

Veterinary Medical Teaching Hospital, School of Veterinary Medicine, University of California, Davis, CA 95616, USA.

OBJECTIVE: To determine incidence of and possible risk factors for catheter-associated urinary tract infection (UTI) among dogs hospitalized in an intensive care unit and compare results of bacterial culture of urine samples with results of bacterial culture of catheter tips. DESIGN: Prospective study. ANIMALS: 39 dogs. PROCEDURE: A standard protocol for aseptic catheter placement and maintenance was used. Urine samples were obtained daily and submitted for bacterial culture. When possible, the urinary catheter tip was collected aseptically at the time of catheter removal and submitted for bacterial culture. Bacteria that were obtained were identified and tested for antimicrobial susceptibility. RESULTS: 4 of the 39 (10.3%) dogs developed a UTI. The probability of remaining free from UTI after 1 day in the intensive care unit was 94.9%, and the probability of remaining free from UTI after 4 days was 63.3%. Bacteria isolates were generally common urinary tract pathogens and were susceptible to most antimicrobials. Specific risk factors for catheter-associated UTI, beyond a lack of antimicrobial administration, were not identified. Positive predictive value of bacterial culture of urinary catheter tips was only 25%. CONCLUSIONS AND CLINICAL RELEVANCE: Results suggest that placement of an indwelling urinary catheter in dogs is associated with a low risk of catheter-associated UTI during the first 3 days after catheter placement, provided that adequate precautions are taken for aseptic catheter placement and maintenance. Results of bacterial culture of urinary catheter tips should not be used to predict whether dogs developed catheter-associated UTI

J Am Vet Med Assoc. 2004 May 15;224(10):1611-4, 1605

Transient proximal renal tubular acidosis and Fanconi syndrome in a dog.

Hostutler RA, DiBartola SP, Eaton KA.

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A 9-year-old spayed female Labrador Retriever was evaluated for anorexia, lethargy, and vomiting of 5 days' duration. Laboratory abnormalities included azotemia, high liver enzyme activities, hyperchloremic metabolic acidosis, glucosuria, ketonuria, proteinuria, and aminoaciduria. These laboratory abnormalities were diagnostic of proximal renal tubular acidosis and Fanconi syndrome. Results of initial and convalescent serologic tests for leptospirosis were negative. The dog was treated with amoxicillin, sodium bicarbonate, and potassium citrate at discharge. Repeated evaluations revealed resolution of the acidosis, azotemia, proteinuria, glucosuria, ketonuria, and high liver enzyme activities. Alkali administration was gradually discontinued, and the dog was clinically normal 8 months after discharge. The dog's clinical condition appeared to have been transient in nature, a phenomenon that is rarely seen in human or veterinary medicine.

J Am Vet Med Assoc. 2004 May 15;224(10):1607-10, 1605.

Congenital ectopic ureters in a continent male dog and cat.

Steffey MA, Brockman DJ.

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A male dog and cat were evaluated because of clinical signs associated with hydronephrosis. Both animals had ectopic ureters, but neither had urinary incontinence. The diagnoses were made by use of ultrasonography, excretory urography, retrograde urethrocytography, and surgery. In both animals, hydronephrosis was bilateral but of unequal severity, such that unilateral ureteronephrectomy could be performed. Both animals underwent ureteroneocystostomy of the remaining ureter. This treatment resulted in good clinical outcome during follow-up periods of 18 months and 3 years.

J Am Vet Med Assoc. 2004 May 1;224(9):1455-8

Evaluation of the effect of cephalexin and enrofloxacin on clinical laboratory measurements of urine glucose in dogs.

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OBJECTIVE: To determine the effects of cephalexin and enrofloxacin on results of 4 commercially available urine glucose tests in dogs. **ANIMALS:** 6 healthy adult female dogs. **PROCEDURE:** In a crossover design, cephalexin (22 and 44 mg/kg [10 and 20 mg/lb], p.o., q 8 h) or enrofloxacin (5 and 10 mg/kg [2.3 and 4.5 mg/lb], p.o., q 12 h) was administered to dogs for 1 day. Urine samples were tested for glucose at 0, 6, and 24 hours after drug administration. In vitro, dextrose was added to pooled glucose-negative canine urine samples containing either no antimicrobial or known concentrations of either antimicrobial; urine samples were then tested for glucose. **RESULTS:** In vivo, false-positive results were obtained by use of a tablet test in the presence of both antimicrobials and by use of a strip test in the presence of cephalexin. In vitro, false-positive results were obtained with the tablet test at the highest urine concentration of cephalexin (2,400 microg/mL) and with a strip test at the highest concentration of enrofloxacin (600 microg/mL). Enrofloxacin in urine samples containing dextrose caused the urine glucose tests to underestimate urine glucose concentration. **CONCLUSIONS AND CLINICAL RELEVANCE:** Cephalexin and enrofloxacin at dosages used in clinical practice may result in false-positive or false-negative urine glucose results, and care should be taken when using urine as a basis for identifying or monitoring diabetic animals.

J Am Vet Med Assoc. 2004 Apr 15;224(8):1290-7

Herbicide exposure and the risk of transitional cell carcinoma of the urinary bladder in Scottish Terriers.

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OBJECTIVE: To determine whether exposure to lawn or garden chemicals was associated with an increased risk of transitional cell carcinoma (TCC) of the urinary bladder in Scottish Terriers. **DESIGN:** Case-control study. **ANIMALS:** 83 Scottish Terriers with TCC (cases) and 83 Scottish Terriers with other health-related conditions (controls). **PROCEDURE:** Owners of study dogs completed a written questionnaire pertaining to exposure to lawn or garden chemicals during the year prior to diagnosis of TCC for case dogs and during a comparable period for control dogs. **RESULTS:** The risk of TCC was significantly increased among dogs exposed to lawns or gardens treated with both herbicides and insecticides (odds ratio [OR], 7.19) or with herbicides alone (OR, 3.62), but not among dogs exposed to lawns or gardens treated with insecticides alone (OR, 1.62), compared with dogs exposed to untreated lawns. Exposure to lawns or gardens treated with phenoxy herbicides (OR, 4.42) was associated with an increased risk of TCC, compared with exposure to untreated lawns or gardens, but exposure to lawns or gardens treated with nonphenoxy herbicides (OR, 3.49) was not significantly associated with risk of TCC. **CONCLUSIONS AND CLINICAL RELEVANCE:** Results suggest that exposure to lawns or gardens treated with herbicides was associated with an increased risk of TCC in Scottish Terriers. Until additional studies are performed to prove or

disprove a cause-and-effect relationship, owners of Scottish Terriers should minimize their dogs' access to lawns or gardens treated with phenoxy herbicides.

J Am Vet Med Assoc. 2004 Apr 15;224(8):1282-9

Evaluation of modified Wright-staining of urine sediment as a method for accurate detection of bacteriuria in dogs.

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OBJECTIVE: To compare the findings of light microscopic evaluation of routine unstained wet-mounted preparations and air-dried, modified Wright-stained preparations of urine sediment with results of quantitative aerobic bacteriologic culture of urine. **DESIGN:** Masked prospective study. **SAMPLE POPULATION:** 459 urine samples collected by cystocentesis from 441 dogs. **PROCEDURE:** Urinalyses and quantitative bacteriologic cultures of urine were performed. Unstained wet-mounted preparations and air-dried, modified Wright-stained urine sediment preparations were examined by light microscopy for the presence of bacteria. **RESULTS:** Compared with results of quantitative bacteriologic culture, routine unstained preparations and modified Wright-stained preparations had sensitivities of 82.4% and 93.2%, specificities of 76.4% and 99.0%, positive predictive values of 40.1% and 94.5%, negative predictive values of 95.8% and 98.7%, and test efficiencies of 77.3% and 98.0%, respectively. Compared with 74 samples that yielded growth on bacteriologic culture, the routine unstained method had concordance and misclassification rates of 39.2% and 60.8%, respectively, whereas the Wright-stained method had concordance and misclassification rates of 78.4% and 21.6%, respectively. Significant associations between each of occult blood in urine, pyuria, female sex, and lower urine specific gravity with bacteriuria detected by Wright-stained sediment examination and quantitative bacteriologic culture of urine were identified. **CONCLUSIONS AND CLINICAL RELEVANCE:** Examination of modified Wright-stained preparations of urine sediment appeared to be a rapid, cost effective method that significantly improved the sensitivity, specificity, positive predictive value, and test efficiency of light microscopic detection of bacteriuria, compared with that of the routine unstained method.

Journal of Comparative Pathology (Apr 04 – Apr 05)

J Comp Pathol. 2005 Jan;132(1):1-26

Attaching-effacing bacteria in animals.

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Enteric bacteria with a demonstrable or potential ability to form attaching-effacing lesions, so-called attaching-effacing (AE) bacteria, have been found in the intestinal tracts of a wide variety of warm-blooded animal species, including man. In some host species, for example cattle, pigs, rabbits and human beings, attaching-effacing *Escherichia coli* (AEEC) have an established role as enteropathogens. In other host species, AE bacteria are of less certain significance. With continuing advances in the detection and typing of AE strains, the importance of these bacteria for many hosts is likely to become clearer. The pathogenic effects of AE bacteria result from adhesion to the intestinal mucosa by a variety of mechanisms, culminating in the formation of the characteristic intimate adhesion of the AE lesion. The ability to induce AE lesions is mediated by the co-ordinated expression of some 40 bacterial genes organized within a so-called pathogenicity island, known as the "Locus for Enterocyte Effacement". It is also believed that the production of bacterial toxins, principally Vero toxins, is a significant virulence factor for some AEEC strains. Recent areas of research into AE bacteria include: the use of *Citrobacter rodentium* to model human AEEC disease; quorum-sensing mechanisms used by AEEC to modulate virulence gene expression; and the potential role of adhesion in the persistent colonization of the intestine by AE bacteria. This review of AE bacteria covers their molecular biology, their occurrence in various animal species, and the diagnosis, pathology and clinical aspects of animal diseases with which they are associated. Reference is made to human pathogens where appropriate. The focus is mainly on natural colonization and disease, but complementary experimental data are also included.

Journal of Small Animal Practice (Feb 04 - March 05)

J Small Anim Pract. 2005 Jan;46(1):10-6

Primary hyperparathyroidism in 29 dogs: diagnosis, treatment, outcome and associated renal failure.

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OBJECTIVES: To review the records of 29 dogs diagnosed with primary hyperparathyroidism and see if any factors correlate with renal failure. **METHODS:** Dogs were selected retrospectively from case files from the QVSH and the QMH. **RESULTS:** The majority of dogs were middle-aged and four were keeshonds. The primary presenting complaints were polyuria and polydipsia. All dogs had an elevated total and ionised plasma calcium concentration. Plasma phosphate concentrations were variable. Ultrasonography of the

parathyroid gland revealed nodular enlargement which was found to correlate well with surgical findings. The majority of dogs underwent surgical parathyroidectomy. Five cases were treated by ultrasound-guided chemical ablation of the parathyroid gland, of which only two cases showed a partial response. Three dogs were euthanased within a week of presentation. Seven other dogs had renal failure diagnosed either at presentation or up to six months after parathyroidectomy. The development of renal failure was correlated with total calcium concentration but did not correlate with any other factor, including the calcium phosphate product. Thirteen treated dogs were known to be alive at the time of writing, which was six months to 3.5 years after parathyroidectomy. **CLINICAL SIGNIFICANCE:** Primary hyperparathyroidism cases with high total calcium were more likely to develop renal failure in this group of dogs; however, the calcium phosphate product did not seem to be a useful predictor. Ultrasound-guided chemical ablation seemed to have limited advantage over surgery.

J Small Anim Pract. 2004 Dec;45(12):618-22

Renal osteosarcoma in a dog.

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A seven-and-a-half-year-old dog presented with anorexia, lethargy and haematuria. A 1.8 kg abdominal mass was excised and determined to be a primary renal osteosarcoma. Haematuria was observed five months after surgery and the tumour was radiographically determined to have recurred locally. The dog was euthanased 12 days later due to refractory pain and anorexia. Although osteosarcomas are expected to develop distant metastases, this dog was euthanased due to clinical evidence of local tumour recurrence. Haematuria was an indication both of initial tumour development and later recurrence

J Small Anim Pract. 2004 Nov;45(11):568-71

Juvenile nephropathy in two related Pembroke Welsh corgi puppies.

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Juvenile nephropathy has been documented in many breeds. Two related Pembroke Welsh corgi puppies presented at three and five months of age, respectively, for evaluation of lethargy, diarrhoea, poor body condition, polyuria and proteinuria. Based upon the clinical presentation, urinalysis and serum biochemistry, chronic renal failure was diagnosed. Renal histopathology was consistent with juvenile nephropathy, revealing lesions similar to the

juvenile renal disease of dobermann dogs. To the authors' knowledge, this is the first report of juvenile nephropathy in related Pembroke Welsh corgi dogs. Familial nephropathy should now be considered as a differential diagnosis in cases of young Pembroke Welsh corgi dogs presenting with clinical signs indicating renal failure.

J Small Anim Pract. 2004 Nov;45(11):563-7

Chronic renal failure in an English bull terrier with polycystic kidney disease.

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An entire female English bull terrier, aged five years and one month, was diagnosed with polycystic kidney disease by renal ultrasonography. It had thickening and abnormal motion of the mitral valve on 2D and M mode echocardiography, and left ventricular outflow tract obstruction, characterised by turbulence in the left ventricular outflow tract and elevated aortic blood flow velocity, detected by colour flow and spectral Doppler echocardiography, respectively. Two years later, haematology, serum biochemistry and urinalysis data suggested the presence of compensated renal failure. The dog was euthanased at 10 years and eight months of age, with haematology, serum biochemistry and urinalysis data indicating decompensated chronic renal failure. Postmortem examination confirmed polycystic kidney disease, chronic renal disease, mitral and aortic valvular myxomatous degeneration, and mixed mammary neoplasia. This case demonstrates that bull terriers with polycystic kidney disease may develop associated chronic renal failure.

J Small Anim Pract. 2004 Aug;45(8):413-6

Post-traumatic paraureteral urinoma in a cat.

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A retroperitoneal urinoma (uriniferous pseudocyst) was diagnosed in a domestic shorthair cat exhibiting a sublumbar swelling two weeks after a road traffic accident. Plain radiography revealed a soft tissue opacity in the left retroperitoneal space. Intravenous urography and fine-needle aspiration were diagnostic. Contrast was seen pooling in the dilated ipsilateral renal pelvis and proximal ureter. Fluid aspirated from the retroperitoneal space had a creatinine level five times that of serum. Surgical drainage followed by nephrectomy and omentalisation of the pseudocyst was curative.

J Small Anim Pract. 2004 Jul;45(7):343-9

Haematological and biochemical abnormalities in canine blood: frequency and associations in 1022 samples.

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Submission of blood samples to referral laboratories is very common in veterinary practice. Internal reference ranges should take into account published ranges adapted to the methods and apparatus used and to the population under consideration. The aim of this study was to examine the results from 1022 consecutive canine blood tests, analysing the frequency and the main associations of abnormalities, and to compare the results in different age groups. Haemograms and serum biochemistry were compared with internal ranges and between age groups: younger than one year, one to eight years and older than eight years. Young dogs exhibited lower numbers of erythrocytes and lower values for haemoglobin concentration and packed cell volume. They also showed higher numbers of lymphocytes and higher concentrations of phosphorus and 71 per cent showed raised alkaline phosphatase. Neutrophilia, hypergammaglobulinaemia and hypoalbuminaemia occurred quite frequently in all dogs, and hypoalbuminaemia and hyperphosphataemia were commonly seen in uraemic patients. The simultaneous evaluation of cytolytic and hepatobiliary enzymes allowed better detection of liver damage, since only a very low percentage of dogs had simultaneous increases in all hepatic enzymes.

J Small Anim Pract. 2004 May;45(5):267-71

Spinal neuroblastoma in a crossbreed dog.

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A three-year-old, male crossbreed dog presented with progressive hindlimb paresis. Magnetic resonance imaging revealed an intramedullary spinal cord lesion of 1.5 cm diameter at the levels of the first and second lumbar vertebrae. Following surgical excision of the mass, there was resolution of the neurological signs. Twelve months later, hindlimb paresis was again evident. A second surgical procedure restored ambulatory status for a further five months before signs recurred and the dog was euthanased. A diagnosis of spinal neuroblastoma was made on the basis of signalment, lesion location and histopathological analysis of biopsy specimens.

J Small Anim Pract. 2004 Apr;45(4):199-201

Acute paraplegia associated with vasculitis in a dog with leishmaniasis.

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A 14-month-old female crossbreed dog with leishmaniasis, receiving allopurinol, was presented with acute paraplegia. A diagnosis of renal failure with pelvic limb lower motor neuron signs was made and the dog was euthanased. Histopathological examination demonstrated leukocytoclastic vasculitis in multiple organs. Malacia and haemorrhage affecting the spinal cord was associated with multiple foci of vasculitis within the nervous tissue. Rupture and thrombosis of inflamed vessels caused haemorrhage in the spinal cord and subsequent paralysis.

Vaginectomy and urethroplasty as a treatment for non-pedunculated vaginal tumours in four bitches.

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Vaginal tumours are uncommon in dogs. Previous reports have shown that 73 to 94 per cent of documented vaginal tumours are benign and pedunculated, often on narrow stalks. Some vaginal tumours are non-pedunculated. They grow in a concentric way either towards the vestibular area or towards the cervix. Their growth can locally affect the function of other organs. Urethral and rectal compression as well as local neurological disturbances have been described. This case series describes total and partial vaginectomy associated with urethroplasty as a treatment for non-pedunculated vaginal tumours in four dogs. These surgical procedures allowed complete resection of the tumour and were associated with low morbidity. Postoperative management and short term outcome are discussed. The final outcome was favourable; throughout the follow-up period, no local recurrence or metastasis was encountered in the animals.

J Small Anim Pract. 2004 Mar;45(3):154-6.

Urethral haemangiosarcoma in a boxer.

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A seven-year-old, entire female boxer presented with a history of restless behaviour and

inappetence. Physical examination revealed that the dog was listless and had a hunched gait. Neurological examination was normal. Abdominal ultrasonography revealed a 4 cm x 4 cm mass in the cranial pelvic canal. Neurological abnormalities were detected three days after presentation, and progressed from proprioceptive deficits to loss of deep pain sensation in the pelvic limbs over a two-day period. The dog was euthanased and postmortem examination revealed that the pelvic mass was a urethral haemangiosarcoma with metastasis to the second lumbar vertebra. This case is unusual as urethral tumours are usually transitional cell carcinomas and frequently present with signs of dysuria.

J Small Anim Pract. 2004 Mar;45(3):144-7

A study of environmental and behavioural factors that may be associated with feline idiopathic cystitis.

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The cause of cystitis in many cats remains unknown. The aim of this study was to determine whether or not any environmental or behavioural factors, particularly those that could be considered potentially stressful, were associated with feline idiopathic cystitis (FIC). The questionnaire-based study involved comparing 31 cats with FIC to 24 cats in the same households that did not have cystitis. They were also compared with a control population of 125 clinically healthy cats. Compared with the live-in controls and the control population, the cats with FIC were significantly more likely to be male, overweight and pedigree. Several stress factors were found to be associated with FIC. The factor that stood out most prominently was living with another cat with which there was conflict. The findings support the hypothesis that stress may be implicated in some cases of FIC.

Journal of Veterinary Internal Medicine (March 04 – March 05)

J Vet Intern Med. 2004 Nov-Dec;18(6):902-3

Bilateral perirenal abscesses in a domestic neutered shorthair cat.

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J Vet Intern Med. 2004 Nov-Dec;18(6):800-6

Vasopressin response to osmotic stimulation in 18 young dogs with polyuria and polydipsia.

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Common disorders of water homeostasis leading to polyuria include a variety of endocrine, metabolic, and renal disturbances. After exclusion of most of these conditions, the diagnostic dilemma of differentiating between central diabetes insipidus, primary polydipsia, and nephrogenic diabetes insipidus may remain. Here, we report on 18 young dogs with polyuria that had been present in most cases since the dogs were puppies. The conditions were categorized according to the plasma vasopressin (VP) response to hypertonicity. The VP response to osmotic stimulation was tested by IV infusion of 20% NaCl for 2 hours. The VP response in all dogs was abnormal. Three categories could be distinguished: an exaggerated response (n = 3), a subnormal response (n = 4), and a nonlinear response with high plasma VP concentrations unrelated to increases in plasma osmolality (n = 11). The VP response to hypertonicity did not consistently distinguish among different clinical entities. In the 9 dogs with variations in urine osmolality compatible with primary polydipsia, exaggerated, subnormal, and nonlinear responses were observed. Examination of the present data questions the generally accepted notion that VP measurements during hypertonic saline infusion are the "gold standard" for the diagnostic interpretation of causes of polydipsia and polyuria. Studies of the peripheral reflection in plasma of the pulsatile VP release in healthy and polyuric individuals, with and without osmotic provocation, should be performed.

J Vet Intern Med. 2004 Sep-Oct;18(5):625-31

Plasma renin activity and plasma concentrations of aldosterone, cortisol, adrenocorticotrophic hormone, and alpha-melanocyte-stimulating hormone in healthy cats.

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A pathogenetic role of the renin-angiotensin-aldosterone system has been implicated in cats in both systemic arterial hypertension and hypokalemic myopathy. Yet, measurement of plasma aldosterone concentrations (PACs) and plasma renin activity (PRA) has not unequivocally pointed to hyperaldosteronism as a cause of these conditions. To obtain appropriate reference ranges, this study included a large number (130) of healthy house cats of different breeds without a history of recent illness and plasma concentrations of urea and creatinine below the upper limit of the respective reference ranges. In addition, the pituitary-adrenocortical axis was studied by measuring plasma concentrations of adrenocorticotrophic hormone (ACTH), alpha-melanocyte-stimulating hormone (alpha-MSH),

and cortisol. Reference ranges for PACs (110-540 pmol/L; 40-195 pg/mL), PRA (60-630 fmol/L/s; 0.3-3 ng/mL/h), and the aldosterone to renin ratio (ARR) (0.3-3.8) were very similar to those established in the same laboratory for humans in a supine position. No breed differences were found. The ARRs in neutered cats were significantly higher than in intact cats, primarily because of low PRA in neutered cats. The ARRs of cats \geq 5 years of age were significantly higher than those of cats $<$ 5 years of age. The plasma concentrations of ACTH, alpha-MSH, and cortisol did not correlate significantly with PAC. Thus, although blood sampling was performed in cats in nonstandardized positions and was associated with a wide variation of stress responses, the reference ranges of PAC, PRA, and ARR were similar to the relatively narrow limits established for humans under standardized conditions. The effects of neutering and aging on PRA and ARR warrant further investigation.

J Vet Intern Med. 2004 Sep-Oct;18(5):618-24

Free light-chain proteinuria and normal renal histopathology and function in 11 dogs exposed to *Leishmania infantum*, *Ehrlichia canis*, and *Babesia canis*.

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The purpose of this retrospective study was to investigate the relationship among proteinuria consisting of immunoglobulin free light chains (FLCs), renal histopathologic findings, and routine markers of renal function in 11 dogs exposed to *Leishmania infantum* (n = 8), *Ehrlichia canis* (n = 2), and *Babesia canis* (n = 1). FLC proteinuria was suspected based on identification of a 22- to 27-kDa band by sodium dodecyl sulfate-agarose gel electrophoresis (SDS-AGE) and later confirmed by immunofixation electrophoresis. SDS-AGE identified an isolated band of 22-27 kDa in 8 dogs, whereas the remaining 3 had a 22- to 27-kDa band and an additional band of 67-72 kDa. The median urine protein-to-urine creatinine ratio was 0.37 (range, 0.11-2.24) and increased ratios were found in 6 dogs (54.5%) (reference value, $<$ 0.7). All dogs underwent histologic examination of renal percutaneous biopsy specimens and determination of serum creatinine and urea concentrations. Tissue samples for light microscopy were stained with hematoxylin-eosin, periodic acid-Schiff, Goldner's trichrome, and methenamine silver. In the study group, the glomerular tufts, mesangium, tubulointerstitium, and vessels appeared unaffected. The median serum creatinine concentration in these 11 dogs was 1.3 mg/dL (range, 0.8-1.5 mg/dL; reference range, 0.6-1.5 mg/dL), whereas the concentration for urea was 28 mg/dL (range, 22-52 mg/dL; reference range, 20-50 mg/dL). All dogs had normal renal morphology and had normal serum creatinine and urea concentrations, suggesting that immunoglobulin FLC may be detected in the urine of dogs exposed to *L. infantum*, *E. canis*, and *B. canis* without any apparent structural or functional renal derangement.

J Vet Intern Med. 2004 Jul-Aug;18(4):483-7

Inheritance of urinary calculi in the Dalmatian.

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Dalmatians are unique among dogs in that they excrete uric acid in their urine as the end product of purine metabolism rather than allantoin as do other breeds of dogs. Urinary calculi form from urate (salts of uric acid) and can cause urethral obstruction in male Dalmatians. Although all Dalmatians have the primary defect, only a subset develops clinical disease. We postulated that calculi formation might have a genetic component that segregates within the breed, causing some animals to form calculi and others to never form calculi despite excreting uric acid in their urine. We used a survey to ascertain the urinary calculi status based on clinical signs of adult Dalmatians aged 6 years or older, and we used pedigrees from these same animals to estimate the heritability of the clinical manifestation of urate calculi within the breed to be .87 (.75-.96). The prevalence of the disease was 34% (24.99-43.70%) among male Dalmatians in our survey. The high heritability of the disease makes it possible for breeders to effectively select against the disease.

J Vet Intern Med. 2004 May-Jun;18(3):301-6

Molecular investigation of Escherichia coli strains associated with apparently persistent urinary tract infection in dogs.

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Persistent Escherichia coli urinary tract infection (UTI) in dogs is a frustrating clinical problem. Affected dogs often appear to fail to respond to therapy or to reacquire infection shortly after therapy is completed. Urovirulence factors (UVFs) of the infecting E. coli, antibiotic resistance, and tissue colonization may be contributory but have not been evaluated in dogs with persistent E. coli UTI. In this study, the strain types of E. coli in dogs with persistent UTI were evaluated with pulsed-field gel electrophoresis (PFGE) to determine whether persistence was due to acquisition of new isolates or failure to eradicate existing isolates. UVFs in these isolates, assessed by polymerase chain reaction, and antibiograms were correlated with treatment outcome in these dogs. Results documented a mixed pattern: 9 dogs remained chronically infected with 1 or 2 strains, each with distinct reproducible UVFs, but 1 dog was infected with numerous unrelated E. coli strains over time. Two dogs had a mixed pattern, consisting of 1 or more episodes of persistent E. coli infection attributable to a single strain in addition to episodes caused by unrelated strains. Many isolates had no detectable UVFs, highlighting the likely importance of impaired colonization resistance in the affected dogs. Antibiotic resistance was common, often in response to previous treatments, especially with trimethoprim-sulfamethoxazole. Antibiotic resistance

patterns differed significantly within PFGE strain types, suggesting lateral acquisition of resistance plasmids or integrons. These results can be used to help guide testing for and management of persistent *E. coli* UTI in dogs.

J Vet Intern Med. 2004 May-Jun;18(3):289-94.

Association of systemic hypertension with renal injury in dogs with induced renal failure.

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Systemic hypertension is hypothesized to cause renal injury to dogs. This study was performed on dogs with surgically induced renal failure to determine whether hypertension was associated with altered renal function or morphology. Mean arterial pressure (MAP), heart rate (HR), systolic arterial pressure (SAP), and diastolic arterial pressure (DAP) were measured before and after surgery. Glomerular filtration rate (GFR) and urine protein:creatinine ratios (UPC) were measured at 1, 12, 24, 36, and 56-69 weeks after surgery, and renal histology was evaluated terminally. The mean of weekly MAP, SAP, and DAP measurements for each dog over the 1st 26 weeks was used to rank dogs on the basis of MAP, SAP, or DAP values. A statistically significant association was found between systemic arterial pressure ranking and ranked measures of adverse renal responses. When dogs were divided into higher pressure and lower pressure groups on the basis of SAP, group 1 (higher pressure, n = 9) compared with group 2 (lower pressure, n = 10) had significantly lower GFR values at 36 and 56-69 weeks; higher UPC values at 12 and 56-69 weeks; and higher kidney lesion scores for mesangial matrix, tubule damage, and fibrosis. When dogs were divided on MAP and DAP values, group 1 compared with group 2 had significantly lower GFR values at 12, 24, 36, and 56-69 weeks; higher UPC values at 12 and 56-69 weeks; and higher kidney lesion scores for mesangial matrix, tubule damage, fibrosis, and cell infiltrate. These results demonstrate an association between increased systemic arterial pressure and renal injury. Results from this study might apply to dogs with some types of naturally occurring renal failure.

J Vet Intern Med. 2004 May-Jun;18(3):271-81

Digital fluoroscopic excretory urography, digital fluoroscopic urethrography, helical computed tomography, and cystoscopy in 24 dogs with suspected ureteral ectopia.

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The purpose of this study was to determine the diagnostic utility of helical computed tomography (CT) for the diagnosis of ectopic ureters in the dog and to compare these findings with those of digital fluoroscopic excretory urography and digital fluoroscopic urethrography. Ureteral ectopia was confirmed or disproved based on findings from cystoscopy and exploratory surgery or postmortem examination. Of 24 dogs (20 female, 4 male) evaluated, 17 had ureteral ectopia. Digital fluoroscopic excretory urography and CT correctly identified ureteral ectopic status and site of ureteral ectopia ($P < .05$). Urethrography did not reliably detect ureteral ectopia. No false-positive diagnoses of ureteral ectopia were made in any of the imaging studies. Cystoscopic findings significantly agreed with findings during surgery in determining ureteral ectopic status and ectopic ureter site. One false-positive cystoscopic diagnosis of unilateral ureteral ectopia was made in a male dog. Kappa statistics showed better agreement between CT and both cystoscopy and surgical or postmortem examination findings with regard to presence and site of ureteral ectopia compared with other imaging techniques. CT was more useful than other established diagnostic imaging techniques for diagnosing canine ureteral ectopia.

J Vet Intern Med. 2004 Mar-Apr;18(2):165-75

Diet modulates proteinuria in heterozygous female dogs with X-linked hereditary nephropathy.

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Young adult heterozygous (carrier) female dogs with X-linked hereditary nephropathy (XLHN) have glomerular proteinuria but are otherwise healthy. Because data regarding dietary influences on the magnitude of proteinuria in dogs with spontaneous glomerular disease are not available, 12 such dogs were studied in a double crossover experiment intended to determine effects of altering dietary protein intake for up to 6 weeks. Dogs were blocked by urine protein : creatinine ratio (UPC) and randomly assigned to receive 2 diets: high protein (34.6% dry matter [DM], HP) or low protein (14.1% DM, LP) fed in HP-LP-HP or LP-HP-LP sequence. Food intake was measured daily, body weight (BW) was measured twice weekly, and UPC, plasma creatinine, blood urea nitrogen, phosphorus, albumin, and protein concentrations were measured at 2-week intervals. Nutrient digestibility was measured during the third treatment period. Diet had a significant effect ($P < .0001$) on all measured variables except plasma phosphorus ($P > .5$), but unintended differences in digestibility of protein and energy ($P < \text{or} = .01$) prevented assignment of the diet effect exclusively to protein. Proteinuria was greater (UPC 4.7 +/- 2.2 versus 1.8 +/- 1.1, $P < .0001$) when the HP diet was fed, but the LP diet did not maintain starting BW or plasma albumin concentration within the normal reference range. Diet greatly affects the magnitude of proteinuria in XLHN carrier females. Dietary protein restriction can reduce proteinuria in dogs with glomerular disease, but BW and blood protein concentrations may not be maintained if the restriction is too severe.

J Vet Intern Med. 2004 Mar-Apr;18(2):141-6

Azotemia and mortality among Babesia microti-like infected dogs.

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Babesia microti-like piroplasms are a recently recognized cause of illness in dogs in northwest Spain. Our objective was to describe the clinical characteristics and investigate the risk factors for azotemia and death among 58 B microti-like infected dogs. Twenty-one of the 58 (36%) dogs were azotemic at the time that the infection was diagnosed. The case fatality rate during the following week was 22%. Dogs with azotemia at the time of diagnosis were 10 times (95% CI, 3.26-28.8) more likely to die during the following week. Azotemia was the main cause of death for B microti-like infected dogs (attributable fraction = 90%). Severe anemia was present in 45 of the 58 (78%) dogs. Azotemic dogs also presented with hyperphosphatemia, hypoalbuminemia, hypercholesterolemia, proteinuria, and high urine protein: creatinine ratios, suggesting a glomerular component to the disease. Age was the only factor significantly associated with the risk of azotemia ($P = .042$): on average, a 4-year age increase doubled the risk of an infected dog being azotemic. The only factor significantly associated with mortality was azotemia ($P = .001$). We concluded that B microti-like infection is associated with a high risk of azotemia and mortality.

J Vet Intern Med. 2004 Jan-Feb;18(1):113-6

Cystoscopic appearance of proliferative urethritis in 2 dogs before and after treatment.

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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 \geq 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. 2004 Jan-Feb;18(1):47-51

Antinuclear antibodies can be detected in dog sera reactive to *Bartonella vinsonii* subsp. *berkhoffii*, *Ehrlichia canis*, or *Leishmania infantum* antigens.

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The presence of antinuclear antibodies (ANAs) is used to support a clinical diagnosis of systemic lupus erythematosus (SLE) in dogs. However, clinicians must interpret the detection of ANAs with caution, particularly in light of increasing evidence that dogs with known bacterial and protozoal infections can have high ANA titers. Retrospectively, medical records were reviewed for all dogs that were concurrently tested for antinuclear antigens and *Bartonella vinsonii* (*berkhoffii*), *Ehrlichia canis*, or *Rickettsia rickettsii* antigens between 1990 and 2000. When analyzed on the basis of reactivity to a specific infectious agent, 75% of the *B vinsonii* (*berkhoffii*) seroreactors, 16.7% of the *E canis* seroreactors, and 0% of the *R rickettsii* seroreactors had concurrent ANAs. Subsequent prospective testing did not detect ANAs in convalescent sera from dogs experimentally infected with *B vinsonii* (*berkhoffii*), *E canis*, or *R rickettsii*. However, 10-20% *B vinsonii* (*berkhoffii*), *E canis*, or *Leishmania infantum* reactive sera from naturally infected dogs contained ANAs. In addition, 45% of sera from dogs that are reactive to multiple vectorborne organisms were more likely to contain ANAs when compared to sera from dogs reactive to only 1 test antigen. When interpreting the relevance of seroreactivity to nuclear antigens, clinicians should recognize that dogs with seroreactivity to *B vinsonii* (*berkhoffii*), *E canis*, or *L infantum* antigens (especially those with seroreactivity to more than one of these pathogens) may produce ANAs.

Journal of Veterinary Medical Science (Jan 04 – March 05)

J Vet Med Sci. 2005 Mar;67(3):249-54

Enzyme-linked immunosorbent assay for the detection of canine *Leptospira* antibodies using recombinant OmpL1 protein.

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OmpL1 is a 31-kDa outer membrane protein characterized in 1993 and known to be expressed only in pathogenic *Leptospira* spp. Recombinant OmpL1 (GST-rOmpL1) was expressed for use as an ELISA antigen for the detection of anti-*Leptospira* antibodies. In immunoblot analysis, the protein reacted with sera of dogs infected with three different serotypes of *Leptospira interrogans*, while did not react with sera of dogs both uninfected negative controls and infected with *Borrelia burgdorferi*, which is closely related to *Leptospira* spp. Moreover, in ELISA using GST-rOmpL1, the optical density (O.D.) values from the positive controls were very high (1.125 +/- 0.549). In contrast, the O.D. values from clinically healthy dogs and dogs with diseases other than leptospirosis were very low (0.109 +/- 0.046 and 0.089 +/- 0.046, respectively). These data suggest that the detection of anti-*Leptospira* antibodies by ELISA using the GST-rOmpL1 protein can be applied for diagnosis of canine leptospirosis.

J Vet Med Sci. 2005 Jan;67(1):57-61

Diagnostic ultrasound of polypoid cystitis in dogs.

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Polypoid cystitis is a rare disease of the urinary bladder in dogs characterized by chronic inflammation, epithelial proliferation, and development of a polypoid mass or masses without histopathologic evidence of neoplasia. The ultrasonographic appearances of eight dogs with polypoid cystitis are described. Ultrasonography confirmed the presence of a bladder mass or masses in all patients. Ultrasonographic findings are mucosal projections and a polypoid to pedunculated mass of variable size and shape. Although a polypoid mass tends to be located in the cranioventral bladder mucosa, the polyps also could arise in the craniodorsal bladder mucosa. Ultrasonographic images are well correlated with contrast radiographic studies and gross morphological appearance. Ultrasound is a non-invasive, very useful diagnostic tool for detecting bladder polyps, but histopathology is required for definitive diagnosis.

J Vet Med Sci. 2004 Dec;66(12):1517-21

Serodiagnosis of *Babesia gibsoni* infection in dogs by an improved enzyme-linked immunosorbent assay with recombinant truncated P50.

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The surface antigen P50 of *Babesia gibsoni* is an important candidate for the development of a diagnostic reagent for canine piroplasmiasis. In order to establish an effective diagnostic method for practical use, the gene encoding truncated P50 (P50t) lacking a signal peptide and C-terminal hydrophobic regions were cloned and expressed in *Escherichia coli* as a fusion protein with glutathione S-transferase (GST). More than 90% portion of the GST-P50t was expressed as a soluble form, in contrast with GST-P50f (full-length), which was completely expressed as an insoluble form. This result indicates that removal of the hydrophobic signal peptide and C-terminus had dramatically improved its hydrophilicity. The purified GST-P50t was tested in an enzyme-linked immunosorbent assay (ELISA) for detection of antibodies to *B. gibsoni* in dogs. The ELISA with GST-P50t clearly differentiated between *B. gibsoni*-infected dog sera and uninfected dog sera. In addition, the ELISA detected no cross-reactivity with sera from dogs experimentally infected with the closely related parasites, *B. canis canis*, *B. canis vogeli*, and *B. canis rossi*. Field serum samples collected from dogs in Japan and China were examined for the diagnosis of *B. gibsoni* infection by using the ELISA. 14.5% (9/62), 5.8% (7/120), and 5.4% (2/37) of tested samples were positive for dogs from Okinawa, Yamaguchi, and Osaka prefectures, Japan, respectively. On the other hand, 4.8% (2/41) of tested samples were positive for dogs from Nanjing, China. These results suggest that the GST-P50t could be a reliable reagent for practical use in ELISA for the serodiagnosis of canine piroplasmiasis caused by *B. gibsoni*.

J Vet Med Sci. 2004 Sep;66(9):1097-105

Effects of dopamine, dobutamine, amrinone and milrinone on regional blood flow in isoflurane anesthetized dogs.

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The effects of cyclic AMP increasing cardiotonics (dopamine, dobutamine, amrinone and milrinone) on the blood flow in most organs were compared using colored microsphere technique in isoflurane-anesthetized dogs. Dopamine increased blood flow in ventricular myocardium. Furthermore dopamine induced the increase in blood flow in intestine and kidney at low to middle dose, but not at high dose. Dobutamine induced the highest increase in blood flow in ventricular myocardium and skeletal muscle among the drugs evaluated at middle and high doses. Amrinone and milrinone increased blood flow in ventricular myocardium almost same with catecholamines, and milrinone decreased vascular resistance moderately in most other organs. Milrinone might be more useful than catecholamines for improvement of congestive heart failure or peripheral circulatory failure accompanied with exceeded vasoconstriction.

J Vet Med Sci. 2004 Mar;66(3):329-31

Hypercalcemia in a dog with resolution of iatrogenic Cushing's syndrome.

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A six-year-old spayed Pug was presented with crust formation and ulcer on the skin. The patient had received long-term glucocorticoid therapy for treatment of tentatively diagnosed panniculitis. Severe calcification and pyoderma was observed and the patient was diagnosed with iatrogenic Cushing's syndrome and prednisolone was gradually withdrawn. After the withdrawal, the patient developed marked hypercalcemia (15.3 mg/dl) and finally died from renal failure. It is postulated that the eluted calcium from the calcified lesions may have contributed to the high serum calcium level as the underlying disease was not identified on necropsy.

Journal of Veterinary Pharmacology and Therapeutics (March 03 – April 05)

J Vet Pharmacol Ther. 2005 Feb;28(1):57-63.

Evaluation of the anti-endotoxic effects of polymyxin-E (colistin) in dogs with naturally occurred endotoxic shock.

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Endotoxin is a potent stimulator of the inflammatory response and is believed to initiate the pathology in gram-negative sepsis. Agents are being searched for that bind and neutralize or block the effects of endotoxin. The aim was to study the anti-endotoxic effects of polymyxin-E (colistin) in endotoxaemic dogs. The study included a total of 30 endotoxaemic dogs, which were divided into two groups (control = 15; test = 15) of both sexes, different breeds and ages. Hetastarch colloid solution (Expahes, 10 mL/kg, i.v.) with lactated Ringer's solution (20 mL/kg, i.v., Q12 h) was given to all dogs. While ampicillin was administered (Alfasilin, 10 mg/kg, i.m., Q12 h) as an antibacterial to the control group, colistin (12,500 IU/kg, i.m., Q12 h) + ampicillin were administered to the test group. The clinical examination (body temperature, pulse and respiration rates, capillary filling times, peripheral pulse qualities, dehydration degrees), hematological and biochemical examinations (WBC, RBC, HGB, HCT,

thrombocyte, serum urea, creatinine and TNF-alpha) were performed both before the treatment, and 2, 4, 12 and 24 h after the treatment. In comparison with the control group, it was observed that test group had shorter capillary filling time at 24 h ($P < 0.001$). Moreover, the degree of dehydration in test group, was significantly improved at 24 h ($P < 0.01$). While the differences in peripheral pulse qualities significantly differed between 0 and 2 h in controls, at 2, 4, 24 h after treatment it was found to be significantly increased when compared with 0 h in the test group. Serum TNF-alpha concentrations were statistically decreased in the test group between 0 h and other times ($P < 0.01$). When compared with controls, serum TNF-alpha concentrations were lower at 2, 4, 12 and 24 h in test group ($P < 0.05$). Results of the study indicated that polymyxin-E (colistin) has an anti-endotoxic effect and is safe for the dogs with endotoxemia at the dosage used in this study.

J Vet Pharmacol Ther. 2004 Dec;27(6):515-25

Pharmacokinetics and pharmacokinetic/pharmacodynamic relationships for angiotensin-converting enzyme inhibitors.

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The pharmacokinetic (PK) properties and the pharmacokinetic/pharmacodynamic (PK/PD) relationships for the angiotensin-converting enzyme (ACE) inhibitors (ACEIs), such as enalaprilat, benazeprilat, imidaprilat and ramiprilat, differ from those of conventional drugs. This is because of their immediate and saturable binding to an ACE pool which is partly circulating (and contributing to the measured plasma concentration), and partly noncirculating (tissular), being anchored to the endothelium of vessels and not measurable by the analytical technique. A physiologically based model is required to allow appropriate interpretation of the different phases of the disposition curve of ACEI. The protracted terminal phase observed for all ACEIs is not a conventional elimination phase but a phase dependent on ACEI dissociation from ACE. In contrast, the phase which reflects ACEI elimination (and which is interpreted as a distribution phase for a conventional drug) has a short half-life, thus explaining the absence of drug accumulation during repeated dosing and mild kidney failure. ACE inhibition is the surrogate endpoint generally selected for establishing a PK/PD relationship and for simulating dosage regimen scenarios in order to decide on the appropriate dosage regimen for ACEIs.

J Vet Pharmacol Ther. 2004 Oct;27(5):265-81

Angiotensin-converting enzyme inhibitors in the therapy of renal diseases.

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Renal diseases, especially chronic renal failure (CRF), are common in canine and feline medicine. The renin-angiotensin-aldosterone system (RAAS) plays a pivotal role in these conditions in the development of renal lesions and the progression of kidney dysfunction. Angiotensin-converting enzyme inhibitors (ACEI) are currently considered as the most efficient agents in therapeutic strategies. The benefit of an ACEI treatment can be explained by at least three mechanisms: ACEI limit systemic and glomerular capillary hypertension, have an antiproteinuric effect, and retard the development of glomerulosclerosis and tubulointerstitial lesions. These effects have been studied in dogs and cats, and there is now some evidence to support the recommendation of ACEI therapy in dogs and cats with CRF. Nevertheless the prescription of ACEI in such patients should take into account the potential influence of renal impairment on ACEI disposition, and adverse effects on the renal function itself (especially hypotension and acute reductions in glomerular filtration rate). The risk of drug interaction with diuretics, nonsteroidal anti-inflammatory drugs and anesthetics, should not be overestimated. Furthermore, hypotension may occur in patients on a low sodium diet.

J Vet Pharmacol Ther. 2004 Jun;27(3):129-38

Idiosyncratic toxicity associated with potentiated sulfonamides in the dog.

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Idiosyncratic toxicity to potentiated sulfonamides occurs in both humans and dogs, with considerable clinical similarities. The syndrome in dogs can consist of fever, arthropathy, blood dyscrasias (neutropenia, thrombocytopenia, or hemolytic anemia), hepatopathy consisting of cholestasis or necrosis, skin eruptions, uveitis, or keratoconjunctivitis sicca. Other manifestations seen less commonly include protein-losing nephropathy, meningitis, pancreatitis, pneumonitis, or facial nerve palsy. The pathogenesis of these reactions is not completely understood, but may be due to a T-cell-mediated response to proteins haptenated by oxidative sulfonamide metabolites. Our laboratory is working on tests to characterize dogs with possible idiosyncratic sulfonamide reactions, to include ELISA for anti-drug antibodies, immunoblotting for antibodies directed against liver proteins, flow cytometry for drug-dependent anti-platelet antibodies, and in vitro cytotoxicity assays. The management of idiosyncratic sulfonamide toxicity involves client education to identify clinical signs early and allow rapid drug discontinuation, supportive care to include possibly ascorbate and glutathione precursors, and avoidance of subsequent re-exposure. It is important to realize that only antimicrobial sulfonamides, such as sulfamethoxazole, sulfadiazine, and sulfadimethoxine, share this clinical syndrome. There is no evidence for cross-reactivity with drugs that have different underlying structures but share a sulfonamide moiety, such as acetazolamide, furosemide, glipizide, or hydrochlorothiazide.

Journal of Veterinary Science (March 04 – April 05)

J Vet Sci. 2005 Mar;6(1):81-2

Cystic endometrial hyperplasia and endometritis in a dog following prolonged treatment of medroxyprogesterone acetate.

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An 8-year-old female Yorkshire Terrier was presented for investigation of reduced appetite, and occasional vomiting. She has been treated with medroxyprogesterone acetate (MPA) from past 3 year-old age for contraception. Abdominal sonography showed abnormal enlargement of uterus, and ovariohysterectomy was performed. Main gross findings of uterus were enlarged lesions in two areas of the left horn, which had thickened wall and yellowish sticky material in the lumen. Histopathologically, cystic endometrial hyperplasia (CEH) and endometritis were present in the thickened area. In this case, CEH and endometritis may be attributed to prolonged treatment of MPA. It was concluded that further study is needed to clarify the association of MPA treatment with age, its pathogenesis and abnormal uterine changes in dogs.

Research in Veterinary Science (March 04 – April 05)

Res Vet Sci. 2004 Aug;77(1):63-6

Oxidative stress and non-enzymatic antioxidative status in dogs with visceral Leishmaniasis.

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Leishmaniasis is a potentially fatal chronic protozoan disease in human, canine and rodent species. The infection by *Leishmania* is endemic in the Mediterranean Sea region, Africa, Asia and South America. Canine visceral leishmaniasis (CanVL) is a systemic disease caused by *Leishmania infantum* and *Leishmania chagasi* from the *Leishmania donovani* complex group. The blood glutathione (GSH), plasma malondialdehyde (MDA), ascorbic acid (AA), beta-carotene, retinol and ceruloplasmin levels of dogs with CanVL were investigated to establish

the status of the antioxidant defense mechanism in the infected animals. Dogs diagnosed as CanVL with amastigotes in lymph node smear examination and/or antibody titers ≥ 128 were used as subjects, while those with no serological response against leishmaniasis were used as healthy controls. The glutathione and retinol amounts were decreased although not significantly ($p > 0.05$), but the MDA levels were significantly higher in dogs with VL, suggesting increased lipid peroxidation.

Res Vet Sci. 2004 Feb;76(1):63-8

Immunohistochemical localization of the progesterone and oestrogen receptors in the shell gland of sexually immature ostriches (*Struthio camelus*) with active or inactive ovaries.

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(A tribute to the passionate reader²)

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The immunohistochemical localization of progesterone and oestrogen receptors was studied in the shell gland of the immature ostrich (*Struthio camelus*) during periods of ovarian activity and inactivity. In birds with active ovaries moderate to strong immunostaining for the progesterone receptor was observed in the surface epithelium and tubular glands. In contrast faint progesterone receptor immunostaining was observed in the surface epithelium of the shell gland in ostriches with inactive ovaries. In addition, bud-like invaginations of the surface epithelium, which signaled tubular gland development, were negative for the progesterone receptor. Oestrogen receptor immunostaining, which was seen only in birds with active ovaries, was weak and restricted to nuclei of the surface epithelium. These results suggest that steroid hormones secreted by the active ovary regulate the differentiation of the shell gland. Furthermore, the influence of these hormones on the shell gland appears to be mediated predominantly through the activation of the progesterone receptor.

Veterinary Clinical Pathology (March 04 – April 05)

Vet Clin Pathol. 2004;33(3):128-32

Inaccuracy of routine creatinine measurement in canine urine.

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BACKGROUND: Urine creatinine concentration often is used in ratios such as urine protein:creatinine to compensate for dilution or concentration of spot urine samples. **OBJECTIVE:** The purpose of this study was to compare the accuracy of different techniques of urine creatinine measurement currently available for veterinary practitioners. **METHODS:** In 104 samples of canine urine diluted 1:20 with distilled water, creatinine concentration was measured using a kinetic Jaffe reaction assay, and an enzymatic technique on an automatic analyzer (Elimat) and 3 benchtop analyzers (Reflovet, Scil; Vitros DT2, Ortho-Clinical Diagnostics; Vetest 8008, IDEXX) used in veterinary practice. **RESULTS:** The Jaffe and enzymatic techniques on the Elimat were not significantly different, and their inaccuracy tested with human control urines was <5%. The benchtop analyzers underestimated creatinine concentration, especially at concentrations >2000 mg/L. Inaccuracy was higher with multilayer slide technology systems (Vitros and Vetest) than with the Reflovet system. Results were approximately 25% and 2% lower, respectively, than with the Elimat at urine creatinine concentrations about 2000 mg/L. **CONCLUSION:** Inaccuracy in urine creatinine measurements using benchtop analyzers should be taken into account when defining decision thresholds, which should be corrected according to the method used to avoid misinterpretations.

Veterinary Record (Feb04 – April 05)

Vet Rec. 2004 Sep 11;155(11):326-9

Use of endoscopy and renal biopsy for the diagnosis of kidney disease in free-living birds of prey and owls.

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Eighty-nine free-living birds of prey and owls were examined and blood samples and radiographs were taken. In addition, 126 specimens of renal tissue were obtained without complications, with a mean postbiopsy haemorrhage time of 67 seconds. On average, the samples were 2.2 mm long, 1.3 mm wide and 1.0 mm deep and they all contained proximal and distal tubuli and from one to 89 glomeruli; 49 of them contained from one to four intralobular veins, and on average each sample contained 10.7 per cent air sac tissue; 113 of the 126 samples could be evaluated histologically.

Vet Rec. 2004 May 1;154(18):562-5

Left perinephric abscess associated with nephrolithiasis and bladder calculi in a bitch.

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An eight-year-old, entire female Pekingese cross, weighing 3.8 kg, had been inappetent with fever, depression, abdominal pain, vomiting and diarrhoea for seven days. The radiographic and ultrasonographic findings were consistent with glomerulonephritis, nephrolithiasis in both kidneys, bladder calculi and an accumulation of fluid in the left perinephric space. The clinical signs, together with the results of the diagnostic imaging, suggested that this fluid could be pus. A definitive diagnosis of a subcapsular abscess in the left kidney was established when this kidney was removed surgically. A histopathological examination of the kidney revealed a diffuse suppurative interstitial nephritis, membranous glomerulonephritis and an abscess invading the perinephric adipose tissue from the renal cortex. Twelve months after surgery the dog remains clinically stable, but owing to the disease of its remaining kidney its long-term prognosis is poor.

Veterinary Research Communications (Dec 04 – Apr. 05)

Vet Res Commun. 2005 May;29(4):281-6

Qualitative risk assessment of chronic renal failure development in healthy, female cats as based on the content of eicosapentaenoic acid in adipose tissue and that of arachidonic acid in plasma cholesteryl esters.

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A study was carried out to assess the qualitative risk of development of chronic renal failure (CRF) in young healthy, female cats as based on the content of arachidonic acid (AA) in plasma cholesteryl esters (CE) and eicosapentaenoic acid (EPA) in adipose tissue. It has been suggested that the content of AA in CE should be <10% of total fatty acids (TFA) and of EPA in adipose tissue be >1.4% of TFA. Subcutaneous adipose tissue and blood samples were obtained from 48 female cats. There was a statistically significant correlation between linoleic acid content of adipose tissue and that of plasma CE. In all cats the EPA content of adipose tissue was lower than 1.4% of TFA and in 30 cats that of AA in plasma CE was higher than 10% of TFA. The EPA content of adipose tissue and the AA content of plasma CE are determined by the contents of these fatty acids in the diet. It is concluded that the fatty acid composition of cat foods should be determined and that, if deemed necessary, the

ingredient composition should be altered so that the content of EPA is raised and that of AA is lowered.

Vet Res Commun. 2005 Apr;29(3):201-13

Effects of cyclosporin A on blood pressure, baroreceptor reflex and renal function in dogs.

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The objective of this study is to investigate the effect of cyclosporin A (CsA) on baroreceptor reflex and renal function. Fifteen male mongrel dogs weighing 13-18 kg were divided into three groups and were treated orally as follows: group 1, enalapril 0.5 mg/kg per day for 10 days; group 2, CsA 20 mg/kg per day for 7 days; group 3, enalapril 0.5 mg/kg per day for 3 days combined with CsA 20 mg/kg per day for 7 more days. Measurements of blood pressure and of baroreflex response to sodium nitroprusside (SNP) and phenylephrine (PE) and renal function studies were performed on the days before and after receiving drugs. In group 1, both systolic arterial pressure (SAP) and mean arterial pressure (MAP) were unaltered, while diastolic arterial pressure (DAP) was reduced significantly. In group 2, all pressures (SAP, MAP and DAP) increased significantly. Group 3 showed no change in blood pressure. Studies of baroreceptor reflex showed that only dogs in group 2 had decreased sensitivity to PE without changing the setpoint. No change of the reflex was found in other groups. Renal function studies were unaltered in all groups. The data indicate that CsA increased blood pressure, which may be due to decreased baroreceptor reflex sensitivity mediated via activation of the renin-angiotensin-aldosterone system.

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Serum levels of 25-hydroxycholecalciferol and 1,25-dihydroxycholecalciferol in dogs with hypercalcaemia.

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1,25-Dihydroxycholecalciferol (1,25-(OH)₂-D₃) and 25-hydroxycholecalciferol (25-OH-D₃) were measured among dogs with hypercalcaemia (total serum calcium > 3.01 mmol/L) due to various causes. All values were compared to those of healthy control dogs. Serum 1,25-(OH)₂-D₃ was measured by a radioimmunoassay test and serum 25-OH-D₃ was measured by a protein binding assay. 1,25-(OH)₂-D₃ ranged from 26 to 332 pmol/L (median 110.0) in dogs with lymphoma (n = 12); from 61 to 398 pmol/L (median 248.0) in dogs with primary hyperparathyroidism (n = 5); from 28 to 310 pmol/L (median 88.5) in dogs with chronic

renal failure (n = 10); and from 60 to 239 pmol/L (median 157.5) in control dogs (n = 24). There was no significant difference in 1,25-(OH)₂-D₃ among dogs with different causes of hypercalcaemia. 25-OH-D₃ ranged from 64 to 291 nmol/L (median 101.5) in dogs with lymphoma; from 66 to 298 nmol/L (median 91.0) in dogs with primary hyperparathyroidism; from 35 to 184 nmol/L (median 67.0) in dogs with chronic renal failure; and from 48 to 350 nmol/L (median 306.5) in control dogs. 25-OH-D₃ was significantly lower in dogs with lymphoma, primary hyperparathyroidism and chronic renal failure than in control dogs. 1,25-(OH)₂-D₃ and 25-OH-D₃ are not predictable in dogs with hypercalcaemia.

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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.