

Abstracts 2002-2003

[American Journal of Veterinary Research \(until Apr 03\)](#)

[Canadian Journal of Veterinary Research \(until Jan03\)](#)

[Journal of the American Animal Hospital Association \(until March 03\)](#)

[Journal of the American Veterinary Medical Association \(until Feb 03\)](#)

[Journal of Comparative Pathology \(until Apr 03 none\)](#)

[Journal of Small Animal Practice \(until Dec 02\)](#)

[Journal of Veterinary Internal Medicine \(until Dec 02\)](#)

[Journal of Veterinary Medical Science \(until Jan 03 none\)](#)

[Journal of Veterinary Medicine A \(until Nov 02\)](#)

[Journal of Veterinary Pharmacology and Therapeutics \(until Dec 02\)](#)

[Journal of Veterinary Science \(until Feb 03 none\)](#)

[Research in Veterinary Science \(until Feb 03 none\)](#)

[Veterinary Clinical Pathology \(until \(Apr 03\)](#)

[Veterinary Immunology and Immunopathology \(until March 03\)](#)

[Veterinary Record \(until Jan 03\)](#)

[Veterinary Research Communications \(until Dec 02 none\)](#)

[Veterinary Radiology and Ultrasound \(until Apr 03\)](#)

American Journal of Veterinary Research (until Apr 03)

Am J Vet Res 2003 Mar;64(3):321-7

Evaluation of the effects of inhibition of angiotensin converting enzyme with enalapril in dogs with induced chronic renal insufficiency.

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OBJECTIVE: To determine whether the angiotensin converting enzyme inhibitor enalapril would lower systemic arterial and glomerular capillary pressure and reduce the magnitude of renal injury in a canine model of renal insufficiency. **ANIMALS:** 18 adult dogs that had renal mass reduced by partial nephrectomy. **PROCEDURE:** After surgical reduction of renal mass and baseline measurements, dogs in 2 equal groups received either placebo (group 1) or enalapril (0.5 mg/kg, PO, q 12 h; group 2) for 6 months. **RESULTS:** Values for systemic mean arterial blood pressure determined by indirect and direct measurement after 3 and 6 months of treatment, respectively, were significantly lower in group 2 than in group 1. During treatment, monthly urine protein-to-creatinine ratios were consistently lower in group 2 than in group 1, although values were significantly different only at 3 months. At 6 months, significant reduction in glomerular capillary pressure in group 2 was detected, compared with group 1, but glomerular filtration rate in group 2 was not compromised. Glomerular hypertrophy, assessed by measurement of planar surface area of glomeruli, was similar in both groups. Glomerular and tubulointerstitial lesions were significantly less in group 2, compared with group 1. **CONCLUSIONS AND CLINICAL RELEVANCE:** Data suggest that inhibition of angiotensin converting enzyme was effective in modulating progressive renal injury, which was associated with reduction of glomerular and systemic hypertension and proteinuria but not glomerular hypertrophy. Inhibition of angiotensin converting enzyme may be effective for modulating progression of renal disease in dogs.

Am J Vet Res 2002 Sep;63(9):1226-31

Laparoscopic-assisted cystopexy in dogs.

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OBJECTIVE: To develop a laparoscopic-assisted technique for cystopexy in dogs. **ANIMALS:** 8 healthy male dogs, 7 healthy female dogs, and 3 client-owned dogs with retroflexion of the urinary bladder secondary to perineal herniation. **PROCEDURES:** Dogs were anesthetized, and positive pressure ventilation was provided. In the healthy male dogs, the serosal surface of the bladder was sutured to the abdominal wall. In the healthy female dogs, the serosa and muscular layer of the bladder were incised and sutured to the aponeurosis of the external and internal abdominal oblique muscles. Dogs were monitored daily for 30 days after

surgery. RESULTS: All dogs recovered rapidly after surgery and voided normally. In the female dogs, results of urodynamic (leak point pressure and urethral pressure profilometry) and contrast radiographic studies performed 30 days after surgery were similar to results obtained before surgery. Cystopexy was successful in all 3 client-owned dogs, but 1 of these dogs was subsequently euthanatized because of leakage from a colopexy performed at the same time as the cystopexy. CONCLUSIONS AND CLINICAL RELEVANCE: The laparoscopic-assisted cystopexy technique was quick, easy to perform, and not associated with urinary tract infection or abnormalities of urination.

Am J Vet Res 2002 Aug;63(8):1083-8

Alkaline phosphatase expression in tissues from glucocorticoid-treated dogs.

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OBJECTIVE: To determine the effect of glucocorticoids on the induction of alkaline phosphatase (ALP) isoenzymes in the liver, kidneys, and intestinal mucosa, 3 tissues that are principally responsible for ALP synthesis in dogs. SAMPLE POPULATION: Tissues from the liver, kidneys, and intestinal mucosa of 6 dogs treated with 1 mg of prednisone/kg/d for 32 days and 6 untreated control dogs. PROCEDURES: Using canine-specific primers for the ALP isoenzymes, a reverse transcription-polymerase chain reaction assay was designed to measure liver ALP (LALP) and intestinal ALP (IALP) mRNA and heterogeneous nuclear RNA (hnRNA) expression in tissues from the liver and kidneys and intestinal mucosa of glucocorticoid-treated and control dogs. Tissue ALP isoenzyme activities were compared between the groups. RESULTS: The LALP activity and mRNA concentrations increased in tissues of the liver and kidneys in dogs treated with prednisone, whereas LALP hnRNA increased only in liver tissues. The IALP activity and mRNA expression increased in intestinal mucosa and liver tissues in prednisone-treated dogs. We did not detect an increase in IALP hnRNA expression in these tissues. CONCLUSIONS AND CLINICAL RELEVANCE: Synthesis of ALP is increased in the liver, kidneys, and intestinal mucosa of dogs in response to prednisone treatment. This response appears to be regulated at the transcriptional level, but mechanisms may differ between LALP and IALP.

Am J Vet Res 2002 Jun;63(6):833-9

Effects of the calcium channel antagonist amlodipine in cats with surgically induced hypertensive renal insufficiency.

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OBJECTIVE: To determine whether amlodipine besylate decreases systemic arterial blood pressure (BP) and reduces the prevalence of complications in cats with induced hypertensive renal insufficiency. **ANIMALS:** 20 cats with partial nephrectomy. **PROCEDURE:** Following reduction in renal mass, 10 cats were administered 0.25 mg of amlodipine/kg, PO, q 24 h (group A). Ten cats served as a control group (group C). Systolic BP (SBP), diastolic BP (DBP), and mean BP (MBP), physical activity, and pulse rate were measured continuously for 36 days by use of radiotelemetric devices. **RESULTS:** Compared with values for clinically normal cats, SBP, DBP, and MBP were significantly increased in cats of group C. Cats in group A had significant reductions in SBP, DBP, and MBP, compared with values for cats in group C. Albuminuria but not urine protein-to-creatinine ratio was significantly correlated ($R^2 = 0.317$) with SBP in hypertensive cats. Prevalence of ocular lesions attributable to systemic hypertension in group C (7 cats) was greater than that observed in group A (2). Two cats in group C were euthanatized on day 16 because of neurologic complications attributed to systemic hypertension. One normotensive cat in group A was euthanatized because of purulent enteritis of unknown cause on day 27. **CONCLUSIONS AND CLINICAL RELEVANCE:** Amlodipine had an antihypertensive effect in cats with coexistent systemic hypertension and renal insufficiency. Its use may improve the prognosis for cats with systemic hypertension by decreasing the risk of ocular injury or neurologic complications induced by high BP.

Am J Vet Res 2002 Mar;63(3):370-3

Evaluation of a bladder tumor antigen test for the diagnosis of lower urinary tract malignancies in dogs.

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OBJECTIVE: To evaluate the use of a human bladder tumor antigen test for diagnosis of lower urinary tract malignancies in dogs. **SAMPLE POPULATION:** Urine samples from dogs without urinary tract abnormalities ($n = 18$) and from dogs with lower urinary tract neoplasia (20) or nonmalignant urinary tract disease (16). **PROCEDURE:** Test results were compared among groups and among 3 observers. The effects of urine pH and specific gravity, degree of hematuria, and storage temperature and time of urine samples on test results were also assessed. **RESULTS:** Test sensitivity and specificity were 90 and 94.4%, respectively, for differentiating dogs with lower urinary tract neoplasia from dogs without abnormalities. However, specificity decreased to 35% for differentiating dogs with neoplasia from dogs with nonmalignant urinary tract disease. In dogs with neoplasia, results were significantly affected by degree of hematuria. However, addition of blood to urine from dogs without hematuria had no significant effect on test results. Although intraobserver variation was significant, urine pH, specific gravity, or storage time or temperature had no significant effect on results. **CONCLUSIONS AND CLINICAL RELEVANCE:** Although this bladder tumor antigen test was sensitive for differentiating dogs with malignancies of the lower urinary

tract from dogs without urinary tract disease, it was not specific for differentiating dogs with neoplasia from dogs with other lower urinary tract abnormalities. It cannot, therefore, be recommended as a definitive diagnostic aid for the detection of lower urinary tract malignancies in dogs.

Am J Vet Res 2002 Feb;63(2):163-9

Associations between dietary factors in canned food and formation of calcium oxalate uroliths in dogs.

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OBJECTIVE: To identify dietary factors in commercially available canned foods associated with the development of calcium oxalate (CaOx) uroliths in dogs. **ANIMALS:** 117 dogs with CaOx uroliths and 174 dogs without urinary tract disease. **PROCEDURE:** Case dogs were those that developed CaOx uroliths submitted to the Minnesota Urolith Center for quantitative analysis between 1990 and 1992 while fed a commercially available canned diet. Control dogs were those without urinary tract disease evaluated at the same veterinary hospital just prior to or immediately after each case dog. A content-validated multiple-choice questionnaire was mailed to each owner of case and control dogs with the permission of the primary care veterinarian. Univariate and multivariate logistic regressions for each dietary component were performed to test the hypothesis that a given factor was associated with CaOx urolith formation. **RESULTS:** Canned foods with the highest amount of protein, fat, calcium, phosphorus, magnesium, sodium, potassium, chloride, or moisture were associated with a decreased risk of CaOx urolith formation, compared with diets with the lowest amounts. In contrast, canned diets with the highest amount of carbohydrate were associated with an increased risk of CaOx urolith formation. **CONCLUSIONS AND CLINICAL RELEVANCE:** Feeding canned diets formulated to contain high amounts of protein, fat, calcium, phosphorus, magnesium, sodium, potassium, chloride, and moisture and a low amount of carbohydrate may minimize the risk of CaOx urolith formation in dogs.

Am J Vet Res 2001 Dec;62(12):1922-7

Effects of acetylpromazine or morphine on urine production in halothane-anesthetized dogs.

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OBJECTIVE: To assess the influence of preanesthetic administration of acetylpromazine or morphine and fluids on urine production, arginine vasopressin (AVP; previously known as antidiuretic hormone) concentrations, mean arterial blood pressure (MAP), plasma osmolality (Osm), PCV, and concentration of total solids (TS) during anesthesia and surgery in dogs. **ANIMALS:** 19 adult dogs. **PROCEDURE:** Concentration of AVP, indirect MAP, Osm, PCV, and concentration of TS were measured at 5 time points (before administration of acetylpromazine or morphine, after administration of those drugs, after induction of anesthesia, 1 hour after the start of surgery, and 2 hours after the start of surgery). Urine output and end-tidal halothane concentrations were measured 1 and 2 hours after the start of surgery. All dogs were administered lactated Ringer's solution (20 ml/kg of body weight/h, i.v.) during surgery. **RESULTS:** Compared with values for acetylpromazine, preoperative administration of morphine resulted in significantly lower urine output during the surgical period. Groups did not differ significantly for AVP concentration, Osm, MAP, and end-tidal halothane concentration; however, PCV and concentration of TS decreased over time in both groups and were lower in dogs given acetylpromazine. **CONCLUSIONS AND CLINICAL RELEVANCE:** Preanesthetic administration of morphine resulted in significantly lower urine output, compared with values after administration of acetylpromazine, which cannot be explained by differences in AVP concentration or MAP. When urine output is used as a guide for determining rate for i.v. administration of fluids in the perioperative period, the type of preanesthetic agent used must be considered.

Canadian Journal of Veterinary Research (until Jan03)

Can J Vet Res 2003 Jan;67(1):30-8

Urethral pressure profile and hemodynamic effects of phenoxybenzamine and prazosin in non-sedated male beagle dogs.

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Prazosin is a readily available alpha-adrenergic antagonist that may be useful in the management of functional urethral obstruction in companion animals. This study used urethral pressure profilometry to evaluate the urethral effects of prazosin and phenoxybenzamine in healthy, non-sedated, male Beagle dogs. Heart rate, indirect systolic, diastolic and mean arterial blood pressures were measured, and saline perfusion urethral pressure profilometry was performed at 0, 10, 20, and 40 min following intravenous administration of prazosin (0.025 mg/kg), phenoxybenzamine (0.2 mg/kg), or placebo. Maximal urethral pressure, maximal urethral closure pressure, post peak nadir, and all blood pressure parameters decreased significantly at nearly all treatment intervals following administration of prazosin compared with placebo. Less consistently significant reductions

were observed following phenoxybenzamine administration. Maximal decreases in urethral pressure parameters were observed 20 min following the injection of prazosin; maximal blood pressure decreases were evident by 10 min postinjection. In this non-sedated dog model, urethral pressure profilometry was a sensitive method of detecting urethral effects of alpha antagonists. Repeatable reductions in urethral pressure measurements were observed, with prazosin effecting more consistently significant changes than phenoxybenzamine. Significant decreases in systolic, diastolic, and mean arterial blood pressures were seen with prazosin, but not phenoxybenzamine or placebo. Further study of selective alpha-1 antagonists in dogs is needed to determine appropriate oral dosing protocols that will produce maximal urethral effects with minimal hemodynamic effects, and to demonstrate clinical efficacy in dogs with functional urethral obstruction.

Journal of the American Animal Hospital Association (until March 03)

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

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

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Thirteen dogs with prostatic abscesses and cysts were treated using percutaneous ultrasound-guided drainage. Eight dogs were diagnosed with prostatic abscesses and five with cysts on the basis of cytopathological examination and bacterial culture of the prostatic fluid. Antibiotic therapy, based on culture and sensitivity results, was administered for a minimum of 4 weeks. Intact dogs were castrated after initial drainage. Repeat ultrasonography of the prostate was performed every 1 to 6 weeks, and any residual 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.

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

Extradural spinal, bone marrow, and renal nephroblastoma.

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

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

Treatment of renal nephroblastoma in an adult dog.

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

J Am Anim Hosp Assoc 2002 Nov-Dec;38(6):541-4

Detection of occult urinary tract infections in dogs with diabetes mellitus.

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Dogs with diabetes mellitus may develop occult urinary tract infections. In this study, diabetic dogs with negative and positive bacterial urine cultures were compared. Records from 51 dogs with diabetes mellitus were reviewed at the University of Illinois. No difference was identified between the groups in urine specific gravity, pH, glucose, ketones, protein, red blood cells, white blood cells, or epithelial cells. Dogs with occult urinary tract infection did have an increased incidence of bacteriuria, but this was not a consistent finding. Therefore, the urine on all diabetic dogs should be cultured to accurately identify the presence or absence of bacterial urinary tract infections.

J Am Anim Hosp Assoc 2002 Nov-Dec;38(6):527-32

Temporary tube cystostomy as a treatment for urinary obstruction secondary to adrenal disease in four ferrets.

Nolte DM, Carberry CA, Gannon KM, Boren FC.

Adrenal neoplasia is a common problem in middle-aged to older ferrets. Male ferrets may present for stranguria and dysuria due to prostatic/paraurethral tissue enlargement secondary to elevation in androgens produced by the neoplastic tissue. Progressive urethral compression followed by complete urinary obstruction can result. Urinary obstruction can persist for days following surgery requiring urinary diversion. Four ferrets presenting with signs consistent with urinary obstruction secondary to adrenal disease were immediately treated with urethral catheterization or cystocentesis followed by adrenalectomy and temporary tube cystostomy. The tube cystostomy placement and use were associated with minimal complications and allowed recovery from surgery.

J Am Anim Hosp Assoc 2002 Sep-Oct;38(5):478-81

Emphysematous prostatitis and carcinoma in a dog.

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A 10-year-old, male beagle was presented for lethargy, anorexia, and straining to urinate. A mass was palpated in the caudal abdomen in the area of the bladder. Abdominal radiography revealed a gas-filled mass in the caudoventral abdominal quadrant. Subsequent positive-contrast cystography revealed that the mass was caudal to the bladder. Abdominal exploratory celiotomy resulted in the drainage of a prostatic abscess containing gas. The histopathological diagnosis of the prostate was a poorly differentiated tubular carcinoma with necrosis. To the authors' knowledge, this article is the first report of an emphysematous prostatitis in a dog.

J Am Anim Hosp Assoc 2002 Jul-Aug;38(4):381-4

A urethropexy technique for surgical treatment of urethral prolapse in the male dog.

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Urethral prolapse is an uncommon condition affecting young male dogs, most commonly English bulldogs. Current described techniques for surgical treatment of urethral prolapse involve manual reduction of prolapsed mucosa and placement of a temporary purse-string suture at the penile tip, or resection of the prolapsed tissue and apposition of urethral and penile mucosa. The incidence of recurrence of urethral prolapse following resection of the prolapse is not known. This report describes a technique for surgical treatment of urethral prolapse in the male dog that minimizes surgical and anesthetic time, is simple to perform, requires minimal equipment, is effective, and is not associated with significant complications or recurrence. Three cases are described.

J Am Anim Hosp Assoc 2002 Jan-Feb;38(1):33-9

Intravesical ureterocele with concurrent renal dysfunction in a dog: a case report and proposed classification system.

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A unilateral intravesical ureterocele was diagnosed by ultrasonography in a 5-year-old female Pekingese that was referred for evaluation of increased hepatic enzymes. Ureteroceles are cystic dilatations of the submucosal portion of the distal ureter. They are frequently reported in humans but are uncommonly reported in dogs. This report describes surgical resection of the ureterocele and reduction of ipsilateral hydroureter in a dog that also had bilateral renal dysfunction and suffered progressive mild azotemia postoperatively. This report demonstrates that canine ureteroceles can occur concurrently with bilateral renal dysfunction and offers a classification system designed to encourage thorough urinary tract evaluation for determining prognosis.

J Am Anim Hosp Assoc 2002 Jan-Feb;38(1):79-83

Results of vulvoplasty for treatment of recessed vulva in dogs.

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The results of vulvoplasty were evaluated in 34 dogs that underwent surgery at the University of Wisconsin Veterinary Medical Teaching Hospital between 1987 and 1999. Case records were evaluated, and clients were interviewed by telephone. The most common clinical signs of a juvenile or recessed vulva at initial examination were perivulvar dermatitis in 59% (20/34) of dogs and urinary incontinence and chronic urinary tract infection (UTI), each present in 56% (19/34) of dogs. Other common complaints included pollakiuria,

irritation, and vaginitis. Most dogs developed clinical signs before 1 year of age. All dogs except one bichon frise were medium to giant breeds, suggesting that vulvar conformation may be related to growth rate or body conformation; prior ovariohysterectomy did not appear to be an influencing factor. Eighty-two percent of owners rated the outcome of the surgery as at least satisfactory. The incidence of urinary incontinence was reduced by vulvoplasty; however, it remained the most common residual sign after surgery, suggesting a multifactorial etiology. The incidences of UTI, vaginitis, and external irritation were greatly reduced after surgery.

J Am Anim Hosp Assoc 2002 Jan-Feb;38(1):29-32

Urinary incontinence in a dog with an ectopic ureterocele.

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A 7-month-old, female English cocker spaniel was examined because of a complaint of urinary incontinence. Excretory urography revealed a small right kidney and right-sided hydroureter, ectopic ureter, and ureterocele. Ureteronephrectomy and ovariohysterectomy were performed, but the distal ureter and ureterocele were left in situ. Recurrent urinary tract infections and intermittent urinary incontinence persisted after surgery. Vaginouretrography demonstrated the presence of a urethral diverticulum associated with the ureterocele. Ureterocelelectomy was performed, and the dog remains continent 4 years after ureterocelelectomy. Persistent urinary incontinence and urinary tract infection were attributed to failure to resect the ureterocele.

J Am Anim Hosp Assoc 2001 Nov-Dec;37(6):573-6

Radiographic diagnosis of a rectourethral fistula in a dog.

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An English bulldog was referred to the Veterinary Medical Teaching Hospital-University of Wisconsin (VMTH-UW) for re-evaluation of an 8-year history of chronic, recurrent prostatitis and cystitis. The patient was first referred to the VMTH-UW at 11 months of age with a history of antibiotic-responsive hematuria and stranguria. Four urinary tract contrast studies were performed during the 8-year time span; however, a rectourethral fistula was not diagnosed until the fourth study. The article presents a literature review of rectourethral fistula, describes the case management of the dog in this study, and provides an explanation

as to the potential reasons the fistula was not diagnosed on the three previous imaging studies.

Journal of the American Veterinary Medical Association (until Feb 03)

J Am Vet Med Assoc 2003 Feb 15;222(4):431-2

High-dose glucosamine associated with polyuria and polydipsia in a dog.

McCoy SJ, Bryson JC.

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

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

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OBJECTIVE: To determine whether high systolic blood pressure (SBP) at the time of initial diagnosis of chronic renal failure in dogs was associated with increased risk of uremic crisis, risk of dying, or rate of decline in renal function. **DESIGN:** Prospective cohort study. **ANIMALS:** 45 dogs with spontaneous chronic renal failure. **PROCEDURE:** Dogs were assigned to 1 of 3 groups on the basis of initial SBP (high, intermediate, low); Kaplan-Meier and Cox proportional hazards methods were used to estimate the association between SBP and development of a uremic crisis and death. The reciprocal of serum creatinine concentration was used as an estimate of renal function. **RESULTS:** Dogs in the high SBP group were more likely to develop a uremic crisis and to die than were dogs in the other groups, and the risks of developing a uremic crisis and of dying increased significantly as SBP increased. A greater decrease in renal function was observed in dogs in the high SBP group. Retinopathy and hypertensive encephalopathy were detected in 3 of 14 dogs with SBP \geq 180 mm Hg. Systolic blood pressure remained high in 10 of 11 dogs treated with antihypertensive drugs. **CONCLUSIONS AND CLINICAL RELEVANCE:** Results suggested that initial high SBP in dogs with chronic renal failure was associated with increased risk of developing a uremic crisis and of dying. Further studies are required to determine whether there is a cause-and-effect relationship between high SBP and progressive renal injury and to identify the risks and benefits of antihypertensive drug treatment.

J Am Vet Med Assoc 2003 Jan 15;222(2):180-3, 174

Cryptococcal pyelonephritis in a dog.

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A 5-year-old castrated male Golden Retriever was evaluated for polyuria, polydipsia, and progressive regurgitation thought to be a result of bacterial pyelonephritis and megaesophagus. Bacteriologic culture of urine failed to yield clinically relevant growth, and results of a urine sediment examination were normal. With time, intention tremors and progressive neurologic dysfunction were also observed. At necropsy, a diagnosis of cryptococcal disease was confirmed histologically and immunohistochemically. Findings in the dog of this report were indicative of nephrogenic diabetes insipidus with polyuria and polydipsia caused by cryptococcal pyelonephritis. Neurologic manifestations of systemic cryptococcus infection included megaesophagus, esophageal hypomotility, and regurgitation attributed to localization of cryptococcal organisms in the brain stem in the region of the dorsal motor nucleus of the vagus nerve. To the authors' knowledge, this is the first report of polyuria secondary to cryptococcal pyelonephritis.

J Am Vet Med Assoc 2003 Jan 15;222(2):176-9

Effects of storage time and temperature on pH, specific gravity, and crystal formation in urine samples from dogs and cats.

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OBJECTIVE: To determine effects of storage temperature and time on pH and specific gravity of and number and size of crystals in urine samples from dogs and cats. **DESIGN:** Randomized complete block design. **ANIMALS:** 31 dogs and 8 cats. **PROCEDURE:** Aliquots of each urine sample were analyzed within 60 minutes of collection or after storage at room or refrigeration temperatures (20 vs 6 degrees C [68 vs 43 degrees F]) for 6 or 24 hours. **RESULTS:** Crystals formed in samples from 11 of 39 (28%) animals. Calcium oxalate (CaOx) crystals formed in vitro in samples from 1 cat and 8 dogs. Magnesium ammonium phosphate (MAP) crystals formed in vitro in samples from 2 dogs. Compared with aliquots stored at room temperature, refrigeration increased the number and size of crystals that formed in vitro; however, the increase in number and size of MAP crystals in stored urine samples was not significant. Increased storage time and decreased storage temperature were associated with a significant increase in number of CaOx crystals formed. Greater numbers of crystals formed in urine aliquots stored for 24 hours than in aliquots stored for 6 hours. Storage time and temperature did not have a significant effect on pH or specific gravity. **CONCLUSIONS**

AND CLINICAL RELEVANCE: Urine samples should be analyzed within 60 minutes of collection to minimize temperature- and time-dependent effects on in vitro crystal formation. Presence of crystals observed in stored samples should be validated by reevaluation of fresh urine.

J Am Vet Med Assoc 2002 Nov 1;221(9):1282-6

Evaluation of urine marking by cats as a model for understanding veterinary diagnostic and treatment approaches and client attitudes.

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OBJECTIVE: To obtain information regarding diagnostic and treatment approaches of veterinarians and attitudes and beliefs of clients about a common clinical problem, urine marking in cats. DESIGN: Cohort study. STUDY POPULATION: 70 veterinarians providing care for urine-marking cats and 500 owners of urine-marking cats. PROCEDURE: Veterinarians were interviewed via telephone regarding criteria for diagnosis of urine marking and recommended treatments. Cat owners who responded to recruitment efforts for a clinical trial for urine-marking cats were interviewed via telephone regarding whether and from what sources they sought help to resolve the marking problem. RESULTS: Almost a third of veterinarians did not seem to correctly distinguish between urine marking (spraying) and inappropriate urination. Those that did make this diagnostic distinction reported recommending environmental management and prescribing medication significantly more often than those that did not make this distinction. Seventy-four percent of cat owners sought help from their veterinarians for urine marking; other common sources of information were the Internet and friends. Among those who did not consult a veterinarian, the most frequently cited reason was that they did not think their veterinarian could help. Among cat owners who consulted their veterinarians, 8% reported receiving advice on environmental hygiene and 4% on environmental management (limiting intercat interactions), although veterinarians who correctly diagnosed urine marking reported giving such advice 100 and 83% of the time, respectively. CONCLUSIONS AND CLINICAL RELEVANCE: Results may serve as a model for obtaining information critical to developing veterinary continuing education and public outreach programs for animal owners for various diseases.

J Am Vet Med Assoc 2002 Oct 1;221(7):995-9

Influence of vestibulovaginal stenosis, pelvic bladder, and recessed vulva on response to treatment for clinical signs of lower urinary tract disease in dogs: 38 cases (1990-1999).

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OBJECTIVE: To determine influence of vestibulovaginal stenosis, pelvic bladder, and recessed vulva on response to treatment for clinical signs of lower urinary tract disease in dogs. **DESIGN:** Retrospective study. **ANIMALS:** 38 spayed female dogs. **PROCEDURE:** Medical records and client follow-up were reviewed for dogs evaluated via excretory urography because of clinical signs of lower urinary tract disease. Clinical signs, results of radiography, and response to surgical or medical treatment were analyzed. **RESULTS:** Clinical signs included urinary tract infection (n = 24), urinary incontinence (20), vaginitis (11), pollakiuria or stranguria (10), and perivulvar dermatitis (4). Vaginoscystourethrographic findings included vestibulovaginal stenosis (n = 28), pelvic bladder (17), and ureteritis or pyelonephritis (4). Ten dogs had a vestibulovaginal ratio of < 0.20 (severe stenosis), 9 dogs had a ratio of 0.20 to 0.25 (moderate stenosis), 9 dogs had a ratio of 0.26 to 0.35 (mild stenosis), and 10 dogs had a ratio of > 0.35 (anatomically normal). Lower urinary tract infection, incontinence, and pelvic bladder were not associated with response to treatment for recessed vulva. Vestibulovaginal stenosis with a ratio < 0.20 was significantly associated negatively with response to treatment. Dogs without severe vestibulovaginal stenosis that received vulvoplasty for a recessed vulva responded well to treatment. **CONCLUSIONS AND CLINICAL RELEVANCE:** Vestibulovaginal stenosis is likely an important factor in dogs with vestibulovaginal ratio < 0.20. Vaginectomy or resection and anastomosis should be considered in dogs with severe vestibulovaginal stenosis and signs of lower urinary tract disease.

J Am Vet Med Assoc 2002 Oct 1;221(7):984-9, 975

Retroperitoneal fibrosis in four cats following renal transplantation.

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Four cats developed fibrosis within the retroperitoneal space following renal transplantation. In human transplant patients, retroperitoneal fibrosis is an uncommon complication following surgery and may be secondary to operative trauma, infection, deposition of foreign material in the operative field, urinary extravasation, and perirenal hemorrhage caused by trauma to the allograft. Possible causes of fibrosis in the cats of this report include abdominal inflammation associated with allograft rejection, pyelonephritis, and septic peritoneal effusion. All of the cats of this report were readmitted to the veterinary teaching hospital following renal transplantation because of recurrence of azotemia 1 to 5 months after transplantation. Abdominal ultrasonography revealed a 2- to 4-mm-thick capsule surrounding the allograft in 2 of 4 cats, hydronephrosis in 4 cats, and hydroureter proximally in 2 cats. An exploratory laparotomy was performed in all cats to remove the fibrotic tissue causing the ureteral obstruction. Normal renal function was restored in all cats following surgery. Histologic evaluation of biopsy specimens revealed

smooth muscle (3 cats) and fibrous connective tissue (4). All 4 cats, regardless of the cause, responded well to surgical resection of the scar tissue that was causing a ureteral obstruction. None of the cats had recurrence of obstruction following surgery.

J Am Vet Med Assoc 2002 Sep 1;221(5):654-8. Erratum in: J Am Vet Med Assoc 2002 Oct 15;221(8):1149

Effects of long-term administration of enalapril on clinical indicators of renal function in dogs with compensated mitral regurgitation.

Atkins CE, Brown WA, Coats JR, Crawford MA, DeFrancesco TC, Edwards J, Fox PR, Keene BW, Lehmkuhl L, Luethy M, Meurs K, Petrie JP, Pipers F, Rosenthal S, Sidley JA, Straus J.

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OBJECTIVE: To determine the effect of long-term administration of enalapril on renal function in dogs with severe, compensated mitral regurgitation. **DESIGN:** Randomized controlled trial. **ANIMALS:** 139 dogs with mitral regurgitation but without overt signs of heart failure. **PROCEDURE:** Dogs were randomly assigned to be treated with enalapril (0.5 mg/kg [0.23 mg/lb], PO, q 24 h) or placebo, and serum creatinine and urea nitrogen concentrations were measured at regular intervals for up to 26 months. **RESULTS:** Adequate information on renal function was obtained from 132 dogs; follow-up time ranged from 0.5 to 26 months (median, 12 months). Mean serum creatinine and urea nitrogen concentrations were not significantly different between dogs receiving enalapril and dogs receiving the placebo at any time, nor were concentrations significantly different from baseline concentrations. Proportions of dogs that developed azotemia or that had a +/- 35% increase in serum creatinine or urea nitrogen concentration were also not significantly different between groups. **Conclusions:** And **Clinical Relevance:** Results suggest that administration of enalapril for up to 2 years did not have any demonstrable adverse effects on renal function in dogs with severe, compensated mitral regurgitation.

J Am Vet Med Assoc 2002 Aug 15;221(4):502-5

Evaluation of trends in frequency of urethrostomy for treatment of urethral obstruction in cats.

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OBJECTIVE: To determine hospital proportional morbidity rates (HPMR) for urethral obstructions, urethral plugs or urethroliths, and urethrostomies in cats in veterinary teaching hospitals (VTH) in Canada and the United States between 1980 and 1999. **DESIGN:**

Epidemiologic study. ANIMALS: 305,672 cats evaluated at VTH. PROCEDURES: Yearly HPMR were determined for cats with urethral obstructions, urethral plugs or urethroliths, or urethrostomies from data compiled by the Purdue Veterinary Medical Database. The test for a linear trend in proportions was used. RESULTS: Urethral obstructions were reported in 4,683 cats. Yearly HPMR for urethral obstructions declined from 19 cases/1,000 feline evaluations in 1980 to 7 cases/1,000 feline evaluations in 1999. Urethral plugs or urethroliths affected 1,460 cats. Yearly HPMR for urethral plugs or urethroliths decreased from 10 cases/1,000 feline evaluations in 1980 to 2 cases/1,000 feline evaluations in 1999. A total of 2,359 urethrostomies were performed. Yearly HPMR for urethrostomies decreased from 13 cases/1,000 feline evaluations in 1980 to 4 cases/1,000 feline evaluations in 1999. CONCLUSIONS AND CLINICAL RELEVANCE: Frequency of feline urethrostomies performed at VTH in Canada and the United States declined during the past 20 years and paralleled a similar decline in frequency of urethral obstructions and urethral plugs or urethroliths. These trends coincide with widespread use of diets to minimize struvite crystalluria in cats, which is important because struvite has consistently been the predominant mineral in feline urethral plugs during this period.

J Am Vet Med Assoc 2002 Aug 15;221(4):502-5. Comment in: [J Am Vet Med Assoc. 2002 Apr 15;220\(8\):1139; discussion 1139-41.](#)

Enrofloxacin resistance in Escherichia coli isolated from dogs with urinary tract infections.

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OBJECTIVE: To assess the strain heterogeneity of enrofloxacin-resistant Escherichia coli associated with urinary tract infections in dogs at a veterinary medical teaching hospital (VMTH). In addition, strains from other veterinary hospitals in California were compared with the VMTH strains to assess the geographic distribution of specific enrofloxacin-resistant E. coli isolates. DESIGN: Bacteriologic study. SAMPLE POPULATION: 56 isolates of E. coli from urine samples (43 isolates from dogs at the VMTH, 13 isolates from dogs from other veterinary clinics in California). PROCEDURES: Pulsed field gel electrophoresis was performed on 56 isolates of E. coli from urine samples from 56 dogs. All 56 isolates were tested for susceptibility to amoxicillin, chloramphenicol, enrofloxacin, tetracycline, trimethoprim-sulphamethoxazole, cephalexin, and ampicillin. Enrofloxacin usage data from 1994 to 1998 were obtained from the VMTH pharmacy. RESULTS: Several strains of enrofloxacin-resistant E. coli were collected from urine samples from the VMTH, and strains identical to those from the VMTH were collected from other veterinary clinics in California. For the isolates that did share similar DNA banding patterns, variable antibiotic resistance profiles were observed. CONCLUSIONS AND CLINICAL RELEVANCE: The increased occurrence of enrofloxacin-resistant E. coli from urine samples from dogs at the VMTH was not likely attributable to a single enrofloxacin-resistant clone but may be attributed to a collective increase in enrofloxacin resistance among uropathogenic E. coli in dogs in general.

J Am Vet Med Assoc 2002 Jun 15;220(12):1799-804

Prevalence of systolic hypertension in cats with chronic renal failure at initial evaluation.

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OBJECTIVE: To determine prevalence of systolic hypertension and associated risk factors in cats with chronic renal failure evaluated in first-opinion practice. **DESIGN:** Prospective study. **ANIMALS:** 103 cats with chronic renal failure. **PROCEDURE:** Systolic arterial blood pressure (SABP) was measured with a noninvasive Doppler technique, and cats that had SABP > 175 mm Hg on 2 occasions or that had SABP > 175 mm Hg and compatible ocular lesions were classified as hypertensive. Information from the history (previous treatment for hyperthyroidism, age), physical examination (sex, body weight), routine plasma biochemical analyses (creatinine, cholesterol, potassium, sodium, chloride, and calcium concentrations), and thyroid status were evaluated as potential risk factors for systolic hypertension. Variables associated with systolic hypertension were evaluated by use of logistic regression. **RESULTS:** 20 (19.4%; 95% confidence interval, 13 to 28%) cats had systolic hypertension. Plasma potassium concentration was significantly and inversely associated with systolic hypertension. **CONCLUSIONS AND CLINICAL RELEVANCE:** Prevalence of systolic hypertension, although clinically important, was lower than that reported previously. The cause of the inverse association between systolic hypertension and plasma potassium concentration is not yet known.

J Am Vet Med Assoc 2002 May 15;220(10):1496-8, 1474-5

Use of intermittent bladder infusion with clotrimazole for treatment of candiduria in a dog.

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J Am Vet Med Assoc 2002 Apr 15;220(8):1163-70. Erratum in: J Am Vet Med Assoc 2002 May 15;220(10):1495

Clinical evaluation of dietary modification for treatment of spontaneous chronic renal failure in dogs.

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OBJECTIVE: To determine whether a diet used for dogs with renal failure (renal food [RF]) was superior to an adult maintenance food (MF) in minimizing uremic crises and mortality rate in dogs with spontaneous chronic renal failure. **DESIGN:** Double-masked, randomized, controlled clinical trial. **ANIMALS:** 38 dogs with spontaneous chronic renal failure. **PROCEDURE:** Dogs were randomly assigned to a group fed adult MF or a group fed RF and evaluated for up to 24 months. The 2 groups were of similar clinical, biochemical, and hematologic status. The effects of diets on uremic crises and mortality rate were compared. Changes in renal function were evaluated by use of serial evaluation of serum creatinine concentrations and reciprocal of serum creatinine concentrations. **RESULTS:** Compared with the MF, the RF had a beneficial effect regarding uremic crises and mortality rate in dogs with mild and moderate renal failure. Dogs fed the RF had a slower decline in renal function, compared with dogs fed the MF. **CONCLUSIONS AND CLINICAL RELEVANCE:** Dietary modifications are beneficial in minimizing extrarenal manifestations of uremia and mortality rate in dogs with mild and moderate spontaneous chronic renal failure. Results are consistent with the hypothesis that delay in development of uremic crises and associated mortality rate in dogs fed RF was associated, at least in part, with reduction in rate of progression of renal failure.

Journal of Small Animal Practice (until Dec 02)

J Small Anim Pract 2002 Dec;43(12):539-42

Clinical and pathological findings of acute zinc intoxication in a puppy.

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This report describes the clinical and pathological findings in a case of acute zinc poisoning in a young dog. The puppy suffered four days of progressively more severe vomiting and diarrhoea. Jaundice and pale mucous membranes, severe haematemesis and haemoglobinuria were other findings. Despite intensive therapy, the dog died a few hours after hospitalisation. Postmortem examination revealed a metallic foreign body in the stomach, catarrhal gastritis, hepatomegaly and enlarged, dark kidneys. Histology showed hepatic centrilobular vacuolar degeneration, haemoglobinuric nephrosis with early tubular necrosis, haemosiderosis and extramedullary haematopoiesis, as well as neuronal damage.

The foreign body was mainly composed of zinc. Plasma zinc values were markedly raised (34.5 microg/ml; normal range 0.8 to 1.0 microg/ml). Pathophysiological mechanisms of zinc poisoning are discussed.

J Small Anim Pract 2002 Nov;43(11):493-6

Evaluation of phenylpropanolamine in the treatment of urethral sphincter mechanism incompetence in the bitch.

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In a multicentre, blinded, placebo-controlled trial, 50 dogs were treated for 28 days with either phenylpropanolamine or a placebo control. Each was given at a dose of one drop per 2 kg orally three times daily, equivalent to 1 mg/kg three times daily of phenylpropanolamine. Dogs that presented with clinical signs consistent with urinary sphincter mechanism incontinence were included in the study. They were examined on three occasions by the investigating veterinary surgeon. The frequency and volume of unconscious urination were scored by veterinary surgeons according to a pre-established scoring system. Phenylpropanolamine proved to be more effective than the placebo in regard to several parameters. At day 28, 85.7 per cent of phenylpropanolamine-treated cases had no episodes of unconscious urination compared with 33.3 per cent of placebo-treated cases. This was statistically significant. Few, mild side effects were seen in either group.

J Small Anim Pract 2002 Nov;43(11):501-5

Management of urethral sphincter mechanism incompetence in a male dog with laparoscopic-guided deferentopexy.

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Urethral sphincter mechanism incompetence is uncommon in the male dog. Diagnosis is made on the basis of the history (full bladder intermittent incontinence with persistence of normal micturitions), clinical examination and by exclusion of other causes of incontinence, such as prostatic disease, lower urinary tract abnormalities and cystitis. This report describes a case in an 11-year-old male poodle in which positive contrast urethrocytography showed no anatomical abnormalities. Surgical treatment by fixation of both ductus deferens to the abdominal wall under laparoscopic guidance with cranial displacement of the urinary bladder improved the incontinence.

J Small Anim Pract 2002 Oct;43(10):452-5

Septic peritonitis secondary to unilateral pyometra and ovarian bursal abscessation in a dog.

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A seven-year-old, female entire Labrador retriever was presented for acute-onset vomiting and lethargy, associated with weakness and generalised tremors. The clinical, radiographic, ultrasonographic and histopathological findings revealed septic peritonitis which occurred secondarily to unilateral pyometra and ovarian bursal abscessation. However, in this case, the initial clinical findings, blood parameters, radiographic and ultrasonographic findings did not allow a specific diagnosis. Repeat monitoring was required, and abdominocentesis proved to be the most useful diagnostic test, allowing a definitive diagnosis and the decision to be made as to whether or not to carry out exploratory surgery.

J Small Anim Pract 2002 May;43(5):213-6

Urinoma (para-ureteral pseudocyst) as a consequence of trauma in a cat.

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A two-year-old cat was involved in a road traffic accident. Survey abdominal radiographs and urinary function were considered unremarkable. Six weeks later the cat presented with a palpable dorsal abdominal mass. Radiography revealed a soft tissue opacity mass caudal to the right kidney. Ultrasonography revealed a cyst-like structure with moderately echogenic contents, and right-sided hydronephrosis. There was no excretion of contrast medium from the right kidney after intravenous urography. Surgery revealed a disrupted right ureter adherent to the retroperitoneal mass. The mass contained serosanguineous fluid consistent with extravasated urine. Ureteronephrectomy was performed. The majority of the mass was excised and the cavity ablated. Histopathology of the excised tissue revealed a thick fibrous wall with no epithelial lining, consistent with a urinoma, which is thought to have developed as a consequence of ureteral trauma. The cat was clinically well three months postoperatively.

J Small Anim Pract 2002 Apr;43(4):182-6

Isoniazid-induced seizures with secondary rhabdomyolysis and associated acute renal failure in a dog.

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Isoniazid-induced seizures resulted in rhabdomyolysis and associated acute renal tubular necrosis in a dog. Rhabdomyolysis and myoglobinuric renal failure, although recognised in the dog, are reported infrequently as a consequence of seizures. The clinical presentation of isoniazid toxicity in a dog is described.

J Small Anim Pract 2002 Jan;43(1):32-5

Unilateral renal agenesis associated with additional congenital abnormalities of the urinary tract in a Pekingese bitch.

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An eight-month-old Pekingese bitch with urinary incontinence was found to have three congenital anomalies of the urinary tract: left renal agenesis, bilateral ectopic ureters with a left cranial blind-ending ureter, and urinary bladder hypoplasia. The diagnoses were made by retrograde vaginourethrography, excretory urography, ultrasonography and duplex Doppler ultrasonography. Although urological anomalies associated with renal agenesis have been frequently observed, a cranial blind-end ectopic ureter has not, to the authors' knowledge, been described in the bitch. The dog was managed medically with a restricted protein diet because of a compromised unilateral kidney with hydronephrosis and hydroureter.

J Small Anim Pract 2001 May;42(5):235-8

Juvenile nephropathy in a Samoyed bitch.

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A case of juvenile nephropathy is reported in a 16-week-old Samoyed bitch. Clinical, laboratory and gross postmortem findings followed by histological analysis of kidney, liver and cerebrum and transmission electron microscopy of renal tissue are described. The histological and ultrastructural findings are similar to those found in a line of related Samoyeds in Canada, termed Samoyed hereditary glomerulopathy. The case is, however, distinct from those documented in Canada as the condition is present in a young female and the mode of inheritance elucidated in Canada is one of X-linked dominance, with the disease only developing in its juvenile form in males.

J Small Anim Pract 2001 Nov;42(11):546-9

Transient renal tubulopathy in a Labrador retriever.

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A four-month-old male Labrador retriever was presented for polyuria, polydipsia and persistent euglycaemic glucosuria. On referral, diagnostic tests demonstrated abnormal fractional excretions of electrolytes, increased urinary excretion of selected amino acids, mild renal tubular acidosis and mild proteinuria, indicating renal tubular dysfunction. Pyelonephritis was suspected and potentiated amoxicillin was administered. On re-evaluation at six months of age, the dog was no longer polyuric or polydipsic and the metabolic abnormalities associated with the tubulopathy had resolved. Transient Fanconi's syndrome has not previously been reported in small animals. This report demonstrates the potential for recovery of function in cases presenting with renal tubulopathies.

Journal of Veterinary Internal Medicine (until Dec 02)

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

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

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

administration of mannitol may be useful as another diuretic agent to identify unilateral ureteral obstruction on Doppler sonographic examination.

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

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

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Polycystic kidney disease (PKD) in Persian cats has been increasingly reported and compared to human autosomal dominant polycystic kidney disease (ADPKD) in the last decade. In cats, however, few studies have dealt with the occurrence and hormonal determinants of hypertension, one of the most common extrarenal manifestations of ADPKD in humans. The purpose of this study was to compare Persian cats >4 years old with PKD to unaffected control cats with regard to blood pressure (BP), plasma renin activity (PRA), serum aldosterone concentration, plasma atrial natriuretic peptide (ANP) concentration, and aldosterone-to-renin ratio (ARR). Three gender- and age-matched groups were studied, each consisting of 7 cats: (1) a control group without cysts, (2) a group with mild PKD, and (3) a group with severe PKD (multiple cysts and renal enlargement). Mild renal insufficiency was found in only 1 of 14 cats with PKD. Cats with PKD had a higher mean arterial pressure ($P = .04$) and more often had a high ARR ($P = .047$) than did control cats. Tendencies toward higher diastolic and systolic arterial pressures (DAPs and SAPs, respectively) and lower PRAs were observed in cats with PKD compared to controls ($.05 < P < \text{or} = .1$). No significant differences were found between the groups in serum aldosterone and plasma ANP concentrations. None of the cats had echocardiographic evidence of cardiac hypertrophy. In conclusion, cats with PKD had a minor increase in mean arterial pressure compared to control cats, and half of the cats had a high ARR.

J Vet Intern Med 2002 Sep-Oct;16(5):510-7

Water transport in the kidney and nephrogenic diabetes insipidus.

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Nephrogenic diabetes insipidus is caused by an inability of the kidney to concentrate urine despite adequate concentration of vasopressin in blood and is characterized by polyuria, polydipsia, and hyposthenuria in the presence of plasma hyperosmolality. Nephrogenic diabetes insipidus is the result of defects in water homeostasis in the kidney. Nephrogenic

diabetes insipidus occurs when the kidneys cannot or do not respond to vasopressin. There are 2 categories of nephrogenic diabetes insipidus. Congenital nephrogenic diabetes insipidus is a rare, inherited, irreversible cause of polyuria and polydipsia in humans that is even rarer in animals. Acquired nephrogenic diabetes insipidus is more common and is often secondary to illness or medication that interferes with the action of vasopressin in the renal tubules. Unlike congenital nephrogenic diabetes insipidus, acquired or secondary nephrogenic diabetes insipidus is often reversible with correction of the associated or causative problem.

J Vet Intern Med 2002 May-Jun;16(3):293-302

Genetic characterization of 2 novel feline caliciviruses isolated from cats with idiopathic lower urinary tract disease.

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Feline caliciviruses (FCVs) are potential etiologic agents in feline idiopathic lower urinary tract disease (I-LUTD). By means of a modified virus isolation method, we examined urine obtained from 28 male and female cats with nonobstructive I-LUTD, 12 male cats with obstructive I-LUTD, and 18 clinically healthy male and female cats. All cats had been routinely vaccinated for FCV. Two FCVs were isolated; I (FCV-U1) from a female cat with nonobstructive I-LUTD, and another (FCV-U2) from a male cat with obstructive I-LUTD. To determine the genetic relationship of FCV-U1 and FCV-U2 to other FCVs, capsid protein gene RNA was reverse transcribed into cDNA, amplified, and sequenced. Multiple amino acid sequence alignments and phylogenetic trees were constructed for the entire capsid protein, hypervariable region E, and the more conserved (nonhypervariable) regions A, B, D, and F. When compared to 23 other FCV isolates with known biotypes, the overall amino acid sequence identity of the capsid protein of FCV-U1 and FCV-U2 ranged from 83 to 96%; identity of hypervariable regions C and E ranged from 58 to 85%. Phylogenetically, FCV-U1 clearly separated from other FCV strains in phenograms based on nonhypervariable regions. In contrast, FCV-U2 consistently segregated with the Urbana strain in all phenograms. Clustering of isolates by geographic origin was most apparent in phenograms based on nonhypervariable regions. No clustering of isolates by biotype was apparent in any phenograms. Our results indicate that FCV-U1 and FCV-U2 are genetically distinct from other known vaccine and field strains of FCV.

J Vet Intern Med 2002 Jan-Feb;16(1):22-33

Plasma exogenous creatinine clearance test in dogs: comparison with other methods and proposed limited sampling strategy.

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Plasma clearance of creatinine was evaluated for assessment of glomerular filtration rate (GFR) in dogs. In 6 healthy dogs (Experiment 1), we determined 24-hour urine clearance of endogenous creatinine, plasma, and urine clearances of exogenous creatinine administered at 40, 80, and 160 mg/kg in a crossover design (linearity study), plasma iothalamate clearance, and plasma and urine clearances of ¹⁴C-inulin. In Experiment 2, plasma creatinine and iothalamate clearances were compared, and a linearity study was performed as for Experiment 1 in 6 dogs with surgically induced renal impairment. Experiment 3 compared plasma creatinine clearance with plasma iothalamate clearance before and 3 weeks after induction of moderate renal impairment in 6 dogs. Plasma creatinine clearances were calculated by both noncompartmental and compartmental analyses. In Experiment 1, plasma inulin clearance was higher ($P < .001$) than other clearance values. Plasma creatinine clearances at the 3 dose rates did not differ from urine inulin clearance and each other. In Experiment 2, plasma creatinine clearances were about 14% lower than plasma iothalamate clearance ($P < .05$). In Experiment 3, decreases in GFR assessed by plasma clearances of iothalamate and creatinine were similar. Renal failure decreased the daily endogenous input rate of creatinine by 25%. Limiting sampling strategies for optimizing GFR calculation were proposed, allowing an error lower than 6.5% with 4 blood samples. These results suggest that determination of plasma creatinine clearance by a noncompartmental approach offers a reliable, inexpensive, rapid, and convenient means of estimating GFR in routine practice.

J Vet Intern Med 2002 Jan-Feb;16(1):45-51

Evaluation of cystatin C as an endogenous marker of glomerular filtration rate in dogs.

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Cystatin C is a cysteine protease inhibitor produced by all nucleated cells. It is freely filtered by the glomerulus and is unaffected by nonrenal factors such as inflammation and gender. Because of greater sensitivity and specificity, cystatin C has been proposed to replace creatinine as a marker of glomerular filtration rate (GFR) in humans. The aims of this study were to validate an automated assay in canine plasma and to evaluate the usefulness of cystatin C as a marker of GFR in dogs. Western blotting was used to demonstrate cross-reactivity of an anti-human cystatin C antibody. An immunoturbidimetric assay was used to detect cystatin C in 25 clinically healthy dogs and 25 dogs with renal failure. Mean cystatin C concentration in the healthy dogs and the dogs with renal failure was 1.08 +/- 0.16 mg/L and 4.37 +/- 1.79 mg/L respectively. Intra- and interassay variability was <5%. The assay was linear ($r = .974$) between 0.14 and 7.53 mg/L. Both cystatin C and creatinine concentrations were measured in banked, frozen serum from 20 remnant kidney model dogs and 10 volume-depleted dogs for which GFR measurements by exogenous creatinine clearance had been determined previously. In the remnant kidney model, cystatin C was better correlated

with GFR than creatinine ($r = .79$ versus $.54$) but was less well correlated with GFR in volume-depleted dogs ($r = .54$ versus $.95$). GFR measurements were repeated in the remnant kidney model dogs 60 days after initial GFR measurements. At this time, cystatin C and creatinine concentrations correlated equally well with GFR ($r = .891$ versus $.894$, respectively). Cystatin C concentration is a reasonable alternative to creatinine for screening dogs with decreased GFR due to chronic renal failure.

Journal of Veterinary Medicine A (until Nov 02)

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

Haemolytic-uraemic syndrome in a dog.

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

Journal of Veterinary Pharmacology and Therapeutics (until Dec 02)

J Vet Pharmacol Ther 2002 Oct;25(5):371-8

Effect of renal insufficiency on the pharmacokinetics and pharmacodynamics of benazepril in cats.

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The effect of renal insufficiency was studied on the pharmacokinetics (PK) and pharmacodynamics (PD) of the angiotensin-converting enzyme (ACE) inhibitor benazepril in

cats. The active metabolite of benazepril, benazeprilat, is eliminated principally (approximately 85%) via biliary excretion in cats. A total of 20 control animals and 32 cats with moderate renal insufficiency induced by partial nephrectomy were used. Assessments were made at steady state after treatment with placebo or benazepril (0.25-2 mg/kg) once daily for a minimum of 10 days. The PK endpoint was the AUC (0-->24 h) of total plasma benazeprilat. The PD endpoints were systolic, diastolic and mean blood pressures (respectively SBP, DBP and MBP) measured by telemetry, and plasma ACE activity, assessed by an ex vivo assay. Renal function was assessed by glomerular filtration rate (GFR), measured by inulin clearance, and plasma creatinine concentrations (1/PCr). As compared with control animals, the renal insufficient cats had a 78% reduction in GFR (0.57 +/- 0.41 mL/min kg), increased plasma creatinine (2.7 +/- 1.0 mg/dL), urea (44.0 +/- 11.9 mg/dL) and ACE activity, and moderately increased blood pressure (SBP 171.8 +/- 5.1 mmHg) (all parameters $P < 0.05$). Renal insufficient cats receiving benazepril had significantly ($P < 0.05$) lower SBP, DBP, MBP and ACE, and higher GFR values as compared with placebo-treated animals. There were no significant differences in SBP, DBP, MBP, benazeprilat or ACE values according to the degree of renal insufficiency in cats receiving benazepril. It is concluded that no dose adjustment of benazepril is necessary in cats with moderate renal insufficiency.

Veterinary Clinical Pathology (until (Apr 03)

Vet Clin Pathol 2002;31(2):56-60

Detection of canine microalbuminuria using semiquantitative test strips designed for use with human urine.

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BACKGROUND: Commercial testing for microalbuminuria in human urine is often performed with point-of-care semiquantitative test strips followed by quantitative testing when indicated. An ELISA that quantifies canine urine albumin concentration has been developed, but semiquantitative test strips for use in the dog are not available. **OBJECTIVE:** The purpose of this study was to prospectively determine the concordance of canine urine albumin concentrations measured by a commercial human test strip and by ELISA. **METHODS:** Urine samples were obtained from 67 dogs evaluated for a variety of clinical conditions. Dipstick urinalyses were performed on all samples; clinician discretion determined method of urine collection and performance of urine sediment examination and/or urine culture. Urine albumin concentration was determined using test strips (Clinitek Microalbumin, Bayer Corporation, Elkhart, Ind, USA), and results were compared with those obtained by ELISA. **RESULTS:** The Clinitek strips correctly determined albumin concentration in 42 of 67 (63%) urine samples tested. Concordance was lowest (48%) for dogs with microalbuminuria (10-300 microg/mL by ELISA). Clinitek strip sensitivity and specificity for correct identification of

microalbuminuria were 48% and 75%, respectively. Concordance was lower in dogs with urinary tract infection or hematuria and in samples collected by catheterization. Sensitivity and specificity for correct identification of microalbuminuria after exclusion of dogs with urinary tract infection or hematuria were 59% and 83%, respectively. CONCLUSIONS: These results suggest that the Clinitek strips lack sufficient concordance with results obtained by ELISA to be a reliable screening for test microalbuminuria in the dog. A reliable semiquantitative point-of-care test for canine urine albumin concentrations below those detected by standard urine dipsticks is still needed.

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The usefulness and limitations of hand-held refractometers in veterinary laboratory medicine: an historical and technical review.

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Medical hand-held refractometers have been used in veterinary practice since their development in the 1960s. They have become ubiquitous for the measurement of protein and urine solute concentrations because of their rapidity of analysis, ease of use, and relatively low cost. Refraction of light offers advantages for the determination of solute concentrations because the measurement requires no chemical alteration of the specimen. Numerous authors have reported that the results of protein estimation by refractometry for domestic mammals correlate well with those obtained by the biuret method, although others have reported both higher and lower refractometric results compared with biuret results. Major discrepancies between biuret and refractometric results have been reported for avian samples. Some of the variation in reported results may be due to differences in design by refractometer manufacturers. Another possible source may be variation in the biuret reagent mixture and assay conditions. Refractometers also can be used to calculate serum water concentration. A table that converts index of refraction to serum water concentration can be used to convert electrolyte concentration from mmol/L of serum to mmol/L of serum water, a more accurate indicator of effective electrolyte concentration. Refractometers are especially useful for determining urine specific gravity on veterinary samples because they require relatively small sample volumes. Specific gravity continues to be the most common unit for reporting total solids concentration. Some solutes, such as acetone, may cause false increases in specific gravity by refractometry, as they increase refraction but are less dense than water.

Veterinary Immunology and Immunopathology (until March 03)

A Leishmania infantum multi-component antigenic protein mixed with live BCG confers protection to dogs experimentally infected with L. infantum.

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The capacity of a quimeric protein, formed by the genetic fusion of five antigenic determinants from four Leishmania proteins, formulated with BCG, to protect dogs against Leishmania infantum infection is described. The data showed that after i.v. administration of 500,000 parasites of the L. infantum M/CAN/ES/96/BCN150 strain, zymodeme MON-1, the animals became infected as suggested by the humoral response against the parasite antigens. All control unvaccinated dogs had parasites in the lymph nodes at day 150 post-infection. One of these unvaccinated infected dog was parasite negative at day 634 behaving, thus, as resistant. In contrast, only 50% of the immunized dogs had parasites in the lymph nodes at day 150 post-infection. Four of these dogs became parasite negative by day 634 post-infection. The control animals developed at various times during the follow-up period clinical symptoms associated with Leishmaniasis. The control diseased dogs developed also in the liver and spleen some of the abnormal histological features associated with natural visceral Leishmaniasis. The immunized dogs, however, were not only normal at the clinical but also at the anatomo-pathological level. A positive delayed type hypersensitivity (DTH) response was observed in nine of the immunized protected dogs. The data indicated that Q+BCG confers 90% protection against infection and at least 90% protection at the clinical level.

Veterinary Record (until Jan 03)

Vet Rec 2001 Dec 22-29;149(25):764-7

Treatment of bitches with acquired urinary incontinence with oestriol.

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Oestriol, a naturally occurring short-acting oestrogen, was used to treat acquired urinary incontinence in 129 bitches selected by 48 veterinary practitioners in the Netherlands, Belgium, France and Germany. The dogs were treated daily for 42 days with oestriol tablets, using a self-controlled study design. The dogs were examined and blood sampled at the beginning and end of the trial. According to the veterinary practitioners 83 per cent of the dogs either became continent or improved, but the others showed no change or became

worse. The owners reported similar results: 82 per cent of the dogs responded to treatment and the others did not. The dose and treatment schedule for each dog were established on the basis of clinical efficacy. Mild and transient oestrogenic effects such as swelling of the vulva and attractiveness to male dogs were observed soon after the treatment began and at the higher dose schedule used in 12 of the dogs. A haematological examination of 114 of the dogs revealed no abnormalities.

Veterinary Radiology and Ultrasound (until Apr 03)

Vet Radiol Ultrasound 2003 Mar-Apr;44(2):155-64

Evaluation of the ureter and ureterovesicular junction using helical computed tomographic excretory urography in healthy dogs.

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Abdominal computed tomography (CT) using a protocol designed for evaluation of the ureters was performed on six normal purpose-bred research dogs. After noncontrast CT, a postcontrast scan was performed 3 min post midpoint of injection of 400 mgI/kg body weight of diatrizoate meglumine/sodium. Ureteral and ureterovesicular junction anatomy were readily assessed with minimal patient preparation. The ureters were similar in size to reported values and the renal pelvis, ureter, and ureterovesicular junction were easily identified on both noncontrast and contrast-enhanced scans. There was a significant relationship between bladder volume and interureterovesicular junction distance but not between bladder volume and ureterovesicular junction to internal urethral orifice distance. A reliable bony landmark for the identification of the internal urethral orifice could not be determined. The results of this preliminary study of normal anatomy should facilitate the clinical use of CT in the evaluation of ureteral disease (e.g., ureteral ectopia).

Vet Radiol Ultrasound 2002 Jul-Aug;43(4):383-91

Effect of region of interest selection and uptake measurement on glomerular filtration rate measured by ^{99m}Tc-DTPA scintigraphy in dogs.

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Determinations of different methods of measurement of uptake of ^{99m}Tc -DTPA using scintigraphy of glomerular filtration rate (GFR) were made from 29 studies on 10 healthy beagle dogs. GFR was measured by calculating the percentage dose uptake (integral method) and rate of uptake (slope method) of ^{99m}Tc -DTPA using manual kidney regions of interest (ROI) and automatic kidney and background ROIs at different time periods of the uptake phase. These results were compared using linear regression analysis to the GFR obtained from ^{99m}Tc -DTPA plasma clearance using multiple blood samples. The best correlation coefficient between percentage DTPA uptake and GFR by DTPA clearance ($r = 0.84$, $P < 0.001$) was derived from time intervals between 30s-120s with a perirenal background ROI at 1 or 2 pixels out from the kidney ROI using automatic kidney ROI at 20% threshold. With the slope method, the best correlation coefficient ($r = 0.85$, $P < 0.001$) was obtained from time intervals between 30s-peak with the background ROI at 2 pixels out from the kidney ROI using automatic ROI at 35% threshold. The offset was higher, and the correlation varied more with different ROIs and the method was unreliable at time intervals extending beyond the peak radioactivity. Manual kidney ROIs with automatic background ROIs had slightly lower correlations. With DTPA renography both integral and slope uptake method with automatic kidney and background ROIs are accurate methods to estimate the GFR, but that the integral method is much more stable to variations in ROI size and the duration of the uptake phase of the renogram.

Vet Radiol Ultrasound 2002 Jul-Aug;43(4):368-73

Renal ultrasonographic and computed tomographic appearance, volume, and function of cats with autosomal dominant polycystic kidney disease.

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The purpose of this study was to describe the ultrasonographic (US) and computed tomographic (CT) appearance of autosomal dominant polycystic kidney disease (ADPKD) in cats; to compare renal volume in cats with ADPKD ($n = 5$; mean age 59 ± 10 months) and normal cats ($n = 5$; mean age 66 ± 10 months) using 2 imaging modalities, US and CT; and to calculate cyst volume using CT. Glomerular filtration rate (GFR) was determined by 2 methods: ^{99m}Tc -diethylene-triaminepentaacetic acid (^{99m}Tc -DTPA) scintigraphic uptake and ^{99}Tc -DTPA plasma clearance. Sonographically, ADPKD affected kidneys were characterized by multiple anechoic to hypoechoic, round to irregularly shaped structures with variation in size. Affected kidneys had indistinct corticomedullary junctions and foci of mineralization. Intravenous (IV) contrast medium administration allowed more definitive identification of cysts with CT, and identification of distortion of renal pelvis by cysts. A significant difference (Welch ANOVA, $P = 0.05$) was detected between the US-estimated renal volumes of normal and affected cats. No statistically significant differences were detected in CT volume (between the normal and affected cats, or between US and CT volume measurements) or the 2 GFR methods. In this group of clinically normal, middle-aged

ADPKD cats, renal function was within normal limits and not significantly different than normal.

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Quantitative and qualitative scintigraphic measurement of renal function in dogs exposed to toxic doses of Gentamicin.

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Five, 3-month-old mongrel dogs weighing between 4.5 to 5.5 kg were studied to evaluate and compare the efficiency of ^{99m}Tc -DTPA, ^{99m}Tc -MAG3, and ^{99m}Tc -DMSA in detecting gentamicin-induced renal tubular injury. After baseline renograms using all three methods, all dogs received daily intramuscular injections of gentamicin at a dose of 30-45 mg/kg. Additional studies were obtained after a cumulative dose of 450, 1,575, and 2,250 mg of gentamicin was reached. Glomerular filtration rate (GFR), effective renal plasma flow (ERPF), and percentage of total renal uptake measurements were calculated. Baseline and post-gentamicin injection blood urea nitrogen (BUN) and serum creatinine values were determined. A Duncan test revealed significant renal function impairment at 450 mgs of cumulated gentamicin with ^{99m}Tc -DMSA and at 1,575 mgs of cumulated gentamicin for ^{99m}Tc -DTPA and ^{99m}Tc -MAG3. There was no correlation between BUN and serum creatinine values when compared to gentamicin ($p > 0.05$). The images obtained with ^{99m}Tc -MAG3 were of better quality than those obtained with ^{99m}Tc -DTPA even under severe renal dysfunction. Percentage of ^{99m}Tc -DMSA uptake indicated renal damage, before than GFR and ERPF. BUN and serum creatinine measurements were poor indicators of gentamicin-induced renal failure.