Pharmacokinetics of erythromycin after intravenous, intramuscular and oral administration to cats.

The aim of this study was to characterise the pharmacokinetic properties of different formulations of erythromycin in cats. Erythromycin was administered as lactobionate (4 mg/kg intravenously (IV)), base (10mg/kg, intramuscularly (IM)) and ethylsuccinate tablets or suspension (15 mg/kg orally (PO)). After IV administration, the major pharmacokinetic parameters were (mean +/- SD): area under the curve (AUC)((0-infinity)) 2.61 +/- 1.52 microg/mL; volume of distribution (V(z)) 2.34 +/- 1.76L/kg; total body clearance (Cl(t)) 2.1 0 +/- 1.37 L/hkg; elimination half-life (t((1/2))(lambda)) 0.75 +/- 0.09 h and mean residence time (MRT) 0.88 +/- 0.13 h. After IM administration, the principal pharmacokinetic parameters were (mean +/- DS): peak concentration (C(max)), 3.54 +/- 2.16 microg/mL; time of peak (T(max)), 1.22 +/- 0.67 h; t((1/2))(lambda), 1.94 +/- 0.21 h and MRT, 3.50 +/- 0.82 h. The administration of erythromycin ethylsuccinate (tablets and suspension) did not result in measurable serum concentrations. After IM and IV administrations, erythromycin serum concentrations were above minimum inhibitory concentration (MIC)(90)=0.5 microg/mL for 7 and 1.5h, respectively. However, these results should be interpreted cautiously since tissue erythromycin concentrations have not been measured and can reach much higher concentrations than in blood, which may be associated with enhanced clinical efficacy.

Feline cerebrovascular disease: clinical and histopathologic findings in 16 cats.

Sixteen cats with cerebrovascular disease confirmed via histology to be of nontraumatic and nonneoplastic origins are described. In addition, the anatomy of the arterial supply of the cat’s brain is reviewed. It is suggested that this unique arterial design may influence the incidence of cerebrovascular accidents in this species. Of the 16 cats reviewed, seven cats had ischemic infarctions, five had hemorrhagic infarctions, and four were diagnosed with intracranial hemorrhage. The median age was 8 yr and 9.5 yr in cats with infarctions and intracranial hemorrhages, respectively. Clinical signs were severe, acute, consistent with the localization of the cerebrovascular lesion, and influenced by underlying pathology. Four cats with infarction showed lateralized neurologic signs. Four cats with infarctions were diagnosed with pulmonary disease antemortem and three cats had hyperthyroidism. Cerebrospinal fluid analysis and computed tomography scans were available in two cats. None of the infarctions were grossly visible. All cats with hemorrhagic infarcts had severe liver pathology and nephritis was identified in four cats. Hypoxia was a feature in four cats and one cat suffered cardiac failure. In conclusion, the clinical picture is influenced by the type of cerebrovascular disease, the localization of the intracranial lesions, and any underlying pathology.

Segmental meningomyelitis in 2 cats caused by Toxoplasma gondii.

Phylogenetic analysis of feline panleukopenia virus (FPLV) strains in Korean cats.

Sixteen Korean feline panleukopenia virus (FPLV) strains were compared with 48 non-Korean strains.
and two vaccine strains to conduct phylogenetic analysis of the FPLVs currently circulating among cats in Korea. Most of the residues that discriminate between FPLVs and canine parvoviruses (CPV-2, -2a, -2b, and -2c), including 80-Lys, 93-Lys, 103-Val, 323-Asp, 564-Asn, and 568-Ala, were conserved in the Korean FLPVs; however, exceptions were observed in two strains, namely K50/08 (80-Gln) and V142 (323-Asn). Phylogenetic analysis using the Bayesian inference and Neighbor-joining method showed that FPLVs were not segregated on a clear temporal or geographical basis. Three clusters (G1, G2, and G3) were formed by the VP2 nucleotide sequences analysed and Korean strains belonged to the G1 (n=13) and G2 (n=3) clusters. The ratio of non-synonymous to synonymous substitutions (dN/dS) revealed that purifying selection acts on the VP2 gene of Korean FPLVs.


Uterine adenocarcinoma with abdominal metastases in an ovariohysterectomised cat. SURGICAL FINDINGS: an adenocarcinoma of the uterine stump with abdominal metastases is described in a 12.5-year-old incompletely ovariohysterectomised domestic shorthair cat. At the time of presentation, the adenocarcinoma had metastasised to the right perirenal lymph node, the abdominal aorta and the right ureter, resulting in the formation of a large cystic structure. This had compressed and displaced surrounding structures, including the abdominal vena cava and the right kidney, and formed multiple adhesions to the body wall and adjacent abdominal structures. Metastatic extension to the aorta had resulted in its regression into a 2 mm diameter non-pulsatile vessel. PRACTICAL RELEVANCE: only one case of uterine adenocarcinoma has previously been reported in an ovariohysterectomised cat. As such, this represents a very unusual and severe complication following an incomplete ovariohysterectomy. Invasion of the tumour tissue into surrounding structures created further complications.

A retrospective study of serum beta-hydroxybutyric acid in 215 ill cats: Clinical signs, laboratory findings and diagnoses.

Serum concentrations of beta-hydroxybutyric acid (sBHBA) are increased in cats with diabetes mellitus (DM), diabetic ketoacidosis (DKA) and hepatic lipidosis (HL). This study assessed sBHBA as a diagnostic tool in 215 consecutively-enrolled ill cats in the general population in a veterinary hospital. At the time of presentation, sBHBA was within the reference range in 158/215 (73.5%) cats (median 0.27; range 0.00-0.49mmol/L) and elevated in 57/215 (26.5%) cats (median 0.87; range 0.51-21.45mmol/L). Compared to cats with normal sBHBA, those with increased sBHBA had higher frequencies of anorexia, weight loss, icterus, polyuria/polydipsia, hyperbilirubinaemia, hypertriglyceridaemia, pancreatitis, HL, DM and DKA. They had higher concentrations of bilirubin and triglycerides and lower concentrations of potassium, chloride and total protein. There were positive correlations (P<0.01) between sBHBA and urinary glucose (r=0.42) and ketones (r=0.76), but there were no group differences in dipstick levels of urinary ketones. Cats with DM/DKA and with HL had significantly higher sBHBA compared to other cats. Receiver operator characteristics analysis of sBHBA as a predictor of HL showed that sBHBA was a good predictor of HL. Increased sBHBA occurs frequently in ill cats and provides useful diagnostic information, especially in DM/DKA and HL.

**Fucosidosis in a domestic shorthair cat.**
This paper documents the first reported case of fucosidosis in a cat. The cat presented with signs of forebrain and cerebellar dysfunction and a magnetic resonance imaging scan of the brain suggested a degenerative or metabolic disease process. A fine needle aspirate of grossly normal lymph nodes revealed vacuolated lymphocytes and a renal biopsy of an irregular shaped kidney identified vacuolated tubular epithelial cells. A white cell lysosomal enzyme screen revealed negligible alpha-fucosidase activity. Fucosidosis should be considered in the differential diagnosis of young cats with cerebellar dysfunction and must be added to the list of lysosomal storage diseases affecting the cat.


**Analysis of immune cells within the healthy oral mucosa of specific pathogen-free cats.**
The oral mucosa is an important interface for host-environment interactions. Based on previous studies, it is generally accepted that the cellular compartments of the oral immune system comprise organized mucosal-associated lymphoid tissues as well as diffusely and focally distributed T- and to lesser extent B-lymphocytes, oral mucosal Langerhans cells (OMLC), macrophages and mast cells. However, a comprehensive quantification of the cellular elements in the oral mucous membranes of the cat has not been reported. The aim of this study was to provide a comprehensive analysis of the immune cell compartments in the oral mucous membranes and anatomically related tissues of healthy cats. Multiple biopsies of the oral mucous membranes and related tissues were obtained from four specific pathogen-free cats for histological and immunohistochemical assessment of lymphocyte subsets, OMLC, macrophages and mast cells. T-lymphocyte subsets, OMLC, mast cells and macrophages were present in varying frequencies among the tissue compartments of the feline oral cavity. B-lymphocytes were not identified in any of the examined tissues except the tonsils and mandibular lymph nodes. Lymphocytic aggregates (follicles) were found in the palatoglossal folds and the gingiva. We describe the topographical distribution of various leucocyte subsets in the normal healthy feline oral mucosa, and demonstrate regional differences in the distribution of these cells.


**Renal effects of Dirofilaria immitis in experimentally and naturally infected cats.**
Canine heartworm infection has been associated with glomerular disease and proteinuria. We hypothesized that proteinuria, likely due to glomerular damage, would also be found in cats experimentally and naturally infected with Dirofilaria immitis. Two populations of cats were evaluated, including 80 that were each experimentally infected with 60 infective heartworm larvae as part of a drug safety study, and 31 that were naturally infected with D. immitis. Each had a control population with which to be compared. In the experimentally infected group, we evaluated urine from 64 cats. Ten of these cats were shown to have microalbuminuria 8 months post infection. No cat refractory to infection with larvae and no cats from the control group demonstrated microalbuminuria. All 10 microalbuminuric cats were shown to have significant proteinuria, as measured by the urine protein:creatinine ratio. There was a subtle, but significant, association between worm burden and proteinuria, and although the presence of adult heartworms was required for the development of proteinuria, both microfilaremic and amicrofilaremic cats were affected. Neither the presence of circulating heartworm antibodies and antigen nor the presence of antigenuria predicted the development of proteinuria. Both heavily infected cats (5-25 adult heartworms) and cats with worm
burdens compatible with natural infections (1-4 adult heartworms) developed proteinuria, and the relative numbers of cats so affected were similar between heavily and more lightly infected cats. Naturally infected cats, for which only dipstick protein determinations were available, were shown to have a significantly greater incidence of proteinuria (90% vs 35%) than did those in an age- and gender-matched control population. Additionally, the proteinuria in heartworm-infected cats was 3- to 5-fold greater in severity. We conclude that cats infected with mature adult heartworms are at risk for developing proteinuria and that this is recognized relatively soon after infection. While heavier infections may predispose cats to developing proteinuria, this complication is seen in naturally infected cats and experimental cats with worm burdens similar to those seen in natural infections (i.e., “clinically appropriate” worm burdens). The clinical relevance of heartworm-associated proteinuria is yet to be determined.

Aupperle H, Baldauf K, and Marz I (2011) J Comp Pathol
An Immunohistochemical Study of Feline Myocardial Fibrosis.
The aim of the present study was to investigate the pathology of feline myocardial fibrosis. The hearts from 40 cats with myocardial fibrosis were compared with the hearts from 25 normal cats. Clinical data were available in 11 cases. Hearts with myocardial fibrosis were hypomotile and there were hyperechoic areas in the ventricular wall on echocardiography. The presence of myocardial fibrosis was correlated significantly with hypertrophy of the ventricles, atrial dilation and angiosclerosis. Immunohistochemical studies demonstrated that normal feline cardiomyocytes expressed matrix metalloproteinase (MMP)-2, MMP-9, MMP-14, tissue inhibitor of matrix metalloproteinase (TIMP)-2 and transforming growth factor (TGF)-beta2. Fibroblasts in normal hearts expressed only TIMP-2. In the hearts with myocardial fibrosis, expression of MMP-2, TIMP-3 and TGF-beta2 by cardiomyocytes was significantly increased, but TIMP-2 expression was diminished. Fibroblasts in the affected hearts showed expression of MMP-14 in several cases. These findings suggest that a complex fibrotic remodelling of the feline myocardium occurs in this disease and that cardiomyocytes are involved in this process.

Treatment of primary immune-mediated hemolytic anemia with mycophenolate mofetil in two cats.
OBJECTIVE: To describe the use of oral mycophenolate mofetil (MMF) as an adjunctive therapy in 2 cats with primary immune-mediated hemolytic anemia. CASE SERIES SUMMARY: Two cats suffering from presumptive primary immune mediated hemolytic were treated with MMF as part of their treatment regimens. Both cats had improved complete blood counts following therapy. NEW OR UNIQUE INFORMATION PROVIDED: This is the first reported use of oral MMF as adjunctive treatment for cats with immune-mediated hemolytic anemia. Outcome was favorable in both cats and no adverse effects were noted from the MMF.

Suspected phenobarbital-induced pseudolymphoma in a cat.
CASE DESCRIPTION: A 4.5-year-old spayed female domestic shorthair cat was evaluated because of a generalized seizure disorder that developed after an anesthesia-related hypoxic event. CLINICAL
FINDINGS: Following administration of phenobarbital, the seizures stopped but the cat developed severe generalized lymphadenopathy. Results of a CBC and serum biochemical analysis were unremarkable. Cytologic examination of the lymph nodes revealed a reactive lymphocyte population. Differential diagnoses included neoplasia and infection, but results of related diagnostic tests were all negative. TREATMENT AND OUTCOME: Treatment was changed from phenobarbital to levetiracetam. Ten days following discontinuation of phenobarbital, the lymph node enlargement resolved, and the cat remained free of seizures with levetiracetam as treatment. CLINICAL RELEVANCE: Pseudolymphoma and anticonvulsant hypersensitivity syndrome are recognized potential sequelae to anticonvulsant administration in humans. However, a pseudolymphoma-like reaction to anticonvulsants in veterinary species has not previously been reported. This case highlighted a potentially serious yet reversible sequela to phenobarbital treatment that may have been mistaken for more severe illness such as neoplasia.


Choledochotomy and primary repair of extrahepatic biliary duct rupture in seven dogs and two cats.

OBJECTIVE: To report clinical findings and outcome in dogs and cats undergoing choledochotomy or primary repair of extrahepatic biliary duct rupture. METHODS: Retrospective study of dogs (n=7) and cats (n=2) that had choledochotomy or primary bile duct repair. RESULTS: Extrahepatic biliary obstruction was confirmed at surgery in all cases. The underlying cause in four dogs and both cats was choledocholithiasis, two dogs had gall bladder mucocoeles with associated bile duct rupture, and one dog had inspissated bile obstructing the bile duct secondary to gall bladder carcinoid tumour. Three dogs and both cats had choledochotomies performed to relieve extrahepatic biliary obstruction, and four dogs with bile duct rupture underwent primary repair of the defect. One dog with a bile duct rupture was re-explored four days postoperatively and had suffered dehiscence of the repair; this rupture was re-repaired. All animals were discharged from the hospital, and did not have clinical recurrence of extrahepatic biliary obstruction. CLINICAL SIGNIFICANCE: Choledochotomy and primary repair of extrahepatic biliary duct rupture were associated with low perioperative morbidity and no mortality in this small cohort of cases. These techniques are reasonable options either alone or in conjunction with other procedures when bile duct patency cannot be re-established by catheterisation or bile duct discontinuity exists.


Feline blood transfusions: A pinker shade of pale.

PRACTICAL RELEVANCE: blood transfusions are a potentially life-saving procedure that are within the reach of most small animal practitioners. Only minimal equipment is required. PATIENT GROUP: any cat with clinical signs attributable to a reduced red blood cell mass that is affecting oxygen transport (as a result of reduced packed cell volume or acute blood loss) is a potential candidate for a transfusion. CLINICAL CHALLENGES: although the principles of transfusion medicine are not complicated, there can be fatal consequences if certain steps are omitted. DIAGNOSTICS: blood typing kits and blood filters are readily available from veterinary wholesalers, laboratories and blood banking services. EVIDENCE BASE: over the past three decades, a substantial body of clinical research and reports has built up covering feline blood types and transfusion medicine. This article draws on that research to provide clinical guidance aimed at all veterinarians in feline or small animal practice who either currently practise transfusion medicine or plan to do so.
Complete Genome Sequence of Mycoplasma haemofelis, a hemotropic mycoplasma.
Here we present the genome sequence of Mycoplasma haemofelis strain Langford 1, representing the first hemotropic mycoplasma (hemoplasma) species to be completely sequenced and annotated. Originally isolated from a cat with hemolytic anemia, it induces severe hemolytic anemia when inoculated into specific pathogen free-derived cats. The genome sequence has provided insights into the biology of this uncultivatable hemoplasma and has identified potential molecular mechanisms underlying its pathogenicity.

Mycoplasma felis-associated meningoencephalomyelitis in a cat.
Mycoplasmas are frequently isolated from many animal species. In domestic cats, mycoplasmas may be isolated from respiratory and ocular mucosae, but other sites are also occasionally colonized by these organisms. No cases of Mycoplasma species-associated neurologic disease have been reported in cats. We describe a case of Mycoplasma felis-associated meningoencephalitis in a 10-month-old domestic shorthair cat.

Comparison of digital and optical hand-held refractometers for the measurement of feline urine specific gravity.
Measuring urine specific gravity (USG) is an important component of urine analysis as it evaluates renal concentrating capability. The objective of this study was to quantify the difference in USG values between a hand-held optical analogue refractometer and a cat-specific digital instrument. Urine samples from 55 cats were assessed. There was a statistically significant difference between these two refractometers (P<0.001), with the optical refractometer (mean USG=1.031) consistently reading higher than the digital refractometer (mean USG=1.027). Results for a random subset of the samples (n=10) were compared with urine osmolality and both the optical and digital instruments demonstrated excellent correlation. While an accurate USG reading is important, it is unlikely that the statistical significance between the two instruments is clinically significant and, therefore, unlikely to result in a change in patient evaluation or treatment plans. While both the digital and optimal refractometers are highly correlated to the urine osmolality, making both devices valid for assessment of USG in clinical practice, this digital device is easier to read and eliminates the variability of subjective interpretation.

Intermittent hemodialysis for small animals.
Hemodialysis is a life-saving medical modality that cleanses the blood using an artificial kidney, called a dialyzer. Hemodialysis uses contact between the patient’s blood and the semipermeable membrane of the extracorporeal dialyzer to remove compounds such as blood urea nitrogen, creatinine, electrolytes,
minerals, anions, cations, certain drugs and toxins, and excess fluid from the bloodstream. The extracorporeal dialyzer distinguishes hemodialysis from peritoneal dialysis, which uses a patient’s peritoneum as the dialysis membrane. There are 2 main types of hemodialysis: intermittent hemodialysis and continuous renal replacement therapy. This article focuses on intermittent hemodialysis for acute and chronic kidney injury.

**Bock P, Hach V, and Baumgartner W (2011) Vet Pathol**

**Oral Masses in Two Cats.**

Incisional biopsies from the oral cavity of 2 adult cats were submitted for histological investigation. Cat No. 1 showed a solitary well-circumscribed neoplasm in the left mandible. Cat No. 2 demonstrated a diffusely infiltrating neoplasm in the left maxilla. Both tumors consisted of medium-size epithelial cells embedded in a fibrovascular stroma. The mitotic index was 0 to 1 mitosis per high-power field. The epithelial cells showed an irregular arrangement forming nests or streams in cat No. 1, whereas a palisading growth was noted in cat No. 2. Both tumors, especially that of cat No. 1, showed multifocal accumulations of amyloid as confirmed by Congo red staining and a distinct green birefringence under polarized light, which lacked cytokeratin immunoreactivity as well as AL and AA amyloid immunoreactivity. In addition, the amyloid in cat No. 2 was positive for the odontogenic ameloblast-associated protein, formerly termed APin. In sum, both cats suffered from an amyloid-producing odontogenic tumor, but their tumors varied with respect to morphology and type of amyloid produced.


**Treatment of three cats with hyperviscosity syndrome and congestive heart failure using plasmapheresis.**

Three cats were evaluated at a veterinary teaching hospital for congestive heart failure (CHF) secondary to hyperviscosity syndrome from plasma cell neoplasia. All cats had severe hyperproteinemia due to hyperglobulinemia. Multiple myeloma or plasma cell neoplasia was diagnosed based on cytopathology and post mortem examination. The cats presented with signs of CHF including acute collapse, tachypnea, increased respiratory effort, and pulmonary crackles. All cats had heart murmurs and echocardiographic signs consistent with hypertrophic cardiomyopathy. An enlarged left atrium was found in all cats and two of three cats also had spontaneous echocardiographic contrast. Plasmapheresis (centrifugal plasma exchange) was performed on all three cats by the removal of whole blood and the infusion of a balanced electrolyte solution while the whole blood was centrifuged and separated. The RBCs were then washed before being readministered to the patient. Plasmapheresis alleviated the clinical signs of CHF (tachypnea) in all three cats. Plasmapheresis should be considered in cases of CHF secondary to hyperviscosity syndrome to rapidly alleviate clinical signs associated with heart failure while diagnosis of the underlying cause is made and appropriate therapy implemented.


**Refinement and initial validation of a multidimensional composite scale for use in assessing acute postoperative pain in cats.**

OBJECTIVE: To refine and test construct validity and reliability of a composite pain scale for use in assessing acute postoperative pain in cats undergoing ovariohysterectomy. SAMPLE POPULATION: 40 cats that underwent ovariohysterectomy in a previous study. PROCEDURES: In a previous
randomized, double-blind, placebo-controlled study, a composite pain scale was developed to assess postoperative pain in cats that received a placebo or an analgesic (tramadol, vedaprofen, or tramadol-vedaprofen combination). In the present study, the scale was refined via item analysis (distribution frequency and occurrence), a nonparametric ANOVA, and item-to-total score correlation. Construct validity was assessed via factor analysis and known-groups discrimination, and reliability was measured by assessing internal consistency. RESULTS: Respiratory rate and respiratory pattern were rejected after item analysis. Factor analysis resulted in 5 dimensions (F1 [psychomotor change], posture, comfort, activity, mental status, and miscellaneous behaviors; F2 [protection of wound area], reaction to palpation of the surgical wound and palpation of the abdomen and flank; F3 [physiologic variables], systolic arterial blood pressure and appetite; F4 [vocal expression of pain], vocalization; and F5 [heart rate]). Internal consistency was excellent for the overall scale and for F1, F2, and F3; very good for F4; and unacceptable for F5. Except for heart rate, the identified factors and scale total score could be used to detect differences between the analgesic and placebo groups and differences among the analgesic treatments. CONCLUSIONS AND CLINICAL RELEVANCE: Results provided initial evidence of construct validity and reliability of a multidimensional composite tool for use in assessing acute postoperative pain in cats undergoing ovariohysterectomy.

Buote NJ, Kovak-McClaran JR, and Schold JD (2011) Vet Surg 40:106-114. Conversion from diagnostic laparoscopy to laparotomy: risk factors and occurrence. OBJECTIVE: To determine reasons for conversion from diagnostic laparoscopic procedures to celiotomy in dogs and cats. STUDY DESIGN: Case series. ANIMALS: Dogs (n=54), cats (40). METHODS: Medical records (2004-2008) were reviewed for dogs and cats that had diagnostic laparoscopic or laparoscopic-assisted biopsy. Numbers of conversions to laparotomy were recorded, including cause and type (elective versus emergent), postoperative complications, and short-term outcome. Specific risk factors for conversion, including signalment, preoperative diagnostics, and surgical findings were assessed; categorical variables were tested by chi(2) and Fisher’s exact tests; continuous variables by Student’s t-test and Wilcoxon’s rank-sum tests; multivariate logistic regression models were created. RESULTS: Twenty animals (21%) had laparoscopic conversion; 13 (65%) were considered elective and 7 (35%) emergent conversions. There was no significant difference between animals requiring and those not requiring conversion for age, weight, sex, body condition score, clinical signs, previous abdominal surgery, or surgeon experience. Significant risk factors for conversion included low total solids (P=.03), presence of a solitary liver tumor (P<.01), and diagnosis of neoplasia (P<.01). CONCLUSIONS: A conversion rate of 21% was found in this population of dogs and cats undergoing laparoscopic diagnostic procedures. A preoperative finding of a solitary liver tumor, low total solids, and diagnosis of malignancy were all significant risk factors for conversion.

Cabassu J, Seim HBr, MacPhail CM, and Monnet E (2011) J Am Vet Med Assoc 238:89-93. Outcomes of cats undergoing surgical attenuation of congenital extrahepatic portosystemic shunts through cellophane banding: 9 cases (2000-2007). OBJECTIVE: To evaluate the long-term prognosis of cats with a congenital extrahepatic portosystemic shunt (CEPSS) attenuated through gradual occlusion with cellophane banding (CB). DESIGN: Retrospective case series. ANIMALS: 9 cats with a CEPSS that was attenuated with CB. PROCEDURES: Medical records of cats surgically treated for CEPSS by means of CB from January 2000 through March 2007 were reviewed. Extracted data included preoperative clinical signs, medications, diagnostic results including serum bile acids concentrations, surgical technique,
intraoperative and postoperative complications, and long-term follow-up information. RESULTS: 2 cats that developed refractory seizures were euthanized within 3 days after the CB procedure. Seven of the 9 cats survived to 15 days after surgery. Four cats did not have any clinical signs of CEPSS at long-term follow up. At that time, 5 cats had a postprandial SBA concentration within reference limits and 1 cat had persistent ptyalism. One cat had biurate ammonium stones removed > 2 years after surgery. One cat was euthanized 105 days after surgery because of uncontrolled seizures. The 3-year survival rate was 66%. CONCLUSIONS AND CLINICAL RELEVANCE: Uncontrolled seizure activity was the most common cause of death after CB. Long-term outcome for cats with CEPSS was fair to good after the procedure. Cats with a CEPSS surviving the immediate postoperative period had a fair to good long-term outcome. Cellophane banding without intraoperative attenuation appears to be an acceptable technique for gradual occlusion of a CEPSS in cats. Cats should be monitored closely for development of neurologic disorders in the postoperative period.


**Assay of two 10% (w/v) fipronil spot-on formulations against feline infestations with Ctenocephalides felis.**

A new fipronil-based spot-on formulation was evaluated against experimental flea infestations in cats in two studies. In both studies, eight cats served as negative controls (groups 1 and 4); on day 0, eight cats were treated with a 10% w/v fipronil-based spot-on solution (Effipro Spot-on, 0.5ml per cat, groups 2 and 5) and eight cats served as positive controls (Frontline Spot-on, 0.5ml per cat, groups 3 and 6). Each cat was infested on day -1 with 50 fleas (study 1) and weekly (day 7-day 56) with 100 fleas (study 2). Geometric mean flea counts obtained 48h after the treatment or each re-infestation were reduced by 99.0 and 98.3% in groups 2 and 3, respectively, on day 2, compared to the negative control group. Cats were protected from re-infestations with an efficacy >99% for 58 days in group 5 and for 37 days in group 6.


**Successful surgical management of a perforating oesophageal foreign body in a cat.**

**CASE PRESENTATION AND SURGICAL INTERVENTION:** a 3-year-old cat was presented with a recent history of dysphagia and intermittent regurgitation. Radiography revealed a bony oesophageal foreign body at the level of the thoracic inlet. Endoscopic retrieval was attempted but resulted in severe dyspnoea due to the development of pneumomediastinum, pneumothorax and subcutaneous emphysema secondary to perforation of the oesophageal wall. Immediate surgical exploration was carried out. Extensive necrosis of the oesophagus resulting from the presence of the foreign body led to a decision to perform an oesophageal resection and anastomosis. CLINICAL RELEVANCE: this is the first clinical report of a cat treated successfully by oesophagectomy following oesophageal perforation due to an obstructive foreign body. The authors suggest that prompt surgical intervention, the ability to convert to a surgical procedure under the same anaesthetic as a non-surgical retrieval, placement of a gastrostomy tube and the availability of advanced anaesthetic and critical care support are important factors to consider when managing feline patients with a perforating oesophageal foreign body.

_Carvalho CF, and Chammas MC (2011) J Feline Med Surg_

**Normal Doppler velocimetry of renal vasculature in Persian cats.**
Renal diseases are common in older cats. Decreased renal blood flow may be the first sign of dysfunction and can be evaluated by Doppler ultrasound. But previous studies suggest that the resistive index (RI) has a low sensitivity for detecting renal disease. Doppler waveforms of renal and intrarenal arteries demonstrate decreased blood flow before there are any changes in the RI. The purpose of this study was to evaluate the normal Doppler flowmetrics parameters of renal arteries (RAs), interlobar arteries (IAs) and abdominal aorta (AO) in adult healthy, Persian cats. Twenty-five Persian cats (13 females and 12 males with mean age of 30 months and an age range 12-60 months) with normal clinical examinations and biochemical tests and normal systemic blood pressure were given B-mode ultrasonographies in order to exclude all nephropathies, including polycystic kidney disease. All measurements were performed on both kidneys. Both kidneys (n=50) were examined by color mapping of the renal vasculature. Pulsed Doppler was used to examine both RAs, the IAs at cranial, middle and caudal sites, and the AO. The RI was calculated for all of the vessels. Early systolic acceleration (ESA) of RA and IA was obtained with Doppler spectral analysis. Furthermore, the ratio indices between RA/AO, and IA/RA velocities were calculated. The mean values of peak systolic velocity (PSV) and the diameter for AO were 53.17+/−13.46cm/s and 0.38+/−0.08cm, respectively. The mean RA diameter for all 50 kidneys was 0.15+/−0.02cm. Considering the velocimetric values in both RAs, the mean PSV and RI that were obtained were 41.17+/−9.40cm/s and 0.54+/−0.07. The RA had a mean ESA of 1.12+/−1.14m/s(2) and the calculated upper limit of the reference value was 3.40m/s(2). The mean renal-aortic ratio was 0.828+/−0.296. The IA showed PSV and RI values of 32.16+/−9.33cm/s and 0.52+/−0.06, respectively. The mean ESA of all IAs was 0.73+/−0.61m/s(2). The calculated upper limit of the reference value was 2.0m/s(2). The mean renal-interlobar artery ratio was 1.45+/−0.57. The RI values obtained in this study were similar to values reported in the literature. Some conditions that lead to a decrease in compliance and to an increase in vascular resistance can affect the Doppler spectral waveforms without changes in RI. To our knowledge, there are no studies that were directed toward to the normal ESA values of the renal vasculature in Persian cats. This study introduced a new ratio between the PSV of the RA and the IA. This index was developed based on the well-known effects of Doppler on the detection of stenosis, regardless of the cause. Further studies are necessary to verify the hemodynamic behavior of this index under pathological conditions in cats as well as the effect of aging, nephropathies and systemic pressure on Doppler velocimetric parameters.


Efficacy of atovaquone and azithromycin or imidocarb dipropionate in cats with acute cytauxzoonosis.

BACKGROUND: Imidocarb or a combination of atovaquone and azithromycin (A&A) has been suggested for treatment of cats with cytauxzoonosis, but neither has been prospectively evaluated for efficacy. HYPOTHESIS/OBJECTIVES: That survival to hospital discharge is improved by treatment with A&A as compared with imidocarb. ANIMALS: Eighty acutely ill cats with Cyttauxzoon felis infection treated at one of 18 veterinary clinics in 5 states. METHODS: An open-label, randomized prospective study compared survival in cats treated with atovaquone (15 mg/kg p.o. q8h) and azithromycin (10 mg/kg p.o. q24h) or imidocarb (3.5 mg/kg i.m.). All received heparin, fluids, and supportive care. Clinical and clinicopathologic data from initial presentation were collated. Parasitemia was quantified (n = 79) and pathogens genotyped (n = 60). Logistic regression was used to determine the impact of treatment group on the primary endpoint, survival to hospital discharge or death. Covariants were analyzed by rank-sum testing. RESULTS: Of 53 cats treated with A&A, 32 (60%) survived to discharge while only 7 of 27 cats (26%) treated with imidocarb survived (P =.0036; odds ratio 7.2, 95% CI 2.2, 24). Cats with a lower parasitemia were more likely to survive, as were cats with higher white blood cell counts and lower total bilirubin. Unique pathogen genotypes were identified.
from 15 cats, while genotype isolated from 21 cats had been described previously. There were multiple pathogen genotypes identified in 24 cats. CONCLUSIONS AND CLINICAL IMPORTANCE: Survival to discharge was more likely in cats treated with A&A as compared with imidocarb, although case fatality rate remained high.


The prevalence of hypocobalaminaemia in cats with spontaneous hyperthyroidism.
OBJECTIVES: To determine the prevalence of hypocobalaminaemia in cats with moderate to severe hyperthyroidism and to investigate the relationship between cobalamin status and selected haematologic parameters. Methods: Serum cobalamin concentrations were measured in 76 spontaneously hyperthyroid cats [serum thyroxine (T(4)) concentration >/=100 nmol/L] and 100 geriatric euthyroid cats. Erythrocyte and neutrophil counts in hyperthyroid cats with hypocobalaminaemia were compared with those in hyperthyroid cats with adequate serum cobalamin concentrations (>290 ng/L). RESULTS: The median cobalamin concentration in hyperthyroid cats was lower than the control group (409 versus 672 ng/L; P=0.0040). In addition, 40.8% of hyperthyroid cats had subnormal serum cobalamin concentrations compared with 25% of controls (P=0.0336). Weak negative correlation (coefficient: -0.3281) was demonstrated between serum cobalamin and T(4) concentrations in the hyperthyroid population, and the median cobalamin concentration was lower in cats with T(4) above the median of 153 nmol/L compared with cats with T(4) below this value (P=0.0281). Hypocobalaminaemia was not associated with neutropenia or anaemia in hyperthyroid cats. CLINICAL SIGNIFICANCE: This study indicates that a substantial proportion of cats with T(4) >/=100 nmol/L are hypocobalaminaemic and suggests that hyperthyroidism directly or indirectly affects cobalamin uptake, excretion or utilisation in this species.


Peritoneal dialysis in veterinary medicine.
Peritoneal dialysis is a modality of renal replacement therapy that is commonly used in human medicine for treatment of chronic kidney disease and end-stage kidney failure. Peritoneal dialysis uses the peritoneum as a membrane across which fluids and uremic solutes are exchanged. In this process, dialysate is instilled into the peritoneal cavity and, through the process of diffusion and osmosis, water, toxins, electrolytes, and other small molecules, are allowed to equilibrate.


BACKGROUND: Peritoneal dialysis (PD) has been described for use in animals with acute kidney injury refractory to fluid therapy. However, no study has examined the use of PD in a large group of cats. HYPOTHESIS: PD is an important adjunctive therapy to treat acute kidney injury in cats. ANIMALS: The medical records of 22 cats with acute kidney injury that had received PD were examined. Animals were excluded if acute uremia was a result of postrenal causes such as uroabdomen or urethral obstruction. METHODS: Medical records were reviewed for the following: indication for PD, outcome, number of cycles performed, survival time, and predialysis and postdialysis results for blood urea nitrogen (BUN), creatinine, potassium, chloride, sodium, phosphorus, total protein, and albumin concentrations, and urine output. RESULTS: Indications for PD include acute-on-chronic
kidney injury, acute kidney injury caused by toxins, bilateral ureteroliths, bilateral ureteral ligation as a complication of ovariohysterectomy, and unknown causes. The median survival time for all cats on PD was 4 days, although the median survival time for the cats that were discharged was 774 days. The most common complications were dialysate retention and sequestration of dialysate SC. There was a significant (P <.05) decrease between predialysis and postdialysis results for BUN, creatinine, potassium, phosphorus, total protein, and albumin concentrations. There was a significant (P <.05) difference in survival times between sexes. CONCLUSIONS AND CLINICAL IMPORTANCE: PD is an effective option for treatment of cats with acute kidney injury refractory to fluid therapy.


**Prevalence of Bartonella species DNA and antibodies in cats (Felis catus) submitted to a spay/neuter program in Rio de Janeiro, Brazil.**

The prevalence of Bartonella species DNA and antibodies for Bartonella henselae were studied in 40 clinically healthy cats (Felis catus, Linnaeus 1758) submitted to a spay/neuter program in Rio de Janeiro, Brazil. Additionally, the prevalence of Bartonella species DNA was investigated in the fleas found parasitizing the subject cats. For this purpose, blood samples were obtained from all cats, and DNA extraction was performed on the blood, and blood clotted samples, as well as on pools of fleas obtained from them. Antibodies for B henselae were detected on serum samples. Bartonella species DNA was detected in 17 cats, whereas serum reactivity for B henselae was found in 19. A total of 20 cats were flea-infested and nine of these 20 had Bartonella species DNA in their blood. In four of the 20 flea-infested cats, Bartonella species DNA was detected in the fleas obtained from those cats, but only one of these four cats had Bartonella species DNA in its blood.


**Clinical significance of renal pelvic dilatation on ultrasound in dogs and cats.**

Renal pelvic dilatation is often recognized sonographically in dogs and cats, but ranges of measurements expected with different urologic conditions remain unknown. Ultrasound images of 81 dogs and 66 cats with renal pelvic dilatation were reviewed, and six groups were formed based on medical records: (I) clinically normal renal function, and (II) clinically normal renal function with diuresis; (III) pyelonephritis; (IV) noninfectious renal insufficiency; (V) outflow obstruction; (VI) miscellaneous nonobstructive anomalies. Medians for maximal pelvic width (range) for group I was 2.0 mm (1.0-3.8) in 11 dogs, and 1.6 mm (0.8-3.2) in 10 cats; for group II, 2.5 mm (1.3-3.6) in 15 dogs, and 2.3mm (1.1-3.4) in 16 cats; for group III, 3.6 mm (1.9-12.0) in nine dogs, and 4.0 mm (1.7-12.4) in seven cats; for group IV, 3.1 mm (0.5-10.8) in 33 dogs, and 2.8 mm (1.2-7.3) in 13 cats; for group V, 15.1mm (5.1-76.2) in six dogs, and 6.8mm (1.2-39.1) in 17 cats; and for group VI, 3.8mm (1.2-7.6) in seven dogs, and 3.0 mm (1.3-7.5) in three cats. Pelvic width in group I was lower than in groups III-V (P = 0.0001), but did not significantly differ from group II. Pelvic width > or =13 mm always indicated obstruction. While the proportion of bilateral pelvic dilatation was not different among groups, the difference in pelvic width (maximal-minimal) was greater in group V vs. groups I, II, and IV (P = 0.0009). These results confirm that renal pelvic dilatation can be detected sonographically in dogs and cats with clinically normal renal function, and that it increases with renal insufficiency, pyelonephritis, or outflow obstruction. Nevertheless, renal pelvic width varies substantially within groups and should be interpreted with caution.
Safety of masitinib mesylate in healthy cats.
Background: Masitinib mesylate is a PO-administered tyrosine kinase inhibitor developed both for human and animal diseases with activity against both mutated and wild type forms of the c-kit receptor and platelet-derived growth factor receptors alpha and beta, and is currently registered in Europe for the treatment of mast cell tumors in dogs. Hypothesis/Objectives: The objective of this study was to determine if healthy cats can tolerate administration of masitinib without clinically relevant adverse effects. Animals: Twenty healthy research colony-specific pathogen-free cats. Methods: This study was a prospective, randomized phase 1 clinical trial. Masitinib was administered PO to 20 healthy cats. Ten cats received 50 mg masitinib every other day for 4 weeks, and 10 cats received 50 mg masitinib daily for 4 weeks. Results: Clinically relevant proteinuria was noted in 2/20 (10%) cats (both treated daily), and neutropenia was noted in 3/20 (15%) (seen in both treatment groups). An increase in serum creatinine concentration and adverse gastrointestinal effects were noted in some cats. Conclusions and Clinical Importance: Masitinib mesylate was tolerated in the majority of cats. Long-term administration and pharmacokinetic studies are needed to further assess the use of masitinib in cats.

Anatomical distribution and genetic relatedness of antimicrobial-resistant Escherichia coli from healthy companion animals.
AIMS: Escherichia coli have been targeted for studying antimicrobial resistance in companion animals because of opportunistic infections and as a surrogate for resistance patterns in zoonotic organisms. The aim of our study is to examine antimicrobial resistance in E. coli isolated from various anatomical sites on healthy dogs and cats and identify genetic relatedness. METHODS AND RESULTS: From May to August, 2007, healthy companion animals (155 dogs and 121 cats) from three veterinary clinics in the Athens, GA, USA, were sampled. Escherichia coli was isolated from swabs of nasal, oral, rectal, abdomen and hindquarter areas. Antimicrobial susceptibility testing against 16 antimicrobials was performed using broth microdilution with the Sensititre system. Clonal types were determined by a standardized pulsed-field gel electrophoresis protocol. Although rectal swabs yielded the most E. coli (165/317; 52%) from dogs and cats, the organism was distributed evenly among the other body sites sampled. Escherichia coli isolates from both dogs and cats exhibited resistance to all antimicrobials tested with the exception of amikacin, cephalothin and kanamycin. Resistance to ampicillin was the most prevalent resistance phenotype detected (dogs, 33/199; 17%; and cats, 27/118; 23%). Among the resistant isolates, 21 resistance patterns were observed, where 18 patterns represented multidrug resistance (MDR; resistance >/= 2 antimicrobial classes). Also among the resistant isolates, 33 unique clonal types were detected, where each clonal type contained isolates from various sampling sites. Similar resistance phenotypes were exhibited among clonal types, and three clonal types were from both dogs and cats. CONCLUSIONS: Healthy companion animals can harbour antimicrobial-resistant E. coli on body sites that routinely come in contact with human handlers. Significance and Impact of the Study: This study is the first report that demonstrates a diverse antimicrobial-resistant E. coli population distributed over various sites of a companion animal’s body, thereby suggesting potential transfer of resistant microflora to human hosts during contact.
Factors related to recovery in a cat treated for lidocaine intoxication.

Cortisol and aldosterone response to various doses of cosyntropin in healthy cats.
OBJECTIVE: To determine the lowest dose of cosyntropin on a per body weight basis that would produce maximal cortisol and aldosterone secretion and the ideal timing of blood sample collection after ACTH stimulation in healthy cats. DESIGN: Randomized crossover trial. ANIMALS: 7 adult sexually intact male purpose-bred cats. PROCEDURES: Each cat received saline (0.9% NaCl) solution (control) and 5 doses (125 mug/cat and 10, 5, 2.5, and 1 mug/kg [4.54, 2.27, 1.14, and 0.45 mug/lb]) of cosyntropin IV with a 2-week washout period between treatments. Blood samples were obtained before (baseline) and at 15, 30, 45, 60, 75, and 90 minutes after administration of saline solution or cosyntropin. RESULTS: Serum cortisol and aldosterone concentration increased significantly, compared with baseline values, after administration of all cosyntropin doses. Lower doses of cosyntropin resulted in an adrenocortical response equivalent to the traditional dose of 125 mug/cat. The lowest doses of cosyntropin that stimulated a maximal cortisol and aldosterone response were 5 and 2.5 mug/kg, respectively. Lower doses of cosyntropin resulted in a shorter interval between IV administration of cosyntropin and peak serum cortisol and aldosterone concentrations. CONCLUSIONS AND CLINICAL RELEVANCE: Low-dose ACTH stimulation testing with IV administration of cosyntropin at 5 mug/kg followed by blood sample collection at 60 to 75 minutes resulted in concurrent peak serum cortisol and aldosterone concentrations that were equivalent to those achieved following administration of cosyntropin at 125 mug/cat, the standard dose currently used.

A review of the pathophysiology, classification, and analysis of canine and feline cavitary effusions.
Effusion is the abnormal accumulation of fluid within a body cavity that can result from a variety of disease processes. This article reviews the normal production and resorption of body cavity fluid and the pathophysiology of abnormal fluid accumulation. In addition, classification schemes, differential diagnoses, and currently available diagnostic tests for evaluation of effusions are reviewed.

Denner J (2011) Hum Vaccin 7
Towards an AIDS vaccine: The transmembrane envelope protein as target for broadly neutralizing antibodies.
Although the development of an effective vaccine is the main goal in the fight against AIDS, all attempts by numerous laboratories to develop a vaccine have failed so far. In addition, it is still unclear whether cytotoxic T cells or neutralizing antibodies or both should be induced. The major advantage of neutralizing antibodies is their ability to prevent infection and subsequent integration of the provirus into the cellular genome where it may persist in a form invisible to the immune system. Broadly neutralizing antibodies have been found in HIV infected individuals, including antibodies directed against a highly conserved region in the membrane proximal external region (MPER) of the
transmembrane envelope (TM) protein gp41 of HIV-1. We successfully induced neutralizing antibodies against different gammaretroviruses by immunization with their respective TM proteins. These antibodies recognized epitopes not only in the MPER but also in the fusion peptide proximal region of the TM protein. In the case of feline leukaemia virus (FeLV), these antibodies protected cats from antigenemia following challenge. To understand the mechanism of neutralization, the interactions between neutralizing antibodies and their corresponding epitopes in the TM protein of gammaretroviruses and HIV-1 were analysed. These data may help to design antigens able to induce specific broadly neutralizing antibodies.


**Serum allergen-specific immunoglobulin E in atopic and healthy cats: comparison of a rapid screening immunoassay and complete-panel analysis.**

Feline and canine atopic dermatitis are thought to have a similar immunopathogenesis. As with dogs, detection of allergen-specific IgE in cat serum merely supports a diagnosis of feline atopy based on compatible history, clinical signs and elimination of other pruritic dermatoses. In this study, a rapid screening immunoassay (Allercept(R)) E-Screen 2nd Generation; Heska AG, Fribourg, Switzerland; ES2G) was compared with a complete-panel serum allergen-specific IgE assay (Allercept(R)); Heska AG; CP) in healthy cats with no history of skin disease and in atopic cats. The latter had no diagnosis of external parasitism, infection, food hypersensitivity or other skin disease explaining their pruritus, and expressed cutaneous reaction patterns typically associated with feline allergic skin disease (head, neck or pinnal pruritus, miliary dermatitis, self-induced alopecia, eosinophilic granuloma complex). The proportion of cats positive on either the ES2G or the CP assays was not significantly different between the atopic and healthy cat groups. There was, however, strong agreement between the results of the ES2G and CP assay; overall, the two tests were in agreement for 43 of 49 (88%) serum samples. There was also strong agreement when individual allergen groups were evaluated (agreement noted: indoor, 41 of 49 samples; grasses/weeds, 37 of 49 samples; and trees, 41 of 49 samples). These results indicate that although neither test is diagnostic for feline atopic dermatitis, the screening assay is beneficial for predicting the results of a complete-panel serum allergen-specific IgE assay in cats.


**Influence of nutrition on feline calcium oxalate urolithiasis with emphasis on endogenous oxalate synthesis.**

The prevalence of calcium oxalate (CaOx) uroliths detected in cats with lower urinary tract disease has shown a sharp increase over the last decades with a concomitant reciprocal decrease in the occurrence of struvite (magnesium ammonium phosphate) uroliths. CaOx stone-preventative diets are available nowadays, but seem to be marginally effective, as CaOx urolith recurrence occurs in patients fed these diets. In order to improve the preventative measures against CaOx urolithiasis, it is important to understand its aetiopathogenesis. The main research focus in CaOx formation in cats has been on the role of Ca, whereas little research effort has been directed towards the role and origin of urinary oxalates. As in man, the exogenous origin of urinary oxalates in cats is thought to be of minor importance, although the precise contribution of dietary oxalates remains unclear. The generally accepted dietary risk factors for CaOx urolithiasis in cats are discussed and a model for the biosynthetic pathways of oxalate in feline liver is provided. Alanine:glyoxylate aminotransferase 1 (AGT1) in endogenous oxalate metabolism is a liver-specific enzyme targeted in the mitochondria in cats, and allows for efficient conversion of glyoxylate to glycine when fed a carnivorous diet. The low
peroxisomal activity of AGT1 in cat liver is compatible with the view that felids utilised a low-carbohydrate diet throughout evolution. Future research should focus on understanding de novo biosynthesis of oxalate in cats and their adaptation(s) in oxalate metabolism, and on dietary oxalate intake and absorption by cats.


Identification of bacteria associated with feline chronic gingivostomatitis using culture-dependent and culture-independent methods.
Feline chronic gingivostomatitis (FCGS) is a chronic inflammatory disease of the oral cavity that causes severe pain and distress. There are currently no specific treatment methods available and little is known regarding its aetiology, although bacteria are thought to play a major role. The purpose of this study was to identify the oral bacterial flora in normal and diseased cats. Oral swabs were obtained from the palatoglossal folds of eight cats (three normal and five FCGS) and were subjected to microbiological culture. Pasteurella pneumotropica and Pasteurella multocida subsp. multocida were the most prevalent species identified by culture methods in the normal and FCGS samples, respectively. Bacteria were also identified using culture-independent methods (bacterial 16S rRNA gene sequencing). For the normal samples, 158 clones were analysed and 85 clones were sequenced. Capnocytophaga canimorsus (10.8% of clones analysed) was the predominant species. Uncultured species accounted for 8.2% of clones analysed, and 43.7% of clones analysed represented potentially novel species. For the FCGS samples, 253 clones were analysed and 91 clones were sequenced. The predominant species was P. multocida subsp. multocida (51.8% of clones analysed). Uncultured species accounted for 8.7% of clones analysed, and 4.7% of clones analysed represented potentially novel species. It is concluded that the oral flora in cats with FCGS appears to be less diverse than that found in normal cats. However, P. multocida subsp. multocida is found to be significantly more prevalent in FCGS than in normal cats and consequently may be of aetiological significance in this disease.


Cyclooxygenase-2 expression in animal cancers.
Cyclooxygenase (COX; also known as prostaglandin endoperoxide synthase) is a key enzyme in the biochemical pathway leading to the synthesis of prostaglandins. A large amount of epidemiological and experimental evidence supports a role for COX-2, the inducible form of the enzyme, in human tumorigenesis, notably in colorectal cancer. COX-2 mediates this role through the production of PGE(2) that acts to inhibit apoptosis, promote cell proliferation, stimulate angiogenesis, and decrease immunity. Similarly, COX-2 is believed to be involved in the oncogenesis of some cancers in domestic animals. Here, the author reviews the current knowledge on COX-2 expression and role in cancers of dogs, cats, and horses. Data indicate that COX-2 upregulation is present in many animal cancers, but there is presently not enough information to clearly define the prognostic significance of COX-2 expression. To date, only few reports document an association between COX-2 expression and survival, notably in canine mammary cancers and osteosarcomas. Some evidence suggests that COX inhibitors could be useful in the prevention and/or treatment of certain cancers in domestic animals, the best example being urinary transitional cell carcinomas in dogs. However, determination of the levels of COX-2 in a tumor does not appear to be a good prognostic factor or a good indicator for the response to nonsteroidal anti-inflammatory drug therapy. Clearly, additional research, including the development of in vitro cell systems, is needed to determine if COX-2 expression can be used as a reliable
prognostic factor and as a definite therapeutic target in animal cancers.

Dunn KF, Levy JK, Colby KN, and Michaud RI (2011) Vet Parasitol
Diagnostic, treatment, and prevention protocols for feline heartworm infection in animal sheltering agencies.
Cats are at risk for heartworm infection (Dirofilaria immitis) wherever the disease is endemic in dogs. Diagnosis is more difficult in cats, and little information is available regarding effective palliative and curative treatments for infected cats. In contrast to the challenges of diagnosis and treatment, chemoprophylaxis is highly effective, and current guidelines call for preventive medications to be administered to all cats in endemic areas. The purpose of this study was to survey feline heartworm management protocols used by 400 animal shelters and foster programs in the endemic states of Alabama, Florida, Georgia, and Mississippi. Only 23% of shelters performed feline heartworm testing. The most common reasons for not testing were expense (36%), lack of treatment options for infected cats (18%), and because the agency considers heartworm infections in cats to be less important than in dogs (12%). Most agencies (69%) did not provide preventive medication to cats. Reasons included because testing was not performed (36%), expense (35%), and the perception that local heartworm risk was low (10%). When preventive was provided, feline-labeled broad-spectrum products were used more commonly (81%) than livestock products (14%). The survey also indicated that many policy decisions were based on inaccurate knowledge of feline heartworm prevalence and pathogenesis. Issues of cost, feasibility, and education prevent most Southeastern sheltering agencies from adequately protecting cats against heartworm disease. Practical guidelines tailored to the needs of these agencies should be developed. Subsidized testing and preventive products may facilitate implementation of feline heartworm management protocols in sheltering agencies.

Nutritional considerations for the dialytic patient.
Nutritional therapy has a key role in the conservative management of renal disease. This role is even more vital with the advent of advanced renal replacement therapies to support patients with life threatening severe oliguric or anuric acute uremia or the International Renal Interest Society stage IV chronic kidney disease. Nutritional assessment and institution of nutritional support is crucial because dialysis only partially alleviates uremic anorexia. Dialytic patients have a higher risk of protein calorie, iron, zinc, vitamin B6, vitamin C, folic acid, 1,25-dihydroxycholecalciferol, and carnitine malnutritions.

Use of antimicrobials in companion animal practice: a retrospective study in a veterinary teaching hospital in Italy.
Objectives To describe the use of antimicrobials in a veterinary teaching hospital for companion animals in Italy, with particular regard to the agreement with recommendations of prudent use Methods The study was conducted with a retrospective, cross-sectional design. The population under investigation included 18 905 cats and dogs that were referred to the hospital between 2000 and 2007. Two different samples of the clinical paper forms were randomly selected to estimate the prevalence of animals receiving an antimicrobial prescription and to describe the pattern of antimicrobials used in
relation to the condition being treated. The proportion of antimicrobials prescribed accomplishing recommendations of prudent use was also estimated, as well as the level of agreement with specific, diagnosis-based guidelines for antimicrobial use. Results Broad-spectrum antimicrobials, including penicillins with beta-lactamase inhibitors, first-generation cephalosporins and fluoroquinolones, were the most frequently prescribed compounds. Antimicrobials prescribed with the support of microbiological analyses and susceptibility testing were less than 5%. Among the recommendation of prudent use, the availability of information from laboratory testing had the poorest degree of agreement, while the other evaluated items were accomplished in most of the cases. Conclusions Our results highlight the need to improve the procedures of antimicrobial prescription in the study setting. This can be achieved by supporting the guidance for antimicrobial use at the local level, with the adoption of specific guidelines, and at the national level with a further implementation of the policies of prudent prescriptions.


What’s in a name? Perceptions of stray and feral cat welfare and control in Aotearoa, New Zealand.

New Zealanders (n = 354) rated the acceptability of lethal and nonlethal cat control methods and the importance of conservation and welfare. Lethal control was more acceptable for feral cats than strays; for nonlethal control, the inverse was true. More than concern for the welfare of cats subjected to control, perceived conservation benefits, risk of disease transfer, and companion cat welfare dictated the acceptability of control measures. Similarly, the welfare consideration for groups of cats differed, transitioning from companion (highest) to feral (lowest). Differences in attitudes toward acceptability of control methods were evident. In particular, nonhuman animal professionals ranked lethal control as more acceptable than did nonanimal professionals. Cat caregivers (owners) considered both conservation and welfare issues of greater importance than did nonowners. Owners ranked the acceptability of nonlethal control methods higher for stray cats, but not feral, than did nonowners. This research indicates that the use of the terms stray and feral may have significant impact on cats in New Zealand. There is also a greater consideration of conservation values than of welfare in stray and feral cat control.


Long-term melatonin treatment prolongs interestrus, but does not delay puberty, in domestic cats.

The objective was to assess the efficacy and safety of long-term administration of melatonin (either as an implant or given orally) on interestrus intervals in domestic cats. Additionally, the effect of melatonin implants on puberty postponement was studied. For these purposes, two randomized controlled trials were conducted. In the first, 68 interestrus intervals (in 28 postpubertal queens) were studied, and in the second, 32 prepubertal female cats were used. During anovulatory interestrus intervals (27 ovulatory interestrus intervals were excluded), postpubertal cats were assigned to the following three treatments: melatonin implant 18 mg/cat SC (n = 17; MEI); melatonin tablets, 4 mg/cat/d orally until the onset of estrus (n = 12; MEO); or control (n = 12; CTL). Prepubertal females were randomly assigned to the following three treatments: melatonin 18 mg/cat sc implants at either 1.9 +/- 0.3 kg (MEI-A; n = 12) or 1.5 +/- 0.3 kg (MEI-B; n = 10) body weight; or control (CTL; n = 10). Interestrus intervals in postpubertal MEI, MEO, and CTL groups were 63.8 +/- 5.4, 63.0 +/- 5.3 and
19.2 +/- 1.4 d (P < 0.05), respectively. In these groups, intervals between onset of treatment and the first estrus cycle were 51.0 +/- 4.7, 50.0 +/- 6.1, and 12.6 +/- 1.1 d (P < 0.05). In the second experiment, neither age (MEI-A: 232.4 +/- 10.5, MEI-B: 208.6 +/- 13.0 and CTL: 192.4 +/- 20.1 d; P > 0.1) nor body weight (P > 0.1) at puberty differed among groups. None of the cats in either study had clinically apparent side effects. We concluded that long-term melatonin treatment of domestic cats slightly prolonged interestrus intervals, but did not postpone puberty.


Serodiagnosis of sporotrichosis infection in cats by enzyme-linked immunosorbent assay using a specific antigen, SsCBF, and crude exoantigens.

The main objective of this study is to standardize an ELISA for the diagnosis of feline sporotrichosis. Sporothrix schenckii is the etiological agent of human and animal sporotrichosis. Cats may act as reservoirs for S. schenckii and can transmit the infection to humans by a bite or scratch. There are few methods for the serological diagnosis of fungal diseases in animals. In this paper, an ELISA test for the diagnosis of cat sporotrichosis is proposed, which detects S. schenckii-specific antibodies in feline sera. Two different kinds of antigens were used: “SsCBF”, a specific molecule from S. schenckii that consists of a Con A-binding fraction derived from a peptido-rhamnomanan component of the cell wall, and a S. schenckii crude exoantigen preparation. The ELISA was developed, optimized, and evaluated using sera from 30 cats with proven sporotrichosis (by culture isolation); 22 sera from healthy feral cats from a zoonosis center were used as negative controls. SsCBF showed 90% sensitivity and 96% specificity in ELISA; while crude exoantigens demonstrated 96% sensitivity and 98% specificity. The ELISA assay described here would be a valuable screening tool for the detection of specific S. schenckii antibodies in cats with sporotrichosis. The assay is inexpensive, quick to perform, easy to interpret, and permits the diagnosis of feline sporotrichosis.


Intestinal parasites in dogs and cats from the district of Evora, Portugal.

Intestinal parasites, both helminths and protozoa, are commonly found in domestic animals, and the possible transmission of enteric parasites from dogs and cats to humans may constitute a global potential health risk worldwide. In the present study, we analysed 148 stool samples from dogs (n=126) and cats (n=22) collected from animal shelters and veterinary clinics, in the district of Evora, Portugal. Microscopic examination confirmed that Giardia was the most frequent parasite in the studied population (34/148; 23%). Other parasites such as Ancylostoma sp., Isospora spp., Toxocara, Trichuris spp., Toxascaris and Toxoplasma were also found. Furthermore, molecular characterization of Giardia duodenalis analysis targeting the small subunit ribosomal RNA (ssu-rRNA) was performed revealing the presence of host-specific (C and D) and zoonotic assemblages (A and B). This work points out to the importance of protozoan parasites in companion animals, and reanalyses the need for parasite prophylaxis.

Morphological and molecular characterisation of a mixed Cryptosporidium muris/Cryptosporidium felis infection in a cat.
To date Cryptosporidium muris has been identified by microscopy and genotyping in cats in two studies. We report morphological and genetic evidence of a mixed C. muris and C. felis infection in a cat and provide the first histological, immunohistochemical, in situ hybridisation and genetic confirmation of a C. muris infection in the stomach of a cat. The cat suffered persistent diarrhoea after the initial consultation, which remained unresolved, despite several medical interventions. Further studies are required to determine the range, prevalence and clinical impact of Cryptosporidium species infecting cats.

Hypertrophic cardiomyopathy in young Maine Coon cats caused by the p.A31P cMyBP-C mutation - the clinical significance of having the mutation.
ABSTRACT: BACKGROUND: In Maine Coon (MC) cats the c.91G > C mutation in the gene MYBPC3, coding for cardiac myosin binding protein C (cMyBP-C), is associated with feline hypertrophic cardiomyopathy (fHCM). The mutation causes a substitution of an alanine for a proline at residue 31 (p.A31P) of cMyBP-C. The pattern of inheritance has been considered autosomal dominant based on a single pedigree. However, larger studies are needed to establish the significance of cats being heterozygous or homozygous for the mutation with respect to echocardiographic indices and the probability of developing fHCM. The objective of the present study was to establish the clinical significance of being homozygous or heterozygous for the p.A31P cMyBP-C mutation in young to middle-aged cats. METHODS: The cohort consisted of 332 MC cats, 282 cats < 4 years (85%). All cats were examined by 2-D and M-mode echocardiography. DNA was extracted from blood samples or buccal swabs and screened for the p.A31P cMyBP-C mutation in exon 3 of the gene, using polymerase chain reaction followed by DNA sequencing. RESULTS: The fHCM prevalence was 6.3% in the cohort. Eighteen cats were homozygous and 89 cats were heterozygous for the mutation. The odds ratio for having fHCM for homozygous cats was 21.6 (95% confidence interval 7.01-66.2) - when the group of equivocal cats was categorized as non-affected. Overall, 50% of the cats that were homozygous for the mutation had fHCM. p.A31P heterozygosity was not associated with a significant odds ratio for fHCM. In cats in the 4 to 6 years of age range a similar, non significant, odds ratio was seen in heterozygous cats. Only two cats over four years were homozygous and both were diagnosed with fHCM. CONCLUSION: As there is no significant odds ratio associated with being heterozygous for the pA31P cMyBP-C mutation at this age, the mutation must have a very low penetrance in this group. From our data it would appear that most MC cats that develop fHCM due to the p.A31P mutation prior to the age of approximately 6 years do so because they are homozygous for this mutation.

Congenital diaphragmatic eventration in two closely related British Shorthair cats.
Two closely related British Shorthair cats, which died after surgery performed in the dorsal position, were presented for dissection. In both, a thin, flaccid, enlarged transparent tendinous diaphragmatic portion protruded cranially into the thoracic cavity, forming a cupola in which left, right medial and quadrate hepatic lobes were encased in both cats and the stomach in one cat. Microscopically, no muscle fibres were observed in the membrane, but numerous hepatocytes and bile ducts were incorporated in its central part. The anomaly was diagnosed as a congenital diaphragmatic eventration.
Susceptibility of rapidly growing mycobacteria isolated from cats and dogs, to ciprofloxacin, enrofloxacin and moxifloxacin.

Rapidly growing mycobacteria (RGM) cause infections in cats and dogs which require prolonged antibacterial medication for resolution. In Australia, pathogens from the Mycobacterium fortuitum and Mycobacterium smegmatis clusters are responsible for most of the RGM infections in cats and dogs. As fluoroquinolones are often recommended for treating such infections, 14 M. fortuitum isolates, 51 isolates from the M. smegmatis cluster and 2 M. mageritense isolates, collected from feline and canine patients, underwent susceptibility testing to the second generation fluoroquinolones ciprofloxacin and enrofloxacin and the newer generation fluoroquinolone moxifloxacin. Using microbroth dilution, the MIC(90) of ciprofloxacin, enrofloxacin, and moxifloxacin that inhibited growth of M. fortuitum isolates were 0.500, 0.250 and 0.063 μg/mL respectively. For the M. smegmatis cluster isolates the corresponding MIC(90) was 0.500, 0.250 and 0.125 μg/mL respectively. E-test results showed similar trends but MICs were lower than those determined by microbroth dilution. Additionally, moxifloxacin was administered to 10 clinically normal cats (50mg per cat, once daily for 4 days). The plasma moxifloxacin concentration 2h after the last dose was determined by liquid chromatography as 2.2 +/- 0.6 μg/mL. The plasma concentration at 2h:MIC(90) ratios for moxifloxacin for M. fortuitum and M. smegmatis cluster was 34.9 and 17.6 respectively which exceeded the recommended threshold of 10, indicating that moxifloxacin has good theoretical efficacy for treatment of those M. fortuitum and M. smegmatis infections in cats and dogs that have become refractory to other antibacterial drug classes.

Inflammatory polyps of the nasal turbinates of cats: an argument for designation as feline mesenchymal nasal hamartoma.

Inflammatory polyps of the nasal turbinates (IPNT) in cats are benign growths that are histologically distinct from feline nasopharyngeal polyps. Most cats with IPNT are presented at less than 1 year of age with sneezing, noisy breathing and epistaxis, but without mucoid or mucopurulent nasal discharge. Histologically, IPNT are characterised by the presence of woven bone as part of the proliferating stroma and erythrocyte-filled spaces. These unique histological features are analogous to nasal hamartomas (NH) of children, specifically chondromesenchymal hamartoma (NCMH) and sinonasal fibro-osseous hamartoma (SFOH), which also result in signs of nasal obstruction, sneezing and epistaxis. In our study, clinical and histopathological features in five cats with IPNT were compared with published descriptions of NH in children. We conclude that the terminology ‘feline mesenchymal nasal hamartoma’ provides a more accurate description of the disease currently termed IPNT, and has the added advantage of being consistent with its human counterpart.

Prospective evaluation of minimally invasive plate osteosynthesis in 36 nonarticular tibial fractures in dogs and cats.

OBJECTIVE: To evaluate the clinical outcome of minimally invasive plate osteosynthesis (MIPO) for nonarticular tibial fractures stabilized using bone plates with or without an intramedullary rod (IMR).
STUDY DESIGN: Prospective study. ANIMALS: Dogs (n=28) and 8 cats. METHODS: After closed reduction, fracture fixation was achieved using an epiperiosteal plate inserted percutaneously through epiphyseal small incisions. In some fractures, an IMR was inserted via medial parapatellar arthrotomy. Radiographs were recommended every 3 weeks until clinical union. Postoperative tibial length and alignment were compared with contralateral measurements (P<.05). Time to clinical union and complications were recorded. RESULTS: An IMR was used in 30.5% of the cases. Repaired tibiae were 1% shorter than contralateral tibiae (P<.05). Frontal and sagittal alignment were similar between repaired and contralateral tibiae (P>.05). Six dogs were lost for follow-up; owners indicated normal function. In 30 cases for which bone healing was documented, mean+/−SD healing time was 45+/−20.8 days; however, when considering the 23 cases, which completed preestablished scheduled follow-ups, healing time was 36+/−11.6 days. Minor complications occurred in 4 cases (11%). One major complication (3%) consisting of a plate fracture was successfully revised using MIPO with a larger plate. CONCLUSIONS: Consistent restoration of alignment was accomplished using MIPO techniques. Furthermore, MIPO appeared to yield faster healing times and lower complication rates than those reported with conventional plate osteosynthesis.


Ultrasonographic study of the feline sciatic nerve.
This study was conducted to describe the ultrasonographic appearance and technique for the evaluation of sciatic nerve (ScN) in cats. An anatomical study was carried out using six feline cadavers to determine anatomic landmarks. An ultrasonographic ‘in vitro’ study was performed using eight pelvic limbs from four fresh feline cadavers to assess the ScN in three regions (glutea, femoralis and popliteal) using a 4-13MHz linear transducer. Five healthy adult experimental cats were employed for an ‘in vivo’ ultrasonographic study of the ScN using the same protocol described for the ‘in vitro’ study. The ultrasonographic images of the ScN were well correlated with those obtained in the anatomical study. The ScN was easily identified in all the approaches. The ScN was observed as a hypoechoic structure with internal echoes, outlined by hyperechoic lines. This study shows the usefulness of ultrasound to evaluate the entire pathology of the ScN in the cat.


The Feline Acute Patient Physiologic and Laboratory Evaluation (Feline APPLE) Score: a severity of illness stratification system for hospitalized cats.
BACKGROUND: Scores allowing objective stratification of illness severity are available for dogs and horses, but not cats. Validated illness severity scores facilitate the risk-adjusted analysis of results in clinical research, and also have applications in triage and therapeutic protocols. OBJECTIVE: To develop and validate an accurate, user-friendly score to stratify illness severity in hospitalized cats. ANIMALS: Six hundred cats admitted consecutively to a teaching hospital intensive care unit. METHODS: This observational cohort study enrolled all cats admitted over a 32-month period. Data on interventional, physiological, and biochemical variables were collected over 24 hours after admission. Patient mortality outcome at hospital discharge was recorded. After random division, 450 cats were used for logistic regression model construction, and data from 150 cats for validation. RESULTS: Patient mortality was 25.8%. Five- and 8-variable scores were developed. The 8-variable score contained mentation score, temperature, mean arterial pressure (MAP), lactate, PCV, urea,
chloride, and body cavity fluid score. Area under the receiver operator characteristic curve (AUROC) on the construction cohort was 0.91 (95% CI, 0.87-0.94), and 0.88 (95% CI, 0.84-0.96) on the validation cohort. The 5-variable score contained mentation score, temperature, MAP, lactate, and PCV. AUROC on the construction cohort was 0.83 (95% CI, 0.79-0.86), and 0.76 (95% CI, 0.72-0.84) on the validation cohort. CONCLUSIONS AND CLINICAL IMPORTANCE: Two scores are presented enabling allocation of an accurate and user-friendly illness severity measure to hospitalized cats. Scores are calculated from data obtained over the 1st 24 hours after admission, and are diagnosis-independent. The 8-variable score predicts outcome significantly better than does the 5-variable score.


Poxvirus infection in a cat with presumptive human transmission.
The present report describes a case of generalized cowpox virus infection with necrotizing facial dermatitis in a cat and a likely transmission to an animal keeper. The viral aetiology was confirmed by histopathology, immunohistochemistry, PCR, virus isolation, DNA sequencing and electron microscopy. Histopathological examination of the cat’s skin revealed a severe, necrotizing dermatitis with ballooning degeneration and hyperplasia of epithelial cells with pathognomonic cytoplasmic eosinophilic inclusion bodies. Additionally, at post-mortem examination, a systemic poxvirus infection was detected affecting pancreas, thymus, lymph node, liver and lung. The human patient’s skin biopsy revealed an ulcerative dermatitis with epidermal hyperplasia and ballooning degeneration. Serological investigation displayed a high orthopoxvirus-specific antibody titre in the human patient. Environmental factors increase the natural reservoir host population for cowpox viruses, such as voles, which results in a higher risk of infection for cats and subsequently for humans. Due to this zoonotic potential, a cowpox virus infection must be considered as an aetiological differential in cases of necrotizing dermatitis in cats.


Airway hyperresponsiveness to adenosine 5’-monophosphate in feline chronic inflammatory lower airway disease.
Airway hyperresponsiveness is a key feature of human asthma and chronic bronchitis and response to the indirectly acting agonist adenosine 5’-monophosphate (AMP) is thought to reflect underlying airway inflammation. To examine whether airway responsiveness testing (ART) with AMP may be used to differentiate healthy cats from those with asthma (FA) and chronic bronchitis (CB), 24 cats (9 FA, 6 CB, 9 controls) underwent ART with AMP at concentrations of 0.1, 1, 10, 100 and 500mg/mL using barometric whole body plethysmography. The defined endpoint of ART, an increase in enhanced pause (Penh) exceeding 300% of the post-saline value (baseline), was reached in 9/15 patients (7 FA, 2 CB), but in none of the controls. Mean Penh (+/-SD) at baseline (BL) was 0.49+-0.16 for cases, and 0.54+-0.16 for controls, and was significantly increased after AMP challenge in clinical cases (2.62+-2.20), but not in controls (0.63+-0.30, P<0.05). After separating responder (R) and non-responder (NR) cases, a more pronounced difference after challenge was found (R: 3.96+-1.84, NR: 0.6+-0.21, P<0.001). The provocative concentration of the agonist that increased Penh to 300% of BL (PC Penh 300) in R cases was 52.98+-48.04mg/mL AMP. Age had no influence on the responder status or PC Penh 300. It was concluded that AMP challenge may offer a new method for the identification of cats with lower inflammatory airway disease, and possibly for monitoring disease progression or response to therapy.
Objective: To identify a method of composite application for maxillomandibular fixation (MMF) in cats that ensures the material will remain bonded during convalescence but be easy to remove with a low complication rate. Study Design: Experimental study Sample Population: Feline cadavers (n=88). Methods: MMF was applied using composite to 4 groups of 22 feline cadaver heads each. The protocols were: group CR: acid etch and composite resin; group CR+: acid etch, bonding agent, and composite resin; group FR50: partial surface acid etch and flowable composite resin; group FR100: complete surface acid etch and flowable composite resin. Removal time and complication rate were noted. Load to failure was determined by tensile loading. Results: Load to failure was similar for groups CR and CR+ and for groups FR50 and FR100; however, load to failure for groups FR50 and FR100 was higher than groups CR and CR+ (P<.01). Time for material removal for group FR100 was longer (P<.01) and the complication rate was higher (P<.01) compared with the groups CR, CR+, and FR50, with no significant differences in removal times and complication rate between the latter groups. The most frequent complication during material removal in group FR100 was crown fracture. Conclusions: Partial coronal surface acid etch before use of flowable composite maintained a strong bond, yet resulted in easy material removal with a low complication rate.

Prevalence of IgG antibodies to Encephalitozoon cuniculi and Toxoplasma gondii in cats with and without chronic kidney disease from Virginia.
Kidney disease is a common and serious condition in domestic cats. There are numerous causes of kidney disease including parasitic infection. Encephalitozoon cuniculi is a microsporidian parasite that develops in the kidneys of rabbits and causes chronic renal disease. Little has been reported concerning E. cuniculi in cats and no serological studies on this parasite in cats have been conducted in the United States to date. The present study explored the possibility that E. cuniculi is an unrecognized contributor to the high prevalence of kidney disease observed in cats. A serological survey was conducted to determine the prevalence of IgG antibodies to spores of E. cuniculi in cats with and without a diagnosis of chronic kidney disease (CKD) according to the International Renal Interest Society (IRIS) staging system. Likewise, samples were examined for IgG antibodies to Toxoplasma gondii, a common well studied protozoan of cats. Plasma and sera were obtained from 232 feline patients at the Virginia-Maryland Regional College of Veterinary Medicine teaching hospital. With the investigators blinded to the renal status of test subjects, samples were screened via indirect immunofluorescent antibody assay (IFA). Thirty-six of the 232 cats met the IRIS staging system criteria for CKD. Antibodies to E. cuniculi were found in 15 of the 232 samples, which included 4 of the 36 cats with CKD. Sera from cats serologically positive to E. cuniculi did not react to spores of E. intestinalis or E. hellem when examined in the IFA. Antibodies to T. gondii were found in 63 of the 232 samples, which included 10 of the 36 cats with CKD. The prevalence of antibodies in cats with CKD to either protozoan was not significantly different (P>0.05) from the cats without CKD in the study. Collectively the results do not support the hypothesis that either E. cuniculi or T. gondii play a significant etiologic role in the occurrence or progression of CKD in cats.
Feline systemic hypertension: Classification and pathogenesis.
PRACTICAL RELEVANCE: the increased availability of indirect blood pressure monitoring devices in clinical practice over the past decade has highlighted the significance of systemic hypertension in the feline population. Without routine monitoring and appropriate intervention, cats with undiagnosed systemic hypertension may first be presented with sudden-onset blindness as a consequence of either hyphaema or retinal detachment. CLINICAL CHALLENGES: the primary aim in the early diagnosis and treatment of systemic hypertension is prevention of hypertensive target organ damage (with respect to the eye, kidney, cardiovascular and central nervous systems, in particular). A prerequisite is a knowledge of the pathophysiological mechanisms and disease conditions that may contribute to the development of hypertension. This allows the clinician to determine those cases in which blood pressure assessment and longitudinal monitoring is essential and can assist in determining appropriate therapeutic strategies for control of blood pressure. Recent studies have also begun to explore the relationship that systemic hypertension may have with proteinuria and the progression of kidney disease. PATIENT GROUP: the geriatric cat appears most susceptible to the development of systemic hypertension, and monitoring of systolic blood pressure is often advocated as part of a routine health screen in cats over 9-12 years old. Consideration must also be given to cats suspected of having an underlying disease such as chronic kidney disease or hyperthyroidism, or which are receiving therapeutic agents, irrespective of their age. EVIDENCE BASE: much of our understanding of the pathogenesis of feline hypertension is extrapolated from studies performed in experimental animal models or in human patients, and interspecies differences are often poorly understood.

Influence of anaesthetic drugs on the epididymal sperm quality in domestic cats.
The present study investigated the effect of different anaesthetic agents commonly used in cats on the fresh and frozen-thawed epididymal sperm. Seventeen male domestic cats were castrated using pentobarbital, ketamine HCl or isoflurane. Sperm samples were recovered from epididymides and evaluated before and after freezing, determining the vigor, motility, morphology, acrosome status, sperm viability and functional membrane integrity. Fresh epididymal sperm was influenced by the drugs used, noting that motility features, i.e. vigor (p<=0.05) and progressive motility (p<=0.05), were higher for the inhalation anaesthetic while the others did not showed statistical differences. In frozen-thawed sperm samples, cats treated with barbiturics showed lower values for acrosome status (p<=0.05) and integrity and functionality of membrane (p<=0.05 and p<=0.01, respectively) than in the others groups. Results suggested that drugs used for castration in cats could affect the sperm quality and this should be considered when implementing sperm cryopreservation in the feline.

Immunological Status Against Toxoplasma gondii in Non-Cat Owners from an Endemic Region of Mexico.
Abstract A cross-sectional study was developed to determine anti-Toxoplasma gondii immunoglobulin G (IgG) and IgM antibodies from 80 persons aged 18-21 years without a history of previous contact with cats. Individuals who consented to take part in the survey were served with a questionnaire to
obtain responses on their eating habits. Blood samples were taken and specific IgM and IgG antibodies against T. gondii were measured by indirect enzyme-linked immunoassay. Seropositivity was found in 29 (37%) and 20 (25%) of 80 persons for IgM and IgG, respectively. Of the cases, 14 (18%) of 80 were positive to both IgM and IgG T. gondii antibodies. A significant association of IgM seropositivity was found in people consuming pork (p-value = 0.04) and wildlife meat (odds ratio = 4.5; confidence intervals = 1.47-14.25; p-value = 0.009). The presence of specific IgG and IgM antibodies in the studied population indicate previous contact and/or recent infections with T. gondii despite avoiding direct contact with cats. Ingestion of pork and meat from wild animals appears to be playing a key role in transmitting the parasite.


Background: Diagnosis of lower respiratory disease requires collection of airway samples to confirm the etiology of disease. Bronchoscopic evaluation is commonly performed in dogs but less information is available in cats. Hypothesis: The presence and number of bronchoscopic abnormalities visualized during bronchoscopic evaluation of cats with lower respiratory disease will correlate with the type of disease and total and differential cell counts in bronchoalveolar lavage (BAL) fluid. Animals: Forty-eight cats prospectively evaluated by a single bronchoscopist. Methods: Bronchoscopy was performed during clinical evaluation of cats presenting with cough, respiratory distress, or both. Cats were evaluated for airway hyperemia, stenosis, or collapse, mucus accumulation, bronchiectasis, and epithelial irregularities. Cats were placed into groups of bronchitis/"asthma," pneumonia, or neoplasia based on BAL findings, histopathology, and response to appropriate medical therapy. Summation of bronchial abnormalities and total and differential cell counts were compared among groups. Results: Endobronchial abnormalities were common in cats with feline bronchitis/asthma, pneumonia, and neoplasia and no differentiating features were found. Excessive mucus accumulation was common (83%), followed by stenosis of bronchial openings and nodular epithelial irregularities (56%), airway hyperemia (54%), airway collapse (48%), and bronchiectasis (27%). Total bronchoscopic score and total cell count did not differ among groups, although differential cell counts were significantly different. A weak correlation (R(2) = 0.16, P=.006) between age and total bronchoscopic score was noted. Conclusions and Clinical Relevance: Bronchoscopic abnormalities are common in cats with lower respiratory tract disease, and visualization of the airways provides additional nonspecific clinical information in cats.


Hypertrophic osteopathy associated with a renal adenoma in a cat.

Hypertrophic osteopathy is a hyperostotic syndrome of the appendicular skeleton that is most commonly associated with intrathoracic neoplasmia or inflammation. The condition is rarely associated with intra-abdominal lesions. The majority of cases have occurred in dogs and human beings, with fewer cases reported in cats, horses, and other species. A 15-year-old male neutered Domestic Shorthair cat presented for swollen limbs and difficulty in ambulation. Radiographs and gross postmortem revealed severe periosteal hyperostosis of the diaphysis and metaphysis of all 4 limbs, including the humerus, radius, ulna, carpi, metacarpi, femur, tibia, tarsi, metatarsi, and phalanges. The axial skeleton was spared. Hyperostotic lesions were characterized microscopically by lamellar bony trabeculae separated by adipocytes and scant hematopoietic tissue. In several areas, fibrovascular connective tissue, woven bone, and islands of cartilage were also present. A 2.5 cm x 2.5 cm perirenal
neoplasm compressed the left kidney and adrenal gland. This mass consisted of well-differentiated tubules of cuboidal epithelial cells and was most consistent with a renal tubular adenoma, because mitotic figures were rare, and no distant metastases were found. Thoracic pathology was absent. Hyperostosis was consistent with hypertrophic osteopathy secondary to the renal adenoma. The pathogenesis of hypertrophic osteopathy is uncertain, but predominant theories point to increased peripheral circulation and angiogenesis as a key initiating event. Recent literature highlights the potential role of vascular endothelial growth factor and platelet-derived growth factor in the human condition. The mechanism by which this renal adenoma caused hypertrophic osteopathy is unknown.


Help stop teenage pregnancy! Early-age neutering in cats.
PRACTICAL RELEVANCE: neutering kittens at an early age, typically between 6 and 14 weeks, has received increasing attention and gained prominence in recent years, particularly in the United States and in shelter medicine in the UK. However, in private practice it has yet to be generally endorsed.
GLOBAL IMPORTANCE: among many of the animal welfare charities, early neutering is seen as a crucial step in conquering and controlling cat overpopulation. CLINICAL CHALLENGES: physiological differences between kittens and adult cats are very important to consider before undertaking elective early neutering. Increased sensitivity to drugs, prolongation of effects and a limited capacity for cardiovascular compensation are the principal anaesthetic concerns in kittens. EVIDENCE BASE: the optimal age for neutering, traditionally deemed to be between 5 and 8 months, is now questioned, as short- and longer-term studies demonstrate no significant behavioural and physical advantages conferred by traditional-age neutering. Furthermore, a number of safe anaesthetic and surgical protocols have been documented that produce lower morbidity and similar mortality rates in early-age neuters compared with traditional-age neuters.


Prognostic markers for myeloid neoplasms: a comparative review of the literature and goals for future investigation.
Myeloid neoplasms include cancers associated with both rapid (acute myeloid leukemias) and gradual (myelodysplastic syndromes and myeloproliferative neoplasms) disease progression. Percentage of blast cells in marrow is used to separate acute (rapid) from chronic (gradual) and is the most consistently applied prognostic marker in veterinary medicine. However, since there is marked variation in tumor progression within groups, there is a need for more complex schemes to stratify animals into specific risk groups. In people with acute myeloid leukemia (AML), pretreatment karyotyping and molecular genetic analysis have greater utility as prognostic markers than morphologic and immunologic phenotypes. Karyotyping is not available as a prognostic marker for AML in dogs and cats, but progress in molecular genetics has created optimism about the eventual ability of veterinarians to discern conditions potentially responsive to medical intervention. In people with myelodysplastic syndromes (MDS), detailed prognostic scoring systems have been devised that use various combinations of blast cell percentage, hematocrit, platelet counts, unilineal versus multilineal cytopenias and dysplasia, karyotype, gender, age, immunophenotype, transfusion dependence, and colony-forming assays. Predictors of outcome for animals with MDS have been limited to blast cell percentage, anemia versus multilineal cytopenias, and morphologic phenotype. Prognostic markers for myeloproliferative neoplasms (eg, polycythemia vera, essential thrombocythemia) include clinical and
hematological factors and in people also include cytogenetics and molecular genetics. Validation of
prognostic markers for myeloid neoplasms in animals has been thwarted by the lack of a large case
series that requires cooperation across institutions and veterinary specialties. Future progress requires
overcoming these barriers.

Effects of short-chain fructooligosaccharides and galactooligosaccharides, individually and in
combination, on nutrient digestibility, fecal fermentative metabolite concentrations, and large
bowel microbial ecology of healthy adults cats.
Short-chain fructooligosaccharides (scFOS) and galactooligosaccharides (GOS) are non-digestible
oligosaccharides that result in a prebiotic effect in some animal species; however, the cat has not been
well studied in this regard. This experiment evaluated scFOS and GOS supplementation on nutrient
digestibility, fermentative end-product production, and fecal microbial ecology of cats. Eight healthy
adult cats were fed diets containing no prebiotic, 0.5% scFOS, 0.5% GOS, or 0.5% scFOS + 0.5% GOS
(scFOS + GOS) in a replicated 4 x 4 Latin square design. Apparent total tract crude protein digestibility
was decreased (P < 0.05) when cats were fed a diet containing scFOS + GOS compared to the other
treatments. Dry matter, OM, acid hydrolyzed fat, and GE digestibilities were not different among
treatments. Cats fed scFOS-, GOS-, and scFOS + GOS-supplemented diets had greater (P < 0.05) fecal
Bifidobacterium spp. populations compared to cats fed the control diet. Fecal pH was lower (P < 0.05)
for cats fed the scFOS+GOS-supplemented diet compared to the control. Butyrate (P = 0.05) and
valerate (P < 0.05) concentrations were higher when cats consumed the scFOS + GOS diet. Acetate
tended (P = 0.10) to be greater when cats were fed the scFOS + GOS diet. Total SCFA (P = 0.06) and
total BCFA (P = 0.06) concentrations also tended to be greater when cats consumed the scFOS + GOS
treatment. Fecal protein catabolites, including ammonia, 4-methylphenol, indole, and biogenic amines,
blood lymphocytes, neutrophils, total white blood cell counts, or fecal DM concentration and output
did not differ among treatments. Low level supplementation of scFOS, GOS, and their combination
exert positive effects on select indices of gut health in cats.

The efficacy and safety of long-term Helicobacter species quadruple therapy in asymptomatic
cats with naturally acquired infection.
Owing to rising drug-resistant Helicobacter species infections in people and animals, currently
therapies are losing their efficacy; therefore, regimens efficacious in the presence of drug resistance are
needed. This study assessed the efficacy and safety of a 14-day quadruple Helicobacter species therapy
in cats with naturally acquired infection. Thirteen asymptomatic adult stray cats with Helicobacter
species infection (identified by analysis of gastric biopsies using polymerase chain reaction and
Helicobacter-specific primers) received omeprazole 0.7mg/kg q 8h plus amoxicillin 20mg/kg q 12h,
metronidazole 20mg/kg q 12h and clarithromycin 7.5mg/kg q 12h, for 14 days. Second molecular
analysis of gastric biopsies revealed persistence of Helicobacter species DNA in four cats that were
negative on quantitative urease testing, cytology and histopathology. Our results suggest that antibiotic
regimens that are effective against Helicobacter pylori in people cannot eradicate Helicobacter species
in cats with naturally acquired infection, although transient suppression may occur.
Plasma and urine concentrations of marbofloxacin following single subcutaneous administration to cats.

The pharmacokinetic properties of marbofloxacin, a third generation fluoroquinolone, were investigated in 12 healthy adult cats after single subcutaneous (SC) administration of 2 mg/kg BW (Part I, n=8 cats) and 4 mg/kg BW (Part II, n=4 cats). In each part of the study blood and urine samples were collected before treatment and thereafter for 5 days. The plasma and urine concentrations of marbofloxacin were determined by HPLC with UV detection. Pharmacokinetic calculations were performed for each treated animal using an open one-compartment-model with first-order elimination after SC dosing.

Marbofloxacin in plasma (means): Maximum concentrations (Cmax) of about 1.2 and 3.0 microg/ml were measured 2.3 and 4 hours (tmax) after dosing of 2 and 4 mg/kg BW, respectively. Elimination from the body was low with a total clearance (Cl/F) of approximately 0.1 l/h/kg for both dosages. The half-life (t 1/2) for this process was calculated with 8-10 hours. AUC increased almost proportional when doubling the dose, i.e., 19.77 +/- 6.25 microg * h/ml (2 mg/kg BW) and 51.26 +/- 11.83 microg * h/ml (4 mg/kg BW). Plasma kinetics measured were in accordance with data from literature.

Marbofloxacin in urine (means): Maximum drug concentrations were detected 4 and 8 hours after dosing with 70 microg/ml (2 mg/kg BW) and 160 microg/ml (4 mg/kg BW), respectively. Inhibitory effects of the urinary matrix on the antimicrobial activity of the drug were taken into account when performing PK/PD calculations. However, a concentration-dependent bactericidal activity (Cmax/MIC > 8-10) which is claimed for fluoroquinolones was sufficiently met with focus on Escherichia (E.) coli (MIC90 0.5 microg/ml). In the same matrix a threshold value of 1.0 microg/ml was undercut 82 and 116 hours after SC dosing, respectively. Hence, a time-dependent bacteria killing kinetic (T > MIC) which may be of relevance for some Gram-positive germs like Staphylococcus spp. (MIC90 1.0 microg/ml) should be covered, too.

Fixation of pelvic floor fractures in cats.

Objectives: To retrospectively evaluate the outcome of internal fixation of trauma-related pelvic floor fractures using a ventral abdominal approach in cats. Methods: Clinical examination and radiographic findings at presentation, after surgery, and at follow-up were assessed. Information gathered included concurrent injuries, surgical technique used, lameness and pain scores, and radiographic signs of implant stability. Results: Ten European shorthair cats were included in the study. Pelvic floor fractures were stabilised using locking plates in nine cats, and symphyseal separation was fixated using hemicerclage wire in one cat. Additional procedures included reduction of sacroiliac luxation in nine cats with positional screws placed in six cats, and plate stabilization of sacral fractures in one cat. All cats were able to walk within five days of surgery. No orthopaedic or neurological deficits were observed in seven cats at follow-up. Neurological deficits were observed in one cat. Signs of pain at implant sites due to inadequate surgical technique were noted in two cats. Anatomical reduction of the pelvic floor was achieved in eight cats. Clinical significance: Stabilization of the pelvic floor and repair of sacroiliac luxation and other injuries by a ventral abdominal approach in cats led to an overall successful outcome. Fixation of the pelvic floor in cats with intact acetabular and ilial bones should be considered in patients with multiple pelvic fractures in combination with sacroiliac joint luxation or sacral fracture, pelvic canal narrowing, traumatic abdominal hernia, and other abdominal injuries.

Diagnostic algorithm to differentiate lymphoma from inflammation in feline small intestinal biopsy samples.

Differentiating between inflammatory bowel disease (IBD) and small intestinal lymphoma in cats is often difficult, especially when only endoscopic biopsy specimens are available for evaluation. However, a correct diagnosis is imperative for proper treatment and prognosis. A retrospective study was performed using surgical and endoscopic intestinal biopsy specimens from 63 cats with a history of chronic diarrhea or vomiting or weight loss. A diagnosis of lymphoma or inflammation was based on microscopic examination of hematoxylin and eosin (HE)-stained sections alone, HE-stained sections plus results of immunohistochemical labeling (IHC) for CD3e and CD79a, and HE staining, immunophenotyping, and polymerase chain reaction (PCR) results for B and/or T cell clonality. In addition, various histomorphologic parameters were evaluated for significant differences between lymphoma and IBD using Fisher’s exact test. The sensitivity and specificity of each parameter in the diagnosis of lymphoma were also determined. Results of Bayesian statistical analysis demonstrated that combining histologic evaluation of small intestinal biopsy specimens with immunophenotyping and analysis of clonality of lymphoid infiltrates results in more accurate differentiation of neoplastic versus inflammatory lymphocytes. Important histologic features that differentiated intestinal lymphoma from IBD included lymphoid infiltration of the intestinal wall beyond the mucosa, epitheliotropism (especially intraepithelial nests and plaques), heterogeneity, and nuclear size of lymphocytes. Based on the results of this study, a stepwise diagnostic algorithm that first uses histologic assessment, followed by immunophenotyping and then PCR to determine clonality of the lymphocytes, was developed to more accurately differentiate between intestinal lymphoma and IBD.


Structural and functional changes of neuronal and glial components of the feline enteric nervous system in cats with chronic inflammatory and non-inflammatory diseases of the gastrointestinal tract.

Immunohistochemical examinations of the enteric nervous system (ENS) were performed on biopsies of healthy cats and compared to findings in cats suffering from inflammatory bowel disease or intestinal lymphoma. In lymphocytic-plasmacytic enterocolitis all affected samples had significant reductions in glial fibrillary acidic protein and vasoactive intestinal peptide (VIP) and mostly of neuron-specific enolase (NSE) possibly reflecting alterations in enteric glial cells and neurons. In cases with eosinophilic gastroenterocolitis significantly reduced phosphorylated neurofilament (PN) expression was present suggesting a disturbance in neuronal cytoskeleton, whereas cats with fibrosing enteropathy had reduced expression of NSE, non-phosphorylated neurofilaments (NPN), PN and VIP, possibly reflecting neuronal disturbances. In cases with intestinal lymphoma only the reduction in PN and the increase in NPN were obvious suggesting direct damage or interference of neoplastic cells with enteric neurons. In conclusion, structural and functional alterations of the ENS may contribute to clinically evident signs of vomiting and/or diarrhea.


Trichomonas foetus infection in purebred cats in Germany: Prevalence of clinical signs and the role of co-infection with other enteroparasites.
The aim of this study was to determine the prevalence of Tritrichomonas foetus infection and associated clinical signs in purebred cats in Germany, to investigate the role of co-infection, and identify determinants of infection. Faecal specimens accompanied by epidemiological questionnaires were scored and collected from 230 purebred cats. Faeces were examined for trichomonads and other enteroparasites. The prevalence of T foetus was 15.7% among cats and 18.5% among catteries. An abnormal faecal score and history of diarrhoea were observed in 64% and 61% of T foetus-positive cats, respectively, and correlated significantly with infection. Co-infection, observed in 36% of T foetus-infected cats, was not associated with diarrhoea. Norwegian Forest cats were infected significantly more often than other breeds. No association was found with any environmental factors. This study demonstrated a high prevalence of symptomatic T foetus infections in purebred cats in Germany. Co-infection with other enteroparasites did not worsen clinical signs of trichomonosis.

Kulasena VA, Rajapakse RP, Dubey JP, Dayawansa PN, and Premawansa S (2011) J Parasitol 97:152. Seroprevalence of Toxoplasma gondii in Cats from Colombo, Sri Lanka. Abstract Cats are essential in the life cycle of Toxoplasma gondii because they are the only hosts that can excrete the environmentally resistant oocysts in nature. Nothing is known of the prevalence of Toxoplasma gondii in cats from Sri Lanka. Serum samples from 86 cats from Colombo, Sri Lanka, were tested for antibodies to T. gondii using the modified agglutination test; antibodies were found in 26 (30.2%) cats with titers of 1 ratio 25 in 4, 1 ratio 50 in 4, 1 ratio 100 in 3, 1 ratio 400 in 2, 1 ratio 800 in 3, 1 ratio 1,600 in 4, and 1 ratio 3,200 or higher in 6 cats. Seropositivity increased with age and was higher in stray cats versus pet cats. This is the first report of seroprevalence of T. gondii in cats from Sri Lanka.

Laflamme DP, Xu H, and Long GM (2011) J Vet Intern Med 25:230-235. Effect of diets differing in fat content on chronic diarrhea in cats. Background: Fat-restricted diets have been advocated for dogs with diarrhea for many years. Recommendations for cats with diarrhea have varied between low-fat and high-fat diets, but there have been no published studies to support either recommendation. Objectives: The objective of this study was to compare the clinical responses of cats with chronic diarrhea to dietary management using either a high fat or a low fat, highly digestible diet. Animals: Sixty pet cats with chronic diarrhea were recruited; 55 cats completed the study. Methods: Randomized, double-blinded, controlled clinical trial. Upon completion of baseline measures, cats were fed 1 of 2 diets for 6 weeks, during which the owners recorded fecal scores daily using an illustrated fecal score chart ranging from 0 (very watery) to 100 (firm and dry). After 6 weeks, cats were reevaluated by the attending veterinarians. Results: Fecal scores improved significantly, with 78.2% of cats improving by at least 25 points on the 100-point scale or having a final fecal score of at least 66. Over one third of the cats developed normal stools. There were no differences in clinical responses between the diets. Clinical improvement was noted within the 1st week, and maximized within 3 weeks. Conclusions and Clinical Importance: These results show that dietary management can be helpful in cats with chronic diarrhea, but dietary fat content does not appear to affect the outcome. Cats that do not respond within 3 weeks should be evaluated further.

We evaluated West Nile virus (WNV) seroprevalence in dogs and cats in Shanghai, China. Seventeen of the 367 dogs (4.6%) and 46 of the 309 cats (14.9%) tested positive for WNV antibodies. A higher WNV seroprevalence was found with outdoor and rural pets than with indoor and urban pets. However, WNV seroprevalence between the sexes were not significantly different. The results indicate that WNV-positive serum antibodies are present in dogs and cats in China, and pets, especially strays, could be served as effective sentinels for WNV surveillance.


A major challenge in the development of vaccines against retroviruses is the induction of neutralizing antibodies since they prevent infection of the cells where the virus may persist. The transmembrane envelope (TM) protein contains highly conserved domains and seems to be a suitable target. To study whether vaccinating with a TM protein of a retrovirus could protect from infection in vivo, cats were immunized with the TM protein p15E of feline leukemia virus (FeLV) and subsequently challenged. For the first time we show that immunization with a retroviral TM protein prevented antigenemia. The level of neutralizing antibodies after the boost immunization correlated with the outcome of FeLV infection.


Background: The epidemiology of feline calicivirus (FCV) infection in cats with idiopathic cystitis (FIC) has not been investigated by contemporary molecular biologic methods. Objectives: To determine the prevalence of and evaluate risk factors for FCV viruria, oral carriage, and virus neutralizing (VN) antibodies in cats with and without FIC. Animals: Cats with nonobstructive FIC (n = 47), obstructive FIC (n = 22), and FCV upper respiratory tract infection (URI; n = 25), and healthy client-owned (n = 18) and colony-housed (n = 24) cats. Methods: Oropharyngeal secretions and urine were evaluated with a FCV p30 gene-based real-time reverse-transcriptase polymerase chain reaction (RT-PCR) assay. Serum VN antibody titers were determined by a modified microtiter assay. Associations of risk factors with log-transformed antibody titers were determined by multivariable generalized linear regression. Results: FCV viruria was detected in 4 (6%) and 3 (12%) cats with FIC and URI, respectively. In 3 FIC cats, viruria was unassociated with detectable oral virus carriage. Oral FCV carriage was detected in 7 (10%) FIC cats. Median antibody titers were significantly higher in cats with obstructive FIC (1 : 256), nonobstructive FIC (1 : 128), and URI (1 : 512) compared with healthy client-owned (1 : 16) and colony-housed (1 : 4) cats (P <.001). Other than disease, multivariate analysis did not identify any other explanatory variables for increased titers in cats with FIC or URI. Conclusions and Clinical Importance: FCV viruria was detected in cats with FIC and URI, however, its etiologic significance is uncertain. Serologic results suggest increased FCV exposure in FIC cats compared with controls. Further investigations are needed to clarify the potential role of FCV in FIC.

Prevalence of Toxoplasma gondii Infection in Feral Cats in Seoul, Korea.

Abstract The present study assessed the prevalence of Toxoplasma gondii infection in feral cat populations in Seoul using enzyme-linked immunosorbent assay (ELISA) and nested polymerase chain reaction (PCR). A total of 456 feral cats from 17 wards in Seoul was surveyed. The overall prevalence of T. gondii infection was 15.8% (69/456) by ELISA and 17.5% (80/456) by PCR; by gender, 17% (44/259) by ELISA and 16.2% (42/259) by PCR in males and 14.3% (28/196) by ELISA and 19.4% (38/196) by PCR in females. On a baseline of the Han River, prevalence was 15.1% (29/192) by ELISA and 15.6% (30/192) by PCR in the upper region and 16.4% (43/264) by ELISA and 18.9% (50/264) by PCR in the lower area. This suggested that toxoplasmosis is widespread throughout Seoul’s feral cat population and it is critical that the city institute policies for the control of the feral cat population to reduce the risk of toxoplasmosis transmission to animals, including humans.


The objective of this study was to investigate whether high-dose inhaled fluticasone propionate (FP), alone or in combination with salmeterol (SAL), is as effective as oral prednisolone in reducing airway inflammation and obstruction in cats with experimentally-induced acute asthma. Six cats sensitised to Ascaris suum (AS) were enrolled in a prospective controlled therapeutic trial and underwent four aerosol challenges, at 1-month intervals with AS allergen. The allergen-stimulated animals received four consecutive days treatment with either oral prednisolone at 1mg/kg twice daily, 500mug of FP inhaled twice daily, or a combination of FP/SAL at 500mug/50mug inhaled twice daily, respectively, according to a randomised cross-over design. Treatment-related changes in lung function, airway responsiveness (AR) and bronchoalveolar lavage fluid (BALF) cytology were assessed. Barometric whole-body plethysmography (BWBP) was used for the assessment of respiratory variables and AR. No significant differences in respiratory rate or Penh (an estimate of airflow limitation measured by BWBP) were detected among treatment groups. Allergen-induced airway hyper-responsiveness was significantly inhibited by all three steroid treatments (P<0.05). The mean BALF eosinophil percentage (+/-SEM) was lower after oral and inhaled corticosteroid treatment and these changes were significant for groups receiving prednisolone and the FP/SAL combination. Findings suggest high-dose FP, particularly in combination with SAL, is effective in ameliorating airway inflammation and hyper-responsiveness in this model of acute feline asthma, and highlight the potential use of these drugs in cats experiencing acute exacerbations of the naturally occurring disease.


OBJECTIVE: To obtain new insights into aetiological backgrounds, and to search for diagnostic biomarkers by assessing the difference in urinary proteins between cats with spontaneous feline idiopathic cystitis (FIC) and healthy controls. MATERIALS AND METHODS: Urine supernatants of 18 cats with FIC and 18 healthy control cats, and bladder biopsies of two FIC diseased cats and four healthy controls were included in the study. The Bradford method was used to determine protein quantity in urine supernatants. Urine was separated by two-dimensional (2-D) gel electrophoresis. Selected protein spots were excised from two-dimensional gels and analysed with tandem mass
Validation of Trefoil factor 2 expression was realized with Western blot and immunohistochemistry. Western blot signal intensities were quantified with image quant software. RESULTS: Eleven differentially expressed protein spots were identified between the 2-D gels of cats with FIC and control cats. Ten spots (only visible in the FIC gel) were identified as albumin and one spot (only visible in the control gel) was identified as Trefoil factor 2. Using quantification of Western blot signal intensities and immunohistochemistry a decrease in Trefoil factor 2 (TFF2) in cats with FIC could be revealed for the first time. CONCLUSION: Deficiency in TFF2 possibly leads to impaired repairing abilities and immune response of the urothelium. The result could be a greater susceptibility to injury, inflammation and relapse. Therefore TFF2 deficiency might be an important event in FIC pathogenesis. Detection of a decrease in urinary TFF2 could serve as diagnostic biomarker, facilitating diagnosis. As FIC can serve as an animal model for human painful bladder syndrome/interstitial cystitis, the findings of this study might also be valuable for interstitial cystitis research and should be further investigated.

**Ronidazole pharmacokinetics after intravenous and oral immediate-release capsule administration in healthy cats.**

Ronidazole (RDZ) is an effective treatment for feline Tritrichomonas foetus infection, but has produced neurotoxicity in some cats. An understanding of the disposition of RDZ in cats is needed in order to make precise dosing recommendations. Single-dose pharmacokinetics of intravenous (IV) RDZ and immediate-release RDZ capsules were evaluated. A single dose of IV RDZ (mean 9.2mg/kg) and a 95mg immediate-release RDZ capsule (mean 28.2mg/kg) were administered to six healthy cats in a randomized crossover design. Plasma samples were collected for 48h and assayed for RDZ using high pressure liquid chromatography (HPLC). Systemic absorption of oral RDZ was rapid and complete, with detection in the plasma of all cats by 10min after dosing and a bioavailability of 99.64 (+/- 16.54)%. The clearance of RDZ following IV administration was 0.82 (+/-0.07) ml/kg/min. The terminal half-life was 9.80 (+/-0.35) and 10.50 (+/-0.82) h after IV and oral administration, respectively, with drug detectable in all cats 48h after both administrations. The high oral bioavailability of RDZ and slow elimination may predispose cats to neurotoxicity with twice-daily administration. Less frequent administration should be considered for further study of effective treatment of T foetus-infected cats.

**Accelerated evolution of CES7, a gene encoding a novel major urinary protein in the cat family.**

Cauxin is a novel urinary protein recently identified in the domestic cat that regulates the excretion of felinine, a pheromone precursor involved in sociochemical communication and territorial marking of domestic and wild felids. Understanding the evolutionary history of cauxin may therefore illuminate molecular adaptations involved in the evolution of pheromone-based communication, recognition, and mate selection in wild animals. We sequenced the gene encoding cauxin, CES7, in 22 species representing all major feline lineages, and multiple outgroups and showed that it has undergone rapid evolutionary change preceding and during the diversification of the cat family. A comparison between feline cauxin and orthologous carboxylesterases from other mammalian lineages revealed evidence of strong positive Darwinian selection within and between several cat lineages, enriched at functionally important sites of the protein. The higher rate of radical amino acid replacements in small felids, coupled with the lack of felinine and extremely low levels of cauxin in the urine of the great cats
(Panthera), correlates with functional divergence of this gene in Panthera, and its putative loss in the snow leopard. Expression studies found evidence for several alternatively spliced transcripts in testis and brain, suggesting additional roles in male reproductive fitness and behavior. Our work presents the first report of strong positive natural selection acting on a major urinary protein of nonrodent mammals, providing evidence for parallel selection pressure on the regulation of pheromones in different mammalian lineages, despite the use of different metabolic pathways. Our results imply that natural selection may drive rapid changes in the regulation of pheromones in urine among the different cat species, which in turn may influence social behavior, such as territorial marking and conspecific recognition, therefore serving as an important mechanism for the radiation of this group of mammals.


**Feline bacterial urinary tract infections: An update on an evolving clinical problem.**
Although feline urine is increasingly submitted for bacterial culture and susceptibility testing as part of a more general diagnostic work-up for a range of presentations in veterinary practice, bacterial urinary tract infections (UTIs) are relatively uncommon due to a variety of physical and immunological barriers to infection. Culture positive urine is most often obtained from older female cats and the clinical history may include hematuria, dysuria and pollakiuria, or the infection may be occult. Urinalysis usually reveals hematuria and pyuria, and Escherichia coli and Gram-positive cocci are cultured most frequently. Most feline UTIs can be successfully treated using oral amoxicillin or amoxicillin/clavulanic acid administered for at least 14 days, but the prevalence of antimicrobial resistance amongst infecting bacterial species is a growing concern. There is currently no conclusive information on the safety and efficacy of alternative therapeutic agents for the treatment of feline UTIs.


**Protein-losing nephropathy in small animals.**
Genetic and acquired defects of glomerular permselectivity may lead to proteinuria and protein-losing nephropathy (PLN). Morbidity and mortality from complications of PLN may be severe even before progression to azotemia and renal failure. Leakage of plasma proteins into the glomerular filtrate can damage tubular cells and the function of the entire nephron. Detection, localization, and treatment of proteinuria are important to decrease the clinical signs and complications of PLN and the likelihood of progression to renal failure. Thorough diagnostic work-ups help to identify subsets of glomerular disease and their response to specific treatment protocols.


**Prevalence of fecal-borne parasites detected by centrifugal flotation in feline samples from two shelters in upstate New York.**
Over a 3.5-year period, fecal samples from 1322 cats from two shelters and affiliated foster homes in upstate New York were processed for parasite detection by both 1.18spg zinc sulfate and 1.3spg sugar double centrifugal flotation. In 50.9% of the samples at least one parasite was detected. Overall, 18 different parasites ranging in prevalence from 0.2% to 21% were recovered. The most prevalent parasites of foster and shelter cats in this study were Cystoisospora species and Toxocara cati (21% prevalence, each). In order of percentage of positive samples, other findings were: Giardia species (8.9%), Aelurostrongylus abstrusus (6.2%), taeniid eggs (3.9%), Cryptosporidium species (3.8%),
Aonchotheca species (3.7%), Eucoleus species (2.3%), Ancylostoma species (2.2%), Cheyletiella species (2.0%), Dipylidium caninum (1.1%), Otodectes species, Toxoplasma-like oocysts and Sarcocystis species (0.8% each), Demodex and Spirometra species (0.4% each), and Alaria species and Felicola subrostratus (0.2% each).


Display quality of different monitors in feline digital radiography.

In human medical imaging, the performance of the monitor used for image reporting has a substantial impact on the diagnostic performance of the entire digital system. Our purpose was to compare the display quality of different monitors used in veterinary practice. Two medical-grade gray scale monitors (one cathode-ray tube [CRT], one liquid crystal display [LCD]) and two standard consumer-grade color monitors (one CRT, one LCD) were compared in the ability to display anatomic structures in cats. Radiographs of the stifle joint and the thorax of 30 normal domestic shorthair cats were acquired by use of a storage phosphor system. Two anatomic features of the stifle joint and five anatomic structures of the thorax were evaluated. The two medical-grade monitors had superior display quality compared with standard PC monitors. No differences were seen between the monochrome monitors. In comparison with the color CRT, the ratings of the color LCD were significantly worse. The ranking order was uniform for both the region and the criteria investigated. Differences in monitor luminance, bit depth, and screen size were presumed to be the reasons for the observed varying performance. The observed differences between monitors place an emphasis on the need for guidelines defining minimum requirements for the acceptance of monitors and for quality control in veterinary radiography.


Structural and ultrastructural changes in the lungs of cats Felis catus (Linnaeus, 1758) experimentally infected with D. immitis (Leidy, 1856).

Clinical signs are seldom observed in feline heartworm disease, and the pathophysiological changes in the lungs of infected animals remain undefined. The goal of this study was to evaluate the structural and ultrastructural changes in the lungs of cats experimentally infected with Dirofilaria immitis. Six healthy cats were each infected with two adult heartworms by intravenous transplantation (Receptor Group, RG). The control group consisted of two uninfected animals kept under the same conditions as the RG. At 42 days after transplantation, all cats were euthanized and necropsied for worm recovery and collection of lung samples for examination by light microscopy (LM) and transmission electron microscopy. By LM, lung sections from the six infected cats exhibited bronchial and bronchiolar lesions. Alterations in all tissues of the pulmonary arteries were observed in the infected animals. In conclusion, cats infected experimentally with D. immitis developed lesions in their lungs as a consequence of arterial disease and intense interstitial pneumonia.


Activation of AKT in feline mammary carcinoma: A new prognostic factor for feline mammary
tumours.
The PI3K/AKT/PTEN pathway is involved in the pathogenesis of several human cancers. This study investigated the biological and prognostic value of PI3K/AKT/PTEN pathway dysregulation in feline mammary tumours. Expression of p-AKT, HER2, PTEN and steroid receptors was assessed by immunohistochemistry (IHC) in 27 malignant and 12 benign mammary tumours from 39 female cats followed up over a 24-month period. Feline mammary carcinoma (FMC) cell lines were analyzed by Western blot and the feline AKT gene sequence was characterized. p-AKT expression statistically correlated with tumour malignancy, histological dedifferentiation and clinical recurrence. The animals with tumours expressing p-AKT had a shorter disease-free period than those with p-AKT-negative tumours. AKT activation was associated with HER2 expression and PTEN down-regulation, as occurs in human breast cancer, and feline AKT sequencing showed high homology with the human AKT gene. No AKT activation was observed in relation to either oestrogen receptor alpha (ERalpha) or progesterone receptor expression. Taken together, these data offer an explanation for AKT signalling and its role in FMC pathogenesis and prognosis, shedding new light on similarities between feline mammary tumours and hormone-independent breast cancer.


Numbers and distribution of immune cells in the tunica mucosa of the small and large intestine of full-thickness biopsies from healthy pet cats.
In this study, CD3(+) T lymphocytes and IgA(+), IgG(+) and IgM(+) plasma cells were quantified in the tunica mucosa of the intestinal tract of 12 pet cats without gastrointestinal diseases. The study included full-thickness biopsies of the duodenum, jejunum, ileum and colon. The distribution and quantification of CD3(+) T cells, IgA(+), IgG(+) and IgM(+) plasma cells within the intestinal tunica mucosa was performed by using immunohistochemical methods and computer-aided morphometry. CD3(+) T cells were significantly prominent in the villi and their numbers increased from duodenum to ileum but decreased towards the colon. The predominant type of plasma cells was IgA(+) cells, followed by IgM(+) cells. The number of IgG(+) cells was generally low compared to the other plasma cell types investigated. The results of the vertical distribution showed that IgA(+) and IgM(+) plasma cells were most numerous in the lower crypt areas, whilst IgG(+) plasma cells accumulated in the upper crypt region with a decline towards the villi and the lower crypt areas of control cats. All types of plasma cells showed a general decline from the duodenum towards the caudal sections of the intestinal tract regarding the horizontal distribution of plasma cells. This study provides a comprehensive overview on the vertical and horizontal distribution and the number of CD3(+) T cells and IgA(+), IgG(+) and IgM(+) plasma cells in the intestinal tunica mucosa of pet cats.


Bone-invasive oral squamous cell carcinoma in cats: pathology and expression of parathyroid hormone-related protein.
Feline oral squamous cell carcinoma (OSCC) is the most common oral tumor in cats. There is no effective treatment, and the average duration of survival after diagnosis is only 2 months. Feline OSCC is frequently associated with osteolysis; however, the mechanisms responsible are unknown. The objective of this study was to characterize the epidemiology and pathology of bone-invasive OSCC in cats and to determine the expression of select bone resorption agonists. In sum, 451 cases of feline OSCC were evaluated. There was no sex or breed predisposition, although there were more intact cats
in the OSCC group compared to the control group. Gingiva was the most common site, followed by the sublingual region and tongue. Cats with lingual OSCC were younger (mean, 11.9 years) compared to cats with gingival OSCC (mean, 13.6 years). In addition to osteolysis, there was periosteal new bone formation, osseous metaplasia of tumor stroma, and direct apposition of OSCC to fragments of bone, suggestive of bone-binding behavior. Eighty-two cases were selected for immunohistochemical detection of parathyroid hormone-related protein (PTHrP). Specimens with osteolysis had increased PTHrP expression and nuclear localization, compared to OSCC without osteolysis. Thirty-eight biopsies of OSCC with osteolysis were evaluated for tumor necrosis factor alpha expression, and only 4 biopsies had such expression in a small proportion of tumor cells. Increased tumor expression of PTHrP and increased localization of PTHrP to the nucleus were associated with osteolysis and may play an important role in bone resorption and tumor invasion in cats with OSCC.


**Rickettsia felis and Bartonella henselae in Fleas from Lebanon.**
Abstract A total of 155 fleas collected in 2009 in Lebanon from 16 cats (104 Ctenocephalides felis specimens, 1 C. canis specimen) and 2 dogs (50 C. canis specimens) were tested for the presence of Rickettsia spp. and Bartonella spp. using molecular methods, including real-time quantitative polymerase chain reaction (PCR), regular PCR, and sequencing of amplified PCR products. Rickettsia felis, the agent of the emerging flea-borne spotted fever in humans, was identified in 17 (16%) C. felis cat fleas. Bartonella henselae, an agent of cat scratch disease, was identified in three (2.9%) C. felis. Our results emphasize the potential risk of these emerging flea-borne infections in Lebanon.

**Seroprevalence of seasonal and pandemic influenza A viruses in domestic cats.**
Infection of domestic cats with pandemic H1N1 influenza virus has recently been documented. We conducted a seroprevalence survey and found that 17 of 78 (21.8%) cats sampled during the 2009-2010 influenza season had antibody titers >/=40 against the novel H1N1 strain by hemagglutinin-inhibition assay, compared to only 1 of 39 (2.6%) sampled in 2008 prior to emergence of the pandemic (p = 0.006). Seroprevalence of seasonal H1N1 (41.9%) and H3N2 (25.6%) viruses was similarly high. These data reflecting past infection of household cats raise the possibility that they may act as a vector of influenza transmission within households.

**Soft-tissue injuries associated with cast application for distal limb orthopaedic conditions. A retrospective study of sixty dogs and cats.**
Objectives: Casts applied for orthopaedic conditions can result in soft-tissue injuries. The purpose of our study was to describe the nature and prevalence of such complications. Methods: We performed a retrospective review of medical records of dogs and cats that had a cast placed for an orthopaedic condition between October 2003 and May 2009. The data were analysed and categorised. Results: Of the 60 animals that had a cast placed, 63% developed a soft-tissue injury (60% mild, 20% moderate and 20% severe). Injuries could occur any time during coaptation, and an association with duration of
casting and severity \(p = 0.42\) was not shown. Severe injuries took the longest to resolve \(p = 0.003\). Sighthounds were significantly more likely to develop a soft-tissue injury \(p = 0.04\), and cross-breeds were less likely \(p = 0.01\). All common calcaneal tendon reconstructions suffered soft-tissue injuries, but significance was not shown \(p = 0.08\). Veterinarians identified the majority of injuries \(80\%\) rather than the owners. The financial cost of treating soft-tissue injuries ranged from four to 121% the cost of the original orthopaedic procedure. Clinical significance: Soft-tissue injuries secondary to casting occur frequently, and can occur at any time during the casting period. Within our study, sighthounds were more likely to develop soft tissue injuries, and should therefore perhaps be considered as a susceptible group. The only reliable way to identify an injury is to remove the cast and inspect the limb.

Partial regulatory T cell depletion prior to acute feline immunodeficiency virus infection does not alter disease pathogenesis.
Feline immunodeficiency virus (FIV) infection in cats follows a disease course similar to HIV-1, including a short acute phase characterized by high viremia, and a prolonged asymptomatic phase characterized by low viremia and generalized immune dysfunction. CD4(+)CD25(hi)FoxP3(+) immunosuppressive regulatory T (Treg) cells have been implicated as a possible cause of immune dysfunction during FIV and HIV-1 infection, as they are capable of modulating virus-specific and inflammatory immune responses. Additionally, the immunosuppressive capacity of feline Treg cells has been shown to be increased during FIV infection. We have previously shown that transient in vivo Treg cell depletion during asymptomatic FIV infection reveals FIV-specific immune responses suppressed by Treg cells. In this study, we sought to determine the immunological influence of Treg cells during acute FIV infection. We asked whether Treg cell depletion prior to infection with the highly pathogenic molecular clone FIV-C36 in cats could alter FIV pathogenesis. We report here that partial Treg cell depletion prior to FIV infection does not significantly change provirus, viremia, or CD4(+) T cell levels in blood and lymphoid tissues during the acute phase of disease. The effects of anti-CD25 mAb treatment are truncated in cats acutely infected with FIV-C36 as compared to chronically infected cats or FIV-naive cats, as Treg cell levels were heightened in all treatment groups included in the study within two weeks post-FIV infection. Our findings suggest that the influence of Treg cell suppression during FIV pathogenesis is most prominent after Treg cells are activated in the environment of established FIV infection.

Prevalence of Giardia species in stool samples by ELISA in household cats from Romania and risk factors.
Stool samples \(n=183\) collected in Romania from cats of different ages, gender, breed, living conditions and origin were analysed by enzyme-linked immunosorbent assay using a commercial kit (Giardia Microwell ELISA, SafePath Laboratories, Carlsbad, USA). Fifty-one cats \(27.9\%\) presented Giardia duodenalis antigens. The prevalence was significantly higher in cats with diarrhoea \(32\%, 16/50; P=0.04\) and in cats from the north-west region \(36.7\%, 29/79; P=0.05\). Young age \(up\) to 6 months was identified as the risk factor for infection \(OR=0.29, 95\% CI 0.09-0.92; P=0.03\). There weren’t any significant differences associated with gender, breed, medium, lifestyle, associated parasite infections, anthelmintic treatments, type of food or season.
**Current prevalence of Dirofilaria immitis in dogs, cats and humans from the island of Gran Canaria, Spain.**  
The island of Gran Canaria is a hyperendemic area for canine dirofilariasis. The aim of the present study was to provide data on Dirofilaria immitis in dogs, cats, and humans on this island in 2010. The data confirms the prevalence in the overall canine population (19%), with a considerably higher prevalence (43%) in the autochthonous breed of Canarian Warren hound. The prevalence in the feline population (33%) is higher than that of the canine population, and the existence of specific D. immitis antibodies in the inhabitants of the island of Gran Canaria (12%) is confirmed. In both cats and humans, the prevalence, according to the different climate areas on the island, is related to the prevalence of D. immitis in dogs in the same area, which shows the key epidemiological role played by the canine host with regard to the transmission to other hosts of D. immitis.

**Maxillomandibular external skeletal fixation in five cats with caudal jaw trauma.**  
Five cats with caudal jaw injuries including mandibular ramus fractures, temporomandibular luxation/subluxation and temporal bone fractures were managed with external skeletal fixation to provide open-mouth maxillomandibular fixation. Three of five cats were able to eat orally during the period of fixation, whereas two cats with jaws fixed in a suboptimal position were dependent on oesophagostomy tube nutrition. Fixation was well tolerated and was maintained for 21 to 42 days. All cats were eating normally and had good jaw function at follow-up (mean 39 months, range 7 to 71 months).

**Trends in intake and outcome data for animal shelters in Colorado, 2000 to 2007.**  
OBJECTIVE: To measure trends in animal shelter intake and outcome data for dogs and cats in Colorado on a statewide, urban, and rural basis from 2000 through 2007. DESIGN: Retrospective cohort study. SAMPLE POPULATION: A group of 104 animal shelters and rescue organizations from Colorado representing 92% and 94% of statewide dog and cat intake, respectively, in 2007. PROCEDURES: Annual animal shelter data were analyzed for trends by use of linear regression analysis. Trends in urban and rural subgroups of shelters were compared by use of Student t tests. RESULTS: Statewide, the number of intakes/1,000 residents decreased by 10.8% for dogs during the 8-year study period, but increased by 19.9% for cats. There was no change in the dog euthanasia rate at 3.7/1,000 residents/y, but the rate for cats increased by 35.7% to 3.9/1,000 residents/y. There was no change in the statewide live release rate for dogs or cats, but there was a decrease of 12.6% for cats in the urban subgroup. CONCLUSIONS AND CLINICAL RELEVANCE: The trends suggested that the number of unwanted dogs in Colorado decreased during the study period, whereas the number of unwanted cats in animal shelters increased. There were clear differences in the trends in the urban and rural data, suggesting different needs in each type of community. At the current level of resource allocation, the shelter dynamics for dogs appeared to have reached equilibrium with respect to euthanasia. Transfers were increasingly being used within all regions of the state to optimize the chances of adoption.
Clinical evaluation of meloxicam versus ketoprofen in cats suffering from painful acute locomotor disorders.

The aim of this study was to evaluate the efficacy and palatability of meloxicam 0.5mg/ml oral suspension, compared to ketoprofen tablets in cats suffering from painful acute locomotor disorders. This single blinded, positively-controlled, randomised, multicentre trial involved 121 client owned cats. Cats received either meloxicam (0.5mg/ml oral suspension) at 0.1mg/kg on day 1 followed by 0.05mg/kg q 24h on days 2-5, or ketoprofen 5mg tablets at 1.0mg/kg q 24h for 5 days. The efficacy of the two treatments was assessed subjectively by clinicians on day 6 using a clinical sum score (CSS). Palatability and accuracy of dosing were also assessed. The baseline CSS was not significantly different between the groups, and after 5 days of treatment the CSS had decreased to a similar extent, reflecting a reduction in pain. There were no significant differences between the CSS of each group at day 6. Both treatments were well tolerated. Meloxicam was significantly more palatable than ketoprofen, and allowed for more accurate dosing. Meloxicam and ketoprofen are a safe and efficacious treatment for acute locomotor disorders in cats. Meloxicam (Metacam) may be associated with superior compliance in clinical practice due to the higher palatability, which results in better ease of administration.

Inbreeding rate and genetic structure of cat populations in Poland.

The objective of the study was to analyze effective population size and inbreeding level in populations of cat breeds registered in the Polish Studbook. The Association of Purebred Cat Breeders in Poland provided access to pedigrees of 26725 cats from seven breeds. The most frequent breed was Persian, however increasing tendency in numbers of registered animals from other breeds was recorded in later years. Although the percentage of inbred individuals was increasing over time, mating of close relatives was avoided by most of the breeders, and the average inbreeding coefficient exceeded 5% only for Siberian and Russian breeds. Current analysis suggests that the Polish pedigree cat populations are not threatened by negative effects of inbreeding.

Storage alters feline bronchoalveolar lavage fluid cytological analysis.

Bronchoalveolar lavage fluid (BALF) collection is a valuable respiratory diagnostic procedure in cats. This study evaluated effects of BALF storage on total nucleated cell counts (TNCCs) and differential cell counts (DCC), cell morphology, and cytological diagnosis. Forty-five research cats with neutrophilic, eosinophilic, and mixed inflammation, and healthy controls were enrolled. BALF samples were processed within 1h (baseline) or stored at 4 degrees C (4C24) or room temperature (RT24) for 24h, or 4 degrees C (4C48) or room temperature (RT48) for 48h before processing. Stored BALF at RT48 had decreased TNCC compared to baseline. The RT24 and RT48 samples had greater eosinophil % and the RT24, 4C48, and RT48 samples had decreased neutrophil % compared with baseline. Cellular morphology deteriorated in all stored samples. Storage resulted in a change in cytological diagnosis in up to 57% of stored samples. We conclude that cytological analysis of BALF in cats should be performed promptly for optimal results.

**90Sr therapy for oral squamous cell carcinoma in two cats.**
Two cats with a superficial oral squamous cell carcinoma responded favorably to treatment using a 90Sr probe. From one to six fields were applied per tumor, depending on tumor size. The surface dose per treatment ranged from 75 to 150 Gy and the total surface dose ranged from 200 to 500 Gy. Adverse effects were minimal. The cats survived 7 months and 5 years 9 months from the time of diagnosis. These data indicate that with careful patient selection 90Sr may be useful for the treatment of feline oral squamous cell carcinoma in some patients.


**Prevalence of echocardiographic evidence of cardiac disease in apparently healthy cats with murmurs.**
The objective of this prospective study was to determine the prevalence of echocardiographic evidence of heart disease in apparently healthy cats with heart murmurs. Thirty-two privately owned domestic cats were examined. All cats were considered healthy on the basis of history and physical examination, except for the finding of a heart murmur on auscultation. Cats on any medications (besides regular flea, tick and heartworm preventative) or that were pregnant or lactating were excluded from this study. The prevalence of echocardiographic evidence of heart disease in this population of cats was 53%. Therefore, identification of a heart murmur on routine physical examination in apparently healthy cats warrants further investigation.


**Use of itraconazole and either lime sulphur or Malaseb Concentrate Rinse (R) to treat shelter cats naturally infected with Microsporum canis: an open field trial.**
In an open non-randomized study, 90 cats with severe dermatophytosis were treated with 21 days of oral itraconazole at 10 mg/kg and one of three topical antifungal rinses applied twice weekly: lime sulphur (LSO); reformulated lime sulphur with an odour-masking agent (LSR); or a 0.2% miconazole nitrate and 0.2% chlorhexidine gluconate rinse (MC). Weekly examinations and fungal cultures were used to monitor the cats' response to therapy. If at day 42 of treatment cats were still strongly fungal culture positive and/or developing new lesions, they were retreated with oral itraconazole and LSO. Cats were not prevented from licking the solutions and none developed oral ulcerations. Thirty-one cats were treated with LSO, 27 with LSR and 32 with MC. The median number of days to cure was 30 (range 10-69 days) and 34 (range 23-80 days) for LSO and LSR, respectively. Thirty-two cats were treated with MC, and 13 of 32 cats required repeat treatment because of persistent culture-positive status and development of new lesions. Median number of days of treatment for the 19 cats that cured with MC was 48 (range 14-93 days). When the number of days to cure was compared between the groups, there was a significant difference between cats treated with LSO and LSR (P=0.029) and cats treated with LSO and MC (P=0.031), but no significant difference between the number of days to cure for cats treated with LSR and MC (P=0.91).

**Coccygeal epidural with local anesthetic for catheterization and pain management in the treatment of feline urethral obstruction.**

**OBJECTIVE:** To describe the technique for performing a coccygeal epidural injection of local anesthetic to facilitate catheterization in male cats with urethral obstructions using low-dose sedation.

**SIGNIFICANCE:** Prompt diagnosis and relief of urethral obstructions is important as many cats may have developed marked metabolic abnormalities at the time of presentation. General anesthesia in these patients may be associated with significant risk for complications. Pain management is also an essential treatment goal, and this technique relieves urethral and penile pain during the unblocking process.

**CONCLUSION:** Coccygeal epidurals can be used safely to provide analgesia to the penis and urethra and to the authors’ knowledge, is a novel treatment modality to aid in the relief of urethral obstructions in male cats.

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**Detection of human papillomavirus DNA in feline premalignant and invasive squamous cell carcinoma.**

Squamous cell carcinoma (SCC) is the most common malignant cutaneous and oral neoplasm of cats. Papillomavirus (PV) DNA has been identified in a proportion of feline Bowenoid in situ carcinomas (BISCs), cutaneous SCCs and a single oral SCC, but its exact role in the pathogenesis remains unknown. In humans, it has been suggested that ultraviolet (UV) light and human PV (HPV) may act as cofactors in cutaneous SCC carcinogenesis. Little is known about the influence of UV light on PV prevalence in feline cutaneous lesions, including actinic keratosis (AK). Additionally, PV prevalence in noncutaneous feline lesions, including oral SCC, is largely not known. This study aimed to determine the presence of PV in 84 cats with premalignant and invasive SCC from cutaneous and noncutaneous sites using polymerase chain reaction and to investigate an association with UV light. Papillomavaliral DNA was amplified from two of 12 cases of AK, seven of 22 BISCs, nine of 39 cutaneous SCCs and two of 35 non-cutaneous SCCs. Of the PV DNA sequenced, 50% was most similar to HPV of the genus Betapapillomavirus, while the other 50% was most similar to Felis domesticus PV type 2. Exposure to UV was not associated with an increase in PV for cutaneous SCC. The results of this study suggest that in the cat, HPV DNA may be detectible within a higher percentage of squamous lesions than previously demonstrated, UV exposure may not be a confounder for PV presence, and noncutaneous lesions may have a low prevalence of PV.

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**The VetMousetrap: a device for computed tomographic imaging of the thorax of awake cats.**

The VetMousetrap, a novel device that allows computed tomography (CT) of awake cats and provides a clinically supportive environment, is described. Ten normal cats were used to test the device for ambient internal oxygen, carbon dioxide levels, and temperature. Twenty-two awake normal cats were imaged using a 16-multislice helical CT unit to evaluate dose-equivalent protocols. Two different X-ray tube potentials (kV), 80 and 120, and two different helical pitches, 0.562 and 1.75, were evaluated. The signal intensity of the pulmonary parenchyma (SIlung), signal intensity of background (SIbackgr), contrast, noise, signal-to-noise ratio (SNR), and contrast-to-noise ratio (CNR) were calculated. Three
Evaluators ranked the images for sharpness of liver margins, motion, helical, and windmill artifacts. CT was successfully completed in 20 of 22 cats. No artifacts directly related to the device were detected. Overall, 75 of 80 (94%) examinations were judged to have absent or minimal motion artifact. A statistically significant difference was found for SNR (P = 0.001) and CNR (P = 0.001) between all protocols. The higher pitch protocols had significantly lower noise and higher SNR and CNR, lower motion artifact but greater helical artifacts. A protocol using 80 kV, 130 mA, 0.5s, and 0.562 pitch with 1.25mm slice thickness, and 0.625 mm slice reconstruction interval is recommended. The VetMousetrap appears to provide the opportunity for diagnostic CT imaging of the thorax of awake cats.

Acute inflammation in humans is associated with transient insulin resistance (IR) and dyslipidemia. Chronic low-grade inflammation is a pathogenic component of IR and adipose tissue dysfunction in obesity-induced type 2 diabetes. Because feline diabetes closely resembles human type 2 diabetes, we studied whether lipopolysaccharide (LPS)-induced subacute inflammation, in the absence of obesity, is the potential primary cause of IR and metabolic disorders. Cats received increasing iv doses (10-1000 ng/kg(-1). h(-1)) of LPS (n = 5) or saline (n = 5) for 10 d. Body temperature, proinflammatory and metabolic markers, and insulin sensitivity were measured daily. Tissue mRNA and protein expression were quantified on d 10. LPS infusion increased circulating and tissue markers of inflammation. Based on the homeostasis model assessment, endotoxemia induced transient IR and beta-cell dysfunction. At the whole-body level, IR reverted after the 10-d treatment; however, tissue-specific indications of IR were observed, such as down-regulation of adipose glucose transporter 4, hepatic peroxisome proliferative activated receptor-gamma1 and -2, and muscle insulin receptor substrate-1. In adipose tissue, increased hormone-sensitive lipase activity led to reduced adipocyte size, concomitant with increased plasma and hepatic triglyceride content and decreased total and high-density lipoprotein cholesterol levels. Prolonged LPS-induced inflammation caused acute IR, followed by long-lasting tissue-specific dysfunctions of lipid-, glucose-, and insulin metabolism-related targets; this ultimately resulted in dyslipidemia but not whole-body IR. Endotoxemia in cats may provide a promising model to study the cross talk between metabolic and inflammatory responses in the development of adipose tissue dysfunction and IR.

In this retrospective study medical records of 11 cats with gastrointestinal lymphoma were evaluated to determine the efficacy of radiation therapy when used in a rescue therapy setting. All cats had relapsed or resistant lymphoma. Two fractions of radiation were delivered over 2 days for a total of 800cGy. Acute effects of radiation were not noted, except one cat that had a self-limiting loss of appetite. Response was noted in 10/11 cats. Median survival post-radiation therapy was 214 days and the overall median survival in this study was 355 days. This study suggests that abdominal irradiation for feline gastrointestinal lymphoma was well tolerated and may contribute to a positive clinical response.
Pulmonary rhodococcosis in a cat.
Feline Rhodococcus equi infection is rare, despite the bacteria is widespread in the environment. R equi infection is typically observed in equine species but the infection has also been reported in dogs, cats and other domestic animals. There are a few reports regarding pulmonary R equi infection in cats and the disease appears to be limited to the skin and the subcutaneous tissue. This report describes the pathological, microbiological and the virulence features associated with an acute necrosuppurative pneumonia in a cat. To the best of our knowledge, this is the first report of feline pulmonary R equi infection in Italy.

Detection of feline haemoplasma species in experimental infections by in-situ hybridisation.
The aim of this study was to use fluorescence in-situ hybridisation (FISH) to search for the tissues and cell types important in survival and persistence of Mycoplasma haemofelis, “Candidatus Mycoplasma haemominutum” or “Candidatus Mycoplasma turicensis” in infected cats. A 16S rDNA probe for each species was applied to formalin-fixed, paraffin wax-embedded tissues sections collected from experimentally infected cats. Tissues (n = 12) were collected, at necropsy, from ten cats which had been infected with M. haemofelis, and one each with “Ca. M. haemominutum” and “Ca. M. turicensis”. M. haemofelis specific hybridisation was present on red blood cells (RBCs) in all tissues from acutely infected cats, but not the majority of tissues from chronically infected cats. “Ca. M. haemominutum” specific hybridisation was present on scattered RBCs within the spleen and liver. Specific probe hybridisation was not detected in any of the “Ca. M. turicensis” infected tissues. Haemoplasmas were detected on the surface of RBCs only and not any other cell type. Additionally, FISH was limited by sensitivity and could not detect the lower numbers of organisms present in tissues of cats chronically infected with M. haemofelis. Occasional organisms were detected in cats acutely infected with “Ca. M. haemominutum” but not “Ca. M. turicensis”.

Excision arthroplasty of the hip joint in dogs and cats.

Chronic kidney disease in small animals.
Chronic kidney disease (CKD) affects multiple body systems and presents with a wide variety of clinical manifestations. Proper application of conservative medical management can profoundly affect the clinical course of CKD. Diagnosis and management is facilitated by staging CKD and applying therapies that are appropriate for the patient’s stage of CKD. Therapy and follow-up of CKD are described, with emphasis on stage-based therapy to ameliorate clinical signs and slow progression.

Background: A new commercial gel column agglutination system is reported to have high sensitivity in detecting cats with blood type AB. Objectives: The aims of this study were to compare gel column agglutination and card agglutination methods for feline blood-typing and to determine the frequency distribution of feline blood types in northern Italy. Methods: Blood-typing was performed on 120 cats using both a commercial gel column containing monoclonal antibodies (ID Gel-Test Micro Typing System) and a card agglutination method (RapidVet-H Feline). Results were confirmed with back-typing. Sensitivity, specificity, positive predictive value, and negative predictive value were calculated for the 2 methods. A second group of 140 Domestic Shorthair (DSH) cats was blood-typed using the gel column technique to determine the frequency distribution of feline blood types in northern Italy. Results: The card agglutination method demonstrated poor sensitivity in identification of type-AB cats (61%) and was only 95% specific when identifying type-B cats. The gel column agglutination technique demonstrated 100% sensitivity and specificity for typing all 3 blood types (A, B, and AB). The frequency distribution study of 140 cats demonstrated that 127 (90.7%) cats were type A, 10 (7.1%) were type B, and 3 (2.1%) were type AB. Conclusion: When blood-typing cats of breeds with a relatively high frequency of blood types B and AB, methods that use monoclonal antibodies for detection of blood types B and AB are recommended. Alternatively, blood type can be confirmed by more sensitive supplemental testing, such as back-typing. The high frequency of blood type A in DSH cats in northern Italy was comparable to previously reported frequencies in Italy and world-wide.


The feasibility of autologous intrarenal mesenchymal stem cell (MSC) therapy in cats with chronic kidney disease (CKD) was investigated. Six cats (two healthy, four with CKD) received a single unilateral intrarenal injection of autologous bone marrow-derived or adipose tissue-derived MSC (bmMSC or aMSC) via ultrasound guidance. Minimum database and glomerular filtration rate (GFR) via nuclear scintigraphy were determined pre-injection, at 7 days and at 30 days post-injection. Intrarenal injection did not induce immediate or long-term adverse effects. Two cats with CKD that received aMSC experienced modest improvement in GFR and a mild decrease in serum creatinine concentration. Despite the possible benefits of intrarenal MSC injections for CKD cats, the number of sedations and interventions required to implement this approach would likely preclude widespread clinical application. We concluded that MSC could be transferred safely by ultrasound-guided intrarenal injection in cats, but that alternative sources and routes of MSC therapy should be investigated.


Autograft is considered ideal for grafting procedures, providing osteoinductive growth factors, osteogenic cells, and an osteoconductive scaffold. Limitations, however, exist regarding donor site morbidity and graft availability. Although allograft provides an osteoconductive matrix with some
osteoinductivity, its availability is limited. To achieve optimal bone graft properties, researchers are developing new materials with the goal of designing synthetics as close to autograft as possible while still facilitating their clinical use. However, the constant evolution of internal fixation stimulates the search for growth factors and cells which could stimulate bone healing.


**Molecular genetic basis for fluoroquinolone-induced retinal degeneration in cats.**

OBJECTIVES: Distribution of fluoroquinolones to the retina is normally restricted by ABCG2 at the blood-retinal barrier. As the cat develops a species-specific adverse reaction to photoreactive fluoroquinolones, our goal was to investigate ABCG2 as a candidate gene for fluoroquinolone-induced retinal degeneration and blindness in cats. METHODS: Feline ABCG2 was sequenced and the consensus amino acid sequence was compared with that of 10 other mammalian species. Expression of ABCG2 in feline retina was assessed by immunoblot. cDNA constructs for feline and human ABCG2 were constructed in a pcDNA3 expression vector and expressed in HEK-293 cells, and ABCG2 expression was analyzed by western blot and immunofluorescence. Mitoxantrone and BODIPY-prazosin efflux measured by flow cytometry and a phototoxicity assay were used to assess feline and human ABCG2 function. RESULTS: Four feline-specific (compared with 10 other mammalian species) amino acid changes in conserved regions of ABCG2 were identified. Expression of ABCG2 on plasma membranes was confirmed in feline retina and in cells transfected with human and feline ABCG2, although some intracellular expression of feline ABCG2 was detected by immunofluorescence. Function of feline ABCG2, compared with human ABCG2, was found to be deficient as determined by flow cytometric measurement of mitoxantrone and BODIPY-prazosin efflux and enrofloxacin-induced phototoxicity assays. CONCLUSION: Feline-specific amino acid changes in ABCG2 cause a functional defect of the transport protein in cats. This functional defect may be owing, in part, to defective cellular localization of feline ABCG2. Regardless, dysfunction of ABCG2 at the blood-retinal barrier likely results in accumulation of photoreactive fluoroquinolones in feline retina. Exposure of the retina to light would then generate reactive oxygen species that would cause the characteristic retinal degeneration and blindness documented in some cats receiving high doses of some fluoroquinolones. Pharmacological inhibition of ABCG2 in other species might result in retinal damage if fluoroquinolones are concurrently administered.


**Generalized Encephalitozoonosis in a Young Kitten with Cerebellar Hypoplasia.** In recent years opportunistic infections due to microsporidial organisms have become increasingly important in immunocompromised people. Infected animals could serve as reservoirs of such infections. A case of generalized encephalitozoonosis in a young kitten is reported. Diagnosis was established by histopathological, immunohistochemical and molecular biological investigations demonstrating characteristic lesions and DNA of Encephalitozoon cuniculi in formalin-fixed and paraffin wax-embedded tissue sections. Infections due to *E. cuniculi* are not common in cats, but a potential role of domestic cats in transmission of the infectious agent cannot be excluded.

Endotracheal nebulization of N-acetylcysteine increases airway resistance in cats with experimental asthma.

N-acetylcysteine (NAC), a mucolytic and antioxidant, is speculated to cause bronchoconstriction in cats when delivered via aerosol. We hypothesized that in cats with experimental asthma, aerosol delivery of NAC (400mg cumulative dose) via an endotracheal tube would increase airflow limitation as measured by ventilator-acquired mechanics. After endotracheal drug delivery, airway resistance and inspiratory plateau pressure (Pplat) measurements were obtained in six mechanically ventilated asthmatic cats. Results demonstrated significantly increased airway resistance ($P=0.0007$) compared with aerosolized saline control; Pplats were not significantly different ($P=0.059$). All cats exhibited at least one adverse effect: excessive airway secretions (n=3), spontaneous cough (n=2), unilateral strabismus (n=1) and post-anesthetic death (n=1). No adverse reactions were noted with saline aerosol; cough was noted in one cat with methacholine challenge. In conclusion, airway resistance and adverse reactions were documented in all cats after NAC aerosol delivery. Further studies must be performed to evaluate if it is an effective mucolytic and/or antioxidant in cats and to determine if bronchodilator pre-treatment will negate NAC-induced bronchoconstriction.


A retrospective epidemiologic study evaluated 1,129 feline intestinal tumor patients via data entered into the Veterinary Medical Database (VMDB) from 1964 to 2004. Cases were analyzed by breed, age, yr of diagnosis, tumor type, and location. The VMDB incidence of all intestinal tumors reported during this 40 yr period was 0.4%, with small intestinal tumors predominating. The most common intestinal tumor was lymphoma, but the most common nonlymphoid tumor was adenocarcinoma. The Siamese breed and increasing age after 7 yr conferred an increased risk. Intact males and females appeared to have a decreased risk compared with neutered patients, but this may be explained by the age difference among these patients as older patients were more likely to be neutered. Prospective studies evaluating neuter status predilection and prognosis are warranted.


The term acute kidney injury (AKI) has replaced the historical term acute renal failure for renal damage occurring over a short period of time (hours to days) because it is thought to better describe the pathophysiologic changes and duration of the different phases of injury. There are many potential causes of AKI in dogs and cats, and the prognosis has been shown to vary with the cause as well as with therapy. This article reviews current concepts of the pathophysiology, causes, clinical presentation, approach to diagnosis, and medical management of AKI in dogs and cats.


The aim of this study was to describe the use of cone beam computed tomography as an auxiliary
method to diagnose changes to the temporomandibular joints in cats. We used five cats of various ages, breeds and genders that showed clinical signs consistent with changes in the temporomandibular joint. Cone beam computed tomography enables a complete and thorough examination of the temporomandibular joints by allowing the evaluation of selected images as a whole. It also enables the identification of all anatomical structures and any changes that may be present. The results showed that this method is effective in confirming or ruling out changes in the temporomandibular joint in cats, such as disjunctions of the palatine raphe; fractures of the mandibular symphysis, zygomatic bone and condylar; and dental resorption.

Phylogenetic characterisation of naturally occurring feline immunodeficiency virus in the United Kingdom.
Feline immunodeficiency virus (FIV) is a significant pathogen of domestic and non-domestic felids worldwide. In domestic cats, FIV is classified into five distinct subtypes (A-E) with subtypes A and B distributed most widely. However, little is known about the degree of intrasubtype viral diversity and this may prove critical in determining whether monovalent vaccines are likely to protect against FIV strains within a single subtype. Here, we characterise novel env sequences from 47 FIV strains recovered from infected cats in the United Kingdom and its environs. Phylogenetic analyses revealed that all bar one sequence belonged to subtype A, the predominant subtype in Western Europe. A single sequence was identified as a likely subtype A/C recombinant, intriguing given that subtype C does not appear to exist in either the UK or North Western Europe and suggestive of a recombination event predating its introduction into the UK. Subtype A strains from the UK were not significantly differentiated from representative subtype A isolates found elsewhere suggesting multiple introductions of FIV into the country. Divergence among isolates was comparable to that observed for subtype A isolates worldwide, indicating that FIV in the UK covers the full spectrum of subtype A diversity seen globally. This study demonstrates that while subtype A is predominant in the UK, novel introductions may result in the emergence of novel subtypes or intersubtype recombinants, potentially circumventing vaccine strategies. However, the dominance of subtype A suggests that the development of a regional or subtype-specific protective vaccine for the UK could be achievable.

Development of monoclonal antibodies (MAbs) to feline interferon (fIFN)-gamma as tools to evaluate cellular immune responses to feline infectious peritonitis virus (FIPV).
Feline infectious peritonitis virus (FIPV) can cause a lethal disease in cats, feline infectious peritonitis (FIP). The antibody-dependent enhancement (ADE) of FIPV infection has been recognised in experimentally infected cats, and cellular immunity is considered to play an important role in preventing the onset of FIP. To evaluate the importance of cellular immunity for FIPV infection, monoclonal antibodies (MAbs) against feline interferon (fIFN)-gamma were first created to establish fIFN-gamma detection systems using the MAbs. Six anti-fIFN-gamma MAbs were created. Then, the difference in epitope which those MAbs recognise was demonstrated by competitive enzyme-linked immunosorbent assay (ELISA) and IFN-gamma neutralisation tests. Detection systems for fIFN-gamma (sandwich ELISA, ELISpot assay, and two-colour flow cytometry) were established using anti-fIFN-gamma MAbs that recognise different epitopes. In all tests, fIFN-gamma production from peripheral blood mononuclear cells (PBMCs) obtained from cats experimentally infected with an FIPV
isolate that did not develop the disease was significantly increased by heat-inactivated FIPV stimulation in comparison with medium alone. Especially, CD8(+)/IFN-gamma(+) cells, but not CD4(+)/IFN-gamma(+) cells, were increased. In contrast, IFN-gamma production from PBMCs isolated from cats that had developed FIP and specific pathogen-free (SPF) cats was not increased by heat-inactivated FIPV stimulation. These results suggest that cellular immunity plays an important role in preventing the development of FIP. Measurement of IFN-gamma production with the anti-IFN-gamma MAbs created in this study appeared to be useful in evaluating cellular immunity in cats.

Feline lower urinary tract diseases in general, and urethral obstruction (UO) in particular, are common clinical conditions in cats. The aims of this study were to identify risk factors for UO, to characterise clinical and clinicopathological signs, outcome and recurrence, as well as risk factors for mortality and recurrence. Eighty-two cats with UO were compared to 82 sex and time matched controls. The mean age of cats with UO was significantly lower compared to controls, while the mean body weight was higher. The proportion of indoors-outdoors cats was significantly lower in the study group compared to the control group, and the proportion of cats consuming only dry food was higher. Overall mortality was 8.5%. Ionised calcium was significantly higher in survivors compared to non-survivors, and the prevalence of hypocalcaemia was lower. Recurrence in 6 months and 2 years were 22% and 24%, respectively. Cats with recurrence had significantly lower urine pH at presentation.

Feline mammary carcinomas (FMC) are highly infiltrative tumours which show a strong tendency for local recurrence and metastasis. Histological type assessment of these tumours is not sufficiently discriminatory in predicting prognosis and in this study the prognostic significance of the Elston and Ellis method of histological grading was evaluated. Ninety-two feline mammary carcinomas from 84 cats were graded and 64 queens were included in a follow-up study. Grade was significantly related to tumour size (P=0.006), clinical stage (P=0.005), lymphovascular invasion (P<0.0001), mitotic index (P<0.0001), Ki67 index (P=0.001), overall survival (P=0.0001) and disease-free survival (P<0.0001). Cox regression analysis identified grade as an independent prognostic factor. Multivariable analysis also showed regional lymph node metastasis and lymphovascular emboli as independent prognostic factors related to overall survival and to disease-free-survival, respectively. The study demonstrated that histological grading can be used as a prognostic factor to evaluate the biological behaviour of FMC.

The aim of this study was to determine the species of dermatophytes isolated from dogs and cats and their prevalence in the two big provinces of Western Turkey. A total of 362 animals (198 dogs and 164 cats) with skin lesions (alopecia and desquamation) were examined from March 2006 to February 2008.
Of the 362 samples examined, 52 (14.4%) were positive for fungal elements by direct microscopic examination, and 70 (19.3%) were culture positive for dermatophytes. The isolation rates of dermatophyte species from dogs and cats were 18.7% and 20.1%, respectively. Microsporum canis (57.1%) was the most common species isolated from dogs and cats. The prevalence of Trichophyton mentagrophytes was five-fold greater in dogs than in cats (odds ratio=5.226; CI=1.152-23.696). No association was detected between prevalence of infection and provinces, and also sex of dogs and cats. The only risk factor found to be significantly associated with infection was age. Dogs and cats younger than one year of age showed a statistically significant higher prevalence of dermatophytes than other age groups (P<0.05). The isolation rate of dermatophytes was relatively high in the spring and winter for dogs, and in the spring, summer and autumn for cats. However, the association of season and prevalence was found not to be significant.


Comparison of five blood-typing methods for the feline AB blood group system.
Objective-To compare the ease of use and accuracy of 5 feline AB blood-typing methods: card agglutination (CARD), immunochromatographic cartridge (CHROM), gel-based (GEL), and conventional slide (SLIDE) and tube (TUBE) agglutination assays. Sample Population-490 anticoagulated blood samples from sick and healthy cats submitted to the Transfusion or Clinical Laboratory at the Veterinary Hospital of the University of Pennsylvania. Procedures-Sample selection was purposely biased toward those from anemic, type B, or type AB cats or those with autoagglutination. All blood samples were tested by use of GEL, SLIDE, and TUBE methods. Fifty-eight samples were also tested by use of CARD and CHROM methods. The presence of alloantibodies in all cats expressing the B antigen as detected by use of any method was also assessed. Results-Compared with the historical gold-standard TUBE method, good to excellent agreement was achieved with the other typing tests: CARD, 53 of 58 (91% agreement); CHROM, 55 of 58 (95%); GEL, 487 of 490 (99%); and SLIDE, 482 of 487 (99%; 3 samples were excluded because of autoagglutination). Four of the samples with discordant test results originated from cats with FeLV-related anemia. Conclusions and Clinical Relevance-Current laboratory and in-clinic methods provide simple and accurate typing for the feline AB blood group system with few discrepancies. Retyping after in-clinic typing with the GEL or TUBE laboratory methods is recommended to confirm any type B or AB cats.

Pharmacokinetics of amantadine in cats.
Siao, K. T., Pypendop, B. H., Stanley, S. D., Ilkiw, J. E. Pharmacokinetics of amantadine in cats. J. vet. Pharmacol. Therap. doi: 10.1111/j.1365-2885.2011.01278.x. This study reports the pharmacokinetics of amantadine in cats, after both i.v. and oral administration. Six healthy adult domestic shorthair female cats were used. Amantadine HCl (5 mg/kg, equivalent to 4 mg/kg amantadine base) was administered either intravenously or orally in a crossover randomized design. Blood samples were collected immediately prior to amantadine administration, and at various times up to 1440 min following intravenous, or up to 2880 min following oral administration. Plasma amantadine concentrations were determined by liquid chromatography-mass spectrometry, and plasma amantadine concentration-time data were fitted to compartmental models. A two-compartment model with elimination from the central compartment best described the disposition of amantadine administered intravenously in cats, and a one-compartment model best described the disposition of oral amantadine in cats. After i.v. administration, the apparent volume of distribution of the central compartment and
apparent volume of distribution at steady-state \[\text{mean } \pm /- \text{ SEM (range)}\], and the clearance and terminal half-life \[\text{harmonic mean } \pm /- \text{ jackknife pseudo-SD (range)}\] were \[1.5 +/0.3 \text{ (0.7-2.5) L/kg, 4.3 +/0.2 (3.7-5.0) L/kg, 8.2 +/2.1 (5.9-11.4) mL.min/kg, and 348 +/9 (307-465) min, respectively. Systemic availability \[\text{mean } \pm /- \text{ SEM (range)}\] and terminal half-life after oral administration \[\text{harmonic mean } \pm /- \text{ jackknife pseudo-SD (range)}\] were 130 +/11 (86-160)% and 324 +/41 (277-381) min, respectively.


**Pharmacokinetics of oxymorphone in cats.**

Siao, K. T., Pypendop, B. H., Stanley, S. D., Ilkiw, J. E. Pharmacokinetics of oxymorphone in cats. J. vet. Pharmacol. Therap. doi: 10.1111/j.1365-2885.2011.01271.x. This study reports the pharmacokinetics of oxymorphone in spayed female cats after intravenous administration. Six healthy adult domestic shorthair spayed female cats were used. Oxymorphone (0.1 mg/kg) was administered intravenously as a bolus. Blood samples were collected immediately prior to oxymorphone administration and at various times up to 480 min following administration. Plasma oxymorphone concentrations were determined by liquid chromatography-mass spectrometry, and plasma oxymorphone concentration-time data were fitted to compartmental models. A three-compartment model, with input in and elimination from the central compartment, best described the disposition of oxymorphone following intravenous administration. The apparent volume of distribution of the central compartment and apparent volume of distribution at steady state \[\text{mean } \pm /- \text{ SEM (range)}\] and the clearance and terminal half-life \[\text{harmonic mean } \pm /- \text{ jackknife pseudo-SD (range)}\] were \[1.1 +/0.2 \text{ (0.4-1.7) L/kg, 2.5 +/0.4 \text{ (2.4-4.4) L/kg, 26 +/7 (18-38) mL/min.kg, and 96 +/49 (62-277) min, respectively.} \]

The disposition of oxymorphone in cats is characterized by a moderate volume of distribution and a short terminal half-life.


**Evaluation of respiratory parameters at presentation as clinical indicators of the respiratory localization in dogs and cats with respiratory distress.**

OBJECTIVE: To describe clinical respiratory parameters in cats and dogs with respiratory distress and identify associations between respiratory signs at presentation and localization of the disease with particular evaluation between the synchrony of abdominal and chest wall movements as a clinical indicators for pleural space disease. Design - Prospective observational clinical study. SETTING: Emergency service in a university veterinary teaching hospital. ANIMALS: Cats and dogs with respiratory distress presented to the emergency service between April 2008 and July 2009. INTERVENTIONS: None. MEASUREMENTS AND MAIN RESULTS: The following parameters were systematically determined at time of admission: respiratory rate, heart rate, temperature, type of breathing, movement of the thoracic and abdominal wall during inspiration, presence of stridor, presence and type of dyspnea, and results of thoracic auscultation. Abdominal and chest wall movement was categorized as synchronous, asynchronous, or inverse. Diagnostic test results, diagnosis, and outcome were subsequently recorded. Based on the final diagnoses, animals were assigned to 1 or more of the following groups regarding the anatomical localization of the respiratory distress: upper airways, lower airways, lung parenchyma, pleural space, thoracic wall, nonrespiratory causes, and normal animals. One hundred and seventy-six animals (103 cats and 73 dogs) were evaluated. Inspiratory dyspnea was associated with upper airway disease in dogs and expiratory dyspnea with lower airway disease in cats. Respiratory noises were significantly associated and highly sensitive and
specific for upper airway disease. An asynchronous or inverse breathing pattern and decreased lung auscultation results were significantly associated with pleural space disease in both dogs and cats (P<0.001). The combination is highly sensitive (99%) but not very specific (45%). Fast and shallow breathing was not associated with pleural space disease. Increased or moist pulmonary auscultation findings were associated with parenchymal lung disease. CONCLUSIONS: Cats and dogs with pleural space disease can be identified by an asynchronous or inverse breathing pattern in combination with decreased lung sounds on auscultation.


Miniplate 1.5 fixation for the repair of mandibular osteotomies in cats.

PURPOSE: To evaluate the application of the maxillofacial miniplate 1.5 in the repair of unilateral mandibular osteotomies in cats. METHODS: Twelve adult cats were divided into two groups. In group 1 (n=6), the osteotomy was performed in the body of the mandible, behind the 1(st) molar. In group 2 (n=6), the osteotomy was performed between the 4(th) premolar and 1(st) molar. The osteotomy was fixed with a titanium miniplate 1.5. Oral alimentation was reinitiated 24 hours after surgery. Cats were euthanized at 12 weeks postoperative. RESULTS: Radiographs taken 1 week after surgery showed a radiolucent line. The osteotomy line was not more visible on the radiographs taken at 12 weeks postoperative. Macroscopic examination confirmed alignment and bone union of operated hemimandibles. Histological examination showed formation of woven bone within the osteotomy line. The percentage of bone tissue at these areas was measured by the histometry. There was no statistically significant difference between the values of group 1 (75.07 +/- 5.99) and group 2 (74.76 +/- 8.54) (Mann-Whitney’s test p= 0.469). CONCLUSION: We concluded that the use of miniplate 1.5 for the fixation of mandibular osteotomy in cats provided the main goals in the treatment of mandibular fractures: bone union, normal dental occlusion and immediate return to oral alimentation.


Identification of Helicobacter DNA in feline pancreas, liver, stomach, and duodenum: Comparison between findings in fresh and formalin-fixed paraffin-embedded tissue samples.

The clinical significance of Helicobacter spp. in feline digestive organs needs to be evaluated and formalin-fixed and paraffin-embedded (FFPE) tissue samples provide an invaluable source for molecular studies. In this study, we performed a PCR assay to investigate the presence of Helicobacter DNA in digestive organs from seven cats and compared this occurrence in fresh and formalin-fixed and paraffin-embedded (FFPE) tissue samples from the same organs. The present study identified Helicobacter DNA in the pancreas, liver, stomach, and duodenum in fresh tissue samples but only in the stomach in FFPE samples. To our knowledge this is the first time that Helicobacter DNA have been identified in the feline pancreas. This study indicates that it is important to be aware of differences between results when analyzing FFPE samples compared to fresh tissue samples, especially regarding longer DNA fragments (>200bp (base pairs)).


Isolation and genotyping of Toxoplasma gondii causing fatal systemic toxoplasmosis in an immunocompetent 10-year-old cat.
A 10-year-old male, neutered domestic shorthair cat was presented with fever, anorexia, vomiting, and diarrhea. Serologic testing for Feline immunodeficiency virus and Feline leukemia virus were negative. Fine-needle aspirates of mesenteric lymph nodes revealed the presence of banana-shaped apicomplexan parasites. The cat died after 4 days of hospitalization. Postmortem polymerase chain reaction (PCR) analysis confirmed the presence of Toxoplasma gondii in all examined organs. Parasites were ex vivo isolated in outbred mice and subsequently transferred into cell culture. Genotyping, using genetic markers for SAG2, SAG3, BTUB, GRA6, c22-8, c29-2, L358, PK1, and Apico for PCR-restriction fragment length polymorphism, revealed infection with type II T. gondii displaying type II alleles at all loci except Apico, which exhibited a type I allele. This is the most frequently identified genotype among cats acting as definitive hosts in central Europe, but to the authors’ knowledge, it has never been associated with systemic toxoplasmosis in an adult, immunocompetent cat.

Reversal of rocuronium-induced neuromuscular block by sugammadex is independent of renal perfusion in anesthetized cats.
PURPOSE: Sugammadex is a selective relaxant binding agent designed to encapsulate the aminosteroidal neuromuscular blocking agent rocuronium, thereby reversing its effect. Both sugammadex and the sugammadex-rocuronium complex are eliminated by the kidneys. This study investigated the effect of sugammadex on recovery of rocuronium-induced neuromuscular block in cats with clamped renal pedicles, as a model for acute renal failure. METHODS: Twelve male cats were divided into two groups and anesthetized with medetomidine, ketamine, and alpha-chloralose. The cats were intubated and ventilated with a mixture of oxygen and air. Neuromuscular monitoring was performed by single twitch monitoring. Rocuronium 0.5 mg/kg i.v. was administered. After spontaneous recovery from neuromuscular block, both renal pedicles were ligated. A second dose of rocuronium 0.5 mg/kg i.v. was given. One minute after disappearance of the twitches, in Group 1 placebo (0.9% saline) and in Group 2 sugammadex 5.0 mg/kg i.v. was administered. Onset time, duration of neuromuscular block, and time to recovery to 25, 50, 75, and 90% were determined. RESULTS: After renal pedicle ligation, sugammadex reversed rocuronium-induced neuromuscular block significantly faster than spontaneous recovery. Mean time (SEM) to 90% recovery of the twitch response was 4.7 (0.25) min (Group 2) versus 31.1 (5.0) min (Group 1) (p < 0.0001). No signs of recurrence of neuromuscular block were observed for 90 min after complete twitch restoration. Sugammadex caused no significant cardiovascular effects. CONCLUSION: Sugammadex rapidly and effectively reversed rocuronium-induced neuromuscular block in anesthetized cats, even when both renal pedicles were ligated and renal elimination of the drugs was no longer possible.

Sickness behaviors in response to unusual external events in healthy cats and cats with feline interstitial cystitis.
OBJECTIVE: To compare sickness behaviors (SB) in response to unusual external events (UEE) in healthy cats with those of cats with feline interstitial cystitis (FIC). DESIGN: Prospective observational study. ANIMALS: 12 healthy cats and 20 donated cats with FIC. PROCEDURES: Cats were housed in a vivarium. Sickness behaviors referable to the gastrointestinal and urinary tracts, the skin, and behavior problems were recorded by a single observer for 77 weeks. Instances of UEE (eg, changes in caretakers, vivarium routine, and lack of interaction with the investigator) were identified during 11 of
the 77 weeks. No instances of UEE were identified during the remaining 66 weeks, which were considered control weeks. RESULTS: An increase in age and exposure to UEE, but not disease status, significantly increased total number of SB when results were controlled for other factors. Evaluation of individual SB revealed a protective effect of food intake for healthy males. An increase in age conferred a small increase in relative risk (RR) for upper gastrointestinal tract signs (RR, 1.2) and avoidance behavior (1.7). Exposure to UEE significantly increased the RR for decreases in food intake (RR, 9.3) and for no eliminations in 24 hours (6.4). Exposure to UEE significantly increased the RR for defecation (RR, 9.8) and urination (1.6) outside the litter box. CONCLUSIONS AND CLINICAL RELEVANCE: SB, including some of the most commonly observed abnormalities in client-owned cats, were observed after exposure to UEE in both groups. Because healthy cats and cats with FIC were comparably affected by UEE, clinicians should consider the possibility of exposure to UEE in cats evaluated for these signs.

A needs-assessment and demographic survey of infection-control and disease awareness in western US animal shelters.
A cross-sectional needs-assessment survey was used to characterize animal shelters in a 6-state region in the western US and describe infection-control practices and disease awareness. Survey questions focused on shelter demographics, infection-control practices and policies, awareness and concern over infectious and zoonotic diseases, staff and volunteer training relating to infection-control and disease awareness, use of diagnostic tools, and isolation procedures and protocols. Fifty percent of shelters responded to the survey and represented a wide variety of shelter types, sizes and locations. The top-three diseases of concern to shelters were feline upper respiratory disease (FURD), canine parvovirus and ringworm. Concern over these diseases was greater in open-admission shelters (compared to limited admission or no-kill/sanctuary) (OR 3.7, 95% CI 1.1-12.5) and in shelters with a desire for more zoonotic-disease training (OR=6.1, 95% CI 1.5-24.8) (compared to shelters desiring infectious-disease training, training on cleaning and disinfection or those who have no need for further training). In 45% of responding shelters many to most animals arrive with infectious diseases. Written protocols for preventive medicine exist in 88% of shelters, cleaning and disinfection protocols in 75%, specific disease protocols for outbreak situations in 36% and infection-control manuals in 15%. Veterinarians are in charge of infection-control in 6% of shelters. Approximately 45% of shelters vaccinate dogs and cats for rabies. Infectious-disease training is provided to 30% of staff and 35% of volunteers upon hire. Overall, volunteers received less training in infectious- and zoonotic-disease identification, prevention and control than staff members. Ninety percent of shelters said they would benefit from training in infectious and zoonotic disease. Results from this study can be used to assess and address needs in animal shelters relating to infection-control, infectious and zoonotic-disease awareness and can help guide development of shelter staff and volunteer training.

Feline systemic hypertension: Diagnosis and management.
PRACTICAL RELEVANCE: the clinical importance of feline hypertension has been recognised for many years and most feline practitioners are quite familiar with this syndrome. Once systemic hypertension is identified, long-term management of the patient is needed to avoid catastrophic (eg, blindness due to retinal detachment) or subtle (eg, accelerated renal damage) target organ damage. PATIENT GROUP: feline systemic hypertension is most commonly a complication of renal disease
and hyperthyroidism, both diseases of older feline patients. By 15 years of age, the probability of having at least one of these two diseases is high. As well cared for cats are living longer, optimal long-term management of feline hypertension in patients with concurrent diseases is an issue of clinical importance. CLINICAL CHALLENGES: obtaining accurate blood pressure measurements in patients that are anxious, fractious or just plain uncooperative remains a significant issue in feline medicine, as does confident analysis of results from these patients. DIAGNOSTICS: careful measurement of systolic blood pressure using Doppler or oscillometric techniques in conjunction with evaluation for evidence of hypertensive choroidopathy (funduscopic examination) and hypertensive cardiac changes (thoracic auscultation) are essential to the diagnosis of systemic hypertension in cats. Other diagnostic techniques, including evaluation of renal and thyroid function, are needed to detect the underlying disease condition. EVIDENCE BASE: numerous well-designed clinical studies have greatly advanced our understanding of the most appropriate methods of diagnosis and therapy of feline hypertension.


**Incidence of persistent viraemia and latent feline leukaemia virus infection in cats with lymphoma.**

In the past, feline leukaemia virus (FeLV) infection, and also latent FeLV infection, were commonly associated with lymphoma and leukaemia. In this study, the prevalence of FeLV provirus in tumour tissue and bone marrow in FeLV antigen-negative cats with these tumours was assessed. Seventy-seven diseased cats were surveyed (61 antigen-negative, 16 antigen-positive). Blood, bone marrow, and tumour samples were investigated by two polymerase chain reaction (PCR) assays detecting deoxyribonucleic acid (DNA) sequences of the long terminal repeats (LTR) and the envelope (env) region of the FeLV genome. Immunohistochemistry (IHC) was performed in bone marrow and tumour tissue. None of the antigen-negative cats with lymphoma was detectably infected with latent FeLV. The prevalence of FeLV viraemia in cats with lymphoma was 20.8%. This suggests that causes other than FeLV play a role in tumorigenesis, and that latent FeLV infection is unlikely to be responsible for most feline lymphomas and leukaemias.


**Hypertension in small animal kidney disease.**

Kidney disease is commonly associated with hypertension in dogs, cats and other species. There are multiple mechanisms underlying the development of renal hypertension including sodium retention, activation of the renin-angiotensin system and sympathetic nerve stimulation. The relative importance of these and other mechanisms may vary both between species and according to the type of kidney disease that is present. Consideration of underlying disease mechanisms may aid in the rational choice of therapy in hypertensive patients.


**Evaluation of orally administered famciclovir in cats experimentally infected with feline herpesvirus type-1.**

OBJECTIVE: To evaluate orally administered famciclovir for treatment of cats with experimentally induced disease attributable to feline herpesvirus type-1 (FHV-1). ANIMALS: 16 nonvaccinated
specific-pathogen-free cats. PROCEDURES: Cats were treated orally with famciclovir (90 mg/kg; n = 10) or a similar volume of lactose (400 mg; 6) 3 times/d for 21 days. Cats were inoculated with FHV-1 and administered the first treatment dose on day 0. Disease score; weight; results of urinalysis, serum biochemical analysis, and CBC; histologic conjunctivitis score; herpetic DNA shedding; goblet cell density; anti-FHV-1 antibody concentration; and plasma penciclovir concentration were measured. RESULTS: On days 4 to 18 following inoculation, disease scores were lower in famciclovir-treated cats than in lactose-treated cats. Lactose-treated cats decreased in weight during the first 7 days after inoculation, but famciclovir-treated cats increased in weight throughout the study. Percentage change in weight was greater in famciclovir-treated cats on days 7 and 14 than in lactose-treated cats. Serum globulin concentration was lower on days 3 through 9, conjunctivitis histologic score was lower on day 14, herpetic DNA was shed less frequently throughout the study, goblet cell density was greater on day 21, and circulating anti-FHV-1 antibody concentration at study end was lower in famciclovir-treated cats, compared with these measurements in lactose-treated cats. Approximate peak plasma penciclovir concentration was 2.0 µg/mL. CONCLUSIONS AND CLINICAL RELEVANCE: Famciclovir administration improved outcomes for systemic, ophthalmic, clinicopathologic, virologic, and histologic variables in cats experimentally infected with FHV-1. Adjunctive topical mucinomorphic and antimicrobial treatments may also be necessary.


Clinicopathological findings and disease staging of feline infectious peritonitis: 51 cases from 2003 to 2009 in Taiwan.

Fifty-one cats histopathologically confirmed to have been naturally infected by feline infectious peritonitis (FIP), were collected to analyse the clinical and laboratory findings and to characterise disease staging. Effusive FIP was found in 33 cats, non-effusive FIP in 12 cats, and mixed-type in six cats. Highly significant decreases in haematocrit and albumin levels and an increase in total bilirubin level were noted in both effusive and non-effusive FIP, at first presentation and before death. In serial blood examinations of the effusive group, anaemia and increases in total bilirubin and aspartate aminotransferase (AST) were observed from 2 weeks to 0-3 days before death. The packed cell volume, bilirubin, AST, potassium, and sodium levels were established to predict disease staging and survival time. Cumulative points ranging from 0 to 4, 5 to 11 and excess of 12, indicate that the cat can survive for at least 2 weeks, less than 2 weeks and less than 3 days, respectively.


Remission of diabetes mellitus in cats cannot be predicted by the arginine stimulation test.

BACKGROUND: Cats with diabetes mellitus frequently achieve clinical remission, suggesting residual beta-cell function. Responsiveness of beta-cells to arginine persists the longest during diabetes progression, making the intravenous arginine stimulation test (IVAST) a useful tool to assess residual insulin and glucagon secretion. HYPOTHESIS: Diabetic cats with and without remission will have different arginine-induced insulin or glucagon response. ANIMALS: Seventeen cats with diabetes, 7 healthy cats. METHODS: Blood samples collected on admission and during subsequent IVAST. Glucose, insulin, and glucagon were measured. Response to IVAST was assessed by calculating the insulin and glucagon area under the curve (AUC) and the AUC glucagon-to-insulin ratio. Diabetic cats were treated with insulin and were followed for 18 weeks. Remission was defined as normoglycemia and disappearance of clinical signs of diabetes for >/=4 weeks, without requiring insulin. RESULTS:
Seven diabetic cats (41%) achieved remission. On admission, blood glucose concentration was significantly lower in cats with remission (median, 389 mg/dL; range, 342-536 mg/dL) than in those without remission (median, 506 mg/dL; range, 266-738 mg/dL). After IVAST, diabetic cats with remission had higher AUC glucagon-to-insulin ratios (median, 61; range, 34-852) than did cats without remission (median, 26; range, 20-498); glucose, insulin, and glucagon AUCs were not different. Diabetic cats had lower insulin AUC than did healthy cats but comparable glucagon AUC.

CONCLUSIONS AND CLINICAL IMPORTANCE: Diabetic cats with and without remission have similar arginine-stimulated insulin secretion on admission. Although cats with remission had lower blood glucose concentrations and higher AUC glucagon-to-insulin ratios, large overlap between groups prevents use of these parameters in clinical practice.

Can heartworm prevalence in dogs be used as provisional data for assessing the prevalence of the infection in cats?

Cats are considered a susceptible host for Dirofilaria immitis; however, increased host resistance is reflected by relatively low adult worm burdens in natural and experimental infections; the prolonged prepatent period (8 months); the low level and short duration of microfilaraemia; and the short life span of adult worms (2-3 years). From April to September 2006, 212 cats and 608 dogs, all exposed for at least one transmission season, were screened for D. immitis infection in a multi-center study in the Po River Valley in northern Italy. Cats were initially evaluated by antibody testing; positive subjects were followed up by antigen testing and echocardiography (and necropsy if death occurred). The prevalence in dogs was 29% by a modified Knott test and antigen testing compared with a prevalence of 4.7% in cats by an antibody test; six of these infections (2.8%) were confirmed by the follow-up evaluations. This field study demonstrated that the prevalence of heartworm infection in cats in this area is within the expected limits of 9-18% of the prevalence in dogs. Antibody testing likely underestimates the real prevalence of D. immitis infection in cats. These results also emphasize the importance of preventive treatment in cats.

Leishmania chagasi infection in cats with dermatologic lesions from an endemic area of visceral leishmaniosis in Brazil.

Although dogs are considered the main domestic reservoirs for Visceral Leishmaniosis (VL), which is caused in the Americas by Leishmania chagasi, infected cats have also been recently found in endemic areas of several countries and became a public health concern. Accordingly, the purpose of this study was to evaluate cats with dermatologic lesions from an endemic area of VL and the natural infection of L. chagasi. A total of 55 cats were selected between April 2008 and November 2009 from two major animal shelters of Aracatuba, Southeastern Brazil. All cats underwent general and dermatologic examinations, followed by direct parasitological examination of lymphoid organs, immunosorbsorbent assay (ELISA) and indirect immunofluorescence (IFAT). In addition, detection of amastigotes was performed by immunohistochemistry (IHC) in skin lesions of all cats. VL was diagnosed in 27/55 (49.1%) cats with dermatological problems. Amastigotes were found in lymphoid organs of 10/27 (37.0%) cats; serology of 14/27 (51.9%), 6/27 (22.2%) and 5/27 (18.5%) cats was positive for ELISA, IFAT and both, respectively. The IHC identified 9/27 (33.3%) cats; 5/27 (18.5%) were positive only for IHC and therefore increased the overall sensitivity. Specific FIV antibodies were found in 6/55
(10.9%) cats, of which 5/6 (83.3%) had leishmaniosis. Real time PCR followed by amplicon sequencing successfully confirmed L. chagasi infection. In conclusion, dermatological lesions in cats from endemic areas was highly associated to visceral leishmaniosis, and therefore skin IHC and differential diagnosis of LV should be always conducted in dermatological patients in such areas.

Factors influencing the temporal patterns of dyadic behaviours and interactions between domestic cats and their owners.

Human-cat dyads may be similar in interaction structure to human dyads because many humans regard their cats as being social companions. Consequently, we predict that dyadic structure will be contingent on owner and cat personalities, sex, and age as well as duration of cohabitation of the partners. Forty owner-cat dyads were visited in their homes, on four occasions, during which their behaviours and interactions were video-taped. Behaviour was coded from tape and was analysed for temporal (t)-patterns using Theme (Noldus; Magnusson, 1996). Owner personality was assessed using the NEO-FFI. Five cat personality axes were identified by Principal Component Analysis (PCA) based on observer-rated items and on coded behaviours. We found that the higher the owner in neuroticism, the fewer t-patterns occurred per minute. The higher the owner in extraversion, the higher was the number of non-overlapping patterns per minute. The more “active” the cat, the fewer non-overlapping patterns occurred per minute, but the higher was the event type complexity. The older the cat, the lower was dyadic event type complexity. We suggest that basic temporal structures similar to those of human-cat dyads may also be found in other long-term and complex dyadic relationships, including those between humans.


Finite element modelling of the canine and feline outer ear canal: benefits for local drug delivery?

Current therapeutic regimes of outer ear infections in dogs and cats aim at the application of efficient local therapeutics after cleaning of the acoustic meatus. One so far insufficiently answered question is if the local application of these substances results in an individually suitable drug concentration in the external ear canal. Thus, the purpose of the present study was to develop a finite element model to calculate the values of the different areas of the external acoustic meatus in dogs and cats in order to provide a tool for the benefit of an appropriate local drug dosage determination. A 3D finite element model (FEM), based on computer tomographic (CT) data sets of four dogs and two cats, was generated to determine areas and volumes of the outer ear canal. Furthermore, various ear therapeutics and cleansers were tested concerning their optimal distribution on 5 cm2 dog and cat skin. The data shows major variations of the area values of the external auditory canal in case of the different dogs but not in the examined cats. These results suggest that manufacturer’s recommendations of the pharmaceuticals might be insufficient in terms of achieving an optimal drug concentration in the outer ear canal especially in larger dogs. In conclusion, the developed finite element model has shown to be suitable to calculate areas of the outer ear canal in cats and dogs and could be of help in context with the definition of optimal drug concentrations for a local drug delivery.
**Feline chronic kidney disease: Can we move from treatment to prevention?**

Chronic kidney disease (CKD) is arguably the most common disease of older domestic cats. Recent research has focused on treatment options and prognostic variables. Specifically, the roles of dietary protein, hypertension and proteinuria as potential causes of a progressive decline in kidney function have been evaluated. The value of prescription kidney diets and the prognostic value of proteinuria have been confirmed. However, in contrast to dogs, rodents and people, significant proteinuria is uncommon in the cat and hypertension is not a prognostic indicator. Despite significant progress, the cause of CKD in the overwhelming majority of cats remains unknown and fundamental questions remain unanswered. Treatment of feline CKD is limited to non-specific options until some of the causes and pathophysiological mechanisms that result in chronic tubulointerstitial nephritis are identified.

**Use of bisphosphonates to treat severe idiopathic hypercalcaemia in a young Ragdoll cat.**

A 3-year-old Ragdoll cat was referred for investigation of polyuria, polydipsia, vomiting, weight loss and hypercalcaemia. Serum biochemical abnormalities included total and ionised hypercalcaemia and hypophosphataemia. Following clinical investigations a diagnosis of idiopathic hypercalcaemia was made. Because of the severity of the hypercalcaemia and the associated clinical signs, treatment for hypercalcaemia was commenced with pamidronate. Major electrolyte abnormalities were detected but, remarkably, were accompanied by minimal clinical signs. The cat was subsequently treated with oral alendronate and is clinically normal 15 months later. Reports of the use of bisphosphonates in cats are limited and close monitoring of patients is recommended.

**Surgical treatment of a cerebral brain abscess in a cat.**

A nine-year-old male castrated European Shorthair cat was presented with a six-day history of progressive depression and ataxic gait. Neurological examination revealed depression, absent menace in the left eye, absent pupillary light reflex in the right eye, anisocoria, circling to the right, and delayed proprioception in all limbs. Magnetic resonance imaging showed a space-occupying right temporal lobe lesion adjacent to a small defect in the temporal bone suggestive of a meningo-encephalitis with concurrent abscess formation. The site was surgically approached by a rostroventral craniectomy. A cerebral abscess was found and debrided. Histopathological examination of the removed tissue demonstrated a subacute to chronic purulent encephalitis with extensive necrosis of brain tissue. Neurological symptoms resolved completely within two weeks and full recovery was observed four weeks after surgery.

**Contamination of infectious RD-114 virus in vaccines produced using non-feline cell lines.**

All domestic cats have a replication-competent endogenous retrovirus, termed RD-114 virus, in their genome and several feline cell lines produce RD-114 viruses. Recently, we found that a portion of live
attenuated feline and canine vaccines produced using feline cell lines was contaminated with infectious RD-114 viruses. In this study, we expanded our survey and examined canine vaccines produced using ‘non-feline’ cell lines. Consequently, we found two vaccines containing RD-114 viral RNA by reverse transcriptase (RT)-polymerase chain reaction (PCR) and real-time RT-PCR. We also confirmed the presence of infectious RD-114 virus in the vaccines by the LacZ marker rescue assay and PCR to detect proviral DNA in TE671 cells (human rhabdomyosarcoma cells) inoculated with the vaccines. It is impossible to investigate the definitive cause of contamination with RD-114 virus; however, we suspect that a seed canine parvovirus type 2 was contaminated with RD-114 virus, because many canine parvoviruses have been isolated and attenuated using feline cell lines. To exclude RD-114 virus from live attenuated vaccines, we must pay attention to the contamination of seed viruses with RD-114 virus in addition to avoiding feline cell lines producing RD-114 virus when manufacturing vaccines.


**Feline ureteral strictures: 10 cases (2007-2009).**

Background: Feline ureteral obstructions have emerged as a common problem. Ureteral strictures rarely are reported as a cause and the predisposing factors and clinical course of this condition have not been described. Objectives: Evaluate cases of feline ureteral strictures and characterize historical features, clinical signs, diagnostic imaging, surgical and endoscopic findings, histopathology, treatment modalities, and short- and long-term outcomes. Animals: Ten cats diagnosed with ureteral strictures based on compatible findings from at least 2 of the following: ultrasonography, ureteropyelography, surgical exploration, or histopathology. Methods: Retrospective study. Results: Median age, serum creatinine concentration, and size of the renal pelvis were 12 years, 3.7 mg/dL, and 11.75 mm, respectively. Six of 10 cats had hyperechoic periureteral tissue on ultrasound examination at the stricture site. Four cats had evidence of a circumcaval ureter at surgery. Eight cats had an intervention including ureteral stent placement (n = 6) and traditional surgery (n = 2). Seven of 8 cats had decreases in serum creatinine concentration and renal pelvic parameters preceding discharge and 6 had persistently improved results at their last examination. All patients survived to discharge. Median survival time was >294 days (range, 14 to >858 days) with 6/10 cats still alive. Conclusions and Clinical Importance: Ureteral strictures may occur in cats secondary to ureteral surgery, inflammation, a circumcaval ureter, impacted ureterolithiasis, or for unknown causes. With appropriate and timely intervention, the prognosis for long-term survival is good. In addition to ureteral reimplantation or ureteronephrectomy, ureteral stenting or SC ureteral bypass may be considered as future therapeutic options.