Small Animal Article Summaries – FELINE MEDICINE & SURGERY

July-August, 2016

Contributor

ISFM
The International Society of Feline Medicine

Small Animal Article Summaries (SAAS) is a veterinarian resource where a range of article summaries can be accessed in one easy location.

The International Society of Feline Medicine (ISFM) was established in 1996 as the veterinary focus for the work of the charity and, together with the American Society of Feline Practitioners, it publishes the Journal of Feline Medicine and Surgery.
Bladder inversion and secondary hematuria in a 6-month-old domestic shorthair cat.

CASE DESCRIPTION: A 6-month-old female domestic shorthair cat was admitted for evaluation of intermittent clinical signs of hematuria and inappropriate urination for the past 2 months. CLINICAL FINDINGS: Transabdominal ultrasonography revealed a multilayered mass in the urinary bladder apex consistent with full-thickness invagination of the bladder wall. TREATMENT AND OUTCOME: Exploratory surgery was performed, and partial inversion of the urinary bladder was confirmed. The invaginated bladder apex was manually reduced, and partial cystectomy was performed to remove the invaginated section of bladder wall. Histologic findings were consistent with vascular congestion and edema secondary to partial invagination. Bacterial culture of a section of the bladder mucosa demonstrated concurrent bacterial urinary tract infection. Clinical signs resolved following surgical resection of the bladder apex and antimicrobial treatment for the concurrent urinary tract infection. CLINICAL RELEVANCE: Partial invagination of the urinary bladder should be considered in the differential diagnosis for cats with clinical signs of hematuria, stranguria, and inappropriate urination. A diagnosis may be made on the basis of detection of invaginated tissue in the bladder apex during abdominal ultrasonography.

The prevalence of microalbuminuria and proteinuria in cats with diabetes mellitus.

The prevalence of microalbuminuria (MA) and proteinuria was evaluated in 66 cats with diabetes mellitus (DM), 35 nondiabetic cats with other illness, and 11 healthy nondiabetic cats with use of the E.R.D.-HealthScreen Feline Urine Test. The MA prevalence was higher in the diabetic than in the nondiabetic sick and healthy control cats (70%, 39%, and 18% respectively, P <.0001). In addition, prevalence of proteinuria defined by a protein/creatinine ratio (UPC) > 0.4 was significantly higher in the diabetic cat than in the control cats (70%, 35%, and 9% respectively, P <.0001). There was a significant but weak correlation between the results of MA and UPC (P <.0001, r = 0.43). Our results showed that MA is common in cats with DM. Further studies are required to evaluate the prognostic value of the presence and the severity of MA in cats with DM.

Pharmacokinetics and bioavailability of a long-acting formulation of cephalexin after intramuscular administration to cats.

The pharmacokinetic profile and bioavailability of a long-acting formulation of cephalexin after intramuscular administration to cats was investigated. Single intravenous (cephalexin lysine salt) and intramuscular (20% cephalexin monohydrate suspension) were administered to five cats at a dose rate of 10 mg/kg. Serum disposition curves were analyzed by noncompartmental approaches. After intravenous administration, volume of distribution (V(z)), total body clearance (Cl(t)), elimination constant (lambda(z)), elimination half-life (t((1/2))(lambda)) and mean residence time (MRT) were: 0.33+/-0.03 L/kg; 0.14+/-0.02 L/hkg, 0.42+/-0.05 h(-1), 1.68+/-0.20 h and 2.11+/-0.25 h, respectively.
Peak serum concentration (C(max)), time to peak serum concentration (T(max)) and bioavailability after intramuscular administration were 15.67±1.95 mug/mL, 2.00±0.61 h and 83.33±8.74%, respectively.


Novel Hepatozoon in vertebrates from the southern United States.

Novel Hepatozoon spp. sequences collected from previously unrecognized vertebrate hosts in North America were compared with documented Hepatozoon 18S rRNA sequences in an effort to examine phylogenetic relationships between the different Hepatozoon organisms found cycling in nature. An approximately 500-base pair fragment of 18S rDNA common to Hepatozoon spp. and some other apicomplexans was amplified and sequenced from the tissues or blood of 16 vertebrate host species from the southern United States, including 1 opossum (Didelphis virginiana), 2 bobcats (Lynx rufus), 1 domestic cat (Felis catus), 3 coyotes (Canis latrans), 1 gray fox (Urocyon cinereoargenteus), 4 raccoons (Procyon lotor), 1 pet boa constrictor (Boa constrictor imperator), 1 swamp rabbit (Sylvilagus aquaticus), 1 cottontail rabbit (Sylvilagus floridanus), 4 woodrats (Neotoma fuscipes and Neotoma micropus), 3 white-footed mice (Peromyscus leucopus), 8 cotton rats (Sigmodon hispidus), 1 cotton mouse (Peromyscus gossypinus), 1 eastern grey squirrel (Sciurus carolinensis), and 1 woodchuck (Marmota monax). Phylogenetic analyses and comparison with sequences in the existing database revealed distinct groups of Hepatozoon spp., with clusters formed by sequences obtained from scavengers and carnivores (opossum, raccoons, canids, and felids) and those obtained from rodents. Surprisingly, Hepatozoon spp. sequences from wild rabbits were most closely related to sequences obtained from carnivores (97.2% identical), and the sequence from the boa constrictor was most closely related to the rodent cluster (97.4% identical). These data are consistent with recent work identifying prey-predator transmission cycles in Hepatozoon spp. and suggest this pattern may be more common than previously recognized.


Genetic structure and variation of van cats.

To determine the genetic structure and variation of Van cats and some other cats, seven enzyme loci were examined using horizontal starch gel electrophoresis. ME bands were observed for the first time in cats. For the enzyme loci CA (1), SOD, GPI, and GOT, neither the individual Van cats nor the specimens of other cat species exhibited any variation. These enzymes presented identical bands, all of which were homozygous. With respect to the PGD, ME, and ESD loci, however, genetic variation was observed in all of the cats. Hence, three of the seven gene-enzyme systems (43%) were polymorphic with two alleles, contributing to an estimate of average heterozygosity of 0.33-0.49 for the Van cats. PGD was the most discriminatory among the three polymorphic loci. The phylogenetic tree indicated that the Van, Persian, Turkish Angora, and Turkish Tekir cats are distinct from Siamese and Bombay cats.

Orthopedic implant of a polyhydroxybutyrate (PHB) and hydroxyapatite composite in cats.

The purpose of this study was to evaluate the tissue response to a 70% polyhydroxybutyrate and 30% hydroxyapatite composite in the form of a bone implant, placed intracortically in the distal metaphyseal of the right femur, and subcutaneous implants in cats. Samples of the composite were implanted subcutaneously in the dorsolumbar region and the distal metaphyseal region of the right femur of the animals. The study used 12 neutered adult mixed breed cats, weighing an average of 3.5kg. The cats were randomly divided into three groups: GI, GII and GIII, according to the length of the assessment period. The assessments of their subcutaneous and bone tissues were performed at 15, 30 and 45 days and at 30, 60 and 90 days, respectively. The subcutaneous and bone reactions to the composites were characterized by granulomatous inflammation with a predominance of macrophages and giant cells. The results showed that the composites triggered a chronic local inflammatory response, despite their clinical acceptance.


Nasal hydropulsion: a novel tumor biopsy technique.

Intranasal tumors of dogs and cats pose a diagnostic and therapeutic challenge for small animal practitioners. Multiple nasal biopsy techniques have been described in the past. This report describes a simplified flushing technique to biopsy and debulk nasal tumors, which often also results in immediate clinical relief for the patient. Based on the results of this retrospective study, the authors recommend high-pressure saline hydropulsion as a minimally invasive diagnostic, and potentially therapeutic, technique for nasal tumors in dogs and cats.


High prevalence of Opisthorchis viverrini infection in reservoir hosts in four districts of Khon Kaen Province, an opisthorchiasis endemic area of Thailand.

Khon Kaen, a northeastern province of Thailand, has been considered as one of the human opisthorchiasis endemic areas with continuing high prevalence. Unsuccessful eradication of the disease is probably from the culture of eating raw and undercooked fish of local residence and the parasitic persistency in animal reservoir hosts, such as cats and dogs. In cooperation with the other human opisthorchiasis control programs in an endemic area of 29 villages in Ban Haet, Ban Phai, Chonnabot and Muncha Khiri Districts, Khon Kaen, this study investigated the prevalence of Opisthorchis viverrini infection using a formalin-ether sedimentation method as the gold standard, and hematology and blood chemistry of the reservoir hosts in this endemic area. The results showed that cats had much higher prevalence (76 of 214, 35.51%) than dogs (3 of 821, 0.37%). Hematology between the infected and uninfected cats was not different. Complete blood count and biochemistry reflected some altered hepatic functions. However, only severely infected cats showed apparent clinical signs, including lethargy, diarrhea, ocular and nasal discharges. Moreover, the ultrasonogram of infected cats with very high egg per gram (>1500 EPG) showed apparent thickening of the gall bladder wall with
hyperechoicity of hepatic parenchyma. This study suggests that cat is the most important animal reservoir of human opisthorchiasis, especially in this endemic area. It is also interesting that villages with infection are mostly located in the vicinity of Chi River and two large water reservoirs (Lawa and Nong Kongkaew Lakes), but people without infection were away from Chi River, on the south of Kudkhow Lake. Further investigation on this particular geofactor is essential for effective opisthorchiasis control programs.


**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.


**Effects of dietary protein content on renal parameters in normal cats.**

This study evaluates the effect of dietary protein content on renal parameters in 23 healthy spayed female cats. The objective was to determine if cats eating diets high in protein will have higher serum urea nitrogen (UN) and creatinine values without a detectable change in kidney function, as assessed by urinalysis. A single random cross-over design was used. Cats were fed a standard maintenance diet for at least 1 month prior to the dietary trial. They were fed in two phases. For the first phase, cats were randomly assigned to receive either a high protein [HP=46% metabolizable energy (ME)] or low protein (LP=26% ME) diet. For the second phase, cats were fed whichever diet they were not fed during the phase I period. Blood and urine samples were collected at 2-week intervals for the duration of the study (10 weeks). UN, albumin, alanine aminotransferase and urine specific gravity were significantly higher, and creatinine and phosphorus were significantly lower (P<0.05) when cats were fed the HP diet as compared to when they were fed the LP diet, although none of the mean values were found to be outside of the corresponding reference interval. Dietary intake can result in clinically significant changes in UN and statistically significantly changes in several other biochemical analytes, although all analytes are likely to remain within normal reference intervals. Therefore, an accurate dietary history is necessary to help determine if renal parameters are being influenced by diet in a particular patient.
Results of parasitological examinations of faecal samples from cats and dogs in Germany between 2003 and 2010.

In a retrospective study, the results of parasitological examinations of faecal samples from 8,560 cats and 24,677 dogs between January 2003 and December 2010 in Germany were analysed. 30.4% of the examined dogs and 22.8% of the cats were infected with endoparasites. The examination of the faecal samples from dogs revealed stages of Giardia spp. (18.6%), Toxocara canis (6.1%), Toxascaris leonina (0.6%), Ancylostomatidae (2.2%), Trichuris vulpis (1.2%), Capillaria spp. (1.3%), Crenosoma vulpis (0.4%), Angiostrongylus vasorum (0.5%), Taeniidae (0.4%), Dipylidiidae (< 0.1%), Mesocestoides spp. (< 0.1%), Isospora spp. (5.6%), I. ohiensis-complex (3.9%), I. canis (2.4%), Sarcocystis spp. (2.2%) and Hammondia heydorni/Neospora caninum (0.3%). Dogs in the age groups up to 3 months and > 3 up to 6 months of age showed significantly higher infection rates with Giardia spp. (37.5% and 38.2%, respectively), Toxocara canis (12.0% and 12.4%, respectively), Toxascaris leonina (1.1% and 1.6%, respectively), Isospora spp. (23.4% and 11.8%, respectively), I. ohiensis-complex (15.6% and 7.2%, respectively) and I. canis (11.8% and 5.2%, respectively) compared to older dogs. In faecal samples from cats, stages of Giardia spp. (12.6%), Toxocara cati (4.7%), Toxascaris leonina (0.1%), Ancylostoma tubaeforme (0.2%), Aelurostrongylus abstrusus (0.5%), Capillaria spp. (1.0%), Taeniidae (0.6%), Dipylidium caninum (< 0.1%) Mesocestoides spp. (< 0.1%), Isospora spp. (6.0%), I. felis (4.4%), I. rivolta (2.2%), Toxoplasma gondii/Hammondia hammondi (0.8%) and Sarcocystis spp. (0.3%) were detected. Cats in the age groups up to 3 months and > 3 up to 6 months of age showed significantly higher infection rates with Giardia spp. (19.5% and 24.0%, respectively), T. cati (8.1% and 6.9%, respectively), Isospora spp. (12.8% and 8.6%, respectively), I. felis (10.0% and 5.9%, respectively) and I. rivolta (4.6% and 2.9%, respectively) compared to older cats.

Markers of feline leukaemia virus infection or exposure in cats from a region of low seroprevalence.

Molecular techniques have demonstrated that cats may harbour feline leukaemia virus (FeLV) provirus in the absence of antigenaemia. Using quantitative real-time polymerase chain reaction (qPCR), p27 enzyme-linked immunosorbent assay (ELISA), anti-feline oncornavirus-associated cell-membrane-antigen (FOCMA) antibody testing and virus isolation (VI) we investigated three groups of cats. Among cats with cytopenias or lymphoma, 2/75 were transiently positive for provirus and anti-FOCMA antibodies were the only evidence of exposure in another. In 169 young, healthy cats, all tests were negative. In contrast, 3/4 cats from a closed household where FeLV was confirmed by isolation, had evidence of infection. Our results support a role for factors other than FeLV in the pathogenesis of cytopenias and lymphoma. There was no evidence of exposure in young cats. In regions of low prevalence, where the positive predictive value of antigen testing is low, qPCR may assist with diagnosis.
Prevalence of Bartonella species, haemoplasmas and Toxoplasma gondii in cats in Scotland.

The objective of this study was to determine the prevalence rates for select infectious agents of cats presented to the Royal (Dick) School of Veterinary Studies at the University of Edinburgh, Scotland. Whole blood, serum, and oral mucosal and nail bed swabs were collected. While Ehrlichia species, Anaplasma species or Rickettsia felis DNA were not amplified from any cat, 44.2% of the cats had evidence of infection or exposure to either a Bartonella species (15.3% were seropositive and 5.8% polymerase chain reaction (PCR) positive), a haemoplasma (28.6% PCR positive), and/or Toxoplasma gondii (19.2% seropositive). No Bartonella species DNA was amplified from the nail or oral mucosal swabs despite a 5.8% amplification rate from the blood samples. This finding likely reflects the absence of Ctenocephalides felis infection from our study population, as this organism is a key component for Bartonella species translocation in cats. The results from this study support the use of flea control products to lessen exposure of cats (and people) to Bartonella species and support discouraging the feeding of raw meat to cats and preventing them from hunting to lessen T gondii infection.


Radiographic findings in cats with mycobacterial infections.

This study describes radiographic changes associated with mycobacterial infection in 33 domestic cats confirmed by culture or interferon-gamma testing. Infection was seen most frequently in adult (average age 5.7 years; range 1.5-12 years), non-pedigree (87%; 27/31), neutered male cats (69%; 22/32). The most common infections were Mycobacterium microti (60%; 18/30) and Mycobacterium bovis (37%; 11/30); Mycobacterium avium and Mycobacterium malmoense were infrequently cultured (3% of each; 1/30). Radiographs were available for the thorax (24 cats), abdomen (eight), appendicular skeleton (11) and head (three). Radiographic changes affected the thorax most commonly, consisting of bronchial (46%; 11/24), alveolar (38%; 9/24), nodular unstructured interstitial (38%; 9/24) or unstructured interstitial (25%; 6/24) lung patterns, which were often mixed. Perihilar or sternal lymphadenopathy were common (42%; 10/24), particularly perihilar lymphadenopathy (25%; 6/24). Skeletal changes were found in the distal antebrachium (three), pes (two), maxilla, scapula, spine, manus, femur, and tarsus (one each). Changes were typically osteolytic (73%; 8/11), often permeative osteolytic (64%; 7/11). Osteoproliferative changes were seen in three cats and soft tissue swelling in five cats, which were adjacent to the bony abnormality in four cats. Other changes included submandibular soft tissue swelling, marked aortic, aortic root and brachiocephalic trunk calcification, and soft tissue swelling with calcification in the distal antebrachium which was not involving bone. Abdominal changes were uncommon (seen in 2/8 cats) and consisted of hepatomegaly and hepatosplenomegaly. In summary, radiographic changes were varied, no lesion was pathognomic for mycobacterial infection, and pathology was seen most commonly in the thorax.


Recurrent demyelination and remyelination in 37 young Bengal cats with polyneuropathy.
BACKGROUND: With the exception of diabetic neuropathy, polyneuropathy associated with hyperchylomicronemia, and a few inherited polyneuropathies, peripheral neuropathies are poorly characterized in cats. A chronic polyneuropathy is described in a cohort of young Bengal cats.

OBJECTIVE: To characterize the clinical and histopathological features of a chronic-relapsing peripheral neuropathy in young Bengal cats.

ANIMALS: Thirty-seven young Bengal cats with clinical weakness consistent with peripheral neuropathy.

METHODS: Bengal cats were included in this study after a diagnosis of polyneuropathy was confirmed by muscle and peripheral nerve biopsy specimens. Pathological changes were characterized at the light and electron microscopic level and by morphometry. Clinical information and long-term outcome from case records of Bengal cats with histologically confirmed peripheral neuropathy were then assessed.

RESULTS: Nerve fiber loss within distal intramuscular nerve branches was a consistent finding in young Bengal cats with polyneuropathy. The most common abnormalities in peripheral nerve biopsies included inappropriately thin myelin sheaths and thinly myelinated fibers surrounded by supernumerary Schwann cell processes, indicative of repeated cycles of demyelination and remyelination. Recovery was common. Response to treatment could not be determined.

CONCLUSIONS AND CLINICAL IMPORTANCE: A chronic-relapsing form of polyneuropathy associated primarily with episodes of demyelination and remyelination was identified in young Bengal cats. The prognosis for recovery is good, although relapses are possible and there can be residual motor deficits.


**In vitro killing of Escherichia coli, Staphylococcus pseudintermedius and Pseudomonas aeruginosa by enrofloxacin in combination with its active metabolite ciprofloxacin using clinically relevant drug concentrations in the dog and cat.**

Enrofloxacin is a fluoroquinolone antibacterial agent used to treat infections in companion animals. Enrofloxacin’s antimicrobial spectrum includes Gram positive and Gram-negative bacteria and demonstrates concentration-dependent bactericidal activity. In dogs and cats, enrofloxacin is partially metabolized to ciprofloxacin and both active agents circulate simultaneously in treated animals at ratios of approximately 60-70% enrofloxacin to 30-40% ciprofloxacin. We were interested in determining the killing of companion animal isolates of Escherichia coli, Staphylococcus pseudintermedius and Pseudomonas aeruginosa by enrofloxacin and ciprofloxacin combined using clinically relevant drug concentrations and ratios. For E. coli isolates exposed to 2.1 and 4.1mg/ml of enrofloxacin/ciprofloxacin at 50:50, 60:40 and 70:30 ratios, a 1.7-2.5log(10) reduction (94-99% kill) was seen following 20min of drug exposure; 0.89-1.7log(10) (92-99% kill) of S. pseudintermedius following 180min of drug exposure; 0.85-3.4log(10) (98-99% kill) of P. aeruginosa following 15min of drug exposure. Killing of S. pseudintermedius was enhanced in the presence of enrofloxacin whereas killing of P. aeruginosa was enhanced in the presence of ciprofloxacin. Antagonism was not seen when enrofloxacin and ciprofloxacin were used in kill assays. The unique feature of partial metabolism of enrofloxacin to ciprofloxacin expands the spectrum of enhanced killing of common companion animal pathogens.


**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 and 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.


Olfactory Neuroblastoma in Dogs and Cats - a Histological and Immunohistochemical Analysis.

Olfactory neuroblastoma (ONB) was identified in 13 dogs and nine cats. The tumours were subjected to microscopical examination and were graded using a human pathological grading system. In the canine and feline tumours there was more necrosis and higher mitotic activity (mitotic index and Ki67 labelling index) than reported in human ONB. Rosettes were a common feature of feline ONBs. A significant correlation was observed between the histological grade and the Ki67 labelling index. The histopathological diagnosis of ONB was confirmed immunohistochemically by demonstration of the neuronal marker neuron-specific enolase (NSE). Two other neuron-specific antibodies specific for microtubule-associated protein-2 (MAP-2) and neuronal nuclei antigen (NeuN) were evaluated. MAP-2 expression proved to have higher specificity than labelling for NSE. NeuN expression was less sensitive and of limited practical value.


CONTRAST MEDIA ENHANCEMENT OF INTRACRANIAL LESIONS IN MAGNETIC RESONANCE IMAGING DOES NOT REFLECT HISTOPATHOLOGIC FINDINGS CONSISTENTLY.

Certain magnetic resonance (MR) enhancement patterns are often considered to be associated with a specific diagnosis but experience shows that this association is not always consistent. Therefore, it is not clear how reliably contrast enhancement patterns correlate with specific tissue changes. We investigated the detailed histomorphologic findings of intracranial lesions in relation to Gadodiamide contrast enhancement in 55 lesions from 55 patients, nine cats, and 46 dogs. Lesions were divided into areas according to their contrast enhancement; therefore 81 areas resulted from the 55 lesions which were directly compared with histopathology. In 40 of 55 lesions (73%), the histomorphologic features explained the contrast enhancement pattern. In particular, vascular proliferation and dilated vessels occurred significantly more often in areas with enhancement than in areas without enhancement (P=0.044). In 15 lesions, there was no association between MR images and histologic findings. In particular, contrast enhancement was found within necrotic areas (10 areas) and ring enhancement was seen in lesions without central necrosis (five lesions). These findings imply that necrosis cannot be differentiated reliably from viable tissue based on postcontrast images. Diffusion of contrast medium within lesions and time delays after contrast medium administration probably play important roles in
the presence and patterns of contrast enhancement. Thus, histologic features of lesions cannot be predicted solely by contrast enhancement patterns.


**Early detection of neuropathophysiology using diffusion-weighted magnetic resonance imaging in asymptomatic cats with feline immunodeficiency viral infection.**

HIV infection results in a highly prevalent syndrome of cognitive and motor disorders designated as HIV-associated dementia (HAD). Neurologic dysfunction resembling HAD has been documented in cats infected with strain PPR of the feline immunodeficiency virus (FIV), whereas another highly pathogenic strain (C36) has not been known to cause neurologic signs. Animals experimentally infected with equivalent doses of FIV-C36 or FIV-PPR, and uninfected controls were evaluated by magnetic resonance diffusion-weighted imaging (DW-MRI) and spectroscopy (MRS) at 17.5-18 weeks post-infection, as part of a study of viral clade pathogenesis in FIV-infected cats. The goals of the MR imaging portion of the project were to determine whether this methodology was capable of detecting early neuropathophysiology in the absence of outward manifestation of neurological signs and to compare the MR imaging results for the two viral strains expected to have differing degrees of neurologic effects. We hypothesized that there would be increased diffusion, evidenced by the apparent diffusion coefficient as measured by DW-MRI, and altered metabolite ratios measured by MRS, in the brains of FIV-PPR-infected cats relative to C36-infected cats and uninfected controls. Increased apparent diffusion coefficients were seen in the white matter, gray matter, and basal ganglia of both the PPR and C36-infected (asymptomatic) cats. Thalamic MRS metabolite ratios did not differ between groups. The equivalently increased diffusion by DW-MRI suggests similar indirect neurotoxicity mechanisms for the two viral genotypes. DW-MRI is a sensitive tool to detect neuropathophysiological changes in vivo that could be useful during longitudinal studies of FIV.


**Idiopathic cystitis in domestic cats--beyond the lower urinary tract.**

Signs of lower urinary tract (LUT) disease in domestic cats can be acute or chronic, and can result from variable combinations of abnormalities within the lumen of the LUT, the parenchyma of the LUT itself, or other organ system(s) that then lead to LUT dysfunction. In the majority of cats with chronic signs of LUT dysfunction, no specific underlying cause can be confirmed after standard clinical evaluation of the LUT, so these cats typically are classified as having idiopathic cystitis. A syndrome in human beings commonly known as interstitial cystitis (IC) shares many features in common with these cats, permitting comparisons between the two species. A wide range of similarities in abnormalities has been identified between these syndromes outside as well as inside the LUT. A variety of potential familial and developmental risk factors also have been identified. These results have permitted generation of the hypothesis that some of these people have a disorder affecting the LUT rather than a disorder of the LUT. This perspective has suggested alternative diagnostic strategies and novel approaches to treatment, at least in cats. The purpose of this review is to summarize research investigations into the various abnormalities present in cats, to compare some of these findings with those identified in human beings, and to discuss how they might modify perceptions about the etiopathogenesis, diagnosis, and treatment of cats with this disease. Dedication: I dedicate this contribution to Professor Dennis J. Chew,
whose collaboration, patience, and support made it all possible.


**Histologic and molecular correlation in shelter cats with acute upper respiratory infection.**

This is a descriptive study designed to correlate diagnostic real-time PCR results with histopathologic lesions in cats with clinical signs of upper respiratory infection (URI). The study occurred over a 9-month period in a single open-intake animal shelter. Cats that were selected for euthanasia by the shelter staff and additionally had URI were included in the study, for a total of 22 study cats. Combined conjunctival and oropharyngeal swab specimens were tested by quantitative real-time PCR (qPCR) for feline herpesvirus type 1 (FHV-1), feline calicivirus (FCV), Mycoplasma felis, Chlamydophila felis, and Bordetella bronchiseptica. Necropsy was performed on all cats, and a complete set of respiratory tract tissues was examined by histopathology. Among 22 cats, 20 were qPCR positive for FHV-1, 7 for M. felis, 5 for FCV, 1 for C. felis, and 0 for B. bronchiseptica. Nine cats were positive for two or more pathogens. Histopathologic lesions were present in all cats, with consistent lesions in the nasal cavity, including acute necroulcerative rhinitis in 16 cats. Histologic or antigenic detection of FHV-1 was seen in 18 of 20 cats positive for FHV-1 by qPCR. No lesions that could be specifically attributed to FCV, M. felis, or C. felis were seen, although interpretation in this cohort could be confounded by coinfection with FHV-1. A significant agreement was found between the amount of FHV-1 DNA determined by qPCR and the presence of specific histopathologic lesions for FHV-1 but not for the other respiratory pathogens.


**Effect of the probiotic Enterococcus faecium SF68 on presence of diarrhea in cats and dogs housed in an animal shelter.**

BACKGROUND: Beneficial effects of probiotics have never been analyzed in an animal shelter. HYPOTHESIS: Dogs and cats housed in an animal shelter and administered a probiotic are less likely to have diarrhea of >/=2 days duration than untreated controls. ANIMALS: Two hundred and seventeen cats and 182 dogs. METHODS: Double blinded and placebo controlled. Shelter dogs and cats were housed in 2 separate rooms for each species. For 4 weeks, animals in 1 room for each species was fed Enterococcus faecium SF68 while animals in the other room were fed a placebo. After a 1-week washout period, the treatments by room were switched and the study continued an additional 4 weeks. A standardized fecal score system was applied to feces from each animal every day by a blinded individual. Feces of animals with and without diarrhea were evaluated for enteric parasites. Data were analyzed by a generalized linear mixed model using a binomial distribution with treatment being a fixed effect and the room being a random effect. RESULTS: The percentage of cats with diarrhea >/=2 days was significantly lower (P = .0297) in the probiotic group (7.4%) when compared with the placebo group (20.7%). Statistical differences between groups of dogs were not detected but diarrhea was uncommon in both groups of dogs during the study. CONCLUSION AND CLINICAL IMPORTANCE: Cats fed SF68 had fewer episodes of diarrhea of >/=2 days when compared with controls suggests the probiotic may have beneficial effects on the gastrointestinal tract.
Molecular identification and phylogenesis of dermatophytes isolated from rabbit farms and rabbit farm workers.

Little information is available on the molecular epidemiology of dermatophytoses in rabbit farms and farm workers. A total of 117 isolates belonging to the Trichophyton mentagrophytes complex and 21 isolates of Microsporum canis were collected from rabbits with or without skin lesions, air samples of farms known to harbour these pathogens, and from farm workers with skin lesions, and molecularly characterized. Sequencing of amplicons from the T. mentagrophytes complex and M. canis isolates revealed the presence of one sequence-type for both partial chitin synthase-1 gene (pchs-1) and ribosomal internal transcribed spacer (ITS+), respectively. On the basis of comparative sequence analyses, isolated representing the T. mentagrophytes complex were molecularly identified as Trichophyton interdigitale (zoophilic) Priestley. The M. canis and T. interdigitale pchs-1 sequences herein analysed were 100% homologous to known sequences from different hosts (i.e., cats, dogs, humans and rabbits). Conversely, the ITS+ sequences of T. interdigitale from dogs, pigs and mice were identical, but displayed up to 8.6% difference with those from humans, guinea pigs and rabbits. The results of this study suggest that environmental and clinical isolates of T. interdigitale (zoophilic) and M. canis might share a common origin. Interestingly, the close phylogenetic relationship between T. interdigitale (zoophilic) strains and isolates from dogs, pigs and mice might indicate that these animals represented a reservoir of dermatophyte infection in rabbit farms. These animal species should therefore be considered when setting up control protocols to prevent infections by dermatophytes and their zoonotic transmission.


Forty-four cats diagnosed with moderate to severe cholangitis at necropsy are described. The population comprised 0.86% of all feline necropsies performed during the 22-year study period. Liver specimens were classified as acute neutrophilic cholangitis (ANC), chronic neutrophilic cholangitis (CNC), lymphocytic cholangitis (LC) or chronic cholangitis associated with liver fluke infestation (CC) based on the World Small Animal Veterinary Association (WSAVA) classification scheme. ANC (seven) and CNC (33) comprised the majority of cases. In contrast to previous descriptions, overlap was seen in clinical findings between ANC and CNC subtypes. Results suggest that liver enzyme activity may not predict degree of inflammation. Severity of inflammation varied between liver sections in individual cats, underscoring the need to obtain biopsy samples from multiple sites. Inflammatory bowel disease (50%), pancreatitis (60%), or both (32%) commonly accompanied cholangitis. We conclude that cholangitis is not a common cause of feline mortality. Most cats that succumb to cholangitis have ANC or CNC, and concurrent disease contributes to death in many.

Cytauxzoon sp. infection in the first endemic focus described in domestic cats in Europe.
Information about epidemiological and clinicopathological aspects of domestic cat infection by species of *Cytauxzoon* other than *Cytauxzoon felis* is limited and it has rarely been reported. Following the detection of clinical cytauxzoonosis in three cats from Trieste (Italy), an epidemiological study was carried out in colony (n=63) and owned (n=52) cats from the same city to investigate the presence of *Cytauxzoon* sp. infection and to assess clinicopathological findings and variables associated with this infection. *Cytauxzoon* sp. infection was detected by 18S rRNA gene PCR in 23% (27/118) and by blood smear examination in 15% (18/118) of domestic cats. The 18S rRNA gene sequences obtained were 99% identical to the *Cytauxzoon* sp. sequences deposited in GenBank((R)) from Spanish, French and Mongolian wild and domestic cats. Erythroparasitemia was observed mainly in apparently healthy cats. *Cytauxzoon* sp. infection was statistically associated with the colony group and the outdoor lifestyle. No statistical association was found between positivity by PCR and breed, gender, age, presence of ticks and/or fleas, clinical status, laboratory findings such as anemia, FIV and/or FeLV status and mortality rate. Persistence of the infection was monitored and documented in four clinical cases. We reported the first clinicopathological description of naturally occurring *Cytauxzoon* sp. infection in domestic cats living in Italy. The predominance of subclinical erythroparasitemia and the evidence of persistent infection support the hypothesis that the domestic cat might serve as a reservoir host for this infection.


**Dose range finding study for the efficacy of meloxicam administered prior to sodium urate-induced synovitis in cats.**

OBJECTIVE: To determine the lowest efficacious dose of oral meloxicam for relieving pain in cats with a sodium urate (SU)-induced acute inflammatory synovitis. STUDY DESIGN: Randomized, blinded, controlled, and four-way crossover study. ANIMALS: Eight surgically neutered cats (four males, four females) paired according to sex. METHODS: Each pair of cats was treated with 0 (placebo), 0.025, 0.05, or 0.075 mg kg(-1) oral meloxicam once daily for 4 days prior to injection, into alternating stifles, of 1 mL of 20 mg mL(-1) SU crystals, beginning with the right stifle. Each cat received each of the four treatments, separated by at least 21 days. Analgesic efficacy was evaluated based on objective (e.g., pressure mat data total force, contact pressure, and contact area) and subjective (e.g., scores for Analgesia Scale [AS], Lameness Scale [LS], and Visual Analog Scale [VAS]) outcome measures for pain assessment. All outcome measures were recorded before and during 30 hours after SU injection. The pre-defined primary outcome measure was the area under the response-time curve (AUC(0-30) hours) of the total force of the injected limb. Data were analyzed by analysis of variance. A sequential test procedure was applied and the test sequence stopped in case of a nonsignificant result. RESULTS: Meloxicam at doses of 0.05 and 0.075 mg kg(-1) day(-1) PO was significantly different from placebo for the pre-defined primary outcome measure (i.e., AUC(0-30) hours of total force). All tested meloxicam doses were lower than placebo for the subjective outcome measures (i.e., AUC(0-30) hours of AS, LS, and VAS). CONCLUSIONS AND CLINICAL RELEVANCE: The lowest efficacious dose of meloxicam for relieving pain in cats with an SU-induced synovitis was 0.05 mg kg(-1) day(-1) PO according to the pre-defined primary outcome measure. However, lower doses may also be effective as seen in the subjective outcome measures.

Inhibition of Feline leukemia virus replication by the integrase inhibitor Raltegravir.

The oncogenic gammaretrovirus Feline leukemia virus (FeLV) has been the leading cause of death among domestic cats until the introduction of efficient diagnostics and vaccines in the late 1980s. So far, no efficient treatment for viremic animals is available. Hence, use of the FeLV model to evaluate antiretroviral therapies applied to HIV is a timely task. The efficacy of the integrase inhibitor Raltegravir, which is widely used for the treatment of HIV in humans, has been assessed in vitro for the FeLV-A/Glasgow-1 strain. EC(50) values for FeLV-A inhibition in feline cell lines are in the range of that observed for HIV and xenotropic murine leukemia virus-related gammaretrovirus. Therefore, Raltegravir may be a potential therapeutical agent for felids with progressive FeLV infection.


Subclinical airway inflammation despite high-dose oral corticosteroid therapy in cats with lower airway disease.

Management of feline chronic lower airway disease focuses on controlling clinical signs and decreasing airway inflammation. This retrospective study evaluated the correlation between the resolution of clinical signs in cats with lower airway disease receiving oral glucocorticoids with the resolution of inflammation based on bronchoalveolar lavage fluid (BALF) cytology. Ten cats diagnosed with lower airway disease based on characteristic clinical signs and inflammatory BALF cytology received oral glucocorticoids for at least 3 weeks. They were required to have resolution of clinical signs and BALF collected while asymptomatic and still receiving glucocorticoids. Cats received prednisolone or prednisone (average dose of 1.8+-0.2mg/kg daily) for 35.7+-5.5 days. Three cats had resolution of clinical signs and lacked inflammatory BALF cytology; seven had persistent inflammatory BALF cytology despite resolution of clinical signs. Given that subclinical inflammation during high-dose glucocorticoid treatment was common, current recommendations to taper therapy based on resolution of clinical signs should be re-evaluated.


Occurrence of Ancylostoma in dogs, cats and public places from Andradina city, Sao Paulo state, Brazil.

The aim of this study was to determine the frequency and intensity of Ancylostoma spp. in 33 dogs and 52 cats by means of coproparasitological examinations and parasitological necropsy, and assess the presence of contaminated feces with eggs of that parasite in public places of Andradina Municipality, Sao Paulo State, Brazil. Willis-Mollay and Sedimentation methods indicated Ancylostoma spp. eggs in 87.8% (29/33) dogs and 94.2% (49/52) cats. The species A. caninum and A. braziliense were found in 63.6% (21/33) and 30.3% (10/33) of dogs, respectively. Considering cats, 67.3% (35/52) were parasitized by A. braziliense, 21.1% (11/52) by A. caninum, and 9.6% (5/52) by A. tubaeforme. Forty-two canine fecal samples were collected from public environments, including 23 squares/gardens and 19 streets/sidewalks. Positive samples for Ancylostoma spp. accounted for 64.3% (27/42); squares/gardens had 60.9% (14/23) positive samples, and streets and sidewalks, 68.4% (13/19). No association was observed between the number of Ancylostoma spp parasites and age, sex and breed of the animals and also the ratio of EPG counts and the parasitic intensity observed at necropsy (p > 0.05).
Based on the high occurrence of hookworm in dogs and cats in this study, the treatment with anti-helminthics is needed even in those animals with negative stool tests, besides adopting control of the number of animals in public places, in order to decrease the likelihood of environmental contamination, since this parasite represents a potential hazard to human and animal health.


Inflammation and wound healing in cats with chronic gingivitis/stomatitis after extraction of all premolars and molars were not affected by feeding of two diets with different omega-6/omega-3 polyunsaturated fatty acid ratios.

Feline chronic gingivitis/stomatitis (FCGS) is a painful inflammatory disease in cats. Extraction of teeth, including all premolars and molars, has been shown to be the therapy of choice in cats not responding sufficiently to home care (e.g. tooth brushing) and/or medical treatment (corticosteroids and/or antibiotics). In this study, we hypothesize that a cat food with an omega-6 polyunsaturated fatty acid (omega6 PUFA) to omega3 PUFA ratio of 10:1 reduces inflammation of the FCGS and accelerates soft tissue wound healing of the gingiva after dental extractions, compared to a cat food with a omega6:omega3 PUFA ratio of 40:1. The cats were fed diets with chicken fat and fish oil as sources of fatty acids. In one diet, part of the fish oil was replaced by safflower oil, resulting in two diets with omega6:omega3 PUFA ratios of 10:1 and 40:1. This double-blinded study in two groups of seven cats revealed that dietary fatty acids influence the composition of plasma cholesteryl esters and plasma levels of inflammatory cytokines. The diet with the 10:1 ratio lowered PGD(2), PGE(2) and LTB(4) plasma levels significantly, compared to the diet with the 40:1 ratio (p = 0.05, p = 0.04, and p = 0.02 respectively). However, feeding diets with dietary omega6:omega3 PUFA ratios of 10:1 and 40:1, given to cats with FCGS for 4 weeks after extraction of all premolars and molars, did not alter the degree of inflammation or wound healing.


Prevalence of meticillin-resistant staphylococci among dogs and cats at a veterinary teaching hospital in Portugal.


Secnidazole for the treatment of giardiasis in naturally infected cats.

Giardia duodenalis causes enteric infections in humans and animals worldwide. Inefficiency of metronidazole is commonly reported in the veterinary clinic routine in the treatment of giardiasis in dogs and cats. The aim of this study was to evaluate the efficacy of secnidazole in the control of infection caused by G. duodenalis in naturally infected cats. For this purpose two experiments were carried out. In the first experiment seven cats were infected with G. duodenalis and treated orally with a single dose of secnidazole (30mg kg(-1)). In the second experiment a total of 16 cats were used, 11 naturally infected with G. duodenalis and five negative for the parasite. Animals were divided into three groups: group A (n=5) was composed by non-infected animals (negative control), group B (n=5)
consisted of infected but untreated animals and group C (n=6) was composed by cats treated orally with a single dose of secnidazole (30mg kg(-1)). Hematological and biochemical parameters were evaluated before and after treatment. The first experiment reached 100% of efficacy because no cysts were found in the feces after treatment. However, doubts about intoxication and interference with hematological and biochemical parameters came to light. No side effects were observed, and the biochemical and hematological parameters of treated animals remained within physiological range, except for one feline which had elevation of liver enzymes. Based on these results, the utilization of secnidazole could be suggested for the treatment of giardiasis in cats. The main advantage of this treatment is that only a single dose is required, which is interesting in animals hard to handle like cats.


Fibre analysis and fibre digestibility in pet foods - a comparison of total dietary fibre, neutral and acid detergent fibre and crude fibre*

Six dry dog foods and six dry cat foods with different carbohydrate sources were investigated in digestion trials. Food and faecal samples were analysed for CF, TDF and starch. In dogs, also neutral detergent fibre (aNDFom) and acid detergent fibre (ADFom) were analysed. N-free extract (NfE) was calculated for CF, and similarly for all other fibre analyses. Linear regressions were calculated between fibre intake and faecal fibre excretion. True digestibility was calculated from the regression coefficients [true digestibility in % = (1 - regression coefficient)*100], with the intercept of the equation representing excretion of material of non-food origin. Crude fibre analyses gave the lowest values, and TDF the highest, while ADFom and aNDFom were in between. Variation between diets was lowest in CF and highest in TDF. Total dietary fibre, aNDFom and ADFom in food were positively correlated. Crude fibre in food did not correlate with any other method. The NfE analogue for TDF was closest to the starch content. Methods of fibre analyses in faeces did not agree very well with each other. Crude fibre had the lowest apparent digestibility, followed by ADFom, TDF and aNDFom. For all fibre analyses, there was a significant correlation between fibre intake and faecal fibre excretion. True digestibility was close to zero for CF, with a high uniformity in both species. In dogs, true digestibility of aNDFom was 53%, of ADFom 26% and of TDF 37%; in cats, true digestibility of TDF was 31%. Except for CF, the intercept of the regression equations suggest that faecal excretion of some material of non-food origin is analysed as fibre. A combination of TDF and CF analyses might give good information on the content of total (TDF), unfermentable (CF) and partially fermentable fibre (TDF-CF) in pet foods.


Feline urate urolithiasis: a retrospective study of 159 cases.

The objective of the study was to characterize the signalment, clinicopathologic data, and diagnostic imaging of cats with urate urolithiasis, as well as the salts of uric acid present in the uroliths. A retrospective analysis of feline urate uroliths submitted to the GV Ling Urinary Stone Analysis Laboratory between 2000 and 2008 was included. From these data, records were assimilated from referring veterinarians (143); furthermore, all recorded cases from within the William R Pritchard Veterinary Medical Teaching Hospital (16) were included. Median values for the complete blood count and chemistry panels available were within the reference intervals, when provided, with only a few
outliers present. Of all cases evaluated, seven had a portosystemic shunt (PSS). Cats with urate uroliths and a PSS were younger than cats without a PSS (2 years vs 7 years). The pathogenesis of urate uroliths in cats is poorly understood. Most cats were not completely evaluated for a PSS, however, clinicopathologic parameters indicating hepatic dysfunction were seldom noted; more sensitive diagnostics such as serum bile acids were rarely performed to confirm or negate the presence of a shunt. Studies are warranted to evaluate pathogenesis of urate uroliths to tailor proper management and breeding strategies.


Role of pet dogs and cats in the transmission of helminthic zoonoses in Europe, with a focus on echinococcosis and toxocarosis.

The close emotional tie between people and companion animals is a beneficial relation known as the human-animal bond. However, pet dogs and cats can play an important role in the transmission of helminthic zoonotic agents such as the tapeworms Echinococcus and the roundworms Toxocara which are directly transmitted from pets to the human environment without the involvement of vectors or intermediate hosts. In humans, echinococcosis has emerged in Europe and toxocarosis is still persisting in large endemic areas despite the availability of highly efficient anthelmintics for dogs and cats. Ecological changes significantly contributed to these trends: the high wild fox populations and the high density of freely roaming dogs and cats maintain a permanent infection pressure of these and other parasites. Further, the establishment of urban recreational environments closer to natural ecological systems boosted vole populations that represent urban reservoirs for zoonotic helminths. A good understanding of the parasites’ biology and epidemiology including the transmission to humans is required for planning and implementing effective prevention strategies. The continuous education of veterinarians and the information of the pet owners by providing uniform recommendations are of priority importance. A close collaboration between veterinary and public health professionals in a ‘One Health’ concept is required.


Canine and feline infections by cardiopulmonary nematodes in central and southern Italy.

Capillaria aerophila, Aeluropstrongylus abstrusus, Angiostrongylus vasorum and Dirofilaria immitis are cardiopulmonary nematodes affecting dogs and cats and presently emerging in several countries. The results obtained in 2009 - 2010 during a study aiming to investigate the occurrence of these nematodes in regions from Central (Marche and Abruzzo regions--Sites A and B, respectively) and southern (Apulia--Site C) Italy are here reported. A total of 534 and 436 individual faecal samples collected from dogs and cats were examined, together with 471 and 34 faecal environmental samples taken from dog shelters and catteries. One hundred and ninety-two individual blood samples were also collected from dogs. Faeces were examined using copromicroscopical flotations and Baermann technique, whereas blood samples were tested by Knott’s method. Eggs of C. aerophila were detected in 1.48 % and 20 % (Site A), 8.67 % and 2.71 % (Site B), and 16.67 % and 0 % (Site C) of individual and environmental canine samples. C. aerophila was found in 2.90 % (Site A), 3.03 % (Site B) and 14.29 % (Site C) of individual cats. Larvae of A. vasorum were found in 0.96 % and 2.48 % of individual and environmental samples from Site B, respectively, while those of A. abstrusus in 1.82 % (Site A) and
9.96 % (Site B) of individual faeces. Microfilariae of Dirofilaria immitis, identified on the basis of key morphological and morphometric features, were detected in 2.56 % of samples collected from Site B. Despite the small sample size, these results indicate that cardiopulmonary nematodes occur in Central and southern Italy, thus they should be included in the differential diagnosis of pet cardiorespiratory diseases. Larger surveys are necessary to gain more information on the diffusion of these parasites, especially for C. aerophila and A. vasorum, for which the actual distribution is poorly known.


Comparison of a continuous glucose monitoring system with a portable blood glucose meter to determine insulin dose in cats with diabetes mellitus.

BACKGROUND: The continuous glucose monitoring system (CGMS) Guardian REAL-Time((R)) allows the generation of very detailed glucose profiles in cats. The performance of CGMS to generate short-term glucose profiles to evaluate treatment response has not been yet evaluated in diabetic cats. HYPOTHESIS: Analysis of glucose profiles generated using the CGMS produces insulin dose recommendations that differ from those of profiles generated using the portable blood glucose meter (PBGM) in diabetic cats. ANIMALS: Thirteen client-owned diabetic cats. METHODS: Prospective, observational study. Simultaneous glucose profiles were generated over an 8-10 hour period using the CGMS, blood glucose concentration was measured every 2 hours with the PBGM. Profiles were submitted to three internal medicine specialists who used them to determine the insulin dose. Differences between insulin doses deduced from paired profiles were compared. Percentages of nadirs recorded with the CGMS that were lower, higher, or equal to those derived with the PBGM were calculated. RESULTS: Twenty-one paired glucose profiles were obtained. There was no difference of insulin doses based on CGMS and PBGM profiles (median 0 U; range: -1 to +0.5). Treatment decisions did not differ among investigators. Compared with the observed PBGM nadir, the CGMS nadir was lower, higher, or equal in 17, 2, and 2 of 21 cases, respectively. CONCLUSIONS AND CLINICAL IMPORTANCE: Adjustments in insulin dose based on glucose profiles generated with the CGMS are similar to those based on the PBGM. The common occurrence of lower nadirs recorded with the CGMS suggests that this device detects hypoglycemic periods that are not identified with the PBGM.


Detection of protective antibody titers against feline panleukopenia virus, feline herpesvirus-1, and feline calicivirus in shelter cats using a point-of-care ELISA.

Serum antibody titers are a useful measurement of protection against infection (feline panleukopenia virus [FPV]) or clinical disease (feline herpesvirus-1 [FHV] and feline calicivirus [FCV]), and their determination has been recommended as part of disease outbreak management in animal shelters. The objective of this study was to determine the sensitivity, specificity, and inter-observer and inter-assay agreement of two semi-quantitative point-of-care assays for the detection of protective antibody titers (PAT) against FPV, FHV and FCV in shelter cats. Low sensitivity for FPV antibodies (28%) rendered a canine point-of-care assay inappropriate for use in cats. The feline point-of-care assay also had low sensitivity (49%) and low negative predictive value (74%) for FPV PAT detection, but was highly accurate in the assessment of FHV and FCV PAT. Improvements in accuracy and repeatability of FPV PAT determination could make this tool a valuable component of a disease outbreak response in animal
shelters.

Ebani, V. V., F. Bertelloni, and F. Fratini (2011) Res Vet Sci

**Occurrence of Bartonella henselae types I and II in Central Italian domestic cats.**

Serological and molecular surveys were conducted to determine the occurrence of Bartonella henselae in domestic cats in Central Italy. Samples from 234 pet cats were tested for B. henselae antibodies by indirect immunofluorescence with 78 (33.3%) positive. A PCR assay specific for the Bartonella 16S rRNA gene was carried out on DNA samples extracted from blood of the 234 cats; 26 (11.1%) of the seropositive cats were positive. Two PCR protocols, which discriminate genotypes I and II of B. henselae, were performed on all DNA samples. Sixteen (6.8%) cats were infected by genotype I, 6 (2.5%) by genotype II, and two males (0.8%) by both genotypes. Two female (0.8%) cats which were Bartonella sp. PCR positive, gave negative results with the types I and II PCR. This protocol facilitates the direct and rapid detection of Bartonella DNA in feline blood samples, and differentiates B. henselae genotypes.


**Use of progesterone-based medications in cats—neutered or otherwise.**


**Treatment and outcome of four cats with apocrine gland carcinoma of the anal sac and review of the literature.**

Anal sac adenocarcinoma is uncommon in cats. We report the outcome of multi-modality therapy in two cats (surgery, definitive radiotherapy and systemic chemotherapy) and surgery alone in two cats. All received surgical excision of the primary tumour followed by radiotherapy and carboplatin chemotherapy in two cases. Both cats that underwent multimodal therapy developed distant metastatic disease and one developed recurrence of the primary tumour. One cat that underwent surgery alone with incomplete margins also developed rapid recurrence. Overall survival times were 89, 161 and 169 days. One cat that had complete surgical excision is still alive without recurrence 425 days postoperatively. Whilst the role of radiation in the local control of this disease is yet to be defined, clearly a more effective systemic therapy is required before such aggressive local treatment can be routinely recommended.


**[Spatial organization of felids populations and some traits of their reproductive strategies].**

In all Felidae species, females are able to mate with several males during the estrus. Promiscuity mating system is the most typical of the solitary living species that have large home ranges. Females are usually widely distributed over the area and males move actively searching for the receptive females and defending them during the estrus period. Mating with few males is usually considered as a
possibility to improve the quality of the offspring. In this article, some characteristics of home range use, marking and acoustic activity, traits of physiology which may result in promiscuity mating in felids are considered. An adaptive significance of mating few males is also discussed.


**Determination of the sevoflurane sparing effect of methadone in cats.**

OBJECTIVE: To determine the magnitude and duration of sevoflurane minimum alveolar concentration (MAC) reduction following a single intravenous (IV) dose of methadone in cats. STUDY DESIGN: Prospective experimental study. ANIMALS: Eight (four females and four males) healthy mixed-breed adult (1-2 years) cats weighing 5.82 +/- 0.42 kg. METHODS: Anesthesia was induced and maintained with sevoflurane. Intravenous catheters facilitated administration of methadone and lactated Ringer’s solution. After baseline MAC determination in triplicate using a tail clamp technique, 0.3 mg kg(-1) of methadone was administered IV. End-tidal sevoflurane concentration (e’S EVO) was reduced and MAC was redetermined. In an effort to determine the duration of MAC reduction, measurements were repeated in a stepwise manner until MAC values returned to baseline. After the last stimulation, the e’S EVO was increased to 1.2 individual MAC for 15 minutes, then sevoflurane was discontinued and cats were allowed to recover from anesthesia. RESULTS: Baseline sevoflurane MAC was 3.18 +/- 0.06%. When compared with baseline the sevoflurane MAC after methadone administration was significantly reduced by 25, 15 and 7% at 26, 76 and 122 minutes, respectively. The final MAC value (3.09 +/- 0.07%) determined 156 minutes after methadone administration was not significantly different from baseline. CONCLUSIONS AND CLINICAL RELEVANCE: Intravenous methadone (0.3 mg kg(-1)) significantly decreased MAC of sevoflurane in cats but the effect was short-lived.


**Multicenter Evaluation of Plasma N-Terminal Probrain Natriuretic Peptide (NT-pro BNP) as a Biochemical Screening Test for Asymptomatic (occult) Cardiomyopathy in Cats.**

BACKGROUND: B-type natriuretic peptide concentrations reliably distinguish between cardiac and respiratory causes of dyspnea, but its utility to detect asymptomatic cats with occult cardiomyopathy (OCM) is unresolved. HYPOTHESIS/OBJECTIVES: Determine whether plasma N terminal probrain natriuretic peptide (NT-proBNP) concentration can discriminate asymptomatic cats with OCM from normal cats, and whether NT-proBNP concentration correlates with clinical, biochemical, and echocardiographic parameters. ANIMALS: One hundred and fourteen normal, healthy cats; 113 OCM cats. METHODS: Prospective, multicenter, case-controlled study. NT-proBNP was prospectively measured and cardiac status was determined from history, physical examination, and M-mode/2D/Doppler echocardiography. Optimal cut-off values were derived using receiver operating characteristic (ROC) curve analysis. RESULTS: NT-proBNP was higher (median, interquartile range [25th and 75th percentiles]) in (1) OCM (186 pmol/L; 79, 478 pmol/L) versus normal (24 pmol/L; 24, 32 pmol/L) (P <.001); and (2) hypertrophic obstructive cardiomyopathy (396 pmol/L; 205, 685 pmol/L) versus hypertrophic cardiomyopathy (112 pmol/L; 48, 318 pmol/L) (P <.001). In OCM, NT-
proBNP correlated (1) positively with LVPWd (rho = 0.23; P = .01), LA/Ao ratio (rho = 0.31; P < .001), LVs (rho = 0.33; P < .001), and troponin-I (rho = 0.64; P < .001), and (2) negatively with %FS (rho = -0.27; P = .004). Area under ROC curve was 0.92; >46 pmol/L cut-off distinguished normal from OCM (91.2% specificity, 85.8% sensitivity); >99 pmol/L cut-off was 100% specific, 70.8% sensitive.

CONCLUSIONS AND CLINICAL IMPORTANCE: Plasma NT-proBNP concentration reliably discriminated normal from OCM cats, and was associated with several echocardiographic markers of disease severity. Further studies are needed to assess test performance in unselected, general feline populations, and evaluate relationships between NT-proBNP concentrations and disease progression.


WSAVA Nutritional Assessment Guidelines.


Oesophageal disease in 33 cats.

A retrospective study was performed to investigate the frequency of identification and characteristics of oesophageal disease in cats, including assessment of the utility of diagnostic techniques and clinical outcome. Thirty-three cats met the inclusion criteria, giving an in-clinic frequency of 33/2894 (approximately 1%) of feline referral cases. Vomiting and/or regurgitation were the most common presenting signs described, although a number of cats (6/33) showed neither. Useful diagnostic modalities included plain radiography, fluoroscopy, barium radiography and endoscopy. A wide range of diseases was reported including congenital disease, oesophagitis, foreign body obstruction, neoplasia, extraluminal compression and hypomotility disorder. Five of six cats with acquired oesophageal strictures had recently received doxycycline per os.


Newcastle disease virus-vectored rabies vaccine is safe, highly immunogenic, and provides long-lasting protection in dogs and cats.

Effective, safe, and affordable rabies vaccines are still being sought. Newcastle disease virus (NDV), an avian paramyxovirus, has shown promise as a vaccine vector for mammals. Here, we generated a recombinant avirulent NDV La Sota strain expressing the rabies virus glycoprotein (RVG) and evaluated its potential to serve as a vaccine against rabies. The recombinant virus, rL-RVG, retained its high-growth property in chicken eggs, with titers of up to 10,50% egg infective doses (EID)/ml of allantoic fluid. RVG expression enabled rL-RVG to spread from cell to cell in a rabies virus-like manner, and RVG was incorporated on the surface of the rL-RVG viral particle. RVG incorporation did not alter the trypsin-dependent infectivity of the NDV vector in mammalian cells. rL-RVG and La Sota NDV showed similar levels of sensitivity to a neutralization antibody against NDV and similar levels of resistance to a neutralization antibody against rabies virus. Animal studies demonstrated that rL-RVG is safe in several species, including cats and dogs, when administered as multiple high doses of recombinant vaccine. Intramuscular vaccination with rL-RVG induced a substantial rabies virus
neutralization antibody response and provided complete protection from challenge with circulating rabies virus strains. Most importantly, rL-RVG induced strong and long-lasting protective neutralization antibody responses to rabies virus in dogs and cats. A low vaccine dose of 10^{3} EID completely protected dogs from challenge with a circulating strain of rabies virus for more than a year. This is the first study to demonstrate that immunization with an NDV-vectored vaccine can induce long-lasting, systemic protective immunity against rabies.


The GLP-1 mimetic exenatide potentiates insulin secretion in healthy cats.

The glucagon-like peptide-1 mimetic exenatide has a glucose-dependent insulinotrophic effect, and it is effective in controlling blood glucose (BG) with minimal side effects in people with type 2 diabetes. Exenatide also delays gastric emptying, increases satiety, and improves beta-cell function. We studied the effect of exenatide on insulin secretion during euglycemia and hyperglycemia in cats. Nine young, healthy, neutered, purpose-bred cats were used in a randomized, cross-over design. BG concentrations during an oral glucose tolerance test were determined in these cats previously. Two isoglycemic glucose clamps (mimicking the BG concentration during the oral glucose tolerance test) were performed in each cat on separate days, one without prior treatment (IGC) and the second with exenatide (1 μg/kg) injected subcutaneously 2 h before (ExIGC). BG, insulin, and exenatide concentrations were measured, and glucose infusion rates were recorded and compared in paired tests between the two experiments. After exenatide injection, insulin serum concentrations increased significantly (2.4-fold; range 1.0- to 9.2-fold; P = 0.004) within 15 min. This was followed by a mild decrease in BG concentration and a return of insulin concentration to baseline despite a continuous increase in serum exenatide concentrations. Insulin area under the curve (AUC) during ExIGC was significantly higher than insulin AUC during IGC (AUC ratio, 2.0 +/- 0.4; P = 0.03). Total glucose infused was not significantly different between IGC and ExIGC. Exenatide was detectable in plasma at 15 min after injection. The mean exenatide concentration peaked at 45 min and then returned to baseline by 75 min. Exenatide was still detectable in the serum of three of five cats 8 h after injection. No adverse reactions to exenatide were observed. In conclusion, exenatide affects insulin secretion in cats in a glucose-dependent manner, similar to its effect in other species. Although this effect was not accompanied by a greater ability to dispose of an intravenous glucose infusion, other potentially beneficial effects of exenatide on pancreatic beta cells, mainly increasing their proliferation and survival, should be investigated in cats.


Prevalence of hypertrophic cardiomyopathy in a cohort of British Shorthair cats in Denmark.

BACKGROUND: Familial hypertrophic cardiomyopathy (HCM) has been described previously in British Shorthair cats (BSH), but until now, no reports have been published describing the prevalence of the disease within this breed. OBJECTIVES: The aim of this study was to assess the prevalence of HCM in a large cohort of BSH and to evaluate the effect of sex, weight, and increasing age as potential risk factors for this disease. ANIMALS: Three hundred and twenty-nine BSH presented for routine HCM screening during a 4-year period. METHODS: Prospective cross-sectional study in which all cats were screened for HCM by conventional echocardiography. RESULTS: A total of 329 cats were
examined, 214 females and 115 males, with a median age of 2.3 years (range, 0.8-14.1). Twenty-eight cats (8.5%) were classified as HCM-positive, 14 (4.3%) as equivocal, 282 (85.7%) as HCM-negative, and 5 (2.1%) were diagnosed with other cardiac diseases. The median age for diagnosis of HCM was 2.7 years (range, 0.9-14.1). Male cats had a significantly higher occurrence of HCM (20.4%) compared with the females (2.1%) corresponding to an odds ratio of 7.89 (95% CI, 2.54-28.08) for males versus females adjusted for age and weight (P < .001).

CONCLUSION: The BSH in our cohort had a high prevalence of HCM, often of early onset and with a significant male sex predisposition. We strongly recommend echocardiographic screening in this breed, especially cats used for breeding.


Proteinuria: measurement and interpretation.

Proteinuria is a general term that describes the presence of any type of protein in the urine (e.g., albumin, globulins, mucoproteins, and Bence-Jones proteins); however, albumin is the predominate protein in urine in healthy dogs and cats as well as dogs and cats with renal disease. Proteinuria can arise from several different physiologic and pathologic causes, but persistent proteinuria associated with normal urine sediment is consistent with kidney disease. The urine dipstick colorimetric test is the usual first-line screening test for the detection of proteinuria, but false-positive reactions are common. When proteinuria of renal origin is suspected, the next diagnostic steps are quantitation and longitudinal monitoring via the urine protein/creatinine ratio. The recent availability of a species-specific albumin enzyme-linked immunosorbent assay technology that enables detection of low concentrations of canine and feline albuminuria has both increased diagnostic capability and stimulated discussion about what level of proteinuria/albuminuria is normal. Beyond being an important diagnostic marker, proteinuria is associated with kidney disease progression in both dogs and cats: the greater the magnitude of the proteinuria, the greater the risk of renal disease progression and mortality. Treatments that have attenuated proteinuria in dogs and cats have also been associated with slowed kidney disease progression and/or improved survival. For these reasons, screening for renal proteinuria and longitudinal assessment of renal proteinuria has recently received renewed interest.


Domestic cats convert [(2) H(8)]-beta-carotene to [(2) H(4)]-retinol following a single oral dose.

Many animals convert beta-carotene to retinol to meet their vitamin A (VA) requirement. However, this pathway is inefficient in many carnivores. This study quantified the plasma response to a single oral dose of [(2) H(8)]-beta-carotene in adult domestic cats, including measurement of [(2) H(4)]-retinol derived from the dose. Cats were fed with either a control diet containing adequate VA (n = 5) or a VA-devoid diet (n = 5) for 28 days. An oral dose of either 5 mg/kg body weight (BW) (n = 4) or 10 mg/kg BW (n = 6) of [(2) H(8)]-beta-carotene was administered on day 28. Plasma samples were collected prior to dosing and at 6, 12, 24, 32, 48, 72, 120, 168 and 216 h post-dose. Plasma retinoids and beta-carotene were measured using HPLC and [(2) H(4)]-retinol by GC-ECNCI-MS (gas chromatography/electron capture negative chemical ionization/mass spectrometry). beta-carotene was undetectable in plasma prior to dosing. Post-dose, mean peak plasma beta-carotene was 0.37 +/- 0.06 nmol/ml at 9.0 +/- 1.8 h following the dose, while [(2) H(4)]-retinol peaked at 3.71 +/- 0.69 pmol/ml at 55.2 +/- 16.3 h. The ratio per cent of total area under the curve for [(2) H(4)]-retinol compared with the
beta-carotene response was 4.6 +/- 2.6%. There was little effect of diet or dose on the beta-carotene or [(2) H(4)]-retinol responses. The appearance of [(2) H(4)]-retinol in plasma indicates that cats are capable of converting beta-carotene to active VA. Conversion efficiency was not calculated in this study, but it is likely inadequate to meet cats’ VA requirement without the inclusion of preformed VA in the diet.


A Serological Investigation of Bartonella henselae Infection in Cats in Turkey.

Bartonella henselae is the causative agent of cat scratch disease (CSD) in humans. Cats are the main reservoir of this bacterium and may infect humans through scratches and bites. The purpose of this study is to determine the B. henselae seroprevalence in cats in Turkey. A total of 298 cats blood samples were collected from six different provinces of Turkey. Sera was tested for the presence of anti-B. henselae IgG antibodies by indirect fluorescent antibody test (IFA). Seroprevalence of B. henselae was detected in 27.8% (83/298) of cats examined. The seroprevalence of cats by province was significantly higher in Bursa (41.3%), Adana (33.9%), Aydin (32.9%), and Burdur (27.5%) than Kayseri (17.9%) and Istanbul (12.5%). Statistically significant differences were not observed between cat sexes and living condition of cats. The results revealed that B. henselae is an important zoonotic pathogen in Turkey.


Toxoplasma gondii in Romanian household cats: Evaluation of serological tests, epidemiology and risk factors.

Felines are the key species in the epidemiology of Toxoplasma gondii infection, as they are the definitive host of the parasite and are the only species that can shed resistant oocysts in the environment. Different assays are in use for the detection of antibodies against T. gondii in cats. However, assay validation studies are limited. For that reason it was our aim to first evaluate 6 serological tests (one commercial and 2 in-house ELISAs, ImmunoComb, IFAT and MAT) for antibodies (IgG) against T. gondii in cats by Bayesian modeling. Factors associated with seropositivity were evaluated by bivariable and multivariable methods. The test evaluation indicated the commercial ELISA had the highest Youden Index. The estimated sensitivity ranged between 95.7% and 97.1% and the specificity between 97.3% and 97.6%. Using this commercial ELISA 111 out of 236 cats (47%) were positive for T. gondii antibodies. Two peaks in the percentage of strong positive samples (S/P>/>=200) were observed, around 10-months-old and 8-years-old. In bivariable analysis the seroprevalence was significantly higher in adult cats, cats with mixed diet, with outdoor access, in cats from a rural area and in cats from centre and north-western Romania. Adult age (adults: OR 6.98; 95% CI: 2.02-24.14 and geriatrics (cats older than 10-years): OR 12.01; 95% CI: 1.60-90.15) and outdoor access (OR 6.38; 95% CI: 2.32-17.53) remained significant risk factors in the multivariable logistic regression analysis. Our results suggest that T. gondii infection is common in household cats in Romania, and especially in those with outdoor access.

Evaluation of medetomidine, ketamine and buprenorphine for neutering feral cats.

A combination of medetomidine (M, 100 µg/kg), ketamine (K, 10 mg/kg) and buprenorphine (B, 10 µg/kg), administered by intramuscular injection, was evaluated for spaying and castration (neutering) of feral cats (n = 101). Eleven animals (11%) required supplemental anesthesia (isoflurane by mask) to maintain an adequate plane of surgical anesthesia. Atipamezole (A, 125 µg/kg) was administered subcutaneously at the completion of surgery. All cats recovered from surgery and were released the following day. A hemoglobin saturation (SpO(2)) value of <95% was recorded at least once during anesthesia in all cats. This MKB combination can be used in a feral cat sterilization clinic, but isoflurane supplementation may be necessary. Further research is indicated to determine the clinical significance of the low SpO(2) values associated with this anesthetic regimen.


Clinical aspects of feline immunodeficiency and feline leukemia virus infection.

Feline leukemia virus (FeLV) and feline immunodeficiency virus (FIV) are retroviruses with a global impact on the health of domestic cats. The two viruses differ in their potential to cause disease. FIV can cause an acquired immunodeficiency syndrome that increases the risk of developing opportunistic infections, neurological diseases, and tumors. In most naturally infected cats, however, FIV itself does not cause severe clinical signs, and FIV-infected cats may live many years without any health problems. FeLV is more pathogenic, and was long considered to be responsible for more clinical syndromes than any other agent in cats. FeLV can cause tumors (mainly lymphoma), bone marrow suppression syndromes (mainly anemia) and lead to secondary infectious diseases caused by suppressive effects of the virus on bone marrow and the immune system. Today, FeLV is less important as a deadly infectious agent as in the last 20 years prevalence has been decreasing in most countries.


Comparative efficacy of a recombinant feline interferon omega in refractory cases of calicivirus-positive cats with caudal stomatitis: a randomised, multi-centre, controlled, double-blind study in 39 cats.

Chronic caudal stomatitis with alveolar/buccal mucositis in calicivirus-positive cats is the most severe presentation of feline chronic gingivostomatitis. Refractory cases are helped by antibiotic and anti-inflammatory treatments often including glucocorticoids. In order to evaluate the comparative efficacy of oromucosal administration of recombinant feline interferon omega (rFeIFN-omega) versus oral administration of glucocorticoids, a randomised, multi-centre, controlled, double-blind study was performed in 39 cats. The progression of behavioural, clinical and lesional scores was assessed over 90 days. Daily oromucosal treatment with 0.1 MU of rFeIFN-omega was associated with a significant improvement of clinical lesions (caudal stomatitis and alveolar/buccal mucositis) and a decrease of pain scores from D0 to D90. Although no such statistical improvement was noticed in the prednisolone group, there was, however, no significant difference between the two groups for most of the parameters, except pain at D60 and D90.

Evaluation of plasma islet amyloid polypeptide and serum glucose and insulin concentrations in nondiabetic cats classified by body condition score and in cats with naturally occurring diabetes mellitus.

OBJECTIVE: To evaluate and compare circulating concentrations of islet amyloid polypeptide (IAPP), insulin, and glucose in nondiabetic cats classified by body condition score (BCS) and in cats with naturally occurring diabetes mellitus. ANIMALS: 109 (82 nondiabetic, 21 nonketoacidotic diabetic, and 6 ketoacidotic diabetic) cats. PROCEDURES: Cats were examined and BCSs were assessed on a scale of 1 to 9. After food was withheld for 12 hours, blood was collected and plasma concentrations of IAPP and serum concentrations of insulin and glucose were measured. Differences in these values were evaluated among nondiabetic cats grouped according to BCS and in diabetic cats grouped as ketoacidotic or nonketoacidotic on the basis of clinicopathologic findings. Correlations were determined among variables. RESULTS: In nondiabetic cats, BCS was significantly and positively correlated with circulating IAPP and insulin concentrations. Mean plasma IAPP concentrations were significantly different between cats with BCSs of 5 and 7, and mean serum insulin concentrations were significantly different between cats with BCSs of 5 and 8. Serum glucose concentrations were not significantly different among nondiabetic cats. Mean IAPP concentrations were similar between nonketoacidotic diabetic cats and nondiabetic cats with BCSs of 8 or 9. Mean IAPP concentrations were significantly reduced in ketoacidotic diabetic cats, compared with those of nondiabetic cats with BCSs of 6 through 8 and of nonketoacidotic diabetic cats. CONCLUSIONS AND CLINICAL RELEVANCE: Results indicated that increased BCS (a measure of obesity) is associated with increased circulating concentrations of IAPP and insulin in nondiabetic cats.


Identification of amino acid residues important for heparan sulfate proteoglycan interaction within variable region 3 of the feline immunodeficiency virus surface glycoprotein.

Heparan sulfate proteoglycans (HSPGs) act as binding receptors or attachment factors for the viral envelope of many viruses, including strains of HIV and feline immunodeficiency virus (FIV). The FIV gp95 glycoprotein (SU) from laboratory-adapted strains (tissue culture adapted [TCA]) such as FIV-34TF10 can bind to HSPG, whereas SU from field strains (FS) such as FIV-PPR cannot. Previous studies indicate that SU-HSPG interactions occur within the V3 loop. We utilized a series of nested V3 peptides to further map the HSPG binding sites and found that both sides of the predicted V3 loop stem were critical for the binding but not the CXCR4 binding domain near the predicted tip of the V3 loop. Neutralization assays for TCA strain entry using the same set of V3 peptides showed that peptides targeting CXCR4 or HSPG binding sites can block infection, supporting the V3 loop as a critical neutralization target. Site-directed mutagenesis identified two highly conserved arginines, R379 and R389, on the N-terminal side of the V3 stem as critical for the contact between SU and HSPG. Residues K407, K409, K410, and K412 on the C-terminal side of the V3 stem form a second nonconserved domain necessary for HSPG binding, consistent with the observed specificity distinctions with FS FIV. Our findings discriminate structural determinants important for HSPG and CXCR4 binding by FIV SU and thus further define the importance of the V3 loop for virus entry and infection.

A specific PCR assay for the diagnosis of Clonorchis sinensis infection in humans, cats and fishes.

Clonorchiasis caused by Clonorchis sinensis is a fish-borne parasitic disease which is endemic in a number of countries. Using the sequences of the internal transcribed spacers (ITS-1 and ITS-2) of nuclear ribosomal DNA (rDNA) of C. sinensis as genetic markers, a pair of C. sinensis-specific primers was designed and used to establish a specific PCR assay for the diagnosis of C. sinensis infection in humans, cats and fish. This approach allowed the specific identification of C. sinensis after optimizing amplification conditions, with no amplicons being amplified from related heterogeneous DNA samples, and sequencing of amplicons confirmed the identity of the sequences amplified. The detection limit of this assay was 1.03 pg of adult C. sinensis, 1.1 metacercariae per gram of fish filet, and a single egg in human and cat feces. The PCR assay should provide a useful tool for the diagnosis and molecular epidemiological investigation of clonorchiasis in humans and animals.

Jackson, J., and A. Villarroel (2011) Zoonoses Public Health

A Survey of The Risk of Zoonoses for Veterinarians.

The objectives of this study were to identify factors associated with zoonotic infections in veterinarians, the incidence of physician consultation and treatment and the incidence of diagnostic and treatment errors. Veterinarians in any area of practice were solicited to participate in an online survey through an invitation letter sent to the Oregon Veterinary Medical Association. Proportions of respondents to various factors were analyzed for differences among gender, age, time since graduation and type of practice in which they worked. In all, 216 complete responses were received. In all, 13.9% of respondents had never been vaccinated against rabies, and 20.8% had been exposed to suspect rabid animals, mostly (64.4%) a single time. Other zoonoses were reported by 47.2% of respondents: mostly diseases transmitted via contact (57.4%) especially ringworm, followed by those with oral transmission (21.7%). Most zoonotic infections were reportedly acquired by young veterinarians working in primary care veterinary practice. Cats were the species most commonly reported as the animal source of a zoonotic infection. Veterinarians likely self-diagnosed zoonotic diseases, especially those transmitted by contact. Medical care providers were consulted for diagnosis of more serious diseases. Diagnosis and treatment errors were uncommon. Results of this study emphasize the need to educate future veterinarians during their early years in veterinary school about the risks associated with their future jobs.


Clinical evaluation of non-surgical sterilization of male cats with single intra-testicular injection of calcium chloride.

BACKGROUND: Calcium chloride solution is an established injectable sterilant in dogs and other mammals. With cat populations a continuing problem, we sought to explore its first use in cats. Six cats per group were injected with 5%, 10% or 20% calcium chloride dihydrate in saline solution with
lignocaine hydrochloride, a local anaesthetic. RESULTS: At the 60th day post-injection, cat testes were collected and showed complete testicular necrosis and replacement by fibrous tissue; very low sperm counts; and reduction of serum testosterone by at least 70% in 20% dose. Androgenic enzyme activities and their expressions were also reduced in all the treated groups along with intra-testicular testosterone concentration was also low. Increased testicular lipid peroxidation, with reduced antioxidants and mitochondrial membrane potential, were evident following calcium chloride treatments. However, there were no apparent changes in serum concentrations of cortisol, fasting blood sugar level, blood urea nitrogen, packed cell volume, or total serum protein following calcium chloride injection, suggesting that this method of sterilization is not associated with any general stress response. CONCLUSION: Calcium chloride solution demonstrates potential for androgenesis-eliminating nonsurgical sterilization of male cats in addition to its proven efficacy in dogs and other mammals.


Investigation of the faecal microbiota of geriatric cats.

AIMS: Aim of the study was to investigate the faecal microbiota of geriatric cats, as aging affects the nutrient digestibility and metabolic function of the feline intestine. METHODS AND RESULTS: Twenty geriatric cats were randomly assigned to two groups that were fed different foods. Coriobacteriaceae, Clostridium cluster XIV, bifidobacteria and lactic acid bacteria were the dominant faecal bacterial groups, accounting for c. 40% of total bacteria. Clostridium cluster IX was less predominant (0.5% of total bacteria), while the remaining bacterial populations enumerated only accounted for 0.2% of total bacteria. Highly diverse microbial profiles were demonstrated for geriatric cats with denaturing gradient gel electrophoresis, although a few common bands were evident. Some differences were seen in the feline faecal microbiota between animal groups at the same time or over time for individual animals. However, no obvious clustering based on animal group or sample time was indicated. CONCLUSIONS: Geriatric cats harboured a complex faecal microbiota and c. 41% of total bacteria have been detected with the probes employed. SIGNIFICANCE AND IMPACT OF THE STUDY: First molecular-based study examining faecal microbiota of geriatric felines. Knowledge of the microbiota associated with ageing in cats may allow improved development of foods specific for the needs of senior cats.


The Effect of Atenolol on NT-proBNP and Troponin in Asymptomatic Cats with Severe Left Ventricular Hypertrophy because of Hypertrophic Cardiomyopathy: A Pilot Study.

Background: Atenolol often is used empirically in cats with hypertrophic cardiomyopathy (HCM) before the onset of heart failure, although evidence of efficacy is lacking. Cardiac biomarkers play a critical role in the early detection of subclinical cardiac disease, in the prediction of long-term prognosis, and in monitoring the response to therapy in humans. Hypothesis: Circulating concentrations of the biomarkers N-terminal pro-B type natriuretic peptide (NT-proBNP) and cardiac troponin I (cTnI) will decrease after chronic administration of atenolol PO to cats with severe HCM but no signs of heart failure. Animals: Six Maine Coon or Maine Coon cross cats with severe HCM. Methods: Cats were treated with atenolol (12.5 mg PO q12 h) for 30 days. No cat had left ventricular dynamic outflow tract obstruction caused by systolic anterior motion of the mitral valve. The concentrations of NT-proBNP
and cTnI were assayed before and on the last day of drug administration. Results: There was no statistically significant change in NT-proBNP (median before, 394 pmol/L; range, 71-1,500 pmol/L; median after, 439 pmol/L; range, 24-1,500 pmol/L; P=.63) or in cTnI (median before, 0.24 ng/mL; range, 0.10-0.97 ng/mL; median after, 0.28 ng/mL; range, 0.09-1.0 ng/mL; P=.69) after administration of atenolol. Conclusions: Atenolol administration did not decrease NT-proBNP or cTnI concentrations in cats with severe left ventricular hypertrophy caused by hypertrophic cardiomyopathy. These results suggest that atenolol did not decrease myocardial ischemia and myocyte death in these cats. A larger clinical trial is warranted to verify these findings.


Genetic characterization of flea-derived Bartonella species from native animals in Australia suggests host-parasite co-evolution.

Fleas are important arthropod vectors for a variety of diseases in veterinary and human medicine, and bacteria belonging to the genus Bartonella are among the organisms most commonly transmitted by these ectoparasites. Recently, a number of novel Bartonella species and novel species candidates have been reported in marsupial fleas in Australia. In the present study the genetic diversity of marsupial fleas was investigated: 10 species of fleas were collected from seven different marsupial and placental mammal hosts in Western Australia including woylies (Bettonia penicillata), western barred bandicoots (Perameles bougainville), mardos (Antechinus flavipes), bush rats (Rattus fuscipes), red foxes (Vulpes vulpes), feral cats (Felis catus) and rabbits (Oryctolagus cuniculus). PCR and sequence analysis of the cytochrome oxidase subunit I (COI) and the 18S rRNA genes from these fleas was performed. Concatenated phylogenetic analysis of the COI and 18S rRNA genes revealed a close genetic relationship between marsupial fleas, with Pygiopsylla hilli from woylies, Pygiopsylla tunneyi from western barred bandicoots and Acanthopsylla jordani from mardos, forming a separate cluster from fleas collected from the placental mammals in the same geographical area. The clustering of Bartonella species with their marsupial flea hosts suggests co-evolution of marsupial hosts, marsupial fleas and Bartonella species in Australia.


Quantitative real-time PCR (qPCR) assay for human-dog-cat species identification and nuclear DNA quantification.

In the United States, human forensic evidence collected from crime scenes is usually comingled with biomaterial of canine and feline origins. Knowledge of the concentration of nuclear DNA extracted from a crime scene biological sample and the species from which the sample originated is essential for DNA profiling. The ability to accurately detect and quantify target DNA in mixed-species samples is crucial when target DNA may be overwhelmed by non-target DNA. We have designed and evaluated a species-specific (human, dog and cat) nuclear DNA identification assay based on the TaqMan(R) quantitative real-time PCR (qPCR) technology that can simultaneously detect and measure minute quantities of DNA specific to either humans, dogs and/or cats. The fluorogenic triplex assay employs primers and hydrolysis probes that target the human TH01 locus as well as the dog and cat Melanocortin 1 Receptor (MC1R) sequences in a species-specific manner. We also demonstrate that the assay is a highly sensitive, reliable and robust method for identifying and quantifying mixed-
species templates of human-dog-cat origin with as little as 0.4pg of human and cat nuclear DNA, respectively, and 4.0pg of dog nuclear DNA.


Quantification and molecular characterization of the feline leukemia virus A receptor.

Virus receptors and their expression patterns on the cell surface determine the cell tropism of the virus, host susceptibility and the pathogenesis of the infection. Feline thiamine transport protein 1 (fTHTR1) has been identified as the receptor for feline leukemia virus (FeLV) A. The goal of the present study was to develop a quantitative, TaqMan real-time PCR assay to investigate fTHTR1 mRNA expression in tissues of uninfected and FeLV-infected cats, cats of different ages, in tumor tissues and leukocyte subsets. Moreover, the receptor was molecularly characterized in different feline species. fTHTR1 mRNA expression was detected in all 30 feline tissues investigated, oral mucosa scrapings and blood. Importantly, identification of significant differences in fTHTR1 expression relied on normalization with an appropriate reference gene. The lowest levels were found in the blood, whereas high levels were measured in the oral mucosa, salivary glands and the musculature. In the blood, T lymphocytes showed significantly higher fTHTR1 mRNA expression levels than neutrophil granulocytes. In vitro activation of peripheral blood mononuclear cells with concanavalin A alone or followed by interleukin-2 led to a transient increase of fTHTR1 mRNA expression. In the blood, but not in the examined tissues, FeLV-infected cats tended to have lower fTHTR1 mRNA levels than uninfected cats. The fTHTR1 mRNA levels were not significantly different between tissues with lymphomas and the corresponding non-neoplastic tissues. fTHTR1 was highly conserved among different feline species (Iberian lynx, Asiatic and Indian lion, European wildcat, jaguarundi, domestic cat). In conclusion, while ubiquitous fTHTR1 mRNA expression corresponded to the broad target tissue range of FeLV, particularly high fTHTR1 levels were found at sites of virus entry and shedding. The differential susceptibility of different species to FeLV could not be attributed to variations in the fTHTR1 sequence.


Identification of feline immunodeficiency virus subtype-B on St. Kitts, West Indies by quantitative PCR.

INTRODUCTION: Although antibodies to the feline immunodeficiency virus (FIV) have been detected by SNAP assay in cats from St. Kitts, there have been no molecular studies to further confirm the infection and determine the FIV subtypes present. METHODOLOGY: Total nucleic acids were extracted from EDTA whole blood specimens from 35 cats, followed by quantitative fluorescence resonance energy transfer (FRET) PCR under a six-channel LightCycler 2.0 Instrument with Software version 4.1. RESULTS: Four of 11 stray cats (36 %) but none of 24 owned cats were FIV positive by real-time PCR. High-resolution melting curve analysis indicated that all four positive cats were infected with FIV subtype-B. CONCLUSIONS: This is the first molecular characterization of FIV subtypes on St. Kitts and the results confirm the high prevalence of FIV infection in stray cats on the island.
A survey study on gastrointestinal parasites of stray cats in northern region of Nile delta, Egypt.

A survey study on gastrointestinal parasites in 113 faecal samples from stray cats collected randomly from Kafrelsheikh province, northern region of Nile delta of Egypt; was conducted in the period between January and May 2010. The overall prevalence was 91%. The results of this study reported seven helminth species: Toxocara cati (9%), Ancylostoma tubaeforme (4%), Toxascaris leonina (5%), Dipyldium caninum (5%), Capillaria spp. (3%), Taenia taeniformis (22%) and Heterophyes heterophyes (3%), four protozoal species: Toxoplasma gondii (9%), Sarcocyst spp. (1%), Isospora spp. (2%) and Giardia spp. (2%) and two arthropod species; Linguatula serrata (2%) and mites eggs (13%). The overall prevalence of intestinal parasites may continue to rise due to lack of functional veterinary clinics for cat care in Egypt. Therefore, there is a need to plan adequate control programs to diagnose, treat and control gastrointestinal parasites of companion as well as stray cats in the region.

Feasibility of single-portal access laparoscopic ovariectomy in 17 cats.

Laparoscopic ovariectomy (LapOVE) using single-portal access was attempted in 17 client-owned cats of different breeds admitted for elective ovariectomy. A 12 mm umbilical portal was placed 1 cm caudal to the umbilicus with the cat in dorsal recumbency. Then, a laparoscope with an operating channel was introduced into the portal with the cat in lateral recumbency. The right ovary was pulled to the abdominal wall using grasping forceps and fixed to the abdominal wall by a transabdominal suspension suture. The ovarian vasculature, suspensor ligament and proper ligament were progressively cauterised and transected with multifunction bipolar electrocoagulation forceps. The resected right ovary was exteriorised through the umbilical portal cannula. The left ovary was then removed from the abdomen in a similar fashion. Surgical time, intraoperative haemorrhage, amount of fat in the ovarian ligament, surgical complications and postoperative pain were recorded. The mean (sd) surgical time was 23 minutes and seven seconds (five minutes and 55 seconds). Intraoperative blood loss and fat deposition of the ovarian ligament were minimal. No intra- and postoperative complications were encountered. No cats needed rescue analgesia within 24 hours postsurgery.

Safety of oral robenacoxib in the cat.

King, J. N., Hotz, R., Reagan, E. L., Roth, D. R., Seewald, W., and Lees, P. Safety of oral robenacoxib in the cat. J. Vet. Pharmacol. Therap. doi: 10.1111/j.1365-2885.2011.01320.x. The safety of robenacoxib, a nonsteroidal anti-inflammatory drug with high selectivity for inhibition of the cyclooxygenase (COX)-2 isoform of COX, was investigated in the cat in two randomized, blinded, placebo-controlled, parallel-group studies. Robenacoxib was administered orally to healthy young domestic short-hair cats at dosages of 0 (placebo), 5 and 10 mg/kg once daily for 28 days (study 1) and at 0 (placebo), 2, 6 and 10 mg/kg twice daily for 42 days (study 2). The recommended minimum dosage for robenacoxib tablets in cats is 1 mg/kg once daily (range 1-2.4 mg/kg). Relative to placebo treatment, no toxicologically significant effects of robenacoxib were recorded in either study, based on general
observations of health, haematological and clinical chemistry variables and urinalyses in life, and by post mortem organ weight, gross pathology and histopathology assessments. Pharmacokinetic-pharmacodynamic simulations indicated that all dosages of robenacoxib were associated with marked inhibition of COX-2 at peak effect (median I(max) 97.8-99.4% inhibition) with lesser inhibition of COX-1 (median I(max) 26.8-58.3% inhibition). Inhibition of the COXs was short lasting, with >10% median inhibition persisting for 4.0 h for COX-2 and 1.5 h for COX-1. These levels of inhibition of COX-1 and COX-2 twice daily with robenacoxib were not associated with any detectable toxicity, suggesting that, as previously described in dogs, the high safety index of robenacoxib in cats may be related to a combination of its high COX-2 selectivity and short residence time in the central compartment.


**Paw preference is not affected by postural demand in a nonprimate mammal (Felis silvestris catus).**

Previously, it has been thought that handedness is unique to humans. Recently, it has been found that hand or paw preferences are common among a variety of vertebrate species. Different models have been put forth to describe the evolution of primate handedness. In this study we aimed to explore whether these models can also be used to predict manual laterality in nonprimate mammalian groups. The cat (Felis silvestris catus) is a good nonprimate model for manual laterality, as cats frequently use paws to catch and hold prey. Cats were exposed to two standardized manual laterality tasks, differing in postural demand. Subjects (N = 28) were forced to use either a stable or unstable body posture (i.e., sitting or standing vs. vertical clinging) to extract food items from a plastic box attached at two different heights. We revealed that cats exhibited paw preferences at an individual level with about 40% left, 30% right, 30% nonlateralized subjects. Postural demand was linked to task difficulty: the unstable body posture was found to be significantly more difficult than the stable body posture. However, these differences in postural demand and task difficulty did not lead to differences in direction or strength of paw preference. Findings suggested that nonprimate mammals differ from primates in their sensitivity to task related factors, such as postural demand. Results coincide with those of some prosimians, providing support for the hypothesis that postural demand and the associated task complexity became influencing factors on manual laterality in the course of primate evolution.


**Evaluation of the transarticular external skeletal fixator for the treatment of tarsocrural instability in 32 cats.**

The medical records of all cats with tarsocrural joint instability that were treated between June 2002 and December 2008 at the Royal Veterinary College were retrospectively reviewed. A total of 32 cats were identified. Information gathered included signalment, type of injury (subluxation or luxation), concurrent fractures, presence of soft tissue wounds, transarticular external skeletal fixation (TESF) type, configuration of TESF (number of pins proximal and distal to the joint), duration of hospitalisation, duration of TESF prior to removal, complications and cost. A significant association was identified between the length of hospitalisation and the presence of wounds. Similarly, a significant
association was present between wounds and final cost of treatment. Additionally, the authors found that a high number of implant related complications were present when only two pins were used proximal and distal to the tarsocural joint, but this association was not significant.


**Young, male neutered, obese, lame? Non-traumatic fractures of the femoral head and neck.**

PATIENT GROUP: Young, male neutered, obese cats are predisposed to sustaining spontaneous capital physeal fractures, as well as fractures of the femoral neck secondary to metaphyseal osteopathy. PRACTICAL RELEVANCE: Although femoral head and neck excision generally leads to adequate limb function, and is appropriate for chronic fractures, it is a salvage procedure and irreversible. Ideally, for acute capital physeal fractures an attempt should be made to stabilise the fracture and save the coxofemoral joint. This requires early detection of the femoral fracture. CLINICAL CHALLENGES: Orthopaedic examination in cats can be challenging. Yet thorough assessment is needed to allow localisation of the pathology to the hip joint, and to rule out other orthopaedic conditions such as cranial cruciate ligament rupture. Stabilisation of these types of fracture may also prove challenging. AUDIENCE: This review is aimed at general practitioners who have some experience in orthopaedic surgical procedures, as well as those simply wishing to expand their knowledge of feline orthopaedic conditions.


**Detection and differentiation of coccidian oocysts by real-time PCR and melting curve analysis.**

Rapid and reliable detection and identification of coccidian oocysts are essential for animal health and foodborne disease outbreak investigations. Traditional microscopy and morphological techniques can identify large and unique oocysts, but they are often subjective and require parasitological expertise. The objective of this study was to develop a real-time quantitative PCR (qPCR) assay using melting curve analysis (MCA) to detect, differentiate, and identify DNA from coccidian species of animal health, zoonotic, and food safety concern. A universal coccidia primer cocktail was designed and employed to amplify DNA from Cryptosporidium parvum, Toxoplasma gondii, Cyclospora cayetanensis, and several species of Eimeria, Sarcocystis, and Isospora using qPCR with SYBR Green detection. MCA was performed following amplification, and melting temperatures (T(m)) were determined for each species based on multiple replicates. A standard curve was constructed from DNA of serial dilutions of T. gondii oocysts to estimate assay sensitivity. The qPCR assay consistently detected DNA from as few as 10 T. gondii oocysts. T(m) data analysis showed that C. cayetanensis, C. parvum, Cryptosporidium muris, T. gondii, Eimeria bovis, Eimeria acervulina, Isospora suis, and Sarcocystis cruzi could each be identified by unique melting curves and could be differentiated based on T(m). DNA of coccidian oocysts in fecal, food, or clinical diagnostic samples could be sensitively detected, reliably differentiated, and identified using qPCR with MCA. This assay may also be used to detect other life-cycle stages of coccidia in tissues, fluids, and other matrices. MCA studies on multiple isolates of each species will further validate the assay and support its application as a routine parasitology screening tool.

Pseudomembranous cystitis, an unusual condition associated with feline urine outflow obstruction: Four cases.

The clinical follow-up of four cats presumptively diagnosed with pseudomembranous cystitis is described. All presented with acute urine outflow obstruction and acute renal failure. Urethral catheterisation was performed without difficulty but ultrasonography and contrast radiography consistently revealed abnormal bladder wall and content. One cat was euthanased, the remaining three underwent an exploratory cystotomy. Abundant inflammatory and necrotic tissue covering an ulcerated bladder mucosa was removed. All cats recovered uneventfully. No definitive cause was identified but the clinical course of the disease was not typical of idiopathic cystitis.


Efficacy and safety of the combination imidacloprid 10 % / moxidectin 1.0 % spot-on (Advocate(R)) spot-on for small cats and ferrets) in the treatment of ear mite infection (Otodectes cynotis) in ferrets.

In this study, the efficacy and safety of a treatment with the combination imidacloprid 10 %/moxidectin 1.0 % spot-on (Advocate((R)) spot-on for small cats and ferrets) was tested in 39 ferrets naturally infested with ear mites (Otodectes cynotis). The study was performed as a multicentre, non-randomised, non-controlled (all study animals were treated) and non-blinded clinical field study in two French veterinary practices. Four visits (day (D) 0 = inclusion and first treatment, D14 = second treatment, D28 = possible third treatment, D56 = termination) were planned. The dosage was one pipet per ferret (designed for cats weighing up to 4 kg, corresponding to a dose of moxidectin ranging from 2.2 to 5 mg/kg body weight) two or three times at 14-days intervals (at D0, D14 and possibly D28 depending on the parasitological examination of the ears at D28). The main efficacy criterion was the absence of the parasite (all stages incl. eggs, larvae, nymphs and adults) from ear scrapings by microscopic examination. At D28 after two treatments (D0 and D14), 76.9 % (30/39) of animals were cured. Only 23 % (9/39) needed a third treatment. At day 56, 100 % were cured. Local symptoms (inflammation and pruritus) were consistently improved (50.6 % improvement at D14, 81.0 % at D28 and 97.9 % at D56) as well as the abnormal cerumen production (14.7 % improvement at D14, 77.7 % at D28 and 100.0 % at D56). No general symptoms were noticed during the study (general health and skin aspect). Advocate((R)) spot-on for small cats and ferrets is an effective and safe treatment for ear mite infection in ferrets. Two or three treatments administered in 14-days intervals to ferrets infested with ear mites provided 100 % parasitological cure on D56.


Renal biopsy and pathologic evaluation of glomerular disease.

Presence of suspected primary glomerular disease is the most common and compelling reason to consider renal biopsy. Pathologic findings in samples from animals with nephritic or nephrotic glomerulopathies, as well as from animals with persistent subclinical glomerular proteinuria that is not associated with advanced chronic kidney disease, frequently guide treatment decisions and inform prognosis when suitable specimens are obtained and examined appropriately. Ultrasound-guided needle biopsy techniques generally are satisfactory; however, other methods of locating or approaching the
kidney, such as manual palpation (e.g., in cats), laparoscopy, or open surgery, also can be used. Visual assessment of the tissue content of needle biopsy samples to verify that they are renal cortex (i.e., contain glomeruli) as they are obtained is a key step that minimizes the submission of uninformative samples for examination. Adequate planning for a renal biopsy also requires prior procurement of the fixatives and preservatives needed to process and submit samples that will be suitable for electron microscopic examination and immunostaining, as well as for light microscopic evaluation. Finally, to be optimally informative, renal biopsy specimens must be processed by laboratories that routinely perform the required specialized examinations and then be evaluated by experienced veterinary nephropathologists. The pathologic findings must be carefully integrated with one another and with information derived from the clinical investigation of the patient’s illness to formulate the correct diagnosis and most informative guidance for therapeutic management of the animal’s glomerular disease.


**Contraceptive vaccines for the humane control of community cat populations.**

Free-roaming unowned stray and feral cats exist throughout the world, creating concerns regarding their welfare as well as their impact on the environment and on public health. Millions of healthy cats are culled each year in an attempt to control their numbers. Surgical sterilization followed by return to the environment is an effective non-lethal population control method but is limited in scope because of expense and logistical impediments. Immunocontraception has the potential to be a more practical and cost-effective method of control. This is a review of current research in immunocontraception in domestic cats. Functional characteristics of an ideal immunocontraceptive for community cats would include a wide margin of safety for target animals and the environment, rapid onset and long duration of activity following a single treatment in males and females of all ages, and sex hormone inhibition. In addition, product characteristics should include stability and ease of use under field conditions, efficient manufacturing process, and low cost to the user. Two reproductive antigens, zona pellucida and GnRH, have been identified as possible targets for fertility control in cats. Zona pellucida, which is used successfully in multiple wildlife species, has achieved little success in cats. In contrast, immunization against GnRH has resulted in long-term contraception in both male and female cats following a single dose. GnRH is an ideal contraceptive target because it regulates pituitary and gonadal hormone responses in both males and females, thus suppressing nuisance behaviors associated with sex hormones in addition to preventing pregnancy. The responsiveness of cats to fertility control via GnRH suppression should encourage researchers and cat control stakeholders to continue efforts to optimize vaccines that induce multiyear contraception following a single dose in a high proportion of treated cats.


**Long-term fertility control in female cats with GonaCon, a GnRH immunocontraceptive.**

The uncontrolled reproduction of free-roaming feral cats contributes to overpopulation and associated concerns regarding their welfare and impact on public health and the environment. Nonsurgical fertility control that could be administered to feral cats in the field would be a powerful tool for cat population control. The objective was to test the efficacy and duration of activity of a single-dose GnRH
immunocontraceptive vaccine (GonaCon) on the fertility of adult female laboratory cats. Vaccinated cats (n = 15) received a single injection of vaccine containing a GnRH-KLH conjugate (200 μg) emulsified in a mycobacterial and oil adjuvant on study Day 0. Sham-treated cats (n = 5) received a single injection containing all vaccine components except the GnRH-KLH conjugate. A breeding trial started on study Day 120. Vaccinated cats had a longer time to conception (median 39.7 mo) compared to sham-treated cats (4.4 mo; P < 0.001). A total of 93% of vaccinated cats remained infertile for the first year following vaccination, whereas 73, 53, and 40% were infertile for 2, 3, and 4 y, respectively. At study termination (5 y after a single GnRH vaccine was administered), four cats (27%) remained infertile. The GnRH antibody titers declined more rapidly in short-term responding cats with < 2 y of infertility (n = 4), compared to long-term responding cats that experienced fertility control for >2 y (n = 11) (P < 0.05). Non-painful but persistent late-onset granulomatous injection site masses appeared 2 y after initial vaccination in five cats. We concluded that GnRH immunocontraception is an ideal candidate for further development for feral cat control.


Feline reproduction: problems and clinical challenges.

AUDIENCE: Many veterinarians are closely involved with pedigree cat breeding and have become familiar with the unique characteristics of feline reproduction and breeding management. However, even veterinarians who do not have involvement with the pedigree cat fancy require a basic knowledge of the reproductive problems that are most likely to be encountered in working with non-breeding pet cats as well as stray and feral cats. CLINICAL CHALLENGES: This article reviews reproductive problems and challenges in both sexes - namely, ovarian remnant syndrome, mammary fibroadenomatous hyperplasia, congenital anomalies of the reproductive tract and pregnancy diagnosis in the queen, and cryptorchidism and low libido in the tom. EVIDENCE BASE: Feline reproduction has not received the amount of investigation and attention that has been directed at canine reproduction. The result is that less data is available both for description of normal reproduction and for management of common problems. This article reviews most of the available evidence for the conditions discussed. Efforts should focus on making information more readily available to the practitioner and expanding the knowledge base in this important area of feline medicine.


DETECTION OF PNEUMOTHORAX AND PLEURAL EFFUSION WITH HORIZONTAL BEAM RADIOGRAPHY.

Forty-seven patients with a known history of thoracic trauma or clinical suspicion of pneumothorax were selected for thoracic imaging. The patient population was composed of 42 dogs and five cats. Standard vertical beam (VB) left and right lateral and ventrodorsal/dorsoventral (VD/DV) projections were obtained for each patient, and at least one horizontal beam (HB) projection (VD projection made in lateral recumbency). A total of 240 images were reviewed. Subjective assessment for the presence and degree of pneumothorax and pleural effusion was made more confidently with HB projections. Pneumothorax was identified in at least one projection in 26 patients (26 dogs) and pleural effusion in 21 patients (19 dogs and two cats). Pneumothorax and pleural effusion were present concurrently in 17 dogs. Pneumothorax and pleural effusion were graded for each image as absent, mild, moderate, or
severe. Right (P<0.001) and left (P<0.05) lateral HB VD projections and the standard VB left lateral projection (P<0.05) were significantly more likely to detect and grade pneumothorax severely than the VB VD/DV views. The right lateral HB projection had the highest rate of detection and gradation of severity for pneumothorax compared with other views. VD/DV projections had the lowest sensitivity for detection of the pneumothorax and gradation of severity for pneumothorax and pleural effusion. No significant difference in diagnosis (P=0.9149) and grade (P=0.7757) of pleural effusion were seen between views, although the left lateral HB had both the highest rate of detection and grade of severity.


**In vitro antimicrobial activity of nitrofurantoin against Escherichia coli and Staphylococcus pseudintermedius isolated from dogs and cats.**

Minimum inhibitory concentrations (MIC) of nitrofurantoin were determined by agar dilution in 269 canine and feline isolates of Escherichia coli and Staphylococcus pseudintermedius, two of the most common bacterial species associated with urinary tract infection (UTI) in small animals. The MIC90 for E. coli and S. pseudintermedius were 32 and 16 μg/ml, respectively. All isolates, including multidrug-resistant strains of known genetic background, displayed MICs below the drug concentrations reported in canine urine following oral administration of nitrofurantoin. Preliminary data on mutant prevention concentration (MPC) and many years of nitrofurantoin usage in human medicine suggest that emergence of resistant mutants during treatment is not a critical issue for this drug. The study provides species-specific data on nitrofurantoin MIC distribution that can be used for setting dog- and cat-specific breakpoints. Although nitrofurantoin is not an appropriate first-line agent for empirical treatment of canine UTI due to toxicity and poor pharmacokinetic properties, it may be indicated for treatment of UTI caused by multidrug-resistant bacteria, which are otherwise difficult to treat using conventional veterinary antimicrobial agents.


**Nutrition—the ‘5th vital assessment’**.


**Can domestic cats be considered reservoir hosts of zoonotic leishmaniasis?**

Canine and human zoonotic leishmaniasis caused by Leishmania infantum, which is transmitted by the bite of infected phlebotomine sand flies, is a serious public health problem in the Mediterranean basin and Latin America. Among reports on newly identified mammalian hosts recurrently found infected with L. infantum, those regarding domestic cats deserve attention for the potential implications to public health. It has been shown that these animals cohabiting with humans can be infected (although only a few cases develop disease) and harbor parasites in an available way for transmission to competent vectors. Nonetheless, their role as reservoir hosts is still controversial.

Reversible encephalopathy secondary to thiamine deficiency in 3 cats ingesting commercial diets.


Hepatic and pancreaticobiliary MRI and mr cholangiopancreatography with and without secretin stimulation in normal cats.

Magnetic resonance (MR) cholangiopancreatography is useful in humans to diagnose biliary and pancreatic diseases. Some of these protocols incorporate the use of secretin, which stimulates the exocrine pancreas to release bicarbonate with secondary dilation of the pancreatic duct. We compared the utility and quality of multiple hepatic-pancreaticobiliary MR imaging sequences before and after secretin stimulation of the pancreatic duct in five healthy cats. Multiple MR sequences were evaluated, including fast Spoiled Gradient Recalled in- and out-of-phase, Single Shot Fast Spin Echo (SSFSE), T2 Fast Spin Echo, MR cholangiopancreatography (pre- and postsecretin administration), and Fast Acquisition with Multiphase Efgre (FAME) (postsecretin and before and after gadolinium administration). The MR cholangiopancreatography protocol with secretin stimulation was feasible and yielded high-contrast maps of the biliary ductal anatomy but the pancreatic duct was seen inconsistently. The FAME series most consistently provided visualization of biliary and postsecretin pancreatic ductal anatomy, combined with very good depiction of the liver and pancreas. The remaining sequences each had satisfactory utility and diagnostic quality, with the exception of the SSFSE sequences. Secretin improved the conspicuity of the pancreatic duct.


Presumptive meningoencephalitis secondary to extension of otitis media/interna caused by Streptococcus equi subspecies zooepidemicus in a cat.

A 5-year-old castrated male domestic longhair cat was presented with neurological signs consistent with a central vestibular lesion and left Horner’s syndrome. Computed tomography images revealed hyperattenuating, moderately contrast-enhancing material within the left tympanic bulla, most consistent with left otitis media/interna. Marked neutrophilic pleocytosis was identified on cerebrospinal fluid analysis. Streptococcus equi subspecies zooepidemicus (SEZ) was isolated from the cerebrospinal fluid. Intracranial extension of otitis media/interna is relatively infrequent in small animals. There are no reports of otitis media/interna caused by SEZ in dogs or cats. This is the first report of otitis media/interna and presumptive secondary meningoencephalitis caused by SEZ in a cat.


Adherent-invasive Escherichia coli phenotype displayed by intestinal pathogenic E. coli strains from cats, dogs, and swine.

The adherent-invasive Escherichia coli (AIEC) pathotype, which has been associated with Crohn’s disease, shows similar traits to human and animal extraintestinal pathogenic E. coli (ExPEC) with respect to their phylogenetic origin and virulence gene profiles. Here, we demonstrate that animal
ExPEC strains generally do not share the AIEC phenotype. In contrast, this phenotype is very frequent among animal intestinal pathogenic E. coli (InPEC) strains, particularly of feline and canine origin, that genetically resemble ExPEC. These results strengthen the particular identity and disease specificity of the AIEC pathotype and the putative role animals might play in the transmission of AIEC-like strains to humans.


**Antimicrobial usage in dogs and cats in first opinion veterinary practices in the UK.**

Objectives: To provide baseline data on patterns of antimicrobial usage in dogs and cats through the analysis of data stored in electronic practice management systems. Methods: Clinical data from 11 first opinion veterinary practices were extracted for the year 2007. Descriptive statistical analysis was performed to assess the usage of antimicrobials. Results: Widespread usage of systemic broad-spectrum antimicrobials was observed. Antimicrobials most frequently used in both species were potentiated amoxicillin (44.4% and 46.1% in cats and dogs, respectively) and amoxicillin (14.3% and 20.7%). Cephalexin (13.4%) and cefovecin (15.0%) were also commonly used in dogs and cats, respectively. Systemic critically important antimicrobials in human medicine were widely used in dogs (60.5%) and cats (82.7%). Topical antimicrobials used in both species included fusidic acid (48.4% and 54.8%), framycetin (20.4% and 13.4%), polymyxin B (12.6% and 9.3%) and neomycin (6.5% and 6.6%). Clinical Significance: Inappropriate usage of broad-spectrum antimicrobials may contribute to the development of antimicrobial resistance and loss of efficacy of antimicrobials in veterinary settings. Data recorded in practice management systems were demonstrated to be a practical source for monitoring antimicrobial usage in pets.


**Rickettsia felis and Bartonella henselae in fleas from Lebanon.**

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.


**Identification, bioinformatics analyses, and expression of immunoreactive antigens of Mycoplasma haemofelis.**

*Mycoplasma haemofelis* infection frequently causes anemia in cats. Despite an intense immune response and/or antibiotic treatment, cats often remain asymptomatic carriers following infection. Our hypothesis is that detection of antibodies to *M. haemofelis* is a sensitive approach for identifying
infected cats, particularly carriers. To date, no immunoassay has been developed. This is due largely to
the inability to culture M. haemofelis in vitro; hence, a source of antigen is not readily available. The
objective of this study was to identify, express, and purify immunogenic proteins of M. haemofelis. To
accomplish this, two whole-genomic expression libraries were created in the Lambda ZapII vector and
immunoscreened with preimmune plasma, plasma from specific-pathogen-free cats, and pooled acute-
and convalescent-phase plasma from experimentally infected cats. The inserts from 21 immunoreactive
clones were sequenced, resulting in the identification of 60 genes coding for putative proteins
necessary for diverse cellular functions, along with several novel genes of M. haemofelis. Fragments of
selected genes based on bioinformatic analyses were PCR amplified, cloned into a high-level protein
expression system, and subsequently expressed in Escherichia coli as a His(6)-fusion protein. The
recombinant fusion proteins of M. haemofelis were purified and evaluated as an antigen in a Western
blot to verify the findings of previous immunoscreening. Together with bioinformatics analyses of
individual genes, this approach provided several putative candidate antigens. Five antigens of M.
haemofelis were reactive by Western blotting against the immune plasma and negative against
nonimmune plasma; these antigens might be useful serologic or even vaccine targets.


Malignant melanoma in pleural effusion in a 14-year-old cat.

CASE DETAILS: A 14-year-old female cat presented with signs of respiratory distress. Pleural fluid
was found on radiographic assessment. Cytologic evaluation of the fluid revealed malignant
melanocytosis. The cat had a previous history of a recurrent malignant melanoma near the base of the
right ear. Due to declining clinical condition, the cat was euthanized. CLINICAL SIGNIFICANCE:
Cutaneous malignant melanomas (or melanosarcomas) are uncommon neoplasms in cats, and
knowledge is limited. As far as the authors are aware, there are no previous reports in the veterinary
literature of malignant melanocytes being identified in pleural effusion in cats, as they have in dogs.
This report suggests that, despite conflicting information in the literature regarding the clinical behavior
of cutaneous melanomas in cats, these tumors are capable of recurrence and metastasis. Aggressive
treatment may be necessary even, as in this case, if the tumor is well differentiated on histopathology.

Parasitol

Detection of Tritrichomonas foetus and Pentatrichomonas hominis in intestinal tissue specimens
of cats by chromogenic in situ hybridization.

In this retrospective study 102 cats were analyzed for the presence of trichomonads in intestinal tissue
sections using chromogenic in situ hybridization (CISH). Two intestinal trichomonad species are
described in cats: Pentatrichomonas hominis and Tritrichomonas foetus. While P. hominis is
considered a mere commensal, T. foetus has been found to be the causative agent of feline large-bowel
diarrhea. For the detection of both agents within intestinal tissue CISH assays using three different
probes were performed. In the first CISH run a probe specific for all relevant members of the order
Trichomonadida (OT probe) was used. In a second CISH run all positive samples were further
examined on three consecutive tissue sections using the OT probe, a probe specific for the family of
Tritrichomonadidae (Tritri probe) and a newly designed probe specifically detecting P. hominis (Penta
hom probe). In total, four of the 102 cats were found to be positive with the OT probe. Thereof, one cat
gave a positive reaction with the P. hominis probe and three cats were positive with the T. foetus probe. All Trichomonas-positive cats were pure-bred and between 8 and 32 weeks of age. In one cat positive for T. foetus large amounts of parasites were found in the gut lumen and invading the intestinal mucosa. The species of the detected trichomonads were confirmed by polymerase chain reaction and nucleotide sequencing of a part of the 18S ribosomal RNA gene. In this study, the usefulness of CISH to detect intestinal trichomonads within feline tissue samples was shown. Additionally, the specific detection of P. hominis using CISH was established. Generally, it was shown that CISH is well suited for detection and differentiation of trichomonosis in retrospective studies using tissue samples.


**Papillomaviral DNA and increased p16CDKN2A protein are frequently present within feline cutaneous squamous cell carcinomas in ultraviolet-protected skin.**

Squamous cell carcinomas (SCCs) are common feline skin tumours. While exposure to ultraviolet (UV) light causes some SCCs, a subset develop in UV-protected skin. In cats, papillomaviruses (PVs) cause viral plaques and Bowenoid in situ carcinomas (BISCs). As both may progress to SCC, it was hypothesized that SCCs in UV-protected skin may represent neoplastic transformation of a PV-induced lesion. To investigate this hypothesis, PCR was used to amplify PV DNA from 25 UV-protected and 45 UV-exposed SCCs. Oncogenic human PVs cause neoplasia by mechanisms that also increase p16(CDKN2A) protein (p16). As increased p16 is present in feline viral plaques and BISCs, immunohistochemistry was used to detect p16 within the SCCs. Papillomaviral DNA was amplified from 76% of UV-protected SCCs, but only 42% of UV-exposed SCCs. Increased p16 was present in 84% of UV-protected SCCs, but only 40% of UV-exposed SCCs. The more frequent detection of PV DNA and increased p16 within UV-protected SCCs supports the hypothesis that some develop from a PV-induced plaque or BISC. Felis domesticus PV-2 is thought to cause viral plaques and BISCs. This PV was detected most frequently within the UV-protected SCCs, supporting development from a PV-induced lesion. Increased p16 and PV DNA were less frequent within UV-exposed SCCs, presumably because these developed from actinic keratosis rather than a PV-induced lesion. The results support the hypothesis that some feline cutaneous SCCs are caused by PV infection and suggest that PVs may cause neoplasia by mechanisms that also increase p16.


**Real-Time Detection and Identification of Chlamydophila Species in Veterinary Specimens by Using SYBR Green-Based PCR Assays.**

Infections caused by members of the Chlamydiaceae family have long been underestimated due to the requirement of special laboratory facilities for the detection of this group of intracellular pathogens. Furthermore, new studies of this group of intracellular pathogens have revealed that host specificity of different species is not as clear as recently believed. As most members of the genus Chlamydophila have shown to be transmissible from animals to humans, sensitive and fast detection methods are required. In this study, SYBR green-based real-time assays were developed that detect all members of Chlamydiaceae and differentiate the most prevalent veterinary Chlamydophila species: Cp. psittaci, Cp. abortus, Cp. felis, and Cp. caviae. By adding bovine serum albumin to the master mixes, target DNA could be detected directly in crude lysates of enzymatically digested conjunctival or pharyngeal swabs or tissue specimens from heart, liver, and spleen without further purification. The assays were
evaluated on veterinary specimens where all samples were screened using a family-specific PCR, and positive samples were further tested using species-specific PCRs. Cp. psittaci was detected in 47 birds, Cp. felis was found in 10 cats, Cp. caviae was found in one guinea pig, and Cp. abortus was detected in one sheep. The screening assay appeared more sensitive than traditional microscopical examination of stained tissue smears. By combining a fast, robust, and cost-effective method for sample preparation with a highly sensitive family-specific PCR, we were able to screen for Chlamydiaceae in veterinary specimens and confirm the species in positive samples with additional PCR assays.


**Efficacy of a single dose of an otic ivermectin preparation or selamectin for the treatment of Otodectes cynotis infestation in naturally infected cats.**

Otodectes cynotis infestation is common in kittens housed in crowded environments like animal shelters. It is unknown how rapidly O. cynotis is killed within the first 72h of treatment with currently available products. Kittens >/= 4 weeks of age with live O. cynotis in both ears (AU) were administered 0.5ml of 0.01% ivermectin otic suspension (Acarexx; Idexx Pharmaceuticals) once, AU or selamectin (Revolution; Pfizer Animal Health) once, on the skin following the manufacturer’s instructions. Repeat microscopic examination was performed on individual ears based on a randomization schedule during the 72h after treatment. There was no evidence of toxicity with either drug and administration of 0.01% ivermectin significantly reduced the time to live mite-free status compared to selamectin. Both drugs have an effect against O. cynotis as early as 10-12h after administration with an increasing effect over time.


**Thoracic computed tomography in feline patients without use of chemical restraint.**

Computed tomography (CT) and thoracic radiography were performed in nonsedated, nonanesthetized, cats with thoracic disease. The final diagnosis was obtained with echocardiography, cytology, histopathology, necropsy, or response to therapy. For CT imaging, cats were in a positioning device using a 16 multislice helical CT system. Fifty-four cats had CT imaging of which 50 had thoracic radiography. The most common diagnoses were lung neoplasia, lower airway disease, and cardiomyopathy (nine each). Other disease groups included mediastinal mass (eight), infection (seven), trauma (four), and hernia (three). CT provided additional correct diagnoses in 28% (14/50) and additional information in 74% (37/50) of the cats. Additional correct diagnoses achieved only with CT were most common for cats with lower airway disease. The most common additional findings with CT were lung nodules (n=4), lung masses (n=4), bronchiectasis (n=4), and mediastinal lymphadenopathy (n=3). Survey CT led to a significant different diagnosis or different prognosis in 20 of the 50 cats that were imaged both modalities. Contrast CT was performed in 19 cats, most commonly in cats with lung neoplasia (n=6), a mediastinal mass (n=4) or an infection (n=3), and provided additional correct diagnosis in two cats not achieved with survey CT. Thoracic CT using a positioning device in diseased awake cats is feasible, safe, and clinically useful.

**A clinical comparison of remifentanil or alfentanil in propofol-anesthetized cats undergoing ovariohysterectomy.**

Sixteen cats were used to compare the cardiovascular and anesthetic effects of remifentanil (REMI) or alfentanil (ALF) in propofol-anesthetized cats undergoing ovariohysterectomy. After premedication with acepromazine, anesthesia was induced and maintained with a constant rate infusion of propofol (0.3mg/kg/min). REMI or ALF infusions were administered simultaneously with propofol. Heart rate (HR), systolic arterial pressure (SAP), pulse oximetry (SpO2), rectal temperature (RT), and response to surgical stimulation were recorded at predefined time points during anesthesia. Data [mean+/standard deviation (SD)] were analyzed by analysis of variance (ANOVA) for repeated measures followed by a Dunnett’s test and Student t-test (P<0.05). SAP was significantly lower in ALF group than in REMI group. Extubation time was significantly shorter in REMI than in ALF group. Overall infusion rate of REMI and ALF was 0.24+/0.05μg/kg/min and 0.97+/0.22μg/kg/min, respectively. The combination of propofol and REMI or ALF provided satisfactory anesthesia in cats undergoing ovariohysterectomy.

**Complex partial cluster seizures in cats with orofacial involvement.**

Seventeen cats were presented with acute onset of complex partial seizures with orofacial involvement (salivation, facial twitching, lip smacking, chewing, licking or swallowing), motor arrest (motionless staring) and behavioural changes. In 11 cats hippocampal necrosis (HN) was confirmed by histopathology. In a further six cats hippocampal changes were suggested by magnetic resonance imaging. The mean monitoring time of eight cats which were not euthanased in the acute phase of the disease, was 408 days (60-908): four cats are still alive. In all surviving cases, the owners reported a good quality of life. We conclude that an acute cluster of complex partial seizures with orofacial involvement are often associated with HN and that HN is not necessarily a fatal condition. Supportive and antiepileptic therapy can result in remission. The long-term outcome can be good to excellent; therefore, euthanasia should be avoided in the acute phase of the signs.

**Primary lens instability in ten related cats: clinical and genetic considerations.**

OBJECTIVES: To describe bilateral lens instability in 10 related domestic shorthair cats over three generations. METHODS: Complete ophthalmic examinations were performed. Lentectomies were carried out. Sections of affected lenses focused on the equatorial area were examined by transmission electron microscopy. The potential involvement of several candidate genes (ADAMTS17, ADAMTSL4, ADAMTS10 and FBN1) known to be associated with lens luxation in other species was investigated. RESULTS: The group of animals included 10 related cats, nine of them being affected by lens instability over three generations. Transmission electron microscopy showed the presence of zonular material at the lens equator. Signs of lens instability were not associated with other ocular
disease. Analysis of the pedigree suggests a dominantly inherited condition. A mutation in ADAMTS17 was excluded, but a possible association between the condition and a microsatellite flanking FBN1 indicates this gene should be considered a strong candidate responsible for primary lens luxation in this pedigree. CLINICAL SIGNIFICANCE: These observations suggest an inherent zonular defect unrelated to extraneous factors. The family relationship is compatible with a possible genetic basis, and the pedigree suggests that the condition could be dominant. Data also suggest the mutation in the FBN1 gene could be responsible for primary lens luxation in this pedigree of cats.


Development and validation of a timed urinary collection system for use in the cat.

The aim of the study was to develop and validate a feline urinary collection system for accurate 24 h urine output measurement and glomerular filtration rate (GFR) evaluation. We hypothesized that precise identification of urination time improves the accuracy of the collection system. In a group of nine cats, urinary volume and micturition times were repeatedly recorded for up to 48 h using purpose-built collection trays containing a temperature data logger. Collection time was determined both with and without using the data loggers on 22 occasions and agreement between estimated 24 h urine outputs obtained with the two calculation methods was evaluated. GFR was repeatedly measured by endogenous urinary creatinine clearance on three occasions. Twenty-four-hour urine output was measured in 98.5% of the attempted collections (300 cat-sampling days). Sensitivity and specificity of the detection system were 97.8% and 100%, respectively. Mean 24 h urine output was 12.4 +/- 4.94 mL/kg/day and mean intra-cat between-days coefficient of variation (CV) was 16.6 +/- 5.6% when data loggers were used. The absolute relative volume error between the two calculation methods ranged from 0% to 131%. Median absolute relative [interquartile range] error was 9.1% [3.25-19.8]. Bias was -1.3% and lower and upper limits of agreement were -39.7% and 35.2%, respectively. Mean estimated GFR was lower than previously reported with comparable urinary clearance methods (1.92 +/- 0.37 mL/min/kg) and mean within-cat CV was 12 +/- 6.9%. The system was simple in design, readily affordable, allowed normal micturition behaviour and reduced intra-animal variability in 24 h feline urine collection.


Pharmacokinetic/pharmacodynamic modelling of robenacoxib in a feline tissue cage model of inflammation.

Pelligand, L., J. N., Toutain, P. L., Elliott, J., Lees, P. Pharmacokinetic/pharmacodynamic modelling of robenacoxib in a feline tissue cage model of inflammation. J. vet. Pharmacol. Therap. doi: 10.1111/j.1365-2885.2011.01288.x. Robenacoxib is a novel nonsteroidal anti-inflammatory drug developed for use in cats. It is a highly selective COX-2 inhibitor. Results from previous feline studies showed that, despite a short half-life in blood, the effect of robenacoxib persisted for 24 h in clinical studies. A tissue cage model of acute inflammation was used to determine robenacoxib’s pharmacokinetics and its ex vivo and in vivo selectivity for COX-1 and COX-2 using serum TxB(2) and exudate PGE(2) as surrogate markers for enzyme activity, respectively. After intravenous, subcutaneous and oral administration (2 mg/kg), the clearance of robenacoxib from blood was rapid (0.54-0.71 L/h/kg). The mean residence time (MRT) in blood was short (0.4, 1.9 and 3.3 h after intravenous, subcutaneous and oral administration, respectively), but in exudate MRT was
approximately 24 h regardless of the route of administration. Robenacoxib inhibition of COX-1 in blood was transient, occurring only at high concentrations, but inhibition of COX-2 in exudate persisted to 24 h. The potency ratio (IC(50) COX-1: IC(50) COX-2) was 171:1, and slopes of the concentration-effect relationship were 1.36 and 1.12 for COX-1 and COX-2, respectively. These data highlight the enzymatic selectivity and inflamed tissue selectivity of robenacoxib and support the current recommendation of once-daily administration.


Development and validation of a tissue cage model of acute inflammation in the cat.

Pelligand, L., House, A. K., Summers, B. A., Hatzis, A., Tivers, M., Elliott, J., Lees, P. Development and validation of a tissue cage model of acute inflammation in the cat. J. vet. Pharmacol. Therap. doi: 10.1111/j.1365-2885.2011.01308.x. Four cylindrical silicon tissue cages (TC, internal volume: 6.7 +/- 0.11 cm(3)) were inserted subcutaneously in 29 young healthy cats. A mild inflammatory reaction was induced by intracaveal injection of 1 mL of a 2% lambda-carrageenan solution. TC exudate was subsequently sampled at predetermined times (up to 120 h) to measure exudate leucocyte counts and the concentrations of protein and eicosanoids. TC remained in situ for 9-10 months and were well tolerated. Leucocyte counts peaked at 34 h (50.1 +/- 57.6 x 10(3) cells/mm(3)) and returned towards baseline after 72 h. Protein concentration increased from 26.2 +/- 2.7 g/L to a peak of 35.9 +/- 6.0 g/L at 12 h before returning to baseline at 48 h. Exudate prostaglandin (PG)E(2) concentration peaked at 24 h (11.7 +/- 13.7 ng/mL) and returned to baseline by 120 h. Repeated collection of fluid from noninjected cages did not increase transudate PGE(2). Ketoprofen (2 mg/kg, subcutaneously) suppressed exudate PGE(2) at 24 h. The carrageenan-stimulated TC model is an ethical and novel means of investigating soft tissue inflammation in the cat, in which exudate PGE(2) acts as surrogate marker of cyclooxygenase-2 activity. This model will facilitate the investigation of in vivo pharmacokinetics and pharmacodynamics of anti-inflammatory drugs in this species.


Efficacy of Procox(R) oral suspension for dogs (0.1% emodepside and 2% toltrazuril) against experimental nematode (Toxocara cati and Ancylostoma tubaeforme) infections in cats.

Two exploratory studies were performed to determine the optimum therapeutic dose of Procox((R)) for the removal of experimental infection with mature adult Toxocara (T.) cati and Ancylostoma (A.) tubaeforme in kittens. Procox((R)) is a new oral suspension containing a combination of the nematocidal and coccidiocidal active principles emodepside (0.1 %) and toltrazuril (2 %). In the first study, 18 eight-weeks-old kittens were inoculated with 450 L3 larvae of T. cati. 56 days after infection, the kittens were allocated to three treatment groups and were treated with 0.5 mg emodepside/kg body weight (group 1), 0.25 mg emodepside/kg body weight (group 2) and 0.1 mg emodepside/kg body weight (group 3), respectively. In the second study, 10 eight-weeks-old kittens were inoculated with 350 L3 larvae of A. tubaeforme. Four weeks after infection, the kittens were allocated to two treatment groups and were treated with 0.1 mg emodepside/kg body weight (group 1) or 0.25 mg emodepside/kg body weight (group 2). In both studies, all kittens received a reference treatment with Drontal((R)) (230 mg pyrantel embonate and 20 mg praziquantel per tablet) at the recommended dose of one tablet/4 kg
body weight 5 days after treatment with Procox((R)). Anthelmintic efficacy was calculated by reduction in worm numbers expelled with the faeces following treatment with Procox((R)) as compared with faecal worm numbers after reference treatment with Drontal((R)), by thus avoiding necropsy of the animals. In the T. cati study, emodepside was at 99.9 %, 100 % and 96.5 % effective at a dosage of 0.5 mg, 0.25 mg and 0.1 mg per kg body weight, respectively. Against A. tubaeforme emodepside was at 95.7 % and 100 % effective at a dosage of 0.1 mg and 0.25 mg per kg body weight. No adverse events were seen during either study. It can be concluded that Procox((R)) is efficacious for the control of mature adult T. cati and A. tubaeforme infections in cats at a single-dose rate of 0.25 mg emodepside/kg body weight.


Efficacy of emodepside/toltrazuril suspension (Procox(R) oral suspension for dogs) against mixed experimental Isospora felis/Isospora rivolta infection in cats.

The coccidia Isospora felis and Isospora rivolta are intestinal parasites occurring worldwide in domestic cats. In young cats, they can be detected with higher prevalence. The effects of toltrazuril in the new combination product Procox((R)) oral suspension for dogs containing 0.1 % emodepside and 2 % toltrazuril (0.9 mg emodepside + 18 mg toltrazuril per ml) were studied in eighteen kittens experimentally infected each with a total of 1 x 10(5) oocysts of a mixture of Isospora felis and Isospora rivolta. In the infectious material, the quantitative relation of I. felis and I. rivolta was about 1:5. Following a three-days period after infection, two groups of 6 kittens were treated during the prepateent period with either a single dose of 0.45 mg emodepside + 9 mg toltrazuril/kg body weight or 0.9 mg emodepside + 18 mg toltrazuril/kg body weight. A group of six kittens without any treatment served as a control. On day 5 post infection, the untreated kittens started the excretion of oocysts. Treatment with both toltrazuril doses significantly reduced oocyst excretion. Following the single higher dose, the reduction of oocysts of both Isospora spp. was more pronounced (96.7 % to 100 %) in comparison to the lower dose (57.2 % to 100 %). The Procox((R)) application was well tolerated and no adverse events were seen with any of the applied dosages. When administered to kittens and as a single treatment during the prepateent period, Procox((R)) is suitable to control the number of oocysts excreted in the faeces in case of an Isospora felis and Isospora rivolta infection.


OBJECTIVE: To evaluate outcomes of radical excision of feline injection-site sarcomas (ISS) via assessment of local recurrence and metastasis rates, survival times, and complications associated with surgery. DESIGN: Retrospective case series. ANIMALS: 91 cats with ISS. PROCEDURES: Medical records of cats that had radical excision of ISS without adjunctive treatment were reviewed. Information extracted included sex, type of surgical procedure, histologic tumor grade, tumor diameter, time from tumor detection to definitive surgery, complications associated with surgery, whether tumors recurred locally or metastasized, and survival times. Diagnosis of ISS was histologically confirmed, and additional follow-up was performed. RESULTS: Overall median survival time was 901 days. Thirteen of 91 (14%) cats had local tumor recurrence; 18 (20%) cats had evidence of metastasis after
surgery. Median survival time of cats with and without recurrence was 499 and 1,461 days, respectively. Median survival time of cats with and without metastasis was 388 and 1,528 days, respectively. Tumor recurrence and metastasis were significantly associated with survival time, whereas other examined variables were not. Major complications occurred in 10 cats, including 7 with incisional dehiscence. CONCLUSIONS AND CLINICAL RELEVANCE: Radical excision of ISS resulted in a metastasis rate similar to rates reported previously; the local recurrence rate appeared to be substantially less than rates reported after less aggressive surgeries, with or without adjuvant treatment. Major complication rates were similar to rates reported previously after aggressive surgical resection of ISS. Radical excision may be a valuable means of attaining an improved outcome in the treatment of feline ISS.


**Vitamin D-dependent non-type 1, non-type 2 rickets in a 3-month-old Cornish Rex kitten.**

CASE PRESENTATION AND ASSESSMENT: A 3-month-old female Cornish Rex kitten was found to have non-painful swelling of the carpal and tarsal regions when presented for routine neutering. The kitten was smaller in stature and less active than its siblings and, according to the owner, had a bunny-hopping gait, was reluctant to climb stairs and strained during defecation. Radiography of the affected limbs and a subsequent radiographic survey of the entire skeleton demonstrated features consistent with rickets. The three littermates were clinically and radiographically normal. As a nutritionally complete diet was being fed, it seemed most likely that the kitten had an inborn error related to vitamin D metabolism. Serum biochemistry demonstrated reduced total alkaline phosphatase activity and increased concentrations of parathyroid hormone. Concentrations of 1,25- and 25-hydroxycholecalciferol were markedly reduced, confirming the diagnosis of rickets. TREATMENT: The kitten was treated with calcitriol, administered orally once daily, and improved rapidly both clinically and radiologically. Serial laboratory studies suggested that the error in vitamin D metabolism was transient, and, at the time of writing, as an adult, the cat appears to require no ongoing replacement calcitriol therapy. CLINICAL RELEVANCE: This case emphasises the value of examining a full ‘calcium profile’ via a human or veterinary reference laboratory, and a favourable prognosis in some kittens with rickets makes such investigations worthwhile. Even when finances preclude detailed investigation, trial therapy using a nutritionally complete diet and physiological doses of calcitriol or cholecalciferol is inexpensive and can produce a good response.


**Partial scapulectomy for treatment of an articular fracture of the scapula in a cat.**

A seven-month-old cat was referred, after having been missing for one week, for evaluation and treatment of a right forelimb injury and facial fractures. On physical examination, a moderate partial weight-bearing lameness of the right forelimb was present, with palpable crepitus in the glenohumeral joint. Dental radiographs revealed a midline palatal fracture and rostral fractures of the left maxillary canine alveolar bone. Radiographs of the right shoulder revealed a Type III or intra-articular fracture of the scapula with moderate displacement of the fracture at the articular surface. Early fibrous healing of the fracture was observed and the caudal aspect of the medial glenohumeral ligament was ruptured.
Due to the chronicity, reduction and stabilization was not attempted. Instead, the caudal aspect of the medial glenohumeral ligament was incised along its origin and approximately 30% of the glenoid was removed. The caudal glenohumeral ligament was attached to the subscapularis muscle. Three years after surgery, the owner reported that the cat continued to experience no visible lameness and led an active lifestyle. This case report demonstrates that a partial caudal scapulectomy can result in full return of function of the forelimbs in cats with scapular fractures, especially when joint involvement is severe and the articular cartilage is affected. To the authors’ knowledge, this is the first report of a partial scapulectomy, utilized for fracture management, in the veterinary literature.


**Magnetic resonance imaging findings in 15 acromegalic cats.**

Feline acromegaly is characterized by chronic excessive growth hormone secretion, most commonly caused by a functional pituitary adenoma. In this study, acromegaly was diagnosed in 15 cats on the basis of compatible clinical signs, laboratory, and magnetic resonance imaging (MRI) findings. MRI findings were reviewed retrospectively. Enlargement of the pituitary gland with suprasellar extension was present in all cats. No characteristic signal patterns were identified on T1-weighted and T2-weighted sequences. Contrast enhancement was nonuniform in all cats, as was suspected involvement of the adjacent hypothalamus. A mass effect on the cavernous sinus and third ventricle was present in 13 cats. Mild peritumoral edema was present in four cats, and moderate edema in one cat. Transtentorial herniation was present in one cat. Histopathology confirmed the presence of a pituitary adenoma in two cases. MRI is a useful modality to establish the diagnosis of acromegaly.


**Studies on the pharmacokinetics and pharmacodynamics of mirtazapine in healthy young cats.**

Mirtazapine pharmacokinetics was studied in 10 healthy cats. Blood was collected before, and at intervals up to 72 h after, oral dose of 3.75 mg (high dose: HD) or 1.88 mg (low dose: LD) of mirtazapine. Liquid chromatography coupled to tandem mass spectrometry was used to measure mirtazapine, 8-hydroxymirtazapine and glucuronide metabolite concentrations. Noncompartmental pharmacokinetic modeling was performed. Median half-life was 15.9 h (HD) and 9.2 h (LD). Using Mann-Whitney analysis, a statistically significant difference between the elimination half-life, clearance, area under the curve (AUC) per dose, and AUC(infinity) /dose of the groups was found. Mirtazapine does not appear to display linear pharmacokinetics in cats. There was no significant difference in glucuronidated metabolite concentration between groups. Pharmacodynamics was studied in 14 healthy cats administered placebo, LD and HD mirtazapine orally once in a crossover, blinded trial. In comparison with placebo, cats ingested significantly more food when mirtazapine was administered. No difference in food ingestion was seen between HD and LD, but significantly more behavior changes were seen with the HD. Limited serum sampling during the pharmacodynamic study revealed drug exposure comparable with the pharmacokinetic study, but no correlation between exposure and food consumed. Mirtazapine (LD) was administered daily for 6 days with no drug accumulation detected.
Evaluation of the effects of hospital visit stress on physiologic parameters in the cat.

Physiologic parameters such as blood pressure, rectal temperature, heart rate, and respiratory rate are an important part of the medical assessment of a patient. However, these factors can potentially be affected by stress. The purpose of this study was to compare physiologic parameter data gathered from cats in the home environment with those gathered in a veterinary hospital. Thirty healthy cats were evaluated both at home and at Colorado State University’s Veterinary Medical Center. Doppler systolic blood pressure, temperature, heart rate, and respiratory rate were recorded, and the differences between the values obtained in the home and veterinary clinic environments were evaluated using the Wilcoxon sign rank test. A significant difference was found in blood pressure, heart rate, and respiratory rate between the home and veterinary hospital environments. This information may help practitioners recognize that physiologic abnormalities can sometimes be due to transportation or environmental stress rather than medical illness.

The pharmacokinetics of mirtazapine in cats with chronic kidney disease and in age-matched control cats.

BACKGROUND: Cats with chronic kidney disease (CKD) often experience inappetence, and may benefit from administration of mirtazapine, an appetite stimulant. The pharmacokinetics of mirtazapine in CKD cats is unknown. HYPOTHESIS: CKD delays the clearance/bioavailability (CL/F) of mirtazapine. ANIMALS: Six CKD cats and 6 age-matched controls (AMC) were enrolled. Two CKD cats each from International Renal Interest Society (IRIS) stage II, III and IV were included. METHODS: Blood samples were collected before and 0.5, 1, 1.5, 2, 4, 8, 24, and 48 hours after a single PO dose of 1.88 mg of mirtazapine. Mirtazapine concentrations were measured by liquid chromatography coupled to tandem mass spectrometry. Non-compartmental pharmacokinetic modeling was performed. RESULTS: Mean age was 11 years (CKD cats) and 10.8 years (AMC cats). Mean serum creatinine concentration +/- standard deviation (SD) was 3.8 +/- 1.6 mg/dL (CKD) and 1.3 +/- 0.4 mg/dL (AMC). Mean half-life +/- SD was 15.2 +/- 4.2 hours (CKD) and 12.1 +/- 1.1 hours (AMC). Mean area under the curve (AUC) +/- SD was 770.6 +/- 225.5 ng/mL*hr (CKD) and 555.5 +/- 175.4 ng/mL*hr (AMC). Mean CL/F +/- SD was 0.6 +/- 0.1 L/hr/kg (CKD) and 0.8 +/- 0.16 L/hr/kg (AMC). A Mann-Whitney test indicated statistically significant differences in AUC (P = 0.01) and CL/F (P = 0.04) between groups. Calculated accumulation factor for 48-hour dosing in CKD cats was 1.15. CONCLUSION: CKD may delay the CL/F of mirtazapine. A single low dose of mirtazapine resulted in a half-life compatible with a 48-hour dosing interval in CKD cats.
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.


Comparative study of IFNgamma and antibody tests for feline tuberculosis.

This study describes the comparison of the cell-based interferon-gamma (IFNgamma) test with serological rapid antibody tests (STAT-PAK and DPP VetTB) for the ante mortem testing of tuberculosis in domestic cats. The antibody specificities of rapid antibody test-positive cats were further discerned using multi-antigen print immunoassay. A total of 62 cats with culture-confirmed Mycobacterium bovis, Mycobacterium microti, Mycobacterium avium and Mycobacterium malmoense, as well as negative controls and dangerous-contact cats were tested. Tests were also applied longitudinally to one further cat undergoing TB chemotherapy for suspected M. bovis infection. Our data from this small study show excellent test specificity (100% for all tests) and encouraging levels of test sensitivity for M. bovis and TB Complex infections (IFNgamma 70-100% depending upon test interpretation criteria; rapid tests both 90% for M. bovis infection and up to 46.2% for M. microti infection). The differential diagnosis of very pathogenic TB Complex (M. bovis, Mycobacterium tuberculosis), as opposed to less-pathogenic TB Complex (M. microti) was possible where positive responses to the protein cocktail ESAT6/CFP10 were observed (80% of M. bovis-infected cats in this study showed positive IFNgamma responses to ESAT6/CFP10, while 20% had antibody responses to ESAT6/CFP10 using MAPIA). Finally, preliminary data from a longitudinal study of one M. bovis-exposed cat with a positive IFNgamma test pre-treatment suggest that a decrease in bacterial burden may be reflected in the IFNgamma response, and thus the IFNgamma test may provide a monitor for TB chemotherapy.


Is treatment of feline hypertrophic cardiomyopathy based in science or faith? A survey of cardiologists and a literature search.

PRACTICAL RELEVANCE: Feline hypertrophic cardiomyopathy (HCM) is the most common cardiac disease of cats. Treatment of HCM is usually directed at controlling signs of congestive heart failure (CHF), preventing occurrence or recurrence of systemic thromboembolism or delaying/preventing/reversing progression of subclinical disease. STUDY OBJECTIVE AND DESIGN: Despite the laudable goals of therapy, however, little objective evidence supporting therapeutic decisions has been published. We, therefore, hypothesized that cardiologists base their treatment strategies on information other than published clinically relevant science. To gain insight into therapeutic decisions that cardiologists and clinicians with an interest in cardiology (n=99) make for
cats with HCM, and on what information they base these decisions, we presented participants with, and asked them to select therapy for, 12 hypothetical scenarios of HCM (+/- CHF). Responses and justifications for treatment choices were compiled and compared with the results of a comprehensive literature search for published information about treatment of feline HCM. FINDINGS: Evaluation of the therapeutic strategies chosen for these hypothetical cases of HCM suggests that cardiologists or clinicians with a strong interest in cardiology often prescribe treatments knowing that little documented evidence supports their decisions.


**Parasite meningomyelitis in cats in Uruguay.**

Two outbreaks of progressive hind limb paresis in cats (Felis catus) caused by parasitic meningomyelitis in Uruguay are reported. The case studies occurred in 2008 and 2009 respectively, in the rural areas of Fray Bentos (33 degrees 07’ 40.39’’ S) and were characterized by hindquarter paralysis. This paralysis was progressive and had a chronic progression of approximately 12 months until the death or euthanasia of the animals. Clinical symptoms started with ataxia of the hindquarters with lateral side-to-side swaying and culminated in total paralysis. Two animals were sent for necropsy in 2009. The main histopathological findings were severe myelitis in the lumbar spinal cord with perivascular cuffing and white matter necrosis, severe nonsuppurative meningitis with thrombi in subarachnoid blood vessels, and intravascular presence of multiple adult parasites. From the morphological characteristics of the parasites and location in the leptomeninges, the parasite was identified as the nematode Gurltia paralysans.


**Science, faith or something else?**


**Symptomatic Capillaria plica infection in a young European cat.**

An 8-month-old owned European cat showing abdominal pain, fever, distended painful bladder and urinary blockage was presented. Intravenous fluids were immediately administered and, after sedation, a urinary catheter was applied. Blood and urine analysis revealed cystitis and a moderate-to-severe degree of renal failure. About 20 thread-like nematodes, identified as Capillaria plica larvae and fragments of adult stages, were found in the urine sediment. After treatment with an oral formulation of fenbendazole at 25mg/kg q 12h for 10 days, urinary signs and bladder worms disappeared. Cases of Capillaria species bladder worms in cats are rarely reported and most infected cats show no clinical signs, presumably because of a low parasite burden. In the present study, feline capillariosis was associated to urethral obstruction, severe difficulties in urination, cystitis and renal failures.

Results of molecular diagnostic assays targeting feline herpesvirus-1 and feline calicivirus in adult cats administered modified live vaccines.

In this pilot study, 12 adult, gang-housed cats that were known to be previously exposed (n=12) to feline herpesvirus-1 (FHV-1) and/or vaccinated against (n=2) feline calicivirus (FCV) and FHV-1 were randomly assigned to one of two groups of six cats each. Nasal and pharyngeal samples were collected from each cat on days -7, -3, and 0 prior to vaccination and on days 3, 7, 10, 14, 17, 21, and 28 after vaccination with an FHV-1, FCV, and panleukopenia (FVRCP) vaccine developed for intranasal (six cats) or parenteral (six cats) use. FHV-1 DNA was amplified from 1/12 cats (1/69 samples; 1.4%) prior to vaccination and 2/12 cats after vaccination (2/154 samples; 1.3%). FCV RNA was amplified from 2/12 cats (2/69 samples; 2.9%) prior to vaccination and 7/12 cats (12/154 samples; 7.8%) after vaccination. Positive molecular diagnostic assay results for FHV-1 and FCV were uncommon prior to or after vaccination in these cats.


Transvesicular percutaneous cystolithotomy for the retrieval of cystic and urethral calculi in dogs and cats: 27 cases (2006-2008).

OBJECTIVE: To describe the use of transvesicular percutaneous cystolithotomy for the retrieval of cystic and urethral calculi and to report the outcome in dogs and cats. DESIGN: Retrospective case series. ANIMALS: 23 dogs and 4 cats. PROCEDURES: Medical records were reviewed for signalment, procedure time, stone number, stone location, pre- and postoperative radiographs, procedure-associated complications, and short-term outcome. A ventral midline approach was made into the abdomen over the urinary bladder apex. A screw cannula was inserted at the bladder apex for normograde rigid and flexible cystourethroscopy. All uroliths were removed via a stone basket device and retrograde flushing and suction. Long-term follow-up (1 year after surgery) information was obtained by telephone or e-mail contact with owners. RESULTS: 27 animals with cystic and urethral calculi were included. Median patient weight was 8.3 kg (18.3 lb; range, 1.8 to 42.6 kg [4.0 to 93.7 lb]). Urolith number ranged from 1 to > 35 (median, 7). Urolith size ranged from < 1 to 30 mm (median, 4.5 mm). Fifteen of the 27 animals had a previous cystotomy (range, 1 to 5 procedures). Median procedure time was 66 minutes (range, 50 to 80 minutes). All patients were discharged within 24 hours. No postoperative complications were reported at the time of suture removal. At the time of long-term follow-up, the 22 clients that could be contacted were satisfied with the procedure. CONCLUSIONS AND CLINICAL RELEVANCE: Transvesicular percutaneous cystolithotomy may decrease the need for urethrotomy, serial transurethral endoscopic procedures, and abdominal insufflation associated with other minimally invasive interventions currently available. This procedure also provided excellent visualization for bladder and urethral luminal inspection.


A randomized, blinded, controlled trial of the antiemetic effect of ondansetron on dexmedetomidine-induced emesis in cats.

OBJECTIVE: To determine the effect of ondansetron on the incidence of vomiting in cats pre-medicated with dexmedetomidine and buprenorphine. STUDY DESIGN: Randomized, blinded,
controlled trial. ANIMALS: Eighty-nine female domestic shorthair cats, aged 3-60 months (median, 12 months) and weighing 1.2-5.1 kg. METHODS: Each cat received dexmedetomidine (40 mug kg(-1)) plus buprenorphine (20 mug kg(-1)), intramuscularly as pre-anesthetic medication. Cats were assigned to three treatment groups: ondansetron (0.22 mg kg(-1), intramuscular [IM]), either 30 minutes before the pre-anesthetic medication (ONDA group, n = 31) or with the pre-anesthetic medication (OPM group, n = 30) mixed with the pre-anesthetic medications in the same syringe, or not to receive the antiemetic (control group, n = 28). Emesis was recorded as an all-or-none response. The number of episodes of emesis and the time until onset of the first emetic episode were recorded for each cat. Clinical signs of nausea were recorded whenever they occurred, and a numerical rating scale was used to quantify these signs. Data were analyzed using Kruskal-Wallis and Chi-square test; a Bonferroni correction was made for six comparisons; thus, the two-sided p for significance was 0.05/6 = 0.008. RESULTS: There was a significant reduction in the number of cats vomiting, in the episodes of vomiting/cat, the time elapsed between the premedication and the first vomiting and the severity of nausea in the OPM group compared to the ONDA and control groups. CONCLUSIONS AND CLINICAL RELEVANCE: In cats, the administration of ondansetron (0.22 mg kg(-1)) ameliorates and reduced the severity of dexmedetomidine-induced nausea and vomiting only when it was administered in association with this drug.


Efficacy of a 0.0584% hydrocortisone aceponate spray in presumed feline allergic dermatitis: an open label pilot study.

This study evaluated the efficacy of a 0.0584% hydrocortisone aceponate (HCA) spray (Cortavance(R); Virbac SA) in 10 cats with presumed allergic dermatitis. The cats initially received two sprays/100 cm(2) of skin once daily. Clinical lesions (a Feline Dermatitis Extent and Severity Index; FeDESI), pruritus (10 cm visual analog scale with grade descriptors) and owner assessments of efficacy, tolerance and ease of use (from 1 = very poor to 5 = excellent) were assessed every 14 days. The frequency of treatment was reduced after day 28 in cats with a >50% reduction in FeDESI and pruritus scores. One cat was lost to follow up at day 28 and two at day 42. Intention-to-treat data were analysed. The FeDESI [mean (SD): day 0, 42.2 (15.7) and day 56, 9.9 (11.7); P < 0.0001] and pruritus scores [day 0, 61.2 mm (20.1) and day 56, 14.6 mm (16.1); P < 0.0001] significantly decreased throughout the trial. The owner scores for tolerance [median (range): day 14, 4 (1-5) and day 56, 4 (3-5); P = 0.003] and ease of administration [day 14, 3 (2-5) and day 56, 4 (2-5); P = 0.02] significantly increased during the trial, but there was no significant change in efficacy scores [day 14, 4 (3-5) and day 56, 4 (2-5); P = 0.5]. There were no adverse effects attributable to the HCA spray, no significant changes in weight [mean (SD): day 0, 5.0 kg (1.4) and day 56, 5.0 kg (1.6); P = 0.51] and no significant changes in haematology, biochemistry or urinalysis (n = 4). Six cats required every-other-day treatment and four required daily treatment. In conclusion, HCA spray appeared to be effective and safe in these cats, although it is not licensed for use in this species.

Scorza, A. V., C. Duncan, L. Miles, and M. R. Lappin (2011) Vet Parasitol

Prevalence of selected zoonotic and vector-borne agents in dogs and cats in Costa Rica.

To estimate the prevalence of enteric parasites and selected vector-borne agents of dogs and cats in San Isidro de El General, Costa Rica, fecal and serum samples were collected from animals voluntarily
undergoing sterilization. Each fecal sample was examined for parasites by microscopic examination after fecal flotation and for Giardia and Cryptosporidium using an immunofluorescence assay (IFA). Giardia and Cryptosporidium IFA positive samples were genotyped after PCR amplification of specific DNA if possible. The seroprevalence rates for the vector-borne agents (Dirofilaria immitis, Borrelia burgdorferi, Ehrlichia canis, and Anaplasma phagocytophilum) were estimated based on results from a commercially available ELISA. Enteric parasites were detected in samples from 75% of the dogs; Ancylostoma caninum, Trichuris vulpis, Giardia, and Toxocara canis were detected. Of the cats, 67.5% harbored Giardia spp., Cryptosporidium spp., Ancylostoma tubaforme, or Toxocara cati. Both Cryptosporidium spp. isolates that could be sequenced were Cryptosporidium parvum (one dog isolate and one cat isolate). Of the Giardia spp. isolates that were successfully sequenced, the 2 cat isolates were assemblage A and the 2 dog isolates were assemblage D. D. immitis antigen and E. canis antibodies were identified in 2.3% and 3.5% of the serum samples, respectively. The prevalence of enteric zoonotic parasites in San Isidro de El General in Costa Rica is high in companion animals and this information should be used to mitigate public health risks.


Bacterial and fungal colonisation of peripheral intravenous catheters in dogs and cats.

Objectives: The purposes of this study were to determine the prevalence of intravenous catheter colonisation in a routine clinical setting, to identify pathogens involved and to explore factors associated with an increased risk of colonisation. Methods: A prospective study of 100 peripherally placed intravenous catheters from 13 cats and 78 dogs was conducted. The distal two-thirds were removed and submitted for bacterial and fungal cultures. Antimicrobial susceptibility of each isolate was determined. Results: Nineteen peripheral catheters were positive for microbiologic culture from 14 animals. Twenty organisms were isolated among which Staphylococcus species was the most common. Isolates displayed lower levels of resistance against the antimicrobial agents amoxicillin-clavulanate, cephalosporins and gentamicin than against other agents tested. Major risk factors predisposing to catheter-related colonisation included dextrose infusion, duration of catheter placement, local complications and immunosuppressive diseases or drugs. Clinical Significance: In a routine clinical setting, the prevalence of microbial colonisation of peripheral intravenous catheters is comparable to that found in an intensive care unit. However, consequences on morbidity and mortality rates differ.


Intravenous administration of docetaxel to cats with cancer.

BACKGROUND: The safety of i.v. administration of docetaxel to cats with cancer has not been reported. OBJECTIVES: Document adverse effects of i.v. administration of docetaxel to cats. ANIMALS: Twenty-one client-owned cats with any confirmed malignancy. METHODS: Cats received up to 5 docetaxel treatments, administered i.v. every 3 weeks. The initial dosage was 1.0 mg/kg, and dosages were increased by increments of 0.25 mg/kg in cohorts of 3 cats. Adverse events were determined by a CBC at days 7 and 21, serum chemistry and urine specific gravity at day 21, and medical histories provided by the owners. RESULTS: Cats received docetaxel dosages ranging from 1.0 to 2.5 mg/kg, for a median of 2 treatments. Dose-limiting toxicoses included fever, neutropenia, and vomiting, seen in 2 of the 4 cats treated at 2.5 mg/kg. Hypersensitivity reactions were infrequent (4 of the 21 cats) and mild. The maximum tolerated dosage was 2.25 mg/kg. CONCLUSIONS AND
CLINICAL IMPORTANCE: Docetaxel can be administered i.v. to cats with a low incidence of adverse effects.


Influence of care of domestic carnivores on their predation on vertebrates.

Domestic dogs (Canis familiaris) and cats (Felis catus) are the most abundant mammalian carnivores worldwide. Given that domestic carnivores rely on human-provided food, their densities are usually independent of prey densities. Nevertheless, underfed pets may need to hunt to meet their energetic and nutritional requirements. We explored the effects of different levels of care (provision of food) of dogs and cats on their predation rates on wild vertebrates in 2 areas of southern Chile. We interviewed cat and dog owners and analyzed prey remains in scats of pets to examine how domestic dogs and cats were managed and to gather information on the wild vertebrates killed and harassed by pets. We used logistic regression to examine the association between pet care and the frequency of wild vertebrate remains in scats. The probability of a dog preying on vertebrates was higher for poorly fed than for adequately fed dogs (odds ratio = 3.7) and for poorly fed than for adequately fed cats (odds ratio = 4.7). Domestic dogs and cats preyed on most endemic and threatened mammals present in the study sites. Our results provide support for the hypothesis that the less care domestic animals receive from owners the higher the probability those animals will prey on wild vertebrates.


The cat flea (Ctenocephalides f. felis) is the dominant flea on domestic dogs and cats in Australian veterinary practices.

This study was undertaken to determine the flea diversity on urban dogs and cats in Australia in 2009-2010. A total of 2530 fleas were recovered from 291 animals (151 dogs, 69 cats and 71 uncategorised dogs or cats) from veterinary clinics across five states of Australia. The majority of specimens were from coastal areas. The cat flea (Ctenocephalides felis felis) was the most frequent flea species identified (98.8%, 2500/2530). The only other flea species identified was the stickfast flea (Echidnophaga gallinacea) from Western Australia. Sequencing of the cytochrome oxidase subunit II mtDNA revealed a single haplotype across Australia within a subset of C. f. felis (n=19). Our study demonstrated dominance and haplotype homogeneity of C. f. felis on dogs and cats. Although Ctenocephalides canis was recovered from a feral fox, it was not identified from the sample of fleas analysed. This suggests that, under current conditions, it is unlikely that foxes are reservoirs of C. canis for domestic dogs or cats residing in coastal Australia, as previously speculated.


Helicobacter heilmannii sp. nov., isolated from feline gastric mucosa.

Three Gram-negative, microaerophilic bacteria with a corkscrew-like morphology isolated from the gastric mucosa of cats and designated ASB1(T), ASB2 and ASB3, were subjected to a polyphasic
taxonomic study. The isolates grew on biphasic culture plates in microaerobic conditions at 37 degrees C and exhibited urease, oxidase and catalase activity. They were also able to grow in colonies on dry agar plates. Based on 16S rRNA gene sequence analysis, ASB1(T), ASB2 and ASB3 were identified as members of the genus Helicobacter and showed 98 to 99% sequence similarity to H. felis, H. bizzozeronii, ‘Candidatus H. heilmannii’, H. cynogastricus, H. baculiformis and H. salomonis, six related Helicobacter species previously detected in the feline or canine gastric mucosa. Sequencing of the partial hsp60 gene demonstrated that ASB1(T), ASB2 and ASB3 constitute a separate taxon among the feline and canine Helicobacter spp. The urease gene sequences of ASB1(T), ASB2 and ASB3 showed approximately 91% similarity to the urease gene sequences of ‘Candidatus Helicobacter helimannii’. Protein profiling, the absence of alkaline phosphatase activity and several other biochemical characteristics also allowed to differentiate the strains ASB1(T), ASB2 and ASB3 from other Helicobacter species of feline or canine gastric origin. The results of this polyphasic taxonomic study show that the cultured isolates constitute a new taxon corresponding to ‘Candidatus Helicobacter helimannii’ previously demonstrated in the stomach of humans, wild felidae, cats and dogs. The name Helicobacter helimannii sp. nov. is proposed for these new isolates. The type strain is ASB1(T) (=DSM 24751(T) =LMG 26292(T)).


**Perioperative Complications after Full-Thickness Gastrointestinal Surgery in Cats with Alimentary Lymphoma.**

Objective: To determine perioperative risk factors for complications that occur before hospital discharge after gastrointestinal (GI) surgery in cats with alimentary lymphosarcoma (LSA). Study Design: Case series. Animals: Cats (n=70) with a histopathologically confirmed diagnosis of alimentary LSA that had full-thickness GI surgery. Methods: Medical record data (February 1996-March 2009) from 3 academic referral centers were reviewed. Retrieved data included signalment, preoperative clinical signs and laboratory findings, perioperative medications administered, type and location of GI surgery performed and outcome until hospital discharge. Results: In 38 surgeries, intestinal resection and anastomosis was performed. Gastrotomy and/or enterotomy was performed in 53 surgeries. A preoperative serum albumin concentration <2.5 g/dL was recorded for 11 cases. There was no clinical evidence of postoperative leakage from any biopsy or anastomosis site. Postoperative complications that occurred before hospital discharge included: anorexia or decreased appetite (n=8), hyperthermia (3), pancreatitis (1) and constipation (1). Conclusions: Cats with alimentary LSA do not appear to be at high risk of postoperative dehiscence after full-thickness GI surgery.


**Suspected epidural morphine analgesia induced chronic urinary and bowel dysfunction in a cat.**

A 12-year-old male castrated domestic shorthair developed chronic urinary retention, constipation and a decreased perineal reflex following a single lumbo-sacral epidural injection of morphine during general anesthesia. Similar adverse effects have been reported in humans following epidural analgesia, but this is the first reported case of both urinary and bowel dysfunction in a cat purportedly from an epidural. The cat was medically managed with manual bladder expressions, intermittent enemas, and various medications including bethanechol, cisapride and stool softeners. The cat continues to have long-term neurologic dysfunction 15 months post-onset. This case report describes a rare but serious
potential risk of lumbo-sacral epidural injections in cats.


Meticillin-resistant strains of Staphylococcus pseudintermedius in companion animals.


Therapeutic and Adverse Effects of Flunixin-Meglumine in Adult and Young Cats.

In this study, we elucidated the difference in nonsteroidal anti-inflammatory drug sensitivities between young and adult cats on therapeutic and adverse effects. In the prevention of lipopolysaccharide (LPS)-induced hyperthermia using flunixin-meglumine, young (<3 months old) and adult (>12 months old) cats of both sexes were given LPS (0.3 mug/kg, i.v.), and body temperature was measured 24 hr later. Flunixin (1 mg/kg, s.c.) was administered 30 min before the LPS injection. LPS-induced hyperthermia was almost completely inhibited by pre-treatment with flunixin in both adult and young cats. In addition, flunixin showed almost the same antipyretic effects in both young and adult cats. The animals were administered flunixin (1 mg/kg, s.c.) once a day for 3 days, and sacrificed 24 hr later to examine the gastrointestinal mucosal lesions. In adult cats, flunixin caused many severe lesions in the small intestine. In contrast, very few gastrointestinal lesions were produced by flunixin in young cats. In the pharmacokinetics of flunixin, plasma concentrations of flunixin were analysed using a high performance liquid chromatography. There were no significant differences in plasma concentration of flunixin between young and adult cats from 0.5 to 4 hr after the injection. These results demonstrated that NSAIDs could be used more safely in young than in adult cats from the points of gastrointestinal adverse effects. Furthermore, this difference in gastrointestinal lesions between adult and young cats was not related with the plasma concentration of flunixin.


Safety and palatability of polyethylene glycol 3350 as an oral laxative in cats.

Recurrent constipation is a common problem in cats. Laxatives often are the cornerstone for management of recurrent constipation; however, there is a paucity of published research on laxative use in cats. This study investigated the safety and palatability of polyethylene glycol (PEG3350) in normal cats. All cats consumed the PEG3350 laxative for 4 weeks without changes in weight or food intake. In all cats soft stools were achieved. Effective doses varied widely in experimental cats, so individualized dosing is important. Mild, non-clinical hyperkalemia was noted although the cause is unknown.


Adiponectin profiles are affected by chronic and acute changes in carbohydrate intake in healthy cats.
Adiponectin is a key adipokine that regulates carbohydrate and lipid metabolism. It circulates in stable low (LMW) and high molecular weight (HMW) forms. The aims of this study were to characterize baseline adiponectin profiles (total, LMW and HMW multimers) in healthy cats and to assess the effects of varying dietary carbohydrate content on adiponectin profiles. Cats were maintained on a diet with moderate carbohydrate content (37% metabolisable energy [ME]) for 4 weeks and then randomly allocated to either a low carbohydrate (19% ME) or high carbohydrate (52% ME) diet for 4 weeks. Fasting and postprandial plasma adiponectin profiles were measured by ELISA and sucrose gradient/Western blot. After consuming the moderate carbohydrate diet for 4 weeks, fasting total, HMW and LMW plasma adiponectin concentrations were 5.0+/-.0.6, 2.5+/-.0.5 and 2.6+/-.0.2 mg/mL, respectively. After changing to the low carbohydrate diet, fasting total adiponectin was unchanged but HMW adiponectin increased and LMW adiponectin decreased. No significant postprandial changes were observed. Cats consuming the high carbohydrate diet had increased fasting total and LMW adiponectin with no change in HMW adiponectin. In the postprandial state total adiponectin was reduced and there was a trend towards a decrease in HMW (p=0.086) but not LMW multimers. These data indicate that feline adiponectin multimer profiles are similar to those reported in other species and demonstrate that changes in plasma adiponectin occur in response to chronic and acute carbohydrate intake and these reflect differential changes in adiponectin multimers.


**Epidemiologic trends of rabies in domestic animals in southern Thailand, 1994-2008.**

Rabies and associated risk factors in dogs, cats and cattle (n = 3,454) in southern Thailand during 1994-2008 were evaluated by using a mixed-effect logistic regression model. Overall prevalence was 48%. In dogs, odds of being rabid were 1.7 times higher in unvaccinated dogs than in vaccinated dogs and two times higher in dogs with bite history than in dogs with no known bite history. Similarly, aggressive dogs were more likely to be rabid than non-aggressive dogs. In cattle, aggression, pharyngeal paralysis, hyperactivity, and depression were clinical signs associated with being rabid. Annual fluctuations of the species-specific prevalence of rabies is suggestive of a positive correlation between canine and either feline (r = 0.60, P = 0.05) or bovine rabies (r = 0.78, P = 0.004). Insufficient vaccination coverage led to maintenance of rabies, which could be easily controlled by increased vaccine coverage and public education.


**The diagnostic significance of the plasma N-terminal pro-B-type natriuretic Peptide concentration in asymptomatic cats with cardiac enlargement.**

We evaluated the diagnostic significance of the N-terminal pro-B-type natriuretic peptide (NT-proBNP) concentration in asymptomatic cats with cardiac enlargement. The plasma NT-proBNP concentration was measured in 21 clinically healthy control cats, and 67 asymptomatic cats with cardiac enlargement defined as end-diastolic interventricular septum thickness (IVSd) and/or diastolic left ventricular posterior wall thickness (LVPWd) >0.6 cm, vertebla heart scale (VHS) >7.8, and/or left atria/aorta ratio (LA/Ao) >1.5. The plasma NT-proBNP concentration in the asymptomatic cats with cardiac enlargement (median: 662.0, range: 24.0-2,449.0 pmol/l) was significantly higher than that in the controls (24.0, 24.0-95.0 pmol/l, P<0.001). The plasma NT-proBNP concentration was significantly correlated with the VHS, LA/Ao, IVSd and LVPWd (r=0.578, P<0.001; r=0.462, P<0.001; r=0.563,
P<0.001; and r=0.764, P<0.001, respectively). Receiver operating characteristic analysis showed a cut-off value of 95.0 pmol/l for the detection of asymptomatic cats with cardiac enlargement, sensitivity and specificity of 88.1 and 100%, respectively, and an area under the curve of 0.971. These results suggest that the determination of the plasma NT-proBNP concentration can be a useful screening test for asymptomatic cats with cardiac enlargement.


Artificial insemination with cryopreserved sperm from feline epididymides stored at 4 degrees C.

Recovering and storing sperm from the epididymides of males of rare felidae is useful for preserving the species. The objective of the present study was to determine pregnancy rates following artificial insemination (AI) of frozen-thawed epididymal sperm, which were cryopreserved following low-temperature storage of the epididymides. In this study, these sperm were used for unilateral intrauterine AI (UIUAI) or unilateral intratubal AI (UITAI) using 40 x 10⁶ and 10 x 10⁶ sperm, respectively. The caudal epididymides of 17 cats were stored at 4 degrees C for 24 h after castration. Artificial insemination of seven female cats was performed on Days 3 or 4 (start of estrus = Day 1) by UIUAI, 20 h after injection of 100 IU hCG to induce ovulation. Furthermore, UITAI at 24 h (UITAI-24) or 30 h (UITAI-30) after hCG were also done (five cats per group). It was noteworthy that AI by UIUAI and UITAI-24 was performed before ovulation, whereas AI by UITAI-30 was performed after ovulation. Pregnancy rates were 28.6% (2/7) by UIUAI, 80% (4/5) by UITAI-24, and 20% (1/5) by UITAI-30. Litter size was one or two by UIUAI, and one to four by UITAI. Spontaneous abortion occurred on Days 25-30 of pregnancy in one of the two female cats pregnant following UIUAI, and in two of five female cats pregnant following UITAI. Based on the high pregnancy rate obtained with 10 x 10⁶ sperm in the UITAI-24 group (AI performed before ovulation), we concluded that this was the most appropriate method for AI with frozen-thawed epididymal sperm after initial low-temperature storage of epididymides.


New insights into morphological and biological features of Capillaria aerophila (Trichocephalida, Trichuridae).

Capillaria aerophila is a trichuroid nematode affecting the respiratory system of dogs, cats, wild carnivores and, occasionally, humans. Animals become infected by ingesting larvated eggs or earthworms, which act as facultative intermediate hosts. The aim of this work is to present new insights into morphological and biological features of this neglected lungworm. Typical features of C. aerophila eggs, differentiating them from those of most known trichuroid whipworms (i.e. size, asymmetry of bipolar plugs and a wall with a network of anastomosing ridges), were detected upon light and scanning electron microscopy. Eggs of C. aerophila were used for in vitro development. Light microscopy showed typical features of C. aerophila eggs: size, asymmetry of bipolar plugs and a wall with a network of anastomosing ridges. All these features were confirmed upon SEM, in that C. aerophila eggs showed an outer densely striated and net-like shell. Eggs of T. vulpis, used for a comparative analysis, were bigger than those of C. aerophila and showed a thick and smooth wall at both light and scanning electron microscopy. Eggs started to develop after 35 days from shedding and mobile larvae were observed in the eggs after two months. The results of this study provide key
information on the biological cycle of C. aerophila and present key morphological characters for the identification of eggs in faeces.


Clinical features and epidemiology of cryptococcosis in cats and dogs in California: 93 cases (1988-2010).

OBJECTIVE: To compare clinical features of cryptococcosis among cats and dogs in California, determine whether the distribution of involved tissues differs from distribution reported previously in a study in southeastern Australia, and identify Cryptococcus spp isolated from the study population.  
DESIGN: Retrospective case series.  
ANIMALS: 62 cats and 31 dogs with cryptococcosis.  
PROCEDURES: Medical records of cats and dogs with cryptococcosis were reviewed. Information collected included geographic location, species, signalment, and tissues or organs involved.  
Cryptococcosis was confirmed via serology, cytology, histology, or microbial culture, and molecular typing was performed. Odds ratios and 95% confidence intervals were calculated to determine significant associations among variables. Other comparisons were evaluated via chi(2) or unpaired t tests.  
RESULTS: American Cocker Spaniels were overrepresented, compared with other dog breeds. Serum cryptococcal antigen test results were positive in 51 of 53 cats and 15 of 18 dogs tested. Cryptococcus gattii was more commonly detected in cats (7/9 for which species identification was performed), and Cryptococcus neoformans was more commonly detected in dogs (6/8). Six of 7 C gattii isolates from cats were molecular type VGIII. Distribution of involved tissues was different between cats and dogs in California and between populations of the present study and those of the previously reported Australian study.  
CONCLUSIONS AND CLINICAL RELEVANCE: Strains of Cryptococcus spp appeared to have host specificity in dogs and cats. Differences in lesion distribution between geographic locations may reflect strain differences or referral bias. Antigen assays alone may not be sufficient for diagnosis of cryptococcosis in cats and dogs.


Bartonella infection in shelter cats and dogs and their ectoparasites.

Mainly through vector transmission, domestic cats and dogs are infected by several Bartonella spp. and represent a large reservoir for human infections. This study investigated the relationship of prevalences of Bartonella infection in shelter dogs and cats and various ectoparasite species infesting them (fleas, ticks, and lice). Moreover, relationships between Bartonella infection and animal gender and age and presence of ectoparasites were analyzed. Blood samples were collected from 120 dogs and 103 cats. There were 386 ticks and 36 fleas harvested on these dogs, and 141 fleas, 4 ticks, and 2 lice harvested on these cats. Isolation/detection of Bartonella sp. was performed by culture, polymerase chain reaction (PCR), and partial sequencing. Bartonella was isolated from 21 (20.4%) cats and detected by PCR from 20 (19.4%) cats, 2 (1.7%) dogs, 55 (39%) fleas collected from cats, 28 (10%) ticks DNA samples, and 1 (2.8%) flea collected from dogs. When combining culture and PCR data, 27 cats and 55 fleas collected on cats were positive for Bartonella henselae or Bartonella clarridgeiae, but none were coinfected. Approximately half of the B. henselae isolates from 21 cats were B. henselae type I. Moreover, B. henselae, Bartonella phoceensis, Bartonella queenslandensis, Bartonella rattimassiliensis,
Bartonella elizabethae DNA was detected in ticks collected from dogs and one flea was B. clarridgeiae PCR positive. This is the first report of such a wide variety of Bartonella spp. detected in Rhipicephalus sanguineus. Further studies are required to understand the relative importance of these ectoparasites to transmit Bartonella spp. in dogs and cats.


Glomerular disease.

Glomerular diseases are a leading cause of chronic kidney disease in dogs but seem to be less common in cats. Glomerular diseases are diverse, and a renal biopsy is needed to determine the specific glomerular disease that is present in any animal. Familial glomerulopathies occur in many breeds of dogs. However, most dogs with glomerular disease have acquired glomerular injury that is either immune-complex mediated or due to systemic factors, both of which are believed to be the result of a disease process elsewhere in the body (i.e., neoplastic, infectious, and noninfectious inflammatory disorders). A thorough clinical evaluation is indicated in all dogs suspected of having glomerular disease and should include an extensive evaluation for potential predisposing disorders. Nonspecific management of dogs with glomerular disease can be divided into 3 major categories: (1) treatment of potential predisposing disorders, (2) management of proteinuria, and (3) management of uremia and other complications of glomerular disease and chronic kidney disease. Specific management of specific glomerular diseases has not been fully studied in dogs. However, it may be reasonable to consider immunosuppressive therapy in dogs that have developed a form of glomerulonephritis secondary to a steroid-responsive disease (e.g., systemic lupus erythematosus) or have immune-mediated lesions that have been documented in renal biopsy specimens. Appropriate patient monitoring during therapy is important for maximizing patient care. The prognosis for dogs and cats with glomerular disease is variable and probably dependent on a combination of factors. The purpose of this article is to discuss the general diagnosis and management of dogs with glomerular disease.


Parotid salivary duct sialocele associated with glandular duct stenosis in a cat.

Feline parotid salivary duct sialocele is an uncommon disorder that has been previously reported in association with traumatic rupture of the duct in only two cats. Both cases were successfully treated by proximal duct ligation. We describe the successful surgical treatment of a parotid duct sialocele, secondary to spontaneous salivary duct stenosis, in an adult domestic shorthair cat. The cat was referred for assessment of a recurrent fluid-filled swelling on the left side of the face. Cytology of the aspirated fluid was consistent with serous saliva. The anatomical localisation of the lesion and the nature of the fluid were indicative of parotid gland/duct involvement. Retrograde sialography by parotid duct cannulation was unsuccessful because the left parotid duct opening was stenosed and obstructed by scar tissue. Surgical exploration revealed a parotid salivary duct sialocele, which was completely removed along with the parotid gland without complications.

Evaluation of predictors for the diagnosis of hyperthyroidism in cats.

BACKGROUND: In humans, subclinical hyperthyroidism is diagnosed when serum thyroid hormone concentrations are within the reference range but thyroid stimulating hormone (TSH) concentration is subnormal. In a previous study, a higher prevalence of thyroid nodular disease was found in euthyroid geriatric cats with undetectable TSH (<0.03 ng/mL) compared to those with detectable TSH concentrations, suggesting subclinical hyperthyroidism might also exist in cats. HYPOTHESIS: Euthyroid cats with undetectable TSH concentrations have subclinical hyperthyroidism and may subsequently develop overt signs of hyperthyroidism. ANIMALS: One-hundred four client-owned cats. METHODS: In this prospective cohort study, euthyroid geriatric (>/>=9 years) cats were recruited during routine health checks. Plasma biochemistry was performed at baseline and every 6 months thereafter. Total thyroxine and TSH concentrations were determined annually. Short-term follow-up data (within 14 months of recruitment) were used to detect variables at entry that were predictive of the diagnosis of hyperthyroidism, using univariable analysis followed by multivariable logistic regression analysis. Log rank analysis was used to test the association of initial TSH concentration with diagnosis of hyperthyroidism during the total available follow-up. RESULTS AND CONCLUSIONS: Median (range) follow-up was 26 (0-54) months and annual incidence of hyperthyroidism during the study was 7.4%. Cats that became hyperthyroid within 14 months had higher ALKP activity (P = 0.02) and higher prevalence of goiter (P =.03) at baseline than controls. Cats with undetectable TSH at baseline (29/104; 28%) were significantly (P <.001) more likely to be diagnosed with hyperthyroidism. However, not all cats with undetectable TSH became hyperthyroid during the study.


Have exotic grass species caused an increase in blades stuck in cats’ throats?


Effect of water content in a canned food on voluntary food intake and body weight in cats.

OBJECTIVE: To determine whether water content in a canned food diet induces decreases in voluntary energy intake (EI) or body weight (BW) in cats fed ad libitum. ANIMALS: 16 sexually intact male domestic shorthair cats. PROCEDURES: Maintenance EI was determined for 2 months in 10 weight-stable cats consuming a control diet (typical colony diet). Cats were allocated into 2 groups of equal BW and fed a canned diet (with-water [WW] diet) or a freeze-dried version of the canned diet (low-water [LW] diet) twice daily. Diets were identical in nutrient profile on a dry-matter basis. Each dietary treatment period of the crossover experiment lasted 3 weeks, with a 3-week washout period between diets. Body composition measurements were determined by use of deuterium oxide at the end of each dietary treatment. Daily food intake was measured for determination of dry-matter intake and EI. Six other cats were used in preference tests for the 3 diets. RESULTS: EI was significantly decreased for the WW diet (mean +/- SD, 1,053.0 +/- 274.9 kJ/d), compared with EI for the LW diet (1,413.8 +/- 345.8 kJ/d). Cats had a significant decrease in BW during consumption of the WW diet. Body composition was unaltered by diet. In short-term preference tests, cats ate significantly more of the WW than the LW diet. CONCLUSIONS AND CLINICAL RELEVANCE: Bulk water in the WW diet stimulated decreases in EI and BW in cats. The impact of water content on energy density and food consumption may help promote weight loss in cats.

**Islet amyloid polypeptide, islet amyloid, and diabetes mellitus.**

Islet amyloid polypeptide (IAPP, or amylin) is one of the major secretory products of beta-cells of the pancreatic islets of Langerhans. It is a regulatory peptide with putative function both locally in the islets, where it inhibits insulin and glucagon secretion, and at distant targets. It has binding sites in the brain, possibly contributing also to satiety regulation and inhibits gastric emptying. Effects on several other organs have also been described. IAPP was discovered through its ability to aggregate into pancreatic islet amyloid deposits, which are seen particularly in association with type 2 diabetes in humans and with diabetes in a few other mammalian species, especially monkeys and cats. Aggregated IAPP has cytotoxic properties and is believed to be of critical importance for the loss of beta-cells in type 2 diabetes and also in pancreatic islets transplanted into individuals with type 1 diabetes. This review deals both with physiological aspects of IAPP and with the pathophysiological role of aggregated forms of IAPP, including mechanisms whereby human IAPP forms toxic aggregates and amyloid fibrils.


**Cats during gestation and lactation fed with canned food ad libitum: energy and protein intake, development of body weight and body composition.**

The NRC recommendations for cats for energy and protein supply during gestation and lactation are based on limited data. This study aimed to answer the question: Can the energy requirement be met with canned food or is the volume restrictive? Therefore, balance trials were conducted in 10 queens before mating, during the 4th and 7th week of gestation and during the 2nd and 6th week of lactation. The cats were fed with canned food ad libitum. Additionally, the body composition of the queens was measured by dual-energy X-ray absorptiometry (Dexa) before mating, after parturition and after weaning. Eight of 10 cats presented increased body fat content and lean body mass during gestation. The weight loss during lactation led to a loss of lean body mass, but only six cats lost body fat of widely differing amounts. It was evident that the queens’ dry matter intake was consistent with that of queens fed ad libitum with dry food. The cats lost lean body mass during lactation and had negative protein balances in the 2nd week of lactation. This seems to be physiological in early lactation. Nevertheless, the protein recommendations for lactation seem to be too low.


**Alteration in blood gases in cats naturally infected with Aelurostrongylus abstrusus.**

Four cats were presented with respiratory signs and first-stage larvae of Aelurostrongylus abstrusus were found in faecal samples. Anthelmintic treatment was given to the infected cats and venous blood gases were analysed during the treatment period. Blood gas analysis suggested hypoventilation and respiratory acidosis in infected cats. Hypoventilation may be the result of airway obstruction by adults and larvae in respiratory bronchioles and the alveolar canals. The blood gas values had returned close to the physiological range by two months after treatment. Assessment of respiratory acidosis may aid development of additional treatment methods in cats infected with A. abstrusus.
Evaluation of oscillometric and vascular access port arterial blood pressure measurement techniques versus implanted telemetry in anesthetized cats.

OBJECTIVE: To compare the use of a semi-invasive vascular access port (VAP) device or noninvasive oscillometry versus invasive telemetry for blood pressure measurements in cats. ANIMALS: 6 healthy cats. PROCEDURES: 30 days before the study, all cats received an implanted telemeter and a VAP device. During normotension and experimentally induced hypertension, blood pressure was measured with the implanted devices and with noninvasive oscillometry at 4 time points. RESULTS: Compared with invasive telemetry, VAP had a correlation coefficient from 0.8487 to 0.9972, and noninvasive oscillometry had a correlation coefficient from 0.7478 to 0.9689. CONCLUSIONS AND CLINICAL RELEVANCE: Use of the VAP device and noninvasive oscillometry had a high degree of correlation with invasive telemetry as the gold standard for blood pressure measurement. Use of a VAP device resulted in a slightly higher degree of correlation, compared with noninvasive oscillometry.