**Abdel-Moein KA, and Samir A (2011) Vector Borne Zoonotic Dis 11:627-629.**

**Isolation of Enterotoxigenic Staphylococcus aureus from Pet Dogs and Cats: A Public Health Implication.**

Abstract Staphylococcus aureus is a globally distributed bacterium causing wide variety of illnesses in humans, which attributed to its ability to produce wide array of virulence factors, including enterotoxins that are responsible for staphylococcal food poisoning outbreaks. The current study was carried out to investigate the prevalence of enterotoxigenic S. aureus among pet dogs and cats and its public health implication. For this purpose, nasal, oral, and wound swabs were collected from 70 dogs and 47 cats, whereas nasal swabs were collected from 26 human contacts. All samples were examined for the presence of enterotoxigenic S. aureus by isolation of S. aureus in culture media and then tested by specific ELISA kits to detect the produced toxins in bacterial cultures. The prevalence of enterotoxigenic S. aureus was 10% and 2.1% for pet dogs and cats, respectively, whereas the nasal carriage rate in human contacts was 7.7%. The majority of animal isolates were obtained from mouth of the apparently healthy animals. All types of staphylococcal enterotoxins were detected in both animal and human isolates. High prevalence of enterotoxigenic S. aureus among pet dogs highlights the possibility of zoonotic transmission to human contacts leading to nasal and/or hand carriage of such strains; thus, pet animals may be incriminated in the epidemiology of household staphylococcal food poisoning outbreaks.


**Treatment of a nonunion, secondary to gunshot fracture, of the distal radius with circular external fixation and rhBMP-2 in a cat.**

Objective: To report the successful use of recombinant human bone morphogenetic protein-2 (rhBMP-2) in the treatment of an antebrachial non-union, secondary to gunshot fracture, stabilized with circular external fixation in a cat. Procedure: Following a diagnosis of a highly comminuted gunshot fracture of the distal right radius and ulna, the fracture was stabilized with a circular external fixation. A two-ring frame was placed in closed fashion. Results: The skin wound healed uneventfully by second intention in 21 days. Twenty-eight weeks after external fixation, bone healing was absent. 0.8mL of 0.2mg/mL of rhBMP-2 in two collagen sponges was placed in the bone defect. Eight weeks after rhBMP-2 implantation, an early bone healing response was noted on radiographic evaluation. Sixteen weeks after rhBMP-2 implantation, fracture union was achieved. Clinical significance: To the authors’ knowledge, 160 mug is the lowest reported dose of rhBMP-2 that leads to bony union in a cat. However as an individual case study, this report can not be used as evidence that rhBMP-2 at this lower dose is appropriate for use in all cats. Further studies are needed to establish the minimum efficient dose of rhBMP-2 in cats.

**Bell CM, Schwarz T, and Dubielzig RR (2011) Vet Pathol 48:742-750.**

**Diagnostic features of feline restrictive orbital myofibroblastic sarcoma.**

A progressive debilitating disease of the orbit and adjacent connective tissues of cats has historically been called feline orbital pseudotumor. The authors reviewed clinical, histopathologic, and diagnostic
imaging features of this disease in 12 cases from the Comparative Ocular Pathology Laboratory of Wisconsin. The cats’ ages ranged from 7 to 16 years (mean, 10.8 years). All cats had a history of severely restricted mobility of the globe and eyelids with secondary corneal disease. Eleven cats (92%) had concurrent involvement of the contralateral eye and/or the oral cavity. Diffuse scleral or episcleral thickening was seen with computed tomography in all clinically affected eyes. Histologically, an insidious infiltration of neoplastic spindle cells in the orbit, eyelids, and periorbital skin and soft tissues, with collagen deposition and a few perivascular lymphocytes, led to entrapment and restricted mobility of the eyelids and orbital tissues. The tumor failed to form a discrete mass, and it spread along fascial planes to the contralateral orbit and eyelids and/or the lips and oral cavity. In all tested cases (n = 10), neoplastic cells were immunohistochemically positive for vimentin, S100 protein, and smooth muscle actin. The authors adopted the term feline restrictive orbital myofibroblastic sarcoma to reflect the restricted mobility of the eyelids and globe and the imaging and histologic features of an invasive yet low-grade myofibroblastic sarcoma.

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.

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.

Nasal plasma cell dermatitis in cats.

Prevalence and genotypes of Toxoplasma gondii in feline faeces (oocysts) and meat from sheep, cattle and pigs in Switzerland.

The protozoan parasite Toxoplasma gondii infects almost all warm blooded animal species including humans, and is one of the most prevalent zoonotic parasites worldwide. Post-natal infection in humans is acquired through oral uptake of sporulated T. gondii oocysts or by ingestion of parasite tissue cysts upon consumption of raw or undercooked meat. This study was undertaken to determine the prevalence of oocyst-shedding by cats and to assess the level of infection with T. gondii in meat-producing animals in Switzerland via detection of genomic DNA (gDNA) in muscle samples. In total, 252 cats (44 stray cats, 171 pet cats, 37 cats with gastrointestinal disorders) were analysed coproscopically, and subsequently species-specific identification of T. gondii oocysts was achieved by Polymerase Chain Reaction (PCR). Furthermore, diaphragm samples of 270 domestic pigs (120 adults, 50 finishing, and 100 free-range animals), 150 wild boar, 250 sheep (150 adults and 100 lambs) and 406 cattle (47 calves, 129 heifers, 100 bulls, and 130 adult cows) were investigated by T. gondii-specific real-time PCR. For the first time in Switzerland, PCR-positive samples were subsequently genotyped using nine PCR-restriction fragment length polymorphism (PCR-RFLP) loci (SAG2, SAG3, BTUB, GRA6, c22-8, c29-2, L358, PK1 and Apico) for analysis. Only one of the cats shed T. gondii oocysts, corresponding to a T. gondii prevalence of 0.4% (95% CI: 0.0-2.2%). In meat-producing animals, gDNA prevalence was lowest in wild boar (0.7%; 95% CI: 0.0-3.7%), followed by sheep (2.0%; 95% CI: 0.1-4.6%) and pigs (2.2%; 95% CI: 0.8-4.8%). The highest prevalence was found in cattle (4.7%; 95% CI: 2.8-7.2%), mainly due to the high prevalence of 29.8% in young calves. With regard to housing conditions, conventional fattening pigs and free-range pigs surprisingly exhibited the same prevalence (2.0%; 95% CI: 0.2-7.0%). Genotyping of oocysts shed by the cat showed T. gondii with clonal Type II alleles and the Apico I allele. T. gondii with clonal Type II alleles were also predominantly observed in sheep, while T. gondii with mixed or atypical allele combinations were very rare in sheep. In pigs and cattle however, genotyping of T. gondii was often incomplete. These findings suggested that cattle in Switzerland might be infected with Toxoplasma of the clonal Types I or III, atypical T. gondii or more than one clonal Type.

**Congenital hypothyroidism of dogs and cats: a review.**
Congenital hypothyroidism is a rare and underdiagnosed congenital endocrine disorder in dogs and cats and the true incidence is unknown. The disorder may cause a range of clinical signs depending on the primary defect, which affect production of thyroid hormones; some cases present when adult. Hallmark clinical signs of congenital hypothyroidism are mental impairment and skeletal developmental abnormalities, resulting in disproportionate dwarfism; goitre may or may not be present. Documented causes of congenital hypothyroidism in dogs include deficiency of, or unresponsiveness to, thyrotropin-releasing hormone (TRH) or thyroid-stimulating hormone (TSH), thyroid dysgenesis, dyshormonogenesis and iodine deficiency. In cats, TSH unresponsiveness, thyroid dysgenesis, dyshormonogenesis and iodine deficiency have been confirmed. Adequate replacement therapy results in a successful outcome in the majority of cases, especially when started early in life, as permanent developmental abnormalities can be prevented. This review describes reported cases in dogs and cats, diagnostic investigation, and recommendations for treatment.


**Distinctive receptor binding properties of the surface glycoprotein of a natural Feline Leukemia Virus isolate with unusual disease spectrum.**
ABSTRACT: BACKGROUND: Feline leukemia virus (FeLV)-945, a member of the FeLV-A subgroup, was previously isolated from a cohort of naturally infected cats. An unusual multicentric lymphoma of non-T-cell origin was observed in natural and experimental infection with FeLV-945. Previous studies implicated the FeLV-945 surface glycoprotein (SU) as a determinant of disease outcome by an as yet unknown mechanism. The present studies demonstrate that FeLV-945 SU confers distinctive properties of binding to the cell surface receptor. RESULTS: Virions bearing the FeLV-945 Env protein were observed to bind the cell surface receptor with significantly increased efficiency, as was soluble FeLV-945 SU protein, as compared to the corresponding virions or soluble protein from a prototype FeLV-A isolate. SU proteins cloned from other cohort isolates exhibited increased binding efficiency comparable to or greater than FeLV-945 SU. Mutational analysis implicated a domain containing variable region B (VRB) to be the major determinant of increased receptor binding, and identified a single residue, valine 186, to be responsible for the effect. CONCLUSIONS: The FeLV-945 SU protein binds its cell surface receptor, fεTHTR1, with significantly greater efficiency than does that of prototype FeLV-A (FeLV-A/61E) when present on the surface of virus particles or in soluble form, demonstrating a 2-fold difference in the relative dissociation constant. The results implicate a single residue, valine 186, as the major determinant of increased binding affinity. Computational modeling suggests a molecular mechanism by which residue 186 interacts with the receptor-binding domain through residue glutamine 110 to effect increased binding affinity. Through its increased receptor binding affinity, FeLV-945 SU might function in pathogenesis by increasing the rate of virus entry and spread in vivo, or by facilitating entry into a novel target cell with a low receptor density.

**Potential Role of Pet Animals in Household Transmission of Methicillin-Resistant Staphylococcus aureus: A Narrative Review.**

Abstract In this narrative review, we found numerous reports suggesting that dogs and cats may play a role in household methicillin-resistant Staphylococcus aureus (MRSA) transmission and recurrent MRSA infection in human contacts. Future work should emphasize elucidating more clearly the prevalence of MRSA in household pets and characterize transmission dynamics of MRSA humans and pet animals.

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**Successful replacement of an obstructed ureter with an ileal graft in a cat.**

CASE DESCRIPTION: A 10-year-old spayed female domestic shorthair cat with a 1-week history of vomiting, lethargy, and anorexia was examined. CLINICAL FINDINGS: Abdominal radiography and ultrasonography revealed that calculi and a nonpatent stricture obstructed the right ureter, which resulted in secondary dilatation of the ureter proximal to the obstruction and severe hydronephrosis. The left kidney was small and suspected to be failing. Concentrations of BUN and creatinine were elevated. Despite administration of fluids, azotemia persisted. TREATMENT AND OUTCOME: Surgery was performed. The obstructed right ureter was replaced with a vascularized segment of ileum. Azotemia resolved, and the cat improved with regard to clinical signs. The cat was clinically normal for > 36 months after the surgery. CLINICAL RELEVANCE: An ileal graft can successfully be used as a surgical option for ureteral obstruction in cats.

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**Dyspnoea and pulmonary consolidation in a cat with T-cell lymphoma.**

A 13-year-old male neutered domestic shorthair cat presented with an acute onset of dyspnoea. Thoracic radiographs revealed marked, bilateral, caudal lung lobe consolidation. A diagnosis of anatomically mixed T-cell lymphoma with pulmonary, renal and alimentary involvement was confirmed on histopathology. Pulmonary involvement in cases of feline lymphoma is uncommon and the radiographic appearance of pulmonary lymphoma is highly variable. Lung lobe consolidation has been described with primary lung tumours in cats, but not previously in association with pulmonary lymphoma. This unusual presentation serves to alert practitioners to the possibility of lymphoma as a cause of severe bronchopulmonary disease in the cat.

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**Brown MA (2011) Vet Immunol Immunopathol**

**Genetic determinants of pathogenesis by feline infectious peritonitis virus.**

Feline infectious peritonitis (FIP) is a fatal, immune-augmented, and progressive viral disease of cats associated with feline coronavirus (FCoV). Viral genetic determinants specifically associated with FIPV pathogenesis have not yet been discovered. Viral gene signatures in the spike, non-structural
protein 3c, and membrane of the coronavirus genome have been shown to often correlate with disease manifestation. An “in vivo mutation transition hypothesis” is widely accepted and postulates that de novo virus mutation occurs in vivo giving rise to virulence. The existence of “distinct circulating avirulent and virulent strains” is an alternative hypothesis of viral pathogenesis. It may be possible that viral dynamics from both hypotheses are at play in the occurrence of FIP. Epidemiologic data suggests that the genetic background of the cat contributes to the manifestation of FIP. Further studies exploring both viral and host genetic determinants of disease in FIP offer specific opportunities for the management of this disease.

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.

Burns RE, Wagner DC, Leutenegger CM, and Pesavento PA (2011) J Clin Microbiol 49:2454-2460. 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.

**Composite fixation of comminuted ilial wing fractures in cats: three cases.**
CLINICAL SUMMARY: The surgical repair of comminuted ilial wing fractures (comprising a long oblique fracture with ventral multiple fragmentation) in three cats using composite internal fixation is reported. The technique comprised the use of pins, screws, wire and polymethylmethacrylate. All cases had an excellent outcome with uneventful bone healing. One case had a very mild reduction in pelvic canal diameter postoperatively. There was no evidence of implant loosening or migration in any cat on follow-up radiographs. PRACTICAL RELEVANCE: This technique provided a quick and highly adaptable means of stabilising this fracture configuration, as well as restoring pelvic symmetry, when limited buttressing support and bone stock were available cranial and ventral to the acetabulum. This method of fixation may have biomechanical advantages over lateral or dorsal plating techniques for this particular type of fracture configuration.

**Pleural omentalisation with en bloc ligation of the thoracic duct and pericardiectomy for idiopathic chylothorax in nine dogs and four cats.**
Conventional treatment of idiopathic chylothorax (IC) involves thoracic duct (TD) ligation (with/without lymphangiography) combined with subphrenic pericardiectomy. Nine dogs and four cats with IC, which received intrathoracic omentalisation with TD en bloc ligation (not preceded by lymphangiography) and subphrenic pericardiectomy, were evaluated retrospectively. Seven of nine dogs and 3/4 cats were still alive and disease-free at the time of reporting (range 10-53 and 19-31 months, respectively). Clinical signs of IC did not decrease after the first surgery in one cat and one dog; in another dog clinical signs recurred after 5 months. Overall efficacy rate of this one-stage combined procedure was 77% (6 months), 73% (12 months), and 57% (24 months). Where a second surgery was performed in case of failure, the success rate in dogs was 89% (6 months) and 80% (24 months). Addition of pleural omentalisation to TD en bloc ligation and subphrenic pericardiectomy does not seem to improve results when compared with published data and at present does not seem advisable as a first choice.

**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 were 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.


Pharmacokinetics, intraoperative effect and postoperative analgesia of tramadol in cats.
Tramadol is a synthetic codeine analogue used as an analgesic in human and veterinary medicine, but not approved for use in cats. Tramadol (2 mg/kg) was administered intravenously (IV) as preoperative analgesic in 12 cats (6 males) undergoing surgical gonadectomy. The pharmacokinetic profile of the drug and its O-desmethyl metabolite were determined in 8 animals (4 males), while intraoperative effects and postoperative analgesia, estimated by subjective pain score (0-24), were evaluated in all. Mean intraoperative isoflurane consumption was reduced, but hypoventilation was not observed. Sex-related differences were not observed, particularly in terms of postoperative analgesia: rescue analgesic was never administered. Concentrations of the active O-desmethyl metabolite were persistently high in all the animals. Considering the results obtained in this study, tramadol, at the dose of 2 mg/kg IV, did not produce any evident intraoperative cardiorespiratory side effects and with additional investigation may prove to be an appropriate intraoperative analgesic in cats undergoing gonadectomy.


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.


**The effects of increasing water content to reduce the energy density of the diet on body mass changes following caloric restriction in domestic cats.**

Caloric restriction induces body mass loss that is often regained when restriction ends. This study aimed to determine if dietary energy density modulates the extent of post-restriction body mass regain. Water (20% wt:wt) was added to a standard dry commercially available feline diet. Twenty-seven domestic short-haired cats underwent a 20% caloric restriction on this diet. Following restriction, cats were offered the same dry diet ad libitum either without additional water or with 40% added water, therefore maintaining macronutrient composition whilst manipulating energy density. Despite no significant difference in energy intake during ad libitum consumption, post-restriction body mass regain was greater on the high energy dense (0% hydrated), compared to the low energy dense (40% hydrated) diet. The same protocol was repeated with a separate cohort of 19 cats with additional measures of physical activity, gut transit time and energy digestibility. Activity levels on the low energy dense diet were significantly higher than in cats on the high energy dense diet (p=0.030) and were similar to those recorded during caloric restriction. These results suggest that body mass gain following caloric restriction is ameliorated, and physical activity enhanced, by feeding a diet which is low in energy density due to the addition of 40% water.


**Normal Doppler velocimetry of renal vasculature in Persian cats.**

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


**Lingual arch bar application for treatment of rostral mandibular body fractures in cats.**

Objective: To describe a lingual arch bar technique for fixation of rostral mandibular body fractures and report outcome in 16 cats. Study Design: Original study. Animals: Cats (n=16) with rostral mandibular body fracture (10 bilateral, 6 unilateral) just caudal to the canine teeth. Methods: Orthodontic wire (Dentaurum(R); 0.9 mm) was used as a lingual arch bar by contouring it to the shape of the lingual side of the alveolar margin, and secured by circum-mandibular wires passed interproximal to teeth. Stability of fixation, occlusion, tolerance to the lingual arch bar, degree of secondary gingivitis/periodontitis, and ability to eat were evaluated clinically, and fracture union was assessed radiographically. Results: The lingual arch bar was well tolerated. Eleven cats without a feeding tube were able to eat within 24 hours. Time to fracture union and appliance removal ranged from 28 to 64 days (mean, 42.5 days). Malocclusion of the rostral part of the fracture occurred in 5 cats; however only 1 required correction. Conclusions: Intraoral stabilization of rostral mandibular fractures using a lingual arch bar is a simple and effective method for the treatment of rostral mandibular fractures just caudal to the canine teeth.

*Cocayne CG, Reinero CR, and Declue AE (2011) J Feline Med Surg*

**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.

Coelho WM, do Amarante AF, Apolinario JD, Coelho NM, de Lima VM, Perri SH, and Bresciani KD (2011) Parasitol Res
Seroepidemiology of Toxoplasma gondii, Neospora caninum, and Leishmania spp. infections and risk factors for cats from Brazil.
The seroprevalence of infection by Toxoplasma gondii, Neospora caninum, and Leishmania spp. was detected through an indirect immunofluorescence in 70 cats from the Andradina Municipality, Sao Paulo State, Brazil. Anti-T. gondii antibodies (titer >64) were detected in 15.7% (11/70) of animals, whereas positivity for N. caninum (titer 16) was not observed in any animal. Of the cats from urban and rural areas, 10.4% (5/48) and 27.2% (6/22) were positive for T. gondii, respectively. Breed, age, food, and contact with animals of other species were significant for considering the positivity for T. gondii (P <= 0.0001). Cats having access to streets (17.1%, 11/64), cats cohabiting with rats (19.6%, 10/51), and cats feeding on homemade food and raw milk (27.2%, 6/22) were positive for T. gondii. In addition, 4.2% (3/70) of the cats were positive for Leishmania spp. by ELISA technique and negative by IFAT without coinfection with T. gondii and Leishmania spp. There was no serological positivity against feline immunodeficiency virus or feline leukemia virus. In conclusion, T. gondii infection in part of the feline population from Andradina is not linked to immunosuppressions or coinfections but probably to postnatal infection in association with the type of diet and presence of rats.

Miniplate fixation for the repair of segmental mandibular defects filled with autogenous bone in cats.
PURPOSE: To evaluate the use of maxillofacial miniplate 1.5 in the repair of segmental mandibular defects filled with autogenous bone in cats. METHODS: Twelve adult cats were divided into two groups. A segmental defect of 4mm was created in one of the hemimandibles and filled with autogenous iliac crest bone graft. The operated hemimandible was fixed with a 1.5mm titanium miniplate. In group 1 (n=6), the defect was performed in the body of the mandible, behind the 1st molar. In group 2 (n=6), the defect was performed between the 4nd premolar and 1st molar, with extraction of the 1st molar. Oral alimentation was reinitiated 24 hours after surgery. Cats were euthanized at 20 weeks postoperative. RESULTS: Incorporation of the graft was suggested by the radiographs taken 20 weeks after surgery. Macroscopic examination confirmed alignment and bone union of operated hemimandibles. Histological examination showed formation of woven bone in rostral and caudal mandible/graft interfaces. The percentage of bone tissue at these areas was measured by the histometry.
There was no statistically significant difference between the values of group 1 (64.48 +/- 4.51) and group 2 (71.69 +/- 14.47) (Mann-Whitney’s test p= 0.294). CONCLUSION: The use of miniplate 1.5 for the fixation of mandibular defects filled with autogenous bone in cats provided the main goals in the treatment of mandibular fractures: bone union, normal dental occlusion and immediate return to oral alimentation.


Use of crude, FML and rK39 antigens in ELISA to detect anti-Leishmania spp. antibodies in Felis catus.
Visceral leishmaniasis is a disease caused by Leishmania (Leishmania) chagasi and represents a serious public health problem. The dog is the main urban reservoir of the disease; however, investigations regarding the occurrence and epidemiological importance of leishmaniasis in cats have recently been initiated. This study aimed to detect cats seropositive for Leishmania spp. using different antigens. Additional studies were performed using sera from cats with Toxoplasma gondii (n=15) to evaluate cross-reactivity. Serum samples (n=113) from cats living in the town of Aracatuba, State of Sao Paulo, Brazil, an endemic area for human and canine visceral leishmaniasis, were tested by indirect ELISA using different antigens: crude (CAG-ELISA), fucose-mannose ligand (FML-ELISA) and K39 (rK39-ELISA). Anti-Leishmania spp. antibodies were detected in 23.0% of samples evaluated by CAG-ELISA, 13.3% by FML-ELISA and 15.9% by RK39-ELISA. Only reactive sera in all three tests were considered truly positive. No disagreement occurred among the tests (p<0.05). Serum samples seropositive for toxoplasmosis tested by CAG-ELISA were negative, but one sample (6.7%) was positive for FML-ELISA and rK39-ELISA suggesting a cross-reaction between these antigens and anti-T. gondii antibodies. These findings indicate the occurrence of feline leishmaniasis in Aracatuba. Further studies are required to clarify the role of cats in the epidemiological cycle of leishmaniasis.

Vaccination of dogs and cats: no longer so controversial?

de Bortoli CP, Andre MR, Braga MD, and Machado RZ (2011) Parasitol Res
Molecular characterization of Hepatozoon sp. in cats from Sao Luis Island, Maranhao, Northeastern Brazil.
Few molecular studies have been done concerning the molecular characterization of Hepatozoon species among domestic and wild felids. The present work aimed to characterize molecularly the presence of Hepatozoon sp. DNA in cat blood samples from Sao Luis Island, Maranhao state, Northeastern Brazil. EDTA-whole blood samples were collected from 200 domestic cats with outdoor and wood areas access from Sao Luis, Maranhao, Brazil. Each sample of extracted DNA was used as a template in PCR reactions aiming to amplify a partial sequence of 18S rRNA of Hepatozoon spp. We also performed sequence alignment to establish the identity of the parasite species infecting these
animals using DNA sequences based on 18S rRNA. From 200 sampled cats, Hepatozoon DNA was only found in one animal (0.5%). The found Hepatozoon DNA showed 97% of identity with Hemobartonella felis isolates 1 and 2 from Spain. When analyzing the phylogenetic tree, the found Hepatozoon DNA was in the same clade than H. felis isolates. Our findings suggest that more than one species of Hepatozoon could infect felids in Brazil.

**Surgical treatment of a meningoencephalocele in a cat.**
Objective: To report the clinical signs, imaging findings and surgical treatment of a meningoencephalocele in a cat. Study Design: Case report. Animal: Domestic shorthaired cat, 4 months old. Methods: A parietal meningoencephalocele was identified and characterized by magnetic resonance and computed tomography (CT) imaging. The abnormal tissue was excised and submitted for histopathology, and the meningeal and skull defects were reconstructed. Results: The cat made a full recovery and the episodes of aggression, restlessness and apparent discomfort that occurred before surgery ceased after surgical treatment. The cat was clinically normal 1 year postoperatively. Conclusion: Surgical management of meningoencephalocele in cats may be a viable treatment option.

**CONTRAST-ENHANCED ULTRASONOGRAPHY OF THE SMALL BOWEL IN HEALTHY CATS.**
We characterized the pattern of ultrasonographic contrast enhancement of the small intestinal wall using a commercial contrast medium (Sonovue(R)) in 10 healthy awake cats. Subjectively, a rapid intense enhancement of the serosal and submucosal layers was followed by gradual enhancement of the entire wall section during the early phase. At peak enhancement, there was a subjective loss of demarcation between intestinal wall layers. In the late phase, there was a gradual wash out of signal from the intestinal wall. Submucosal wash out occurred last. Time-intensity curves were generated for selected regions in the intestinal wall and multiple perfusion parameters were calculated for each cat. Perfusion parameters included arrival time (7.64 +/- 2.23 s), baseline intensity (1.04 +/- 0.04 a.u.), time to peak from injection (10.74 +/- 2.08 s), time to peak from initial rise (3.1 +/- 1.15), peak intensity (8.92 +/- 3.72 a.u.), wash-in rate (2.06 +/- 0.70 a.u./s) and wash-out rate (-1.07 +/- 0.91 a.u./s). The perfusion pattern of normal feline small bowel may be useful for characterizing feline gastrointestinal disorders that involve the intestinal wall.

**Feline tetherin efficiently restricts release of feline immunodeficiency virus but not spreading of infection.**
Domestic cats endure infections by all three subfamilies of the retroviridae: lentiviruses (feline
immunodeficiency virus [FIV]), gammaretroviruses (feline leukemia virus [FeLV]), and spumaretroviruses (feline foamy virus [FFV]). Thus, cats present an insight into the evolution of the host-retrovirus relationship and the development of intrinsic/innate immune mechanisms. Tetherin (BST-2) is an interferon-inducible transmembrane protein that inhibits the release of enveloped viruses from infected cells. Here, we characterize the feline homologue of tetherin and assess its effects on the replication of FIV. Tetherin was expressed in many feline cell lines, and expression was induced by interferons, including alpha interferon (IFN-alpha), IFN-omega, and IFN-gamma. Like human tetherin, feline tetherin displayed potent inhibition of FIV and HIV-1 particle release; however, this activity resisted antagonism by either HIV-1 Vpu or the FIV Env and “OrfA” proteins. Further, as overexpression of complete FIV genomes in trans could not overcome feline tetherin, these data suggest that FIV lacks a functional tetherin antagonist. However, when expressed stably in feline cell lines, tetherin did not abrogate the replication of FIV; indeed, syncytium formation was significantly enhanced in tetherin-expressing cells infected with cell culture-adapted (CD134-independent) strains of FIV (FIV Fca-F14 and FIV Pco-CoLV). Thus, while tetherin may prevent the release of nascent viral particles, cell-to-cell spread remains efficient in the presence of abundant viral receptors and tetherin upregulation may enhance syncytium formation. Accordingly, tetherin expression in vivo may promote the selective expansion of viral variants capable of more efficient cell-to-cell spread.

Use of recombinant interferon omega in feline retrovirosis: From theory to practice.
Type-I interferons (IFNs) are cytokines that have non-specific antiviral activity, participating mostly in innate defense mechanisms. Their administration has been proposed to treat several viral and immunomediated diseases as an immunomodulatory therapy. Due to its availability, recombinant human interferon-alpha (rHuIFN-alpha) has been studied in relation to feline retrovirosis, both in vitro and in vivo. However, IFNs are species-specific and antibodies have been shown to develop in response to the high rHuIFN-alpha doses necessary for an effective therapy. A recombinant feline IFN has been developed, which has been characterized as interferon-omega (rFelIFN-omega), designed to overcome these problems. Nonetheless, very few studies have been undertaken to evaluate its efficacy in cats naturally infected with FIV or FeLV. In an initial study, we here demonstrated that rFelIFN-omega can dramatically improve the clinical condition of infected cats, and induce improvement of hematologic parameters. Minor changes or no change was observed for hypergammaglobulinemia, CD4/CD8 ratio, proviral load, viremia and RT activity, suggesting that the overall effect of IFN was on innate immunity. More studies are needed in order to better understand its in vivo mechanisms.

Laboratory tests for diagnosis of gastrointestinal and pancreatic diseases.
The panel of laboratory tests available for diagnosis of gastrointestinal (GI) diseases in dogs and cats is wide, and, recently, several new tests have been developed. This article will focus on advances in laboratory tests that are available for the general practitioner for diagnosis of GI diseases. Laboratory tests for diagnosis of gastric and intestinal infectious diseases include fecal parasite screening tests,
enzyme-linked immunosorbent assays for parvoviral enteritis, and some specific bacterial tests like fluorescent in situ hybridization for identification of specific bacteria attached to the intestinal epithelial cells. Serum concentrations of folate and cobalamin are markers of intestinal absorption, but are also changed in exocrine pancreatic insufficiency and intestinal bacterial overgrowth. Hypocobalaminemia is common in GI and pancreatic disease. Decreased serum trypsin-like immunoreactivity is a very sensitive and specific test for the diagnosis of exocrine pancreatic insufficiency in dogs and cats. Serum pancreatic lipase is currently the most sensitive and specific test to identify pancreatic cell damage and acute pancreatitis. However, serum canine pancreas-specific lipase is less sensitive in canine chronic pancreatitis. Increased serum trypsin-like immunoreactivity is also specific for pancreatic damage but is less sensitive. It is very likely that further studies will help to better specify the role of these new tests in the diagnosis of canine and feline pancreatic diseases.

ABSTRACT: BACKGROUND: There is considerable international research regarding the link between human demographics and pet ownership. In several international studies, pet ownership was associated with household demographics including: the presence of children in the household, urban/rural location, level of education and age/family structure. What is lacking across all these studies, however, is an understanding of how these pets are spatially distributed throughout the regions under study. This paper describes the spatial distribution of pet dog and pet cat owning households on the island of Ireland. RESULTS: In 2006, there were an estimated 640,620 pet dog owning households and 215,542 pet cat owning households in Ireland. These estimates are derived from logistic regression modelling, based on household composition to determine pet dog ownership and the type of house to determine pet cat ownership. Results are presented using chloropleth maps. There is a higher density of pet dog owning households in the east of Ireland and in the cities other than the west of Ireland and rural areas. However, in urban districts there are a lower proportion of households owning pet dogs than in rural districts. There are more households with cats in the urban areas, but the proportion of households with cats is greater in rural areas. CONCLUSIONS: The difference in spatial distribution of dog ownership is a reflection of a generally higher density of households in the east of Ireland and in major cities. The higher proportion of ownership in the west is understandable given the higher proportion of farmers and rural dwellings in this area. Spatial representation allows us to visualise the impact of human household distribution on the density of both pet dogs and pet cats on the island of Ireland. This information can be used when analysing risk of disease spread, for market research and for instigating veterinary care.

Thirteen cats and 7 dogs living in 14 homes were treated topically with either a dinotefuran (22%, w/w)/pyriproxyfen (3.00%, w/w) (DP) or dinotefuran (4.95%, w/w)/pyriproxyfen (0.44%,
w/w)/permethrin (36.08%, w/w) (DPP) topical spot-on, respectively. Twenty cats and 7 dogs living in 16 homes were treated topically with either a fipronil (9.8%, w/w)/(S)-methoprene (11.8%, w/w) or fipronil (9.8%, w/w)/(S)-methoprene (8.8%, w/w) topical spot-on (FM), respectively. All products were applied according to label directions by study investigators on day 0 and again between days 28 and 30. Flea populations on pets were assessed using visual area counts and premise flea infestations were assessed using intermittent-light flea traps on days 0, 7, 14, 21, 28-30, 40-45, and 54-60. A single application of the DP-DPP and FM formations reduced flea populations by 87.35% and 88.44%, respectively within 7 days. Following two monthly applications of either the DP-DPP or FM formulations, pet flea burdens were reduced by 95.24% and 95.47%, respectively. Flea numbers in the indoor-premises were also markedly reduced by days 54-60, with 98.05% and 96.15% reductions in intermittent-light flea trap counts in the DP-DPP or FM treatment groups, respectively.

**Plasma concentrations of buprenorphine after epidural administration in conscious cats.**
Buprenorphine plasma concentrations were measured after administering buprenorphine (20 μg/kg) into the lumbosacral epidural space of conscious cats chronically instrumented with an epidural catheter. Blood was collected from a jugular vein before injection and 15, 30, 45 and 60 min and 2, 3, 4, 5, 6, 8, 12 and 24 h after administration. Plasma buprenorphine concentrations were measured using ELISA. Background concentration (before injection) was 1.27 +/- 0.27 ng/mL (mean +/- SD). Including background concentration, the mean peak plasma concentration was obtained 15 min after injection (5.82 +/- 3.75 ng/mL), and ranged from 3.79 to 2.20 ng/mL (30 min-3 h), remaining between 1.93 and 1.77 ng/mL (4-12 h), and declined to 1.40 +/- 0.62 ng/mL at 24h. Elimination half-life was 58.8 +/- 40.2 min and clearance 56.7 +/- 21.5 mL/min. Results indicate early rapid systemic uptake of buprenorphine from epidural administration with plasma concentrations similar to using buccal or IM routes by 15 min postinjection.

**The epidemiology of sporadic human infections with unusual cryptosporidia detected during routine typing in England and Wales, 2000-2008.**
SUMMARYRoutine typing of 14 469 isolates from human cryptosporidiosis cases between 2000 and 2008 revealed that 7439 (51.4%) were Cryptosporidium (C.) hominis, 6372 (44.0%) C. parvum, 51 (0.4%) both C. hominis and C. parvum, 443 (3.1%) were not typable and 164 (1.1%) were other Cryptosporidium species or genotypes. Of the latter, 109 were C. meleagridis, 38 C. felis, 11 C. ubiquitum, one C. canis, two horse, two novel and one skunk genotype. C. hominis monkey genotype and C. cuniculus were identified in a separate study. Patients with unusual infections were older than those with C. hominis (P<0.01) or C. parvum (P<0.01) and were more likely to be immunocompromised (Fisher’s exact P<0.01). Forty-one percent of unusual cases had travelled abroad, mainly to the Indian subcontinent. Significant risk factors in those with unusual species were travel abroad (C. meleagridis, P<0.01), being immunocompromised (C. felis, Fisher’s exact P=0.02), and contact with cats (C. felis, Fisher’s exact P=0.02).

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


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


Plasma concentrations and behavioral, antinociceptive, and physiologic effects of methadone
after intravenous and oral transmucosal administration in cats.

Objective-To determine plasma concentrations and behavioral, antinociceptive, and physiologic effects of methadone administered via IV and oral transmucosal (OTM) routes in cats. Animals-8 healthy adult cats. Procedures-Methadone was administered via IV (0.3 mg/kg) and OTM (0.6 mg/kg) routes to each cat in a balanced crossover design. On the days of drug administration, jugular catheters were placed in all cats under anesthesia; a cephalic catheter was also placed in cats that received methadone IV. Baseline measurements were obtained >/= 90 minutes after extubation, and methadone was administered via the predetermined route. Heart and respiratory rates were measured; sedation, behavior, and antinociception were evaluated, and blood samples were collected for methadone concentration analysis at predetermined intervals for 24 hours after methadone administration. Data were summarized and evaluated statistically. Results-Plasma concentrations of methadone were detected rapidly after administration via either route. Peak concentration was detected 2 hours after OTM administration and 10 minutes after IV administration. Mean +/- SD peak concentration was lower after OTM administration (81.2 +/- 14.5 ng/mL) than after IV administration (112.9 +/- 28.5 ng/mL). Sedation was greater and lasted longer after OTM administration. Antinociceptive effects were detected 10 minutes after administration in both groups; these persisted >/= 2 hours after IV administration and >/= 4 hours after OTM administration. Conclusions and Clinical Relevance-Despite lower mean peak plasma concentrations, duration of antinociceptive effects of methadone was longer after OTM administration than after IV administration. Methadone administered via either route may be useful for perioperative pain management in cats.


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’SEVO) 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’SEVO 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.

1475.

Osteoma of the oral and maxillofacial regions in cats: 7 cases (1999-2009).
Objective-To describe clinical features of oral and maxillofacial osteomas in cats. Design-Retrospective case series. Animals-7 cats with oral or maxillofacial osteoma or both. Procedures-Medical records were reviewed for information on signalment, history, clinical signs, physical examination findings, diagnostic imaging findings, results of serum biochemical analyses and histologic testing, surgical procedures performed, and perioperative complications. Outcome was determined on the basis of follow-up telephone interviews of owners. Results-Cats ranged from 1 to 23 years of age. Clinical signs were observed in 5 cats and were attributed to the presence of the mass. Diagnostic imaging (radiography and computed tomography) and histologic examination confirmed the diagnosis of osteoma. Three cats were euthanatized; 1 cat was treated by mandibulectomy, 1 was treated by maxillectomy, and 2 were treated by debulking. At the time of follow-up at least 1 year after surgery, all 4 treated cats were alive, with owners reporting an acceptable quality of life. Conclusions and Clinical Relevance-Osteoma of the oral and maxillofacial regions is an uncommon tumor in cats. Most cats are examined during an advanced stage of the disease, when treatment options may be limited. Although osteoma is a benign tumor, the recommendation is to perform a clinical evaluation, diagnostic imaging, biopsy, and treatment early in the disease process, when less invasive surgical approaches may be feasible.

Treatment of oral squamous cell carcinoma with accelerated radiation therapy and concomitant carboplatin in cats.
BACKGROUND: Feline oral squamous cell carcinoma (SCC) carries a very poor prognosis with traditional treatments. HYPOTHESIS/OBJECTIVES: To examine the effectiveness of adding carboplatin to a previously published accelerated radiation protocol in the treatments of oral SCC in cats. ANIMALS: Thirty-one cases of oral SCC in cats. Tumor sites included lingual (n = 9), mandible (n = 10), maxilla (n = 7), tonsil (n = 4), and cheek (n = 1). METHODS: Prospective trial using a planned radiation protocol consisting of 14 fractions of 3.5 Gy given within a 9-day period with the addition of carboplatin given at 90-100 mg/m(2) on day 1 and day 4.5. Treatments were twice daily with a 6-hour delay between treatments. All cats presenting with oral SCC without evidence of distant metastasis were eligible. RESULTS: Median survival for all cats was 163 days (range 53-770 days) with a mean of 319 +/- 53 days with significant predictors of survival being site (P =.004) and whether there was a complete response at 30 days (P =.001). Cats with tumors of tonsil origin or cheek responded best to therapy and were long-term survivors with a mean survival of 724 days and the median had not been reached because of continued survival of 4 cats. CONCLUSIONS AND CLINICAL IMPORTANCE: This protocol offers an aggressive yet tolerable treatment of oral SCC in cats that might offer improved survival as compared with previously reported treatments. The long-term survival of cats with tonsillar SCC has not been reported previously.

Behavioral differences between urban feeding groups of neutered and sexually intact free-
roaming cats following a trap-neuter-return procedure.

OBJECTIVE: To examine behavioral differences during a 1-year observational period between urban feeding groups of neutered and sexually intact free-roaming cats following a trap-neuter-return procedure. DESIGN: Natural-setting trial. Animals-Free-roaming cats (n = 184) living in 4 feeding groups in an urban region of Israel. PROCEDURES: Trap-neuter-return procedures were applied to 2 cat feeding groups (A and B). Their social and feeding behaviors and frequency of appearance at feeding time were compared with those of 2 unneuter ed cat groups (C and D). Behavioral data were obtained from weekly observations before and during feeding over a 1-year period. Results-A lower rate of agonistic interactions was observed in the neutered groups than in the unneuter ed groups. Sexually intact male cats participated in more agonistic male-male encounters than did neutered male cats. Of 199 such encounters in the feeding groups, only 1 occurred between 2 neutered males. Neutered cats in group A appeared earlier and had higher frequencies of feeding and appearance at the feeding site, compared with unneuter ed cats. CONCLUSIONS AND CLINICAL RELEVANCE: Less aggression was observed in the neutered groups, specifically, fewer agonistic neutered-neutered male encounters occurred. This reduced agonistic behavior of neutered males resulted in reduced fighting and vocalizations, potentially leading to fewer injuries and reduced transmission of fight-related infectious diseases and reduced noise disturbance from a human perspective. Regarding food delivery, the feeding groups were time-and-place dependent, exhibiting context-related social interactions. When competing for food resources, as neutered cats time their arrival in accordance with food delivery, they thereby gain access to the choicest items.


Fozivudine tidoxil as single-agent therapy decreases plasma and cell-associated viremia during acute feline immunodeficiency virus infection.

BACKGROUND: Feline immunodeficiency virus (FIV) is a lentivirus that infects domestic and wild felidae and the course of disease is similar to that of human immunodeficiency virus infection. The thymidine nucleoside analog fozivudine (FZD) tidoxil is a lipid-zidovudine (ZDV) conjugate and member of the family of nucleoside reverse transcriptase (RT) inhibitors (NRTIs). HYPOTHESIS: FZD administration to cats during acute FIV infection produces antiviral activity with fewer adverse effects than its parent compound ZDV (AZT). ANIMALS: Male, neutered cats approximately 7 months of age (n = 12). METHODS: FZD (45 mg/kg q12h, n = 6) or placebo (n = 6) was administered PO in a nonblinded trial for 6 weeks to cats infected with the NCSU(1) isolate of FIV. Peripheral blood was collected preinfection and at 2, 4, and 6 weeks postinfection for CBC, evaluation of CD4(+) and CD8(+) cell counts by flow cytometry, and quantification of plasma and cell-associated viremia by real time RT-PCR. RESULTS: Treatment of cats with FZD during the acute stage of FIV infection decreased plasma and cell-associated viremia during the first 2 weeks of infection, but was not protective against FIV, as all cats were infected by 6 weeks. CONCLUSIONS: At the dosage used in this study, treatment with FZD results in a short-term decrease in viral load with no adverse effects. Further investigation of FZD is warranted to assess pharmacokinetics, optimal dosage, and to directly compare the antiviral activity of FZD to ZDV in naturally infected cats.
Cutaneous epitheliotropic T-cell lymphoma in the cat: a review of the literature and five new cases.
Cutaneous epitheliotropic T-cell lymphoma (CETL) is characterized by cutaneous infiltration of neoplastic T lymphocytes with a specific tropism for the epidermis and adnexal epithelium. This disease is reported very rarely in the cat. Clinical data were collected from an informal discussion with veterinary dermatologists through the Vetdermlist (vetderm@lists.ncsu.edu). In parallel, case archives of two European diagnostic histopathology laboratories (Institut de Pathologie et Genetique/Bio.be Gosselies, Belgium and the School of Veterinary Sciences, University of Bristol, UK) were reviewed. Fifteen cases with a good clinical description were selected, and five sets of skin biopsies were available for review. Cutaneous epitheliotropic T-cell lymphoma generally affects older cats with no apparent sex or breed predisposition. Solitary or multiple lesions were reported without predilection for any particular location. The lesions consisted of erythematous plaques or patches, scaly alopecic patches and nonhealing ulcers or nodules, which sometimes mimicked an eosinophilic plaque. Pruritus was rarely reported. No lesions affecting the oral mucosa were observed. Clinical diagnosis of CETL is more challenging in cats than in dogs. Final diagnosis must be based on histopathological examination of skin biopsy samples. The characteristic lesions of feline CETL are similar to those reported in the dog, but involvement of the adnexal glands was not observed in this series (n = 5). The neoplastic T cells were generally small to medium in size. The survival time of cats with CETL seems to be more variable than that of affected dogs. Too few cases have been evaluated to permit clear recommendations to be made with respect to treatment.

Rickettsia, Ehrlichia, Anaplasma, and Bartonella in Ticks and Fleas from Dogs and Cats in Bangkok.
Abstract Flea and tick specimens (5-10 fleas or ticks) on dogs and cats from various sites in Bangkok were tested by polymerase chain reaction and DNA sequencing to detect DNA of bacteria Rickettsia (gltA and 17 kDa genes), Anaplasmataceae (16S rRNA gene), and Bartonella (pap31 and its genes). We confirmed that Rickettsia sp. related to Rickettsia felis was detected in 66 of 98 (67.4%) flea specimens from dogs, whereas 8 Bartonella henselae and 2 Bartonella clarridgeiae were detected in 10 of 54 (18.5%) flea specimens from cats. Further, this work provides the first evidence of 10 Ehrlichia canis (3.3%), 7 Anaplasma platys (2.3%), and 2 Wolbachia spp. (0.66%) in 304 Rhipicephalus sanguineus tick specimens in Thailand.

Lower respiratory tract infections in cats: reaching beyond empirical therapy.
PRACTICAL RELEVANCE: Lower respiratory tract infections (LRTIs) in cats can be due to bacteria, parasites, fungi and viruses. This review details the practical investigation of these infections and highlights specific therapy where possible. The aim is to avoid the all-too-frequent temptation in practice to treat cats with lower respiratory tract signs empirically for feline bronchial disease
(FBD)/asthma. This is potentially hazardous as immunosuppressive therapy for FBD/asthma could exacerbate disease due to a LRTI. Empirical treatment of suspected LRTI is also difficult to recommend given the wide range of potential pathogens. CLINICAL CHALLENGES: Making a clinical ante-mortem diagnosis of LRTI in a cat can be challenging. Consistent historical, clinical, haematological and radiographic abnormalities are often lacking and findings may be non-specific. Astute clinical acumen, thorough investigation and high quality laboratory analysis are usually required for a diagnosis. Bronchoalveolar lavage, if feasible, and tests for lungworm should be routine in cats with lower respiratory tract signs. Lung fine needle aspiration may be useful in cases of diffuse or nodular pulmonary disease. Histopathology is rarely employed in ante-mortem investigations.

EVIDENCE BASE: The authors have reviewed a substantial body of literature to provide information on many of the reported bacterial, parasitic, fungal and viral pathogens, including some that occur in Asia. Attention has been given to specific therapy for each pathogen, with evidence-based comments when there is a deviation from routine recommendations.


Radiographic evaluation of feline appendicular degenerative joint disease vs. Macroscopic appearance of articular cartilage.

Degenerative joint disease (DJD) is common in domesticated cats. Our purpose was to describe how radiographic findings thought to indicate feline DJD relate to macroscopic cartilage degeneration in appendicular joints. Thirty adult cats euthanized for reasons unrelated to this study were evaluated. Orthogonal digital radiographs of the elbow, tarsus, stifle, and coxofemoral joints were evaluated for the presence of DJD. The same joints were dissected for visual inspection of changes indicative of DJD and macroscopic cartilage damage was graded using a Total Cartilage Damage Score. When considering all joints, there was statistically significant fair correlation between cartilage damage and the presence of osteophytes and joint-associated mineralizations, and the subjective radiographic DJD score. Most correlations were statistically significant when looking at the different joints individually, but only the correlation between the presence of osteophytes and the subjective radiographic DJD score with the presence of cartilage damage in the elbow and coxofemoral joints had a value above 0.4 (moderate correlation). The joints most likely to have cartilage damage without radiographic evidence of DJD are the stifle (71% of radiographically normal joints) followed by the coxofemoral joint (57%), elbow (57%), and tarsal joint (46%). Our data support radiographic findings not relating well to cartilage degeneration, and that other modalities should be evaluated to aid in making a diagnosis of feline DJD.


Efficacy of iopanoic acid for treatment of spontaneous hyperthyroidism in cats.

Iopanoic acid is an iodine containing oral cholecystographic agent that has been used to treat hyperthyroidism in humans and has recently been evaluated in an experimental model of feline hyperthyroidism. The aim of this study was to evaluate the efficacy of iopanoic acid in cats with spontaneous hyperthyroidism. Eleven cats were included in the study. Eight were treated initially with
50mg orally q 12h and three were treated with 100mg orally q 12h. Prior to treatment (baseline) and at 2, 4, and 12 weeks of treatment, owner questionnaires, physical exams, complete blood count, biochemistry analyses, and T(3) and T(4) concentrations were evaluated. The mean serum T(3) concentration decreased with treatment at all time periods compared to baseline. Mean T(4) concentrations were increased at weeks 4 and 12 compared to baseline. Five cats had a partial response during the initial 4 weeks of therapy, but the effects were transient and no significant improvements in clinical signs or physical exam findings were noted at any time period. Results suggest that iopanoic acid may be beneficial for acute management of thyrotoxicosis in some cats, but is not suitable for long-term management.


Effective, safe, and affordable rabies vaccines are still being sought. Newcastle disease virus (NDV), an avian paramyxovirus, has shown promise as a vectored vaccine for mammals. Here, we generated the recombinant avirulent NDV LaSota 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(9.8) EID(50)/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. The rL-RVG and LaSota NDV showed similar sensitivity to a neutralization antibody against NDV and similar resistance to a neutralization antibody against rabies virus. Animal studies demonstrated that rL-RVG is safe in several species, including cats and dogs, which was 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(8.3)EID(50) 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.


Feline leukemia virus outbreak in the critically endangered Iberian lynx (Lynx pardinus): high-throughput sequencing of envelope variable region A and experimental transmission.

The Iberian lynx is the most endangered felid species. During winter/spring 2006/7, a feline leukemia virus (FeLV) outbreak of unexpected virulence killed about 2/3 of the infected Iberian lynxes. All FeLV-positive animals were co-infected with feline hemoplasmas. To further characterize the Iberian lynx FeLV strain and evaluate its potential virulence, the FeLV envelope gene variable region A (VRA) mutant spectrum was analyzed using the Roche 454 sequencing technology, and an in vivo...
transmission study of lynx blood to specified-pathogen-free cats was performed. VRA mutations indicated weak apolipoprotein B mRNA editing enzyme and catalytic polypeptide-like cytidine deaminase (APOBEC) restriction of FeLV replication, and variants characteristic of aggressive FeLV strains, such as FeLV-C or FeLV-A/61C, were not detected. Cats exposed to FeLV/Candidatus Mycoplasma haemominutum-positive lynx blood did not show a particularly severe outcome of infection. The results underscore the special susceptibility of Iberian lynxes to infectious diseases.


**Imprecision when using measuring cups to weigh out extruded dry kibbled food.**
Many pet cats and dogs are fed dry extruded kibbled food by measuring cup, yet the precision and accuracy of this feeding strategy is not known. Over 12 studies, we assessed precision and accuracy of weighing out food portions, of various dry kibbled foods, by measuring cup. Poor precision was noted in all studies, with intra- and inter-subject coefficients of variation ranging from 2 to 13% and 2 to 28% respectively. Variable accuracy was also noted, which ranged from an 18% under-estimate to an 80% over-estimate in portion size. No specific factors were associated with imprecision, but the degree of inaccuracy was negatively associated with portion size (R = -0.67, p = 0.022), and positively associated with the number of subjects participating in the study (R = 0.60, p = 0.048). This is the first study to document imprecision and inaccuracy of using measuring cups to estimate portions of extruded dry kibbled food. Over time, such errors could contribute to insidious weight gain in companion animals, potentially contributing to the development of obesity. Imprecision in measuring food portions could also contribute to failure of weight management programmes for obese animals.


**Agarose gel serum protein electrophoresis in cats with and without lymphoma and preliminary results of tandem mass fingerprinting analysis.**
Background: Serum electrophoretic profiles in cats are poorly characterized with respect to the proteins that comprise the globulin fractions, and interpretation of the electrophoretograms is routinely done in the absence of information about identity of the proteins found within each fraction. Objectives: The aims of this study were to compare protein fractions separated by serum protein electrophoresis (SPE) in healthy cats and in cats with lymphoma and to confirm some component proteins in the major fractions following SPE using tandem mass fingerprinting analysis (TMFA). Methods: Total protein concentration was measured and agarose gel SPE performed on serum from 14 healthy cats and 14 cats with lymphoma. The absolute protein concentration within each fraction was compared between the 2 groups. Bands corresponding to the SPE fractions were excised from the gels of 2 control cats and 1 cat with lymphoma and analyzed by liquid chromatography coupled to mass spectrometry. Results were compared with sequences in the National Center for Biotechnology Information protein database. Results: Median albumin concentrations were significantly decreased and median beta-globulin concentrations were significantly increased in cats with lymphoma. Narrow electrophoretic spikes were present in the beta/gamma-globulin fraction in 3 cats with lymphoma. Following TMFA, multiple
proteins were identified in each fraction, and their mobility agreed with results from previous studies generated using alternative techniques. Inter-alpha (globulin) inhibitor 4 was identified in feline serum for the first time. Conclusions: Cats with lymphoma had lower albumin and higher beta-globulin concentrations than did healthy cats. Despite limitations of one-dimensional agarose gel SPE, TMFA provided preliminary data to confirm the protein components of the various fractions.


The incretin effect in cats: comparison between oral glucose, lipids, and amino acids.
Incretin hormones are secreted from the intestines in response to specific nutrients. They potentiate insulin secretion and have other beneficial effects in glucose homeostasis. We aimed to study the incretin effect in cats and to compare the effect of oral glucose, lipids, or amino acids on serum concentrations of insulin, total glucose-dependent insulinotropic peptide (GIP) and total glucagon-like peptide 1 (GLP-1). Ten healthy cats were used in a repeated measures design. Glucose, lipid, or amino acids were administered through nasoesophageal tubes on separate days. Blood glucose (BG) concentrations were matched between experiments by measuring BG every 5 min and infusing glucose intravenously at a changing rate. Intravenous glucose infusion with no prior treatment served as control. The incretin effect was estimated as the difference in insulin area under the curve (AUC) after oral compared with intravenous glucose. Temporal changes and total amount of hormone secretions were compared between treatment groups with the use of mixed models. Total glucose infused (TGI) at a mean dose of 0.49 g/kg resulted in slightly higher BG compared with 1 g/kg oral glucose (P = 0.038), but insulin concentrations were not significantly different (P = 0.367). BG and the TGI were not significantly different after the 3 oral challenges. Total GIP AUC was larger after lipids compared with amino acids (P = 0.0012) but GIP concentrations did not increase after oral glucose. Insulin and GIP concentrations were positively correlated after lipid (P < 0.001) and amino acids (P < 0.001) stimulations, respectively, but not after oral glucose stimulation. Total GLP-1 AUC was similar after all three oral stimulations. Insulin and GLP-1 concentrations were positively correlated after glucose (P = 0.001), amino acids (P < 0.001), or lipids (P = 0.001) stimulations. Our data indirectly support an insulinitropic effect of GIP and GLP-1. Potentiation of insulin secretion after oral glucose is minimal in cats and is mediated by GLP-1 but not GIP.


Whole blood transfusion in small animals: indications and effects.
Transfusion therapy is a major resource that can improve the patient’s capability to overcome the underlying disease. However, the effects of whole blood infusion, and how they affect the patient’s outcome, are not yet clear. For this study, a protocol was developed in order to monitor a group of 15 animals (9 dogs, 6 cats) that received a total of 19 transfusions; 3 animals received more than one transfusion each. The most common indications for blood transfusion included acute blood loss (47%), coagulopathy (33%) and other anaemias (20%). The mean pre-transfusion packed cell volume (PCV) of animals with acute blood loss (18%) was higher than in the group of coagulopathy (15%) or other anaemias (15%). The survival rates at 6 days after transfusion were greater in the coagulopathy
(80.0%) and other anaemias (66.7%) than in the group of acute blood loss (42.9%). After transfusion, pulse rate (p <0.01) and platelet count (p <0.05) decreased significantly, and there was a significant increase in body temperature of the animals that suffered from hypothermia before the transfusion (p <0.05). Overall survival was predictable based upon posttransfusion body temperature, observed PCV change, the difference between the obtained and the calculated PCV, and administered transfusion volume (p <0.05).


Feline immunodeficiency virus (FIV) is a lentivirus that causes a progressive disruption of immune function in cats. The neuroendocrine and immune systems communicate bidirectionally, mediated by cytokines such as tumour necrosis factor-alpha (TNF), several interleukins (IL-1, IL-6, IL-10), and through signals induced by the ratio of IL-10 to IL-12. FIV can affect both pituitary adrenal and thyroid axis function. Twenty FIV-infected cats in similar stages of the disease were evaluated for six months. A cross-sectional study in which the twenty cats were divided into two groups was performed. Ten were treated with Zidovudine (ZDV: 5mg/kg/d, PO, q12h, for six months) and 10 were untreated. Plasma concentrations of adrenocorticotropic hormone (ACTH), cortisol, T4, FT4, T3, IL-10, IL-12 and viral load (VL) were evaluated after six months. ACTH was found in significantly lower concentrations (p<0.0001) in the treated group whereas cortisol did not show significant differences between the two groups. Both T4 and FT4 had high values in untreated individuals (p<0.001) compared with Zidovudine treated cats. T3 did not show significant differences between the two groups. Both IL-10 and IL-12 were found in significantly higher concentrations in ZDV treated cats (p<0.001). By contrast, the IL10/IL-12 ratio values were significantly lower in untreated cats. Viral load was significantly lower in the treated cats after six months of therapy, compared with values detected pre-treatment (p<0.002). Untreated cats showed a significant increase of VL (p<0.04) compared with the values at the beginning of the study. In treated cats, VL showed lower numbers of viral copies than in untreated cats (p<0.01). In summary, Zidovudine treatment appeared to contribute to the normalization of both the adrenal and thyroid axes. This effect could be attributed to the decrease observed in VL, resulting in a change in cytokine patterns.


Feline herpesvirus-1: ocular manifestations, diagnosis and treatment options.

PRACTICAL RELEVANCE: Feline herpesvirus-1 (FHV-1) is a major cause of feline morbidity. Following exposure to the virus, virtually all cats become persistently infected and many of these will develop recrudescent disease on one or more occasions during their lifetime. Acute ocular herpetic disease manifests as conjunctivitis, corneal ulceration and keratitis, and can be severe and painful. Repeated bouts of recrudescent ocular disease can lead to progressive corneal pathology that can be ultimately blinding in affected cats. GLOBAL IMPORTANCE: FHV-1 has a worldwide distribution, with reported exposure rates in some cat populations of up to 97%. As such it is a significant cause of clinical disease in the global cat population. PATIENT GROUP: Young and adolescent cats are most at
risk of acute primary disease, and the vast majority of these will become persistently infected. Around half of all persistently infected cats will shed virus at some stage in their life and these may develop recrudescent ocular disease. CLINICAL CHALLENGES: Treatment of FHV-1 ocular disease is challenging. Antiviral medications may be expensive, and require good owner and patient compliance. Clinical responses in patients can be variable. Selecting the appropriate therapeutic approach requires good clinical judgement, with assessment of factors such as severity and stage of clinical disease, patient and owner compliance, and financial considerations. EVIDENCE BASE: Although a wide range of antiviral treatments is available, few have been tested in controlled clinical trials. Therapeutic decisions are, therefore, often based on results of in vitro studies, case-based reports and anecdote. Large, masked, controlled clinical trials are required in order to determine the efficacy of the antiviral drugs currently available to treat FHV-1.

Susceptibility of rapidly growing mycobacteria and Nocardia isolates from cats and dogs to pradofloxacin.
Rapidly growing mycobacteria (RGM) and Nocardiae can cause severe or refractory infections in cats and dogs. Prolonged antibacterial therapy is required to cure these infections. As fluoroquinolones have been used in combination therapy for treating RGM infections, isolates from the Mycobacterium smegmatis cluster (n=64), Mycobacterium fortuitum cluster (n=17), and M. mageritense cluster (n=2), collected from feline and canine patients, underwent susceptibility testing to pradofloxacin. The MIC(50), MIC(90) and tentative epidemiological cut-off (ECOFF) values as determined by microbroth dilution susceptibility testing that inhibited growth of the M. smegmatis and M. fortuitum clusters were 0.063, 0.125 and \( \leq 0.25 \); and 0.125, 0.250 and \( \leq 1.0 \mu g/mL \), respectively. E-Test results showed similar trends but MICs were lower than those for microbroth dilution. In summary, pradofloxacin demonstrated effective in vitro activity against RGM isolates. Additionally, veterinary isolates of Nocardia nova (n=18), Nocardia farcinica (n=3) and Nocardia cyriacigeorgica (n=1) underwent microbroth dilution testing to ciprofloxacin, enrofloxacin and pradofloxacin. The MIC(50) and MIC(90) of pradofloxacin, ciprofloxacin and enrofloxacin that inhibited growth of Nocardia nova isolates were 2 (4), 8 (16), 16 (32) \( \mu g/mL \), respectively. The tentative ECOFF values for pradofloxacin and ciprofloxacin were 32\( \mu g/mL \) and for enrofloxacin 64\( \mu g/mL \). The MIC or MIC range for the three N. farcinica isolates of pradofloxacin, ciprofloxacin and enrofloxacin were 0.25-0.5, 2 and 2\( \mu g/mL \) and for the single N. cyriacigeorgica isolate were 1, 4 and 4\( \mu g/mL \), respectively. On the basis on these results, fluoroquinolones appear to have limited therapeutic potential for most Nocardia infections.

A wound retraction device for laparoscopic-assisted intestinal surgery in dogs and cats.
Objectives: To report experience with laparoscopic-assisted intestinal resection and anastomosis for treatment of discrete intestinal masses using a novel wound retraction device. Study Design: Case series. Animals: Dogs (n=2) and cats (6). Methods: Dogs and cats with discrete intestinal masses
identified by ultrasonography without evidence of intestinal perforation or peritonitis, were included. A 2 portal technique was used; 1 portal was enlarged for insertion of the wound retraction device through which the intestine was examined as thoroughly as possible. The diseased portion of the intestine was exteriorized through the wound retractor and resection and anastomosis of the intestinal mass performed. Results: Of the 8 animals, laparoscopic-assisted intestinal resection and anastomosis through the wound retractor was performed in 2 dogs and 3 cats. In 3 cats, based on either location or extent of the lesion, 2 were converted to laparoscopic-assisted intestinal biopsies and 1 to an open colocolostomy. No other intra- or perioperative complications were encountered and all animals survived to discharge. Conclusions: Laparoscopic-assisted intestinal resection and anastomosis can be performed in select canine and feline patients with modestly sized, discrete intestinal masses.

**When normal is abnormal: keys to laboratory diagnosis of hidden endocrine disease.**
Although veterinary clinicians commonly rely on panels of laboratory tests with individual results flagged when abnormal, care should be taken in interpreting normal test results as well. There are several examples of this in evaluating patients with endocrine disease. The finding of a normal leukogram (absence of a stress leukogram) can be indicative of adrenal insufficiency in dogs, and this disorder can be especially elusive when there are no overt indicators of mineralocorticoid deficiency. Cats with hyperthyroidism can have normal serum thyroid hormone concentrations, normal hematocrits, and normal serum concentrations of creatinine despite the presence of disease that affects these parameters. A normal serum phosphorus concentration, in the face of azotemia, isostenuria, and hypertension can point a clinician toward a diagnosis of primary hyperaldosteronism rather than primary renal disease. A normal serum parathyroid hormone concentration in the face of hypercalcemia is inappropriate and can indicate the presence of primary hyperparathyroidism. Similarly, hypoglycemia accompanied by a normal serum insulin concentration can be found in cases of hyperinsulinism. These normal findings in abnormal patients, and their mechanisms, are reviewed.

**Demographic differences between urban feeding groups of neutered and sexually intact free-roaming cats following a trap-neuter-return procedure.**
OBJECTIVE: To examine demographic differences during a 1-year observational period between urban feeding groups of neutered and unneutered free-roaming cats following a trap-neuter-return procedure. DESIGN: Natural-setting trial. Animals-Free-roaming adult cats (n = 184) and kittens (76) living in 4 feeding groups in an urban region of Israel. PROCEDURES: Cats in 2 feeding groups were subjected to a trap-neuter-return (TNR) procedure. Cats in 2 other feeding groups were untreated. Data were collected on a weekly basis before and during feeding time over a 1-year period. Following individual cat identification, presence of adults and kittens was recorded throughout the year. Rates of immigration, emigration, and kitten survival were compared between neutered and unneutered groups. RESULTS: The number of adult cats in the 2 neutered groups increased significantly during the study period because of higher immigration and lower emigration rates than in the unneutered groups, in which the number decreased. In the neutered groups, annual presence of neutered cats was significantly
higher than that of sexually intact cats. Kitten survival in the neutered groups was significantly higher than in the unneutered groups. CONCLUSIONS AND CLINICAL RELEVANCE: Targeting the TNR method mainly at feeding groups in urban residential neighbourhoods may result in increased group size, as a consequence of 2 major changes in group dynamics: sexually intact cats immigrate into the neutered groups more readily and neutered cats reduce their emigration rates, possibly because of a reduction in reproductive and competitive pressures. To maintain a high proportion of neutered cats in such cat groups, persistent TNR campaigns are therefore necessary.


**Imaging diagnosis-intracranial cryptococcal mass in a cat.**
A 4-year-old neutered female domestic shorthair was evaluated for mentation changes and left prosencephalic signs. This imaging report describes the imaging findings for this patient. A diagnosis of a cryptococcal mass was made based on imaging and additional diagnostics. Complete resolution of the mass was demonstrated by follow-up imaging. This report serves as a reminder that masses associated with cryptococcal infection should be included on the differential list for cats with intracranial masses. In addition, this report provides evidence that large intracranial cryptococcal masses may resolve with long-term medical therapy.


**Massive parallel 16S rRNA gene pyrosequencing reveals highly diverse fecal bacterial and fungal communities in healthy dogs and cats.**
This study evaluated the fecal microbiota of 12 healthy pet dogs and 12 pet cats using bacterial and fungal tag-encoded FLX-Titanium amplicon pyrosequencing. A total of 120,406 pyrosequencing reads for bacteria (mean 5017) and 5359 sequences (one pool each for dogs and cats) for fungi were analyzed. Additionally, group-specific 16S rRNA gene clone libraries for Bifidobacterium spp. and lactic acid-producing bacteria (LAB) were constructed. The most abundant bacterial phylum was Firmicutes, followed by Bacteroidetes in dogs and Actinobacteria in cats. The most prevalent bacterial class in dogs and cats was Clostridia, dominated by the genera Clostridium (clusters XIVa and XI) and Ruminococcus. At the genus level, 85 operational taxonomic units (OTUs) were identified in dogs and 113 OTUs in cats. Seventeen LAB and eight Bifidobacterium spp. were detected in canine feces. Ascomycota was the only fungal phylum detected in dogs, while Ascomycota, Basidiomycota, Glomeromycota, and Zygomycota were identified in dogs. Nacaseomyces was the most abundant fungal genus in dogs; Saccharomyces and Aspergillus were predominant in cats. At the genus level, 33 different fungal OTUs were observed in dogs and 17 OTUs in cats. In conclusion, this study revealed a highly diverse bacterial and fungal microbiota in canine and feline feces.

**Immunohistochemical characterization of oral mucosal lesions in cats with chronic gingivostomatitis.**

Histological and immunohistochemical studies were performed on samples of the glossopalatine mucosa from 30 cats with feline chronic gingivostomatitis (FCGS). Immunohistochemical labelling and computer-assisted morphometric analysis were used to identify expression of CD3, CD4, CD8, CD79a, IgG, IgM, IgA, leucocyte antigen 1 (L1) and class II molecules of the major histocompatibility complex (MHC) in tissue sections. Mast cells were detected by toluidine blue staining. The microscopical lesions were graded by severity of inflammation and although this grading correlated significantly with the severity of mucosal inflammation assessed at clinical examination, sites assessed as clinically normal or mildly inflamed were poorly predictive of the histopathological grade in the corresponding tissue sample. The number of CD79a+ cells (mostly plasma cells), L1+ cells (mostly neutrophils) and CD3+ T cells, and the level of MHC class II expression, tended to correlate with the severity of the inflammation. In general, CD8+ T cells were more numerous than CD4+ T cells. The majority of the plasma cells were of the IgG isotype and fewer IgA+ and IgM+ plasma cells were present. In some cases MHC class II expression by mucosal epithelium, salivary duct epithelium or skeletal muscle fibres was observed. Relative to equivalent oral mucosal samples from healthy cats, the number of cells labelled for CD3, CD4, CD8, CD79a, IgG, IgM, IgA or L1, and the number of mast cells, within the lamina propria/submucosa were significantly increased. Limited analysis of the epithelial compartment also found more CD3+ T cells compared with healthy cats. These findings indicate that the glossopalatine mucosal lesions in FCGS represent a complex, chronic and destructive inflammatory process affecting the epithelium and lamina propria, with frequent extension into submucosal tissues. The predominance of CD8+ cells over CD4+ cells suggests the induction of an underlying cytotoxic cell-mediated immune response, which could be consistent with a viral aetiology.

**Headley SA, Gillen MA, Sanches AW, and Satti MZ (2011) J Helminthol 1-6.**

**Platynosomum fastosum-induced chronic intrahepatic cholangitis and Spirometra spp. infections in feral cats from Grand Cayman.**

The occurrence of platynosomiasis and intestinal sparganosis is described in feral cats from Grand Cayman, Cayman Islands. Spirometra spp. was observed within the intestine of 18.18% (10/55) of cats; 1.18% (1/55) of cats demonstrated gross and histological manifestation of parasitism by Platynosomum fastosum, but 14.5% (8/55) of cats had the characteristic pathological manifestations of P. fastosum-induced intrahepatic cholangitis without the concomitant presence of the intraductal trematode. Combined parasitism (Spirometra spp. and P. fastosum) was observed in 9.09% (5/55) of feral cats. Significant pathological findings were only associated with the hepatic fluke, P. fastosum, and were grossly characterized by moderate hepatomegaly with enlarged and dilated bile ducts. Examples of cestodes with morphological features characteristic of Spirometra spp. were observed within the small intestine without any associated pathological lesion. The histopathological evaluation of liver fragments revealed chronic intrahepatic cholangitis with and without the associated intraductal trematode, and was characterized by marked periductal fibrosis, adenomatous proliferation of bile duct epithelium, dilation of intrahepatic bile ducts and portal accumulations of inflammatory cells. The occurrence of the cestode in feral cats coupled with factors that are unique to Grand Cayman makes this island the ideal location for sporadic cases of human sparganosis.
Heinrich NA, McKeever PJ, and Eisenschenk MC (2011) Vet Dermatol

Adverse events in 50 cats with allergic dermatitis receiving ciclosporin.

Ciclosporin is an immunosuppressive drug that has been used to treat allergies and other immune-mediated diseases in cats, dogs and humans. Information about the adverse effects of ciclosporin in cats has been limited to smaller studies and case reports. Adverse effects in dogs are mainly gastrointestinal in nature, but humans can also experience hypertension and altered renal function. The aim of this retrospective case series study was to document the occurrence and clinical appearance of adverse events in cats receiving ciclosporin to treat allergic skin disease. The medical records of 50 cats with allergic dermatitis treated with oral ciclosporin (1.9-7.3 mg/kg/day) were reviewed. Adverse events occurred in 66% (33 cats). Adverse events likely to be associated with ciclosporin included the following: vomiting or diarrhoea within 1-8 weeks of receiving ciclosporin (24%), weight loss (16%), anorexia and subsequent hepatic lipidosis (2%) and gingival hyperplasia (2%). Other adverse events less likely to be associated with ciclosporin therapy included the following: weight gain (14%), dental tartar and gingivitis (10%), otitis (4%), chronic diarrhoea (4%), inflammatory bowel disease with indolent gastrointestinal lymphoma (2%), urinary tract infection (2%), cataract (2%), elevated liver enzymes (2%), hyperthyroidism and renal failure (2%) and transient inappropriate urination (2%). Some cats experienced multiple adverse events. Case-control studies are needed to prove cause and effect of ciclosporin with regard to these adverse events.


When cats’ ways of life interact with their viruses: A study in 15 natural populations of owned and unowned cats (Felis silvestris catus).

In natural populations, virus circulation is influenced by host behavior and physiological characteristics. Cat populations exhibit a great variability in social and spatial structure, the existence of different ways of life within a same population may also result in different epidemiological patterns. To test this hypothesis, we used a logistic regression to analyze the risk factors of Feline immunodeficiency virus (FIV), feline herpes virus (FHV), feline calicivirus (FCV), and feline parvovirus (FPV) infection in owned (fed and sheltered) and unowned (neither fed nor sheltered, unsocialized) cats living in a rural environment in the North Eastern part of France. A serological survey was carried out in 492 non-vaccinated and non-sterilized individuals from 15 populations living in the same area. The prevalence of feline leukemia virus (FeLV) was also studied, but too few were infected to analyze the risk factors of this virus. For each virus, the epidemiological pattern was different in owned and unowned cats. Unowned cats were more frequently infected by directly transmitted viruses like FIV, FHV and FCV (21.22%, 67.66%, 86.52% in unowned cats vs 9.55%, 53.88%, 77.18% in owned cats, respectively), a difference that may be explained by a more solitary and more aggressive behavior in unowned adults, and/or possibly by a higher sensitivity related to a more stressful life. On the contrary, owned cats were more frequently infected with FPV (36.41% in owned cats vs 15.61% in unowned cats), possibly as a result of their concentration around human settlements. The present study showed that owned and unowned cats living in a same area have behavioral and physiological characteristics sufficiently different to influence virus circulation. Pooling different types of cats in a single sample without taking
it into account could give a wrong picture of the epidemiology of their viruses. The conclusion of this work can be extended to any epidemiological studies led in wildlife species with flexible behavior as any variations in social or spatial structure, between or within populations, could result in different virus circulation.


**Evaluation of composite resin materials for maxillomandibular fixation in cats for treatment of jaw fractures and temporomandibular joint luxations.**

OBJECTIVE: To identify a method of composite application for maxillomandibular fixation (MMF) in cats that ensures the material will remain bonded during convalescence but be easy to remove with a low complication rate. STUDY DESIGN: Experimental study. SAMPLE POPULATION: Feline cadavers (n=88). METHODS: MMF was applied using composite to 4 groups of 22 feline cadaver heads each. The protocols were: group CR: acid etch and composite resin; group CR+: acid etch, bonding agent, and composite resin; group FR50: partial surface acid etch and flowable composite resin; group FR100: complete surface acid etch and flowable composite resin. Removal time and complication rate were noted. Load to failure was determined by tensile loading. RESULTS: Load to failure was similar for groups CR and CR+ and for groups FR50 and FR100; however, load to failure for groups FR50 and FR100 was higher than groups CR and CR+ (P<.01). Time for material removal for group FR100 was longer (P<.01) and the complication rate was higher (P<.01) compared with the groups CR, CR+, and FR50, with no significant differences in removal times and complication rate between the latter groups. The most frequent complication during material removal in group FR100 was crown fracture. CONCLUSIONS: Partial coronal surface acid etch before use of flowable composite maintained a strong bond, yet resulted in easy material removal with a low complication rate.


Aims: To investigate the faecal microbiota of geriatric cats, as aging affects the nutrient digestibility and metabolic function of the feline intestine. Methods and results: 20 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 approximately 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 approximately 41% of total bacteria have been detected with the probes employed. Significance and impact of 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.


**Carriage of methicillin-resistant Staphylococcus aureus by veterinarians in Australia.**

**OBJECTIVE:** To estimate the prevalence of carriage of methicillin-resistant Staphylococcus aureus (MRSA) among Australian veterinarians. **METHODS:** Individuals attending veterinary conferences in Australia in 2009 were recruited to provide nasal swabs and complete a questionnaire about their professional activities. Swabs were processed by standard methods for detecting MRSA and questionnaire responses were used to group veterinarians according to their areas of major work emphasis (species and practice type). Prevalence was estimated for each of these grouping and contingency tables and regression tree analysis used to explain the variation in MRSA carriage. **RESULTS:** Among the 771 respondents ‘industry and government veterinarians’ (controls) had the lowest prevalence of MRSA carriage at 0.9%. Veterinarians with horses as a major area of work emphasis had a prevalence of 11.8% (13-fold that of controls) and those whose only major emphasis was horses had a prevalence of 21.4% (23-fold that of controls). Veterinarians with dogs and cats as a major activity had a 4.9% prevalence (5-fold that of controls). Prevalence rates for other major activities (pigs, dairy and beef cattle, avian and wildlife) were also increased, but were estimated from smaller numbers of respondents. Regression tree analysis clearly isolated equine veterinarians and dog and cat practitioners as groups at increased risk of carriage of MRSA. **CONCLUSION:** Carriage of MRSA is a notable occupational health issue for veterinarians in clinical practice in Australia, particularly those who work with horses.


**Cutaneous Lymphoplasmacytic Lymphoma with Systemic Metastasis in a Cat.**

A lymphoplasmacytic lymphoma was diagnosed in a 12-year-old domestic cat that had a primary cutaneous mass involving the stomach, liver, kidneys, heart, abdominal wall, diaphragm, bone marrow and several lymph nodes. Histopathologically, the most characteristic feature of this tumor was its composition of heterogeneous cells, such as small lymphocytes, well-differentiated plasma cells and plasmacytoid transformed lymphocytes. Amyloid was deposited in the skin, stomach, and several lymph nodes. Immunohistochemically, neoplastic small lymphocytes were positive for CD20, and well-differentiated plasma cells and plasmacytoid transformed lymphocytes were positive for lambda-lg light chains and MUM1/IRF-4. These results emphasize the importance of lymphoplasmacytic lymphoma as a differential diagnosis of extramedullary cutaneous plasmacytoma in cats.


**Effects of short-chain fructooligosaccharides and galactooligosaccharides, individually and in combination, on nutrient digestibility, fecal fermentative metabolite concentrations, and large**
bowel microbial ecology of healthy adults cats.

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


Companion animals symposium: role of microbes in canine and feline health.

Whether in an ocean reef, a landfill, or a gastrointestinal tract (GIT), invisible communities of highly active and adaptable microbes prosper. Over time, mammals have developed a symbiosis with microbes that are important inhabitants not only in the GIT, but also in the mouth, skin, and urogenital tract. In the GIT, the number of commensal microbes exceeds the total number of host cells by at least 10 times. The GIT microbes play a critical role in nutritional, developmental, defensive, and physiologic processes in the host. Recent evidence also suggests a role of GIT microbes in metabolic phenotype and disease risk (e.g., obesity, metabolic syndrome) of the host. Proper balance is a key to maintaining GIT health. Balanced microbial colonization is also important for other body regions such as the oral cavity, the region with the greatest prevalence of disease in dogs and cats. A significant obstruction to studying microbial populations has been the lack of tools to identify and quantify microbial communities accurately and efficiently. Most of the current knowledge of microbial populations has been established by traditional cultivation methods that are not only laborious, time-consuming, and often inaccurate, but also greatly limited in scope. However, recent advances in molecular-based techniques have resulted in a dramatic improvement in studying microbial communities. These DNA-based high-throughput technologies have enabled us to more clearly characterize the identity and metabolic activity of microbes living in the host and their association with health and diseases. Despite this recent progress, however, published data pertaining to microbial communities of dogs and cats are still lacking in comparison with data in humans and other animals. More research is required to provide a more detailed description of the canine and feline microbiome and its role in health and disease.

Ultrasound-guided mesenteric lymph node iohexol injection for thoracic duct computed tomographic lymphography in cats.
Computed tomographic (CT) lymphography was performed in cats using percutaneous ultrasound-guided injection of contrast medium into a mesenteric lymph node. The thoracic duct and its branches were clearly delineated in CT images of seven cats studied. The thoracic duct was characterized by anatomic variation and appeared as single or multiple branches. The thoracic duct and the cisterna chyli were identified along the ventral or left ventral aspect of the vertebrae from the level of the cranial lumbar to the caudal cervical vertebrae. The thoracic duct was identified in the central caudal mediastinum, deviated to the left in the cranial mediastinum, and finally moved toward the venous system. Small volumes of extranodal contrast medium leakage were identified in all cats. After injection, the mesenteric lymph nodes were cytologically normal. Ultrasound-guided CT lymphography via percutaneous mesenteric lymph node injection appears safe and effective in cats.

Kleinschmidt S, Nolte I, and Hewicker-Trautwein M (2011) Anat Histol Embryol Structural and Functional Components of the Feline Enteric Nervous System. With 5 figures and 2 tables SUMMARY: Neurohistological and immunohistochemical examinations of the feline enteric nervous system (ENS) were performed by using antibodies against neuron-specific enolase (NSE), phosphorylated neurofilaments (PN), non-phosphorylated neurofilaments (NPN) and vasoactive intestinal peptide (VIP), whereas glial cells were investigated by using antibodies against glial fibrillary acidic protein (GFAP). The study included full-thickness biopsies of the stomach, duodenum, jejunum, ileum and colon of 11 healthy cats. In this study, immunohistochemical staining of feline ENS with antibodies to NSE, PN and NPN revealed the presence of different ganglionated and aganglionated plexus. The two ganglionated plexus were arranged in a plexus submucosus internus & externus and a plexus myentericus. Furthermore, plexus mucosus and subserosal plexus represented two aganglionated plexus. GFAP-stained cellular elements were smaller than and in close contact to enteric neurons possibly resembling astrocytes of the central nervous system. VIP is one of the major neurotransmitters of enteric inhibitory neurons, and immunoactivity was present in all layers of the gut, especially in ganglionated plexus. This is the first report, describing feline ENS by using immunohistochemical methods.

Following the recovery of first-stage nematode larvae indicative of Aelurostrongylus abstrusus infection in the faeces of free-roaming cats from the greater Tirana area, examination of 18 cats at
necropsy revealed nine of them harbouring adult *A. abstrusus* (Railliet, 1898) in the lungs (prevalence, 50%; range, 1-11). In addition to *A. abstrusus*, *Eucoleus aerophilus* (16.7%; 1-9) was isolated from the lungs, and *Toxocara cati* (83.3%; 2-33), *Ancylostoma tubaeforme* (44.4%; 1-20), *Dipylidium caninum* (83.3%; 1-164), *Joyeuxiella pasqualei* (11.1%; 1-3) and one specimen of an acanthocephalan (5.5%) were recovered from the gastrointestinal tract. Furthermore, oocysts of *Cystoisospora felis* and *C. rivolta* were found in the rectal faeces of 5.6% and 11.1% of the cats, respectively. In conclusion, the prevalence of endoparasite infection in free-roaming cats in Tirana can be considered to be high. The occurrence of *A. abstrusus*, which may cause respiratory distress in cats, is reported for the first time in Albania.


**Where do we stand in the control of rabies? Knowledge and practices among physicians in a health district in Turkey.**

**OBJECTIVE:** The aim of this study was to determine the level of knowledge of rabies transmission and control among physicians practicing in healthcare centers in Sanliurfa, Turkey where 2 cases of human rabies were reported in the past 12 months. Implementation issues regarding the current guidelines will also be discussed. **METHODS:** A cross-sectional study was conducted among 84 physicians practicing in healthcare centers in Sanliurfa, located in the Southeastern Anatolian region of Turkey. **RESULTS:** Among physicians, average duration of medical practice was 8.5 +/- 6.7 years. The correct incubation period of rabies cases was known by 57.1% of the physicians. While 88.1% of physicians were aware of possible exposure routes, only 44.0% of them had the information that mucosal contact may also lead to transmission. While 96.4% of the physicians correctly indicated that cats and dogs can transmit the disease, the fact that foxes also have a role in transmission was known by only 48.8%. Post-exposure prophylaxis was correctly indicated by 65.5% of participants, but only 17.9% had correct information about pre-exposure prophylaxis. **CONCLUSION:** An important approach in rabies control is to increase community awareness, particularly among healthcare providers. It was found that basic management issues and insufficient awareness still exist despite the presence of legal regulations. To control rabies, the issue must be dealt with locally, through both economic and social means, by supporting rabies control efforts of local health and agricultural directorate managers and by encouraging collaboration with academics.


**[Mitral valve dysplasia in a cat causing reversible left ventricular hypertrophy and dynamic outflow tract obstruction].**

A 6-month-old male European shorthair cat was examined because of a 2/6 systolic left apical cardiac murmur. Echocardiography revealed severe concentric left ventricular hypertrophy and severe dynamic left ventricular outflow tract obstruction (pressure gradient of 85 mmHg) caused by systolic anterior motion (SAM) of the septal mitral valve leaflet. After 2 months of oral treatment with atenolol, the cardiac murmur had disappeared. Echocardiography showed only slight thickening of the interventricular septum and resolution of the pressure gradient. The cat was discharged and its owner was advised to continue atenolol lifelong. Echocardiographic findings of a combination of left
ventricular concentric hypertrophy and dynamic left ventricular outflow tract obstruction can be caused by hypertrophic obstructive cardiomyopathy (HOCM) or mitral valve dysplasia in the absence of hypertension and fixed aortic stenosis. In the case of HOCM, left ventricular hypertrophy is the primary process. In the case of mitral valve dysplasia, systolic anterior motion of the mitral valve is the primary problem, which leads to dynamic left ventricular outflow tract obstruction and ultimately to left ventricular concentric hypertrophy, due to pressure overload. If the left ventricular outflow tract obstruction is reduced with an oral beta-receptor blocker the secondary left ventricular hypertrophy may resolve. This would not happen in the case of hypertrophic obstructive cardiomyopathy. To the best of the authors’ knowledge, this is the first documented case of severe dynamic left ventricular outflow tract obstruction and severe left ventricular hypertrophy in a cat successfully treated with oral atenolol.


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


Ultrasonography of intestinal mast cell tumors in the cat.
The sonographic features of intestinal mast cell tumors (MCT) were reviewed in 14 cats. The mean age was 13.4 +/- 2.5 years. There were 16 focal intestinal tumors and one diffuse submucosal infiltrate. The most common pattern was focal, hypoechoic wall thickening that was noncircumferential and eccentric (9/16 tumors) or circumferential, asymmetric, and eccentric (5/16 tumors). Nine of the cats had lesions in the jejunum or duodenum, four were at the ileoceccolic junction, and one cat had a colonic mass. Six MCTs had altered but not loss of wall layering, and the most commonly affected layer on ultrasound examination was the muscularis propria. Nine cats had enlarged abdominal lymph nodes, and seven were due to metastatic disease. Metastatic disease was not routinely detected by ultrasound in the liver (1/4 cats) or the spleen (0/3 cats). Concurrent small cell (T cell) lymphoma was present in four of 14 cats (29%).


Lipogenic gene expression in abdominal adipose and liver tissues of diet-induced overweight cats.
The effect of overweight status on the expression of SREBP-1c and downstream lipogenic genes, such as ATP citrate lyase (ACL) and fatty acid synthase (FAS), in abdominal adipose and liver tissues was
determined in cats using a diet-induced weight gain model. ACL and SREBP-1c mRNA expression was significantly reduced (approximately 65% and 20%, respectively) in liver tissue, whereas FAS and SREBP-1c expression was significantly increased (approximately 80% and 45%, respectively) in abdominal omental adipose tissue of overweight animals as compared to healthy animals. Additionally, ACL, FAS, and SREBP-1c expression was significantly reduced by approximately 50%, 75%, and 70%, respectively, in abdominal subcutaneous adipose tissue of overweight animals. Omental adipose tissue appeared to foster, whereas subcutaneous adipose and liver tissues appeared to defer lipid storage based on differences in SREBP-1c mRNA expression. Overall, reduced lipogenic gene mRNA expression patterns support the hypothesis that SREBP-1c expression is reduced in overweight and possibly obese cats, reflecting down-regulation of the lipogenic pathway to prevent further fat accumulation and weight gain.

Effects of level of consciousness on urodynamic procedure in female cats.  
Urodynamic evaluation is an invasive and uncomfortable procedure that can cause physical distress and is difficult to perform in uncooperative patients. The aim of this study was to evaluate the effects of consciousness on urodynamic evaluation in an animal model. Repeated cystometry, electromyogram, and measurement of serum cortisol concentrations were performed in female cats under conscious (CON), conscious sedation (CS) and deep anesthesia (DA) conditions. Urodynamic evaluation showed that there were no statistical differences in maximum detrusor pressure or bladder capacity observed among the three conditions. Under the DA condition, but not the CON and CS conditions, bladder contraction was accompanied by an un-relaxed anal sphincter. Residue urine volume significantly increased in the DA condition compared to the CON and CS conditions. The levels of serum cortisol significantly increased after performing urodynamic evaluation under the CON condition, whereas these levels were not significantly increased under the CS and DA conditions. This study showed that conscious sedation has no adverse effects on the urodynamic variables, and that it significantly reduces distress in cats undergoing the examination. These results may provide novel insights for performing urodynamic studies in uncooperative patients.

Litster AL (2011) Vet J  
Chronic kidney disease in cats: An ounce of prevention is worth a pound of cure.

Cytology of canine and feline cutaneous and subcutaneous lesions and lymph nodes.  
Fine-needle aspirates and impression smears of cutaneous and subcutaneous lesions and lymph nodes are the most commonly submitted cytology samples from veterinary patients. Diagnostic cytology samples of these lesions are easily collected in patients without anesthesia or analgesia. Cytology can yield immediate results and may prevent the need for additional tests that use more invasive methods of sample collection. This article offers a brief review of how to collect and submit cytology samples and describes cytologic lesions that often are diagnosed in dogs and cats. When applicable, differences between disease progression in dogs and cats are described.
Magden E, Quackenbush SL, and Vandewoude S (2011) Vet Immunol Immunopathol

FIV associated neoplasms-A mini-review.
Retroviral induced neoplasms have been key to understanding oncogenesis and are important etiologic agents associated with cancer formation. Cats infected with feline immunodeficiency virus (FIV), the feline analogue to human immunodeficiency virus (HIV), are reported to be at increased incidence of neoplasia. This review highlights reported risk factors and tumor cell phenotypes associated with neoplasias arising in FIV-infected animals, differences in oncogenic disease in natural versus experimental FIV infections, and similarities between FIV- and HIV-related malignancies. The most common type of FIV-associated neoplasm reported in the literature is lymphoma, specifically of B-cell origin, with experimentally infected cats developing neoplastic lesions at an earlier age than their naturally infected cohorts. The mechanism of FIV-induced lymphoma has not been completely ascertained, though the majority of published studies addressing this issue suggest oncogenesis arises via indirect mechanisms. HIV-infected individuals have increased risk of neoplasia, specifically B cell lymphoma, in comparison with uninfected individuals. Additional similarities between FIV- and HIV-associated neoplasms include the presence of extranodal lymphoma, a synergism with other oncogenic viruses, and an apparent indirect mechanism of induced oncogenesis. This literature supports study of FIV-associated neoplasms to further characterize this lentiviral-neoplasia association for the benefit of both human and animal disease, and to advance our general knowledge of mechanisms for viral-induced oncogenesis.


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.

Identification of beta-1 adrenergic receptor polymorphisms in cats.
In human beings, genetic polymorphisms within the beta-1 adrenergic receptor (ADRB1) gene have been associated with variable pharmacologic responses to beta blocker therapy. Beta-blockers are commonly given to cats with heart disease, particularly hypertrophic cardiomyopathy, a common cause of feline heart disease. We hypothesized that polymorphisms are present in the feline ADRB1 gene, which could result in an altered pharmacologic response to beta-blocker therapy. We sequenced the feline ADRB1 gene in 42 cats of five breeds. We identified three polymorphisms within the ADRB1
gene. Two polymorphisms did not change the amino acid produced and are unlikely to be clinically significant. A third polymorphism identified was an AA/CC substitution at the 830-831 base pair sites. This alteration changed the amino acid produced from proline to glutamine at position 277 and computer modeling predicts an altered protein structure. Further study is warranted to determine if this polymorphism alters response to beta blocker therapy.


**Frequency of blood type A, B, and AB in 515 domestic shorthair cats from the Lisbon area.**

Background: The A, B, and AB feline blood types are recognized worldwide and their frequencies vary geographically and among breeds. Frequencies of feline blood types have been reported previously from northern Portugal; however, they are unknown in other parts of the country. Objectives: This 13-year retrospective study was undertaken to determine the frequency of feline blood types in domestic shorthair (DSH) cats from the Lisbon area of central Portugal. Methods: Blood samples were obtained at the Veterinary Teaching Hospital of the Technical University of Lisbon and its Veterinary Blood Bank and at several veterinary clinics in the Lisbon area. Blood typing was performed by the classical agglutination assay or using a cartridge assay. Results: The study population comprised 515 DSH cats of both sexes and various ages. Frequencies of blood types A, B, and AB were 97.5%, 2.1%, and 0.4%, respectively. Conclusion: As in other parts of the world, this study showed a clear predominance of type-A cats in the Lisbon area of Portugal.


**Feline injection-site sarcoma: past, present and future perspectives.**

Feline injection-site sarcomas (FISS) have been known since the early 1990s. After an initial correlation with rabies and feline leukaemia virus vaccination, subsequent studies have demonstrated that an abnormal reaction of feline tissues to chronic inflammation was mainly responsible for the disease. The low incidence of FISS in the population is explained by its multifactorial aetiology, since individual genetic characteristics are also implicated. FISS is an infiltrative tumour with low metastatic potential but local recurrence is common. Multimodal treatment (extensive surgery, radiotherapy, chemotherapy) is recommended. The use of sophisticated imaging techniques can improve diagnosis and help in surgical planning. After the initial enthusiasm in understanding the disease, only few advances have been made in the last few years. New promising therapies may arise from a better knowledge of the molecular pathogenesis of FISS and the successful development of drugs modulating the immune system.


**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.

Intestinal pathogenic E. coli strains from cats, dogs and swine display an Adherent-Invasive Escherichia coli (AIEC) phenotype.
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 amongst 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.

Iron homeostasis and disorders in dogs and cats: a review.
Iron is an essential element for nearly all living organisms and disruption of iron homeostasis can lead to a number of clinical manifestations. Iron is used in the formation of both hemoglobin and myoglobin, as well as numerous enzyme systems of the body. Disorders of iron in the body include iron deficiency anemia, anemia of inflammatory disease, and iron overload. This article reviews normal iron metabolism, disease syndromes of iron imbalance, diagnostic testing, and treatment of either iron deficiency or excess. Recent advances in diagnosing iron deficiency using reticulocyte indices are reviewed.

Pharmacokinetics and pharmacodynamics of A77 1726 and leflunomide in domestic cats.
The pharmacokinetics and pharmacodynamics of A77 1726 and leflunomide after intravenous (i.v.) and oral (p.o.) administration were evaluated in adult cats. Three treatments were administered: a single i.v. dose of A77 1726 (4 mg/kg), a single oral dose of leflunomide (4 mg/kg), and multiple oral doses of leflunomide (2 mg/kg). Mean pharmacokinetic parameter values after a single i.v. dose of A77 1726 were distribution (A) and elimination (B) intercepts (15.2 mug/mL and 34.5 mug/mL, respectively), distribution and elimination half-lives (1.5 and 71.8 h, respectively), area under the curve (AUC(0->infinity) ; 3723 mug*h/mL), mean residence time (MRT; 93 h), clearance (Cl(obs) ; 1.1 mL/kg/h),
and volume of distribution at steady state (Vd(ss); 97 mL/kg). Mean pharmacokinetic parameter values after a single oral dose of leflunomide were absorption and elimination rate constants (0.3 1/h and 0.01 1/h, respectively), absorption and elimination half-lives (2.3 and 59.1 h, respectively), AUC(0-\(\infty\)) (3966 mug*h/mL), and maximum observed plasma concentration (C(max); 38 mug/mL). The bioavailability after a single oral dose of leflunomide was 100%. The mean +/- SD A77 1726 concentration that inhibited 50% lymphocytes (EC(50)) was 16 +/- 13.5 mug/mL. The mean +/- SD maximum A77 1726 concentration (EC(max)) was 61.0 +/- 23.9 mug/mL.

Characterization of ectoparasites in an urban cat (Felis catus Linnaeus, 1758) population of Rio de Janeiro, Brazil.
Ectoparasites are capable of transmitting infectious diseases and, therefore, are of zoonotic concern. Cats submitted to a spay/neuter program in the city of Rio de Janeiro were examined to determine the distribution of ectoparasites in cats from a city with a tropical climate. Independent of gender, breed, or age, 292 cats were combed and subjected to otoscopic examination. Ectoparasites were collected, and blood samples were taken to determine packed cell volume. The majority of the 292 cats were female (71%), and most of them were categorized as domestic short hair cats (92%). Different species of ectoparasites that produced both single agent and multi-agent infestations were detected in these cats. Most cats were infested by Ctenocephalides felis (60%); however, other ectoparasites were found to a lesser degree in the sampled population (Felicola subrostratus (5.4%), Rhipicephalus sanguineus (1.4%), Lynxacarus radovskyi (1%), and Otodectes cynotis (6.2%)). Within the infested cats, 16.3% were also anemic, and there was a significant association between the occurrence of anemia and flea infestation. Of all sampled cats, 65% were infested by at least one species of ectoparasites, which suggests both a heavy infestation of the environment and owner negligence. Ectoparasites are not only nuisances to both cats and owners, but they are also significant carriers of disease. Therefore, the implementation of rigorous, safe preventive measures is of great importance.

Reduction of feral cat (Felis catus Linnaeus 1758) colony size following hysterectomy of adult female cats.
The size of urban cat colonies is limited only by the availability of food and shelter; therefore, their population growth challenges all known population control programs. To test a new population control method, a free-roaming feral cat colony at the Zoological Park in the city of Rio de Janeiro was studied, beginning in 2001. The novel method consisted of performing a hysterectomy on all captured female cats over 6 months of age. To estimate the size of the colony and compare population from year to year, a method of capture-mark-release-recapture was used. The aim was to capture as many individuals as possible, including cats of all ages and gender to estimate numbers of cats in all population categories. Results indicated that the feral cat population remained constant from 2001 to 2004. From 2004 to 2008, the hysterectomy program and population estimates were performed every other year (2006 and
The population was estimated to be 40 cats in 2004, 26 in 2006, and 17 cats in 2008. Although pathogens tend to infect more individuals as the population grows older and maintains natural behavior, these results show that free-roaming feral cat colonies could have their population controlled by a biannual program that focuses on hysterectomy of sexually active female cats.

**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 Zap(R)II vector and immunoscreened with pre-immune plasma, plasma from SPF 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 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 blot against the immune plasma and negative against non-immune plasma; these antigens might be useful serologic or even vaccine targets.

**Axial pattern flap based on a cutaneous branch of the facial artery in cats.**

OBJECTIVE: To describe the cutaneous portion of the facial artery in cats and an axial pattern flap based on a branch of this artery. STUDY DESIGN: Ex vivo study. SAMPLE POPULATION: Cat cadavers (n=12). METHODS: The common carotid artery was identified, cannulated, and infused with methylene blue to assist in the identification of the facial artery, which was subsequently cannulated and selectively infused with methylene blue. The main trunk of the artery and its branches were dissected. The extent of blue coloration of the skin was evaluated on the contralateral side of the same specimen after infusing methylene blue into the facial artery. In 4 specimens, the flap was raised along previously defined borders and adequacy of perfusion was evaluated. RESULTS: The area of skin perfused by the facial artery extended from the lower eyelid dorsally, to the angularis oris cranially, and the wing of the atlas caudally. Borders of the skin flap were defined on the basis of the anatomic dissection and skin coloration after selective infusion of the facial artery with methylene blue. A skin flap of 6 cm x 3.4 cm, based on the first caudally directed cutaneous branch of the facial artery was
shown to be well perfused. The viability of this flap was confirmed in a clinical case. CONCLUSION: The facial artery flap is useful for repair of skin defects of the head in cats.


**Strain-specific viral distribution and neuropathology of feline immunodeficiency virus.**

Feline immunodeficiency virus (FIV) is a naturally occurring lentivirus of domestic cats, and is the causative agent of feline AIDS. Similar to human immunodeficiency virus (HIV), the pathogenesis of FIV involves infection of lymphocytes and macrophages, and results in chronic progressive immune system collapse and death. Neuropathologic correlates of FIV infection have not yet been elucidated, and may be relevant to understanding HIV-associated neurologic disease (neuroAIDS). As in HIV, FIV strains have been shown to express differential tendencies towards development of clinical neuroAIDS. To interrogate viral genetic determinants that might contribute to neuropathogenicity, cats were exposed to two well-characterized FIV strains with divergent clinical phenotypes and a chimeric strain as follows: FIV(PPR) (PPR, relatively apathogenic but associated with neurologic manifestations), FIV(C36) (C36, immunopathogenic but without associated neurologic disease), and Pcev (a chimeric virus consisting of a PPR backbone with substituted C36 env region). A sham inoculum control group was also included. Peripheral nerve conduction velocity, CNS imaging studies, viral loads and hematologic analysis were performed over a 12 month period. At termination of the study (350 days post-inoculation), brain sections were obtained from four anatomic locations known to be involved in human and primate lentiviral neuroAIDS. Histological and immunohistochemical evaluation with seven markers of inflammation revealed that Pcev infection resulted in mild inflammation of the CNS, microglial activation, neuronal degeneration and apoptosis, while C36 and PPR strains induced minimal neuropathologic changes. Conduction velocity aberrations were noted peripherally in all three groups at 63 weeks post-infection. Pcev viral load in this study was intermediate to the parental strains (C36 demonstrating the highest viral load and PPR the lowest). These results collectively suggest that (i) 3’ C36 genomic elements contribute to viral replication characteristics, and (ii) 5’ PPR genomic elements contribute to CNS manifestations. This study illustrates the potential for FIV to provide valuable information about neuroAIDS pathogenesis related to genotype and viral kinetics, as well as to identify strains useful to evaluation of therapeutic intervention.


**Serological detection of Epstein-Barr virus infection in dogs and cats.**

Epstein-Barr virus (EBV) is widespread in humans world-wide. The virus, which is linked to Burkitt’s and Hodgkin lymphoma in humans, has recently been detected in pet dogs in Taiwan. The aim of this study was to determine if EBV is present in other canine populations, whether infection is associated with lymphoma in dogs, and whether infection is present in cats. Canine and feline serum samples were analysed by immunofluorescence assay. Antibodies to EBV or an EBV-like virus were detected in 38.4% of UK dog sera, 64% of US dog sera and 38% of cat sera. Canine blood samples, tissue samples from the palatine tonsil and formalin-fixed, paraffin-embedded biopsy samples from canine lymphoma cases were analysed by PCR. Using EBV-specific primers, EBV was detected in one tonsil sample,
whereas all other samples tested were negative. PCR using consensus herpesvirus primers identified canine herpesvirus in twelve tonsil samples and one biopsy but no gammaherpesviruses were detected. Canine blood samples from EBV antibody-positive dogs were analysed by RT-PCR to determine if transcripts associated with lytic EBV infection (BcLF1) or latency (LMP2) were present, however all samples tested were negative. In conclusion, there is serological evidence of exposure to EBV or an EBV-like virus in dogs and cats but persistent infection in the canine palatine tonsil is rare and no evidence was found of EBV in canine peripheral blood mononuclear cells. The effect of EBV on canine and feline cells and the possible outcome of the infection for the host require further investigation.

Prevalence of Giardia species in stool samples by ELISA in household cats from Romania and risk factors.
Stool samples (n=183) collected in Romania from cats of different ages, gender, breed, living conditions and origin were analysed by enzyme-linked immunosorbent assay using a commercial kit (Giardia Microwell ELISA, SafePath Laboratories, Carlsbad, USA). Fifty-one cats (27.9%) presented Giardia duodenalis antigens. The prevalence was significantly higher in cats with diarrhoea (32%, 16/50; P=0.04) and in cats from the north-west region (36.7%, 29/79; P=0.05). Young age (up to 6 months) was identified as the risk factor for infection (OR=0.29, 95% CI 0.09-0.92; P=0.03). There weren’t any significant differences associated with gender, breed, medium, lifestyle, associated parasite infections, anthelmintic treatments, type of food or season.

Traumatic elbow luxation in 14 dogs and 11 cats.
OBJECTIVE: To report the presentation and treatment of traumatic elbow luxation and to evaluate success following closed or open reduction. DESIGN: Retrospective case series conducted between April 1999 and April 2009. METHODS: Records of 14 dogs and 11 cats were reviewed for signalment, history, radiographic findings and treatment; 14 owners were contacted via phone questionnaire to assess for limb function following treatment. Fisher’s two-tailed P test was used to evaluate potential risk factors for lameness. RESULTS: The majority of luxations were caused by car accident and 96% of the cases luxated in a lateral direction. Closed reduction was successful in all cats and 11 dogs; 3 dogs required open reduction. Owners rated the animals’ limb function as excellent (71%), good (7%), fair (22%) or poor (0%). All cats were rated excellent. An excellent result following closed reduction was achieved in 67% of canine cases. All cases of open reduction achieved fair results. All owners were satisfied with the outcome. No risk factors were significantly associated with post-reduction lameness. CONCLUSIONS: Elbow joints with good stability following closed reduction have a favourable outcome. Poor stability following closed reduction is an indication for surgery. Results suggest that cats tolerate elbow luxation better than dogs.
Development of correction formulas for canine and feline urine specific gravity measured using a Japanese refractometer.  
One of the most important functions of the kidney is to concentrate urine through the reabsorption of water. Urine specific gravity (USG) is used in routine tests of urine concentration and can be estimated using a refractometer. However, as the scale of Japanese refractometer is based on experimental data from healthy Japanese people, and human USG obtained by Japanese refractometers show higher values than that by refractometer produced in Europe or the U.S.A. The purpose of this study was to establish correction formulas for the USG of dogs and cats measured using Japanese refractometers. In this study, we found that Japanese refractometers overestimated USG in both dogs and cats. This study shows that the correlation formulas described in this study are useful for the accurate evaluation of USG.

Bartonella henselae and the potential for arthropod vector-borne transmission.  
INTRODUCTION: Bartonella henselae, the causative agent of the illness referred to as cat scratch disease, is a common infection, particularly in children, and clinicians need to be aware of its potential transmission to humans by arthropod vectors such as fleas and ticks in addition to animal bites and scratches. The absence of a vertebrate bite or scratch does not preclude infection with B. henselae. MATERIALS AND METHODS: Literature regarding arthropod transmission of B. henselae was reviewed. RESULTS: B. henselae appears to be transmitted among cats and dogs in vivo exclusively by arthropod vectors (excepting perinatal transmission), not by biting and scratching. In the absence of these vectors disease does not spread. On the other hand, disease can be spread to humans by bites and scratches, and it is highly likely that it is spread as well by arthropod vectors. DISCUSSION: Clinicians should be aware that a common illness, infection with B. henselae, can be transmitted by arthropod vectors and a history of an animal scratch or bite is not necessary for disease transmission.

Cutaneous malignant melanoma in an 11-month-old Russian blue cat.  
CASE HISTORY: A grey mass developed on the tail base of an 11-month-old Russian blue cat. The mass grew slowly for 2 months and then became ulcerated. CLINICAL FINDINGS: The mass was excised, and histology revealed it to be a malignant melanoma. Skin adjacent to the melanoma and underlying tissue contained large aggregates of melanin and numerous melanophages. Seven months later, an additional malignant melanoma was excised from the skin on the left thorax. Three months after the second melanoma was excised, the left axillary lymph nodes were enlarged; four were excised, and found to contain metastases. The cat became lethargic and anorexic, and was subject to euthanasia at 26 months of age. Post-mortem examination revealed numerous small well-circumscribed melanomas scattered within the S/C tissue overlying the left thorax and within the left axilla. These were interpreted to be in-transit metastases. Metastatic foci were also visible within the spleen, liver, lungs, lymph nodes and a rib; numerous small melanomas were also present throughout the mesentery. DIAGNOSIS: Cutaneous malignant melanoma with numerous distant and in-transit metastases.
CLINICAL RELEVANCE: Although cutaneous malignant melanomas appear to be rare in young cats, they can display a similar clinical behaviour to malignant melanomas in humans, and a guarded prognosis should be suggested for neoplasms of this type. In humans, in-transit metastases are a well-recognised consequence of removing lymph nodes that drain areas containing neoplastic disease. This manifestation of metastatic disease has not previously been reported in the veterinary literature.


Sedative effects of three doses of romifidine in comparison with medetomidine in cats.

OBJECTIVE: To compare the sedative effects of three doses of romifidine with one dose of medetomidine. STUDY DESIGN: Prospective blinded experimental cross-over. ANIMALS: Five adult Domestic Short Hair cats. METHODS: Cats were administered romifidine at 80, 120 and 160 mug kg(-1) or medetomidine at 20 mug kg(-1) (M20) intramuscularly (IM). Sedative effects were assessed for 3 hours by summing the scores given to posture, auditory response, resistance to positioning, muscular relaxation, and response to noxious stimuli, giving a total sedation score (TS). The area under the curve (AUC) of TS >/=7 (the score considered as clinically useful sedation) was calculated. Times to stages of sedation were determined. Some physiological parameters were measured. Data to compare treatments were analysed by anova or Kruskal-Wallis test as relevant. RESULTS: All treatments gave a TS considered clinically useful. There were no significant differences between treatments for times to onset of sedation, maximum TS reached, or AUC. Differences between romifidine treatments for other sedation parameters were not significant but the time to maximum TS and to recovery was shortest in M20. Heart rate (HR) fell significantly with all treatments and, although with M20 it recovered at 65 minutes, it remained significantly depressed for 3 hours after all romifidine treatments. Most cats vomited, and/or hypersalivated after all treatments. CONCLUSIONS: Doses of 80, 120 and 160 mug kg(-1) romifidine IM produce sedation in cats which is similar to that following medetomidine 20 mug kg(-1). Recovery from sedation and of physiological parameters was quickest after M20. CLINICAL RELEVANCE: Doses of romifidine considerably lower than those investigated by previous authors give a clinically useful level of sedation, and their use might result in less side effects and a quicker recovery.


Renal lesions of nondomestic felids.

To comprehensively evaluate the occurrence of renal lesions in a variety of nondomestic felids, necropsy cases from 1978 to 2008 were reviewed from a municipal zoo and a large cat sanctuary for those in which the kidneys were examined histologically. Seventy exotic felids were identified (25 tigers, 18 lions, 6 cougars, 5 leopards, 3 snow leopards, 3 clouded leopards, 3 Canadian lynx, 2 ocelots, 2 bobcats, 2 cheetahs, 1 jaguar), and their histologic renal lesions were evaluated and compared. The most common lesion was tubulointerstitial nephritis (TIN); 36 of 70 (51%) cats were affected to some degree. Lymphocytic interstitial nephritis was the most common lesion in the tigers (9 of 25, 36%) and was rarely seen in other species. Although the renal pelvis was not available for all cats, 28 of 47 (60%) had some degree of lymphocytic pyelitis. There was no significant association between the presence of
pyelitis and that of TIN. Only 1 cat had pyelonephritis. Renal papillary necrosis was present in 13 of 70 (19%) cats and was significantly associated with historical nonsteroidal anti-inflammatory drug treatment (odds ratio, 7.1; 95% confidence interval, 1.9 to 26.8). Only 1 cat (lion) had amyloid accumulation, and it was restricted to the corticomedullary junction. Primary glomerular lesions were absent in all cats. Intraepithelial pigment was identified in many of the cats but was not correlated with severity of TIN. Despite several previous reports describing primary glomerular disease or renal amyloidosis in exotic felids, these lesions were rare to absent in this population.


**Methicillin-resistant Staphylococcus pseudintermedius among cats admitted to a veterinary teaching hospital.**


**Rickettsia felis in fleas from Catalonia (Northeast Spain).**

INTRODUCTION: Rickettsia felis produces a syndrome indistinguishable from murine typhus, which has been described in Spain. R. felis is transmitted to humans by fleas. Although no clinical case has been described so far, serologic evidence of infections in humans, cats, and dogs has been obtained in our area. However, no study has been conducted regarding its presence in vectors. Recognition of routes of transmission is of great importance to prevent infection in humans. Taking into account these results, R. felis seems to be present in animals that are in contact with humans. The aim of this study was to determine the presence of R. felis in the fleas of cats and dogs from Northeast Spain, to show the presence of peridomestic cycle in our area. MATERIALS AND METHODS: Between May 2006 and July 2008, 78 fleas were collected. Sixty-three fleas were recovered from kennels. Most of them were collected from cages and a few of them on dogs and cats living in kennels. Fifteen fleas were collected from dogs and cats attended at a veterinary clinic. Fleas were rinsed with ethanol, dried, identified, and stored at 4 degrees C. DNA was extracted from each flea individually. Rickettsial DNA was determined by quantitative real-time polymerase chain reaction. OmpB-specific primers and molecular beacon probes targeting specifically R. felis were used. RESULTS: All 78 fleas were identified as Ctenocephalides felis. R. felis was detected in 34 (43.6%) fleas. No nucleic acids were amplified from negative controls and expected results were obtained from positive controls. Eight positive samples were also confirmed by sequencing. CONCLUSIONS: R. felis was found in a high percentage of Ct. felis from cats and dogs. It seems that there is a peridomestic cycle in Northeast Spain, which would allow contact of R. felis with humans.


**Phenotypic and Molecular Identification of Sporothrix Isolates from an Epidemic Area of Sporotrichosis in Brazil.**

Sporotrichosis has significantly increased in Brazil in the last decade, particularly in the state of Rio de Janeiro, with the occurrence of an epidemic related to zoonotic transmission from cats to humans.
Recently, four new phylogenetic species were incorporated into the Sporothrix species complex based on the phenotypic and molecular characteristics, and a new species name (Sporothrix brasiliensis) was proposed for some of the Sporothrix isolates from this epidemic. This study describes the characterization of 246 isolates obtained from patients attending the Laboratory of Infectious Dermatology, IPEC-FIOCRUZ, between 1998 and 2008, together with one environmental sample. Two hundred and six of the isolates (83.4%) were characterized as S. brasiliensis, 15 (6.0%) as S. schenckii, and one (0.5%) as S. mexicana. Twenty-five isolates (10.1%) could not be identified according to their phenotype and were classified as Sporothrix spp. The calmodulin gene was sequenced to confirm the identity of these isolates. The molecular analysis demonstrated that 24 of the isolates were S. brasiliensis, with the remainder being a S. globosa isolate. The isolate characterized phenotypically as S. mexicana was clustered on the S. schenckii clade. The correlation between molecular data and phenotypic characteristics described in this study is fundamental to the identification of the Sporothrix complex.


Inflammation of the bile ducts is common in cats. This review article reports on what is currently known about the various types of cholangitis (i.e., cholangitis caused by liver flukes, neutrophilic cholangitis, and lymphocytic cholangitis). Treatment is available for cholangitis caused by liver flukes and for neutrophilic cholangitis, and the prognosis is good. However, the cause of lymphocytic cholangitis is not known and there is currently no evidence-based therapy. Several causes are mentioned in the literature, but more research is needed in order to establish the cause of this disease and to develop an appropriate therapy.


Objective-To determine the effects of once-daily oral administration of N-acetyl-d-glucosamine (NAG) on plasma and urine glycosaminoglycan (GAG) concentrations in cats with idiopathic cystitis (IC).

Animals-19 cats with IC and 10 clinically normal cats. Procedures-Cats with IC were randomly assigned to receive 250 mg of NAG in capsule form orally once daily for 28 days (n = 12) or a placebo (capsule containing cellulose) orally once daily for the same period (7). In cats with IC, plasma and urine GAG concentrations and urine creatinine concentration were measured on days 0 (immediately before first dose), 7, 14, 21, 28, and 56. For purposes of comparison, those variables were measured in 10 clinically normal cats on day 0. Results-Mean +/- SEM urine GAG-to-creatinine concentration ratios (day 0 data) for cats with IC and clinically normal cats differed significantly (3.11 +/- 0.62 mug/mL and 14.23 +/- 3.47 mug/mL, respectively). For cats with IC, mean plasma GAG concentration in NAG-treated cats (39.96 +/- 5.34 mug/mL) was higher than that in placebo-treated cats (24.20 +/- 3.35 mug/mL) on day 21. In the NAG-treated cats, plasma GAG concentration on days 21 (39.96 +/- 5.34 mug/mL) and 28 (39.91 +/- 6.74 mug/mL) differed significantly from the day 0 concentration (27.46 +/- 3.90 mug/mL). Conclusions and Clinical Relevance-Cats with IC have lower urinary GAG-
to-creatinine concentration ratios than did clinically normal cats. Administration of NAG (250 mg, PO, q 24 h) significantly increased plasma GAG concentrations in cats with IC after 21 days of treatment.


**Dietary fish oil and flaxseed oil suppress inflammation and immunity in cats.**
The modulatory activity of dietary n-3 fatty acids on inflammation and immune response in domestic cats is unknown. Mature female cats (n=14/treatment) were fed control, fish oil or flaxseed oil diets with n-6:n-3 fatty acid ratios of 20:1, 5:1 and 5:1, respectively, for 12 wk. Immune response was assessed on wk 0, 6 and 12, and skin hypersensitivity response on wk 6 and 12. Fish oil increased (P<0.01) eicosapentaenoic and docosahexaenoic acids in plasma and skin, whereas flaxseed oil increased alpha-linolenic acid. Fish and flaxseed oils decreased (P<0.01) skin inflammatory response to histamine. Cats fed fish but not flaxseed oil had higher (P<0.05) skin leukotriene LTB(5), but not LTB(4). Fish and flaxseed oils lowered B, total T and T(h) subset populations, and leukocyte proliferative response to PWM (P<0.05). In contrast, there was no change in ConA- or PHA-induced lymphocyte proliferation, Tc and MHC II cell populations, DTH response, NK cytotoxicity, IL-2 production, or plasma IgG concentrations. Therefore, fish and flaxseed oil can reduce skin inflammatory responses in cats, however, flaxseed oil appears less immunosuppressive than fish oil.


**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.

Comparison of two sampling methods for microbiological evaluation of periodontal disease in cats.

BACKGROUND: Periodontal disease in cats is highly prevalent, and its aetiology is associated to bacteria located in the subgingival microbiota, being Porphyromonas sp. the most prevalent genus. The conventional technique to sample the subgingival microbiota is the use of cotton swabs over the mucosa and teeth; however the use of subgingival paper points could improve the bacterial recovery.

AIM: The objective was to compare two microbial sampling approaches for the evaluation of the periodontal disease-associated microflora in cats.

METHODS: The study was designed as a pilot study. Ten cats were clinically evaluated and sampled under sedation. Subgingival pooled samples were collected from four sites. In parallel, samples were obtained with a cotton swab, by striking over the gingival margin and surface of the upper right canine. Samples were cultured on blood agar (aerobic and anaerobic incubation), Dentaid-1 (for Aggregatibacter actinomycetemcomitans and enterics), and a specific medium for Bartonella henselae. RESULTS: For total anaerobic counts, paper point samples (6.59 +/- 0.5) demonstrated significantly higher counts (p=0.03) than cotton swab samples (5.54 +/- 1.1). Moreover, the use of paper points increased the frequency detection of most pathogens thus reducing false negatives for Porphyromonas gulae (100% with paper points samples and 80% with cotton swab samples). CONCLUSIONS: Significant higher recoveries of anaerobic bacteria and more frequent detection of putative periodontal pathogens was observed when microbiological sampling was performed with paper points, in cats with periodontal disease.


Detection of feline herpes virus 1 via polymerase chain reaction and immunohistochemistry in cats with ulcerative facial dermatitis, eosinophilic granuloma complex reaction patterns and mosquito bite hypersensitivity.

Ulcerative dermatitis caused by feline herpes virus 1 (FHV-1) is an uncommon disease characterized by cutaneous ulcers secondary to epidermal, adnexal and dermal necrosis. Differential diagnoses for FHV-1 lesions include, but are not limited to, mosquito bite hypersensitivity and eosinophilic granuloma complex. Histopathological diagnosis of FHV-1 dermatitis is based on the detection of the intranuclear inclusion bodies. In cases where intranuclear inclusions are missing but clinical and histological findings are compatible with FHV-1 dermatitis, immunohistochemistry (IHC) and PCRs have been used. In this retrospective study, we evaluated the presence of FHV-1 by IHC and PCR in skin biopsies and compared the results of the two tests. Sixty-four skin biopsy specimens from cats with compatible lesions were reviewed and tested via PCR and IHC for evidence of FHV-1. Polymerase chain reaction was positive in 12 of 64 biopsies; PCR and IHC were positive only in two of 64 biopsies, and these cases were considered true positive cases. The higher number of PCR-positive cases was possibly attributed to amplification of viral DNA from a live attenuated vaccination, but a previous FHV-1 infection with subsequent amplification of latently inserted FHV-1 could not be excluded. If clinical signs and histopathology suggest FHV-1 infection in the absence of typical inclusion bodies, IHC is the preferred diagnostic test; PCR may be useful for initial screening, but due to false positives is not sufficient for a definitive diagnosis.

Radiographic characterization of the os penis in the cat.
The os penis in the cat has not been described radiographically, as compared with the dog. However, a small linear bony radiopacity is sometimes detected in the perineal area of male cats. We hypothesized that the feline os penis might be visible on survey radiographs of the pelvis, and we aimed to investigate the frequency of its visualization using analog and computed radiography (CR) system. One hundred radiographs of the pelvis of 99 male cats were reviewed retrospectively (50 were obtained with a CR system and 50 with an analog system). Age, breed, neutering status, and reason for presentation were recorded, as well as the visualization of the os penis. An os penis was detected in 19/50 (38%) cats with CR and in eight of 50 (16%) cats with analog radiography; this difference was statistically significant. With CR, the median age of cats with a visible os penis was significantly higher than in cats where the os penis was not seen. In one cat with a visible os penis examined with CR and analog radiography, the os penis was only visible on CR images. The penile tissues were examined histopathologically in one cat and well-differentiated bone was found but there were no pathologic findings detected in surrounding tissues. Thus, the os penis can be detected on radiographs of cats and this should not be mistaken for a pathologic finding such as urolithiasis or dystrophic mineralization.


Q fever in Japan: an update review.
As neglected zoonosis for many years, Q fever is now ubiquitous in Japan. Similarly to elsewhere in the world, domestic animals are considered to be important reservoirs of the causal agent, Coxiella burnetii, a resistant intracellular bacterium. Infected animals shed bacteria in milk, feces, urine, vaginal mucous and birth products. Inhalation of bacteria present in the environment is the main route of animal and human infection. Shedding of C. burnetii in milk by domestic ruminants has a very limited impact as raw milk is seldom ingested by the Japanese population. The clinical expression of Q fever in Japan is similar to its clinical expression elsewhere. However clinical cases in children are more frequently reported in this country. Moreover, C. burnetii is specified as one of the causative organisms of atypical pneumonia in the Japanese Respiratory Society Guideline for the management of community-acquired pneumonia. In Japan, C. burnetii isolates are associated with acute illness and are mainly of moderate to low virulence. Cats are considered a significant source of C. burnetii responsible for human outbreaks in association with the presence of infected parturient cats. Since its recognition as a reportable disease in 1999, 7-46 clinical cases of Q fever have been reported by year. The epidemiology of Q fever in Japan remains to be elucidated and the exact modes of transmission are still unproven. Important further research is necessary to improve knowledge of the disease itself, the endogenous hosts and reservoirs, and the epidemiological cycle of coxiellosis in Japan.

Factors associated with adverse outcomes during parenteral nutrition administration in dogs and cats.
BACKGROUND: Parenteral nutrition (PN) is increasingly used to support hospitalized dogs and cats. Published assessments of outcome are limited. OBJECTIVE: Evaluate type and prevalence of complications and risk factors for death and complications in dogs and cats receiving PN. ANIMALS: Three hundred and nineteen dogs and 112 cats that received PN at a teaching hospital between 2000 and 2008. METHODS: Retrospective case review. Diagnosis, duration of PN administration, concurrent enteral feeding, death, and mechanical, septic, and metabolic complications were abstracted from medical records. Association of each parameter with complications and death was analyzed by binary logistic regression. RESULTS: Pancreatitis was the most common diagnosis (109/319 dogs, 34/112 cats), and 137/319 dogs and 51/112 cats died. Dogs and cats received 113 +/- 40% and 103 +/- 32% of resting energy requirement, respectively. Mechanical (81/319 dogs, 16/112 cats) and septic (20/319 dogs, 6/112 cats) complications were not associated with death (P >.05). Hyperglycemia was the most common metabolic complication (96/158 dogs, 31/37 cats). Hypercreatininemia in dogs (8/79) was the only complication associated with death (P <.01). Chronic kidney disease in dogs, hepatic lipidosis in cats, and longer duration of inadequate caloric intake before PN in both species were negatively associated with survival (P <.05). Factors positively associated with survival included longer duration of PN administration in both species, enteral feeding in cats with any disease, and enteral feeding in dogs with respiratory disease (P <.05). CONCLUSIONS AND CLINICAL IMPORTANCE: PN can be effectively used to provide the energy requirements of most critically ill dogs and cats. Most complications accompanying PN administration do not affect survival.

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

What is your diagnosis? Osteochondromatosis.

Evaluation of four drugs for inhibition of paracentesis-induced blood-aqueous humor barrier breakdown in cats.

Objective-To compare inhibitory effects of topically applied 1% prednisolone acetate suspension, 0.03% flurbiprofen solution, 0.1% dexamethasone suspension, and 0.1% diclofenac solution on paracentesis-induced blood-aqueous barrier breakdown in cats. Animals-9 healthy cats. Procedures-Paracentesis of the anterior chamber was performed in both eyes of each cat. One eye of each cat was treated with a topically administered anti-inflammatory medication (1% prednisolone [n = 7 cats], 0.03% flurbiprofen [7], 0.1% dexamethasone [9], or 0.1% diclofenac [8]) immediately following paracentesis and at 6, 10, and 24 hours after paracentesis. The contralateral untreated eye served as the control eye. Each cat had a 6-day washout period between experimental drugs. Breakdown of the blood-aqueous barrier was quantified by use of laser flaremetry. Results-Topical administration of 1% prednisolone significantly reduced aqueous humor flare at 4, 8, and 26 hours after paracentesis. Topical administration of 0.1% diclofenac significantly reduced aqueous humor flare at 8 and 26 hours after paracentesis. Topical administration of 0.1% dexamethasone and 0.03% flurbiprofen did not significantly decrease flare at any time point. There were significant differences in intraocular pressures between NSAID-treated eyes and untreated contralateral eyes. Conclusions and Clinical Relevance-Topical administration of 1% prednisolone and 0.1% diclofenac may be appropriate choices when treating cats with anterior uveitis. Topical administration of diclofenac and flurbiprofen should be used with caution in cats with a history of ocular hypertension.


Comparison of the effects of ivabradine and atenolol on heart rate and echocardiographic variables of left heart function in healthy cats.

BACKGROUND: Ivabradine is a novel negative chronotropic drug used for treatment of ischemic heart disease in people. Little is known about its effects and safety in cats.

HYPOTHESIS/OBJECTIVES: Ivabradine is not inferior to atenolol with regard to clinical tolerance, heart rate (HR) reduction, and effects on cardiac function in healthy, lightly sedated cats. ANIMALS: Ten healthy laboratory cats. METHODS: Physical examination, systolic blood pressure measurement, and transthoracic echocardiography were performed in all cats at baseline and after oral administration (4 weeks each) of ivabradine (0.3 mg/kg q12h) and atenolol (6.25 mg/cat q12h; 1.0-1.7 mg/kg) in a prospective, double-blind, randomized, active-control, fully crossed study. A priori noninferiority margins for the effects of ivabradine compared with atenolol were set at 50% (f = 0.5) based on predicted clinical relevance, observer measurement variability, and in agreement with FDA guidelines. Variables were compared by use of 2-way repeated measures ANOVA. RESULTS: Ivabradine was clinically well tolerated with no adverse events observed. HR (ivabradine, P <.001; atenolol, P <.001; ivabradine versus atenolol, P =.721) and rate-pressure product (RPP) (ivabradine, P <.001; atenolol, P =.001; ivabradine versus atenolol, P =.847) were not different between treatments. At the dosages used, ivabradine demonstrated more favorable effects than atenolol on echocardiographic indices of left
ventricular (LV) systolic and diastolic function and left atrial performance. CONCLUSIONS AND CLINICAL IMPORTANCE: Ivabradine is not inferior to atenolol with regard to effects on HR, RPP, LV function, left atrial performance, and clinical tolerance. Clinical studies in cats with hypertrophic cardiomyopathy are needed to validate these findings.


Azodyl, a synbiotic, fails to alter azotemia in cats with chronic kidney disease when sprinkled onto food.
The effect of probiotic therapy in chronic kidney disease (CKD) in cats is poorly defined, but gaining in popularity. However, cat owners often prefer to administer probiotics by combining them with food, rather than administering capsules intact, as is prescribed by the manufacturer. The efficacy of such non-recommended administration is unknown. In this double-blinded, controlled clinical trial, 10 cats with naturally occurring CKD were randomized to receive either a probiotic-prebiotic combination (synbiotic) or psyllium husk (prebiotic only) for 2 months. Medications were sprinkled and mixed into food or given as a slurry. Blood urea nitrogen (BUN) and creatinine were measured twice prior to administration of medication, and then monthly for 2 months during the medication administration. Owners and clinicians were masked as to treatment. The maximal percentage change in BUN and creatinine was calculated for each cat. No differences in percentage change were detected between groups (P=0.8 for both BUN and creatinine). The synbiotic supplement used in this study, when applied to food or administered as a slurry fails to reduce azotemia in cats with CKD. Therefore, owners should not administer this synbiotic in this manner.


The innate antiviral immune system of the cat: Molecular tools for the measurement of its state of activation.
The innate immune system plays a central role in host defence against viruses. While many studies portray mechanisms in early antiviral immune responses of humans and mice, much remains to be discovered about these mechanisms in the cat. With the objective of shedding light on early host-virus interactions in felids, we have developed 12 real-time TaqMan(R) qPCR systems for feline genes relevant to innate responses to viral infection, including those encoding for various IFNalpha and IFNomega subtypes, IFNbeta, intracellular antiviral factor Mx, NK cell stimulator IL-15 and effectors perforin and granzyme B, as well as Toll-like receptors (TLRs) 3 and 8. Using these newly developed assays and others previously described, we measured the relative expression of selected markers at early time points after viral infection in vitro and in vivo. Feline embryonic fibroblasts (FEA) inoculated with feline leukemia virus (FeLV) indicated peak levels of IFNalpha, IFNbeta and Mx expression already 6h after infection. In contrast, Crandell-Rees feline kidney (CrFK) cells inoculated with feline herpes virus (FHV) responded to infection with high levels of IFNalpha and IFNbeta only after 24h, and no induction of Mx could be detected. In feline PBMCs challenged in vitro with feline immunodeficiency virus (FIV), maximal expression levels of IFNalpha, beta and omega subtype genes as well as IL-15 and TLRs 3, 7 and 8 were measured between 12 and 24h after infection, whereas
expression levels of proinflammatory cytokine gene IL-6 were consistently downregulated until 48h post inoculation. A marginal upregulation of granzyme B was also observed within 3h after infection. In an in vivo experiment, cats challenged with FIV exhibited a 2.4-fold increase in IFNalpha expression in blood 1 week post infection. We furthermore demonstrate the possibility of stimulating feline immune cells in vitro with various immune response modifiers (IRMs) already known for their immunostimulatory properties in mice and humans, namely Poly IC, Resiquimod (R-848) and dSLIM, a synthetic oligonucleotide containing several unmethylated CpG motifs. Stimulation of feline PBMCs with dSLIM and R-848 effectively enhanced expression of IFNalpha within 12h by factors of 6 and 12, respectively, and Poly IC induced an increase in Mx mRNA expression of 28-fold. Altogether, we describe new molecular tools and their successful use for the characterization of innate immune responses against viruses in the cat and provide evidence that feline cells can be stimulated by synthetic molecules to enhance their antiviral defence mechanisms.


Postoperative mortality in cats after ureterolithotomy.

Objective: To identify preoperative risk factors associated with mortality before discharge in cats having a single or multiple ureterotomy procedures to treat a ureteral obstruction. Study Design: Case series. Animals: Cats (n=47). Methods: Data were obtained from the medical records (2002-2009) of cats that had undergone ureterolithotomy procedures. Multiple preoperative factors were evaluated for association of survival to discharge. Result: Survival to discharge after ureterolithotomy was 79% (37/47). Over 79% of cats were azotemic before surgery and 94% had chronic kidney disease changes at the time of ultrasonographic diagnosis. Six cats required an additional surgical procedure because of complications with ureterolithotomy. Overall prevalence of postoperative uroabdomen was 6% (3/47). On multivariate analysis, there were no preoperative variables significantly associated with survival to discharge. Conclusions: Ureterolithotomy in cats was associated with a 21% mortality rate before hospital discharge. No preoperative variables associated with mortality were identified; therefore, further studies are needed to identify more discriminating preoperative characteristics for mortality after ureterolithotomy in this population of cats.


Helping cats get the care they need.


AAFP and ISFM feline-friendly handling guidelines.

BACKGROUND: The number of pet cats is increasing in most countries, often outnumbering pet dogs, yet cats receive less veterinary care than their canine counterparts.(1) Clients state the difficulty of getting the cat into a carrier at home, driving to the clinic, and dealing with the fearful cat at the veterinary clinic as reasons for fewer visits.(2) Educating and preparing the client and the veterinary team with regard to respectful feline handling is necessary in order to avoid stress and accomplish the goal of good health care. Without such preparation, feline stress may escalate into fear or fear-
associated aggression. The resulting stress may alter results of the physical examination and laboratory tests, leading to incorrect diagnoses (eg, diabetes mellitus) and unnecessary treatments. (3-5) Without compassionate and respectful handling by the veterinary team, clients may feel the team lacks skills and compassion, or does not understand cats. Injury may occur to the cat, client and/or veterinary team. (6) Clients who want to avoid stress for their cat may avoid veterinary visits or choose another practice instead. GOALS: The use of feline-friendly handling techniques should reduce these problems. Handling is most successful when the veterinary team adapts the approach to each individual cat and situation. The goal of these guidelines is to provide useful information for handling cats that can lead to: Reduced fear and pain for the cat. Reinforced veterinarian-client-cat bond, trust and confidence, and thus better lifelong medical care for the cat. Improved efficiency, productivity and job satisfaction for the veterinary team. Increased client compliance. Timely reporting and early detection of medical and behavioral concerns. Fewer injuries to clients and the veterinary team. Reduced anxiety for the client.


Composition of uroliths in small domestic animals in the United Kingdom.
The mineral composition of 7819 small animal uroliths in the UK was determined by semi-quantitative X-ray diffraction over a period of 90 months from 2002 to 2010. Canine and feline uroliths constituted 97% of the study population and the mineral phase detected most frequently was struvite (43%), followed by calcium oxalate (41%). Uroliths from crossbreeds, Dalmatians, Yorkshire terriers and Shih Tzus accounted for almost 30% of all canine uroliths, with the highest frequency in Dalmatians, which had a predominance of urate uroliths. The average ages of dogs and cats with uroliths were 7.0 years and 7.4 years, respectively. The ratio of the number of dogs presenting with struvite compared to oxalate phases reached a maximum at 3 years of age.


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

Causes of lower urinary tract disease in Norwegian cats.
A study was made on causes of lower urinary tract disease in cats, and to investigate whether demographic data and factors related to husbandry might influence the occurrence of a particular diagnosis. The study was a prospective, descriptive, and analytical study of primary cases of feline lower urinary tract disease (FLUTD) in Norway. Only cats sampled by cystocentesis were included in the present study. Of the 119 cats included, 28.6% were diagnosed with obstructive FLUTD. The majority of cats were diagnosed with feline idiopathic cystitis (FIC) (55.5%). Urethral plugs were the second most common diagnosis (21.0%), whereas bacterial cystitis and urolithiasis each were diagnosed in 11.8%. Nearly one-third (28.6%) of the cats diagnosed with urolithiasis had significant bacteriuria. Thus, significant bacteriuria was diagnosed in a total of 15.1% of the cats. There were no significant differences in the urine specific gravity, pH and amount of epithelial cells in the urine sediment in the different aetiological categories of FLUTD. There was a higher amount of red blood cells in the urine sediment in cats diagnosed with urethral plugs and urolithiasis, whereas cats with bacterial cystitis and urolithiasis had a higher amount of white blood cells in their sediment. Regarding demographic data and factors related to husbandry, cats diagnosed with FLUTD were more often males and kept strictly indoors, when compared with a ‘reference population’.


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

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.


Development of monoclonal antibodies (MAbs) to feline interferon (fIFN)-gamma as tools to evaluate cellular immune responses to feline infectious peritonitis virus (FIPV).

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


**Intravenous Administration of Docetaxel to Cats with Cancer.**

Background: The safety of IV administration of docetaxel to cats with cancer has not been reported. Objectives: Document adverse effects of IV administration of docetaxel to cats. Animals: Twenty-one client-owned cats with any confirmed malignancy. Methods: Cats received up to 5 docetaxel treatments, administered IV 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 IV 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.

**Smith K (2011) Vet Rec 168:507-508.**

Feline muscular dystrophy: parallels between cats and people.

**Song DS, An DJ, Moon HJ, Yeom MJ, Jung HY, Jung WS, Park SJ, Kim HK, Han SY, Oh JS, Park BK,**

Interspecies transmission of the canine influenza H3N2 virus to domestic cats in South Korea, 2010.

In the last 4 years, incidences of endemic or epidemic respiratory diseases associated with canine influenza H3N2 virus in Asian dogs have been reported in countries such as South Korea and China. Canine species were considered to be the new natural hosts for this virus. However, at the beginning of 2010, influenza-like respiratory signs, such as dyspnea, were also observed among cats as well as in dogs in an animal shelter located at Seoul, South Korea. The affected cats showed 100% morbidity and 40% mortality. We were able to isolate a virus from the lung specimen of a dead cat that had suffered from the respiratory disease, in embryonated chicken eggs. The 8 viral genes isolated were almost identical to those of the canine influenza H3N2 virus suggesting interspecies transmission of canine influenza H3N2 virus to the cat. Moreover, 3 domestic cats infected with intranasal canine/Korea/GCVP01/07 (H3N2) all showed elevated rectal temperatures, nasal virus shedding, and severe pulmonary lesions, such as suppurative bronchopneumonia. Our study for the first time shows that cats are susceptible to canine influenza H3N2 infection, suggesting that cats may play an intermediate host role in transmitting the H3N2 virus among feline and canine species, which could lead to the endemic establishment of the virus in companion animals. Such a scenario raises a public health concern, as the possibility of the emergence of new recombinant feline or canine influenza viruses in companion animals with the potential to act as zoonotic infection cannot be excluded.


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.


Are endogenous feline leukemia viruses really endogenous?

Full length endogenous feline leukemia virus (FeLV) proviruses exist within the genomes of many breeds of domestic cat raising the possibility that they may also exist in a transmissible exogenous form. Such viruses would share receptor usage with the recombinant FeLV-B subgroup, a viral subgroup that arises in vivo by recombination between exogenous subgroup A virus (FeLV-A) and endogenous FeLV. Accordingly, all isolates of FeLV-B made to date have contained a “helper” FeLV-A, consistent with their recombinatorial origin. In order to assess whether endogenous viruses are transmitted between cats, we examined primary isolates of FeLV for which the viral subgroup had been determined for the presence of a subgroup B virus that lacked an FeLV-A. Here we describe the identification of two
primary field isolates of FeLV (2518 and 4314) that appeared to contain subgroup B virus only by classical interference assays, raising the possibility of between-host transmission of endogenous FeLV. Sequencing of the env gene and U3 region of the 3’ long terminal repeat (LTR) confirmed that both viral genomes contained endogenous viral env genes. However the viral 3’ LTRs appeared exogenous in origin with a putative 3’ recombination breakpoint residing at the 3’ end of the env gene. Further, the FeLV-2518 virions also co-packaged a truncated FeLV-A genome containing a defective env gene, termed FeLV-2518(A) whilst no helper subgroup A viral genome was detected in virions of FeLV-4314. The acquisition of an exogenous LTR by the endogenous FeLV in 4314 may have allowed a recombinant FeLV variant to outgrow an exogenous FeLV-A virus that was presumably present during first infection. Given time, a similar evolution may also occur within the 2518 isolate. The data suggest that endogenous FeLVs may be mobilised by acquisition of exogenous LTRs yielding novel viruses that type biologically as FeLV-B.

Medial radio-carpal arthrodesis in three cats with a 2.0 mm locking maxillofacial plate system.
The medical records of three cats that were presented with severe carpal injury requiring radiocarpal arthrodesis were reviewed. Medial plating using the Compact 2.0 LOCK systema was performed in all three cases. Although screw positioning may be difficult because of the large distance between the holes of the plate and the relatively large size of screws, plate loosening or metacarpal fractures did not occur. Long-term clinical and radiographic follow-up (6 months to 4.5 years) revealed excellent outcome in two cats. In the third cat, the radiocarpal joint did not undergo complete fusion. At four and a half years following surgery, recurrence of forelimb lameness was associated with breakage of the plate.

Shedding of chlamydiae in relation to titers of serum chlamydiae-specific antibodies and serum concentrations of two acute-phase proteins in cats without conjunctivitis.
Objective-To investigate shedding of chlamydiae from conjunctiva and genital tracts of cats without clinical signs of conjunctivitis or other infectious disease in relation to their titers of serum antibodies against chlamydiae and to serum amyloid A (SAA) and serum alpha(1)-acid glycoprotein (AGP) concentrations. Animals-62 healthy cats. Procedures-Serum from each cat was analyzed for antibodies against chlamydiae and for SAA and AGP concentrations. Swab samples from the conjunctival sac and genital tract were analyzed with a real-time PCR assay for Chlamydiaceae. Results-4 of 8 of cats with high antibody titers (ie, 1,600) shed chlamydiae, but only from the conjunctiva. Chlamydiae could not be detected in samples from cats with lower antibody titers nor from any genital tract samples. In cats with antibody titers of 1,600, mean +/- SD SAA concentration was significantly higher when chlamydiae were detected in conjunctival swab samples (3.9 +/- 1.0 mg/L) than when no chlamydiae were detected (1.4 +/- 1.0 mg/L). However, SAA concentration was greater than the limit for an acute-phase response in only one of those cats. There was no significant difference in serum AGP concentrations between cats with high titers that were or were not shedding chlamydiae. Nine of 30 (30%) cats (5 with and 4 without detectable serum antibodies against chlamydiae) that had been mated...
developed reproductive disorders. Conclusions and Clinical Relevance-Clinically normal cats with high chlamydiae-specific antibody titers can shed and thus transmit chlamydiae. Venereal spread from cats without clinical signs of infection is likely not common.


Companion animals symposium: microbes and gastrointestinal health of dogs and cats.
Recent molecular studies have revealed complex bacterial, fungal, archaeal, and viral communities in the gastrointestinal tract of dogs and cats. More than 10 bacterial phyla have been identified, with Firmicutes, Bacteroidetes, Proteobacteria, Fusobacteria, and Actinobacteria constituting more than 99% of all gut microbiota. Microbes act as a defending barrier against invading pathogens, aid in digestion, provide nutritional support for enterocytes, and play a crucial role in the development of the immune system. Of significance for gastrointestinal health is their ability to ferment dietary substrates into short-chain fatty acids, predominantly to acetate, propionate, and butyrate. However, microbes can have also a detrimental effect on host health. Specific pathogens (e.g., Salmonella, Campylobacter jejuni, and enterotoxigenic Clostridium perfringens) have been implicated in acute and chronic gastrointestinal disease. Compositional changes in the small intestinal microbiota, potentially leading to changes in intestinal permeability and digestive function, have been suggested in canine small intestinal dysbiosis or antibiotic-responsive diarrhea. There is mounting evidence that microbes play an important role in the pathogenesis of canine and feline inflammatory bowel disease (IBD). Current theories for the development of IBD favor a combination of environmental factors, the intestinal microbiota, and a genetic susceptibility of the host. Recent studies have revealed a genetic susceptibility for defective bacterial clearance in Boxer dogs with granulomatous colitis. Differential expression of pathogen recognition receptors (i.e., Toll-like receptors) were identified in dogs with chronic enteropathies. Similarly to humans, a microbial dysbiosis has been identified in feline and canine IBD. Commonly observed microbial changes are increased Proteobacteria (i.e., Escherichia coli) with concurrent decreases in Firmicutes, especially a reduced diversity in Clostridium clusters XIVa and IV (i.e., Lachnospiraceae, Ruminococcaceae, Faecalibacterium spp.). This would indicate that these bacterial groups, important short-chain fatty acid producers, may play an important role in promoting intestinal health.


Evaluation of modified Wright-staining of dried urinary sediment as a method for accurate detection of bacteriuria in cats.
Background: Urinary sediment examination and quantitative urinary culture results are frequently discordant. Objectives: The aims of this study were to compare accuracy of light microscopic examination of wet-mounted unstained (wet-unstained) and air-dried modified Wright-stained (dry-stained) sedimented preparations of urine with results of quantitative aerobic bacterial culture for detection and characterization of bacteriuria in cats. In addition, the presence of pyuria detected by urinalysis and potential risk factors were assessed. Methods: A blinded prospective study was conducted on 472 urinary samples collected from 410 cats by cystocentesis. The age and sex of each cat were recorded. Complete urinalyses were performed and included quantification of WBCs.
Quantity and morphology of bacteria in each specimen were determined by light microscopic examination of wet-unstained (performed by certified medical technologists) and dry-stained (performed by a veterinary clinical pathologist) sedimented preparations of urine and compared with results of quantitative bacterial cultures. Results: Of 472 urinary specimens, 29 were positive for bacteriuria by culture and considered true positives and 443 were considered true negatives. Compared with these results, examination of wet-unstained and dry-stained urines had sensitivities of 75.9% and 82.8%, specificities of 56.7% and 98.7%, and test efficiencies of 57.8% and 97.7%, respectively. Positive likelihood ratios were 1.8 and 63.7 and negative likelihood ratios were 0.42 and 0.17 for wet-unstained and dry-stained examinations, respectively. Compared with 29 culture-positive samples, the wet-unstained method had morphologic concordance and misclassification rates of 37.9% and 62.1%, respectively, whereas the dry-stained method had morphologic concordance and misclassification rates of 65.5% and 34.5%, respectively. Only 34% of samples with bacteriuria had pyuria. Frequency of bacteriuria was not significantly different based on age and sex of the cat, but there was a tendency for increased frequency in female cats and in cats >10 years old. Conclusions: Staining dried urinary sediment with a modified Wright-stain significantly improved sensitivity, specificity, and test efficiency of microscopic detection and classification of bacteriuria compared with the wet-unstained method. Pyuria should not be a criterion for determining the presence or absence of bacteriuria.


**Ultrasonographic characterization of feline ileoceccolic abnormalities.**
The clinical signs of 29 cats with ultrasonographic abnormalities at the ileoceccolic junction were reviewed. Twenty-eight cats had gastrointestinal signs, with acute vomiting and diarrhea being most prevalent. Eighteen of 29 cats had enlarged cecal lymph nodes. Focal hyperechoic mesenteric fat was noted in 18 of 29 cats, and mild focal fluid accumulation was seen in seven of 29 cats. Six cats had a round cecum, and eight cats had cecal content. The cecal wall was thickened in 19 cats, and the ileal wall was mildly thickened in six cats. Three cats had changes involving the ascending colon adjacent to the ileoceccolic junction. Fourteen cats had no ultrasonographic evidence of changes in the remainder of the gastrointestinal tract, and 13 of these 14 cats were symptomatic for gastrointestinal disease. Four cats with resolution of the ultrasonographic changes also had resolution of clinical signs. These results suggest that ultrasonographic abnormalities at the level of the ileoceccolic junction in cats are clinically significant and are seen in cats with acute vomiting or diarrhea. Fine-needle aspirates and biopsies of the ileoceccolic area had a low diagnostic yield. When no other gastrointestinal abnormalities are detected, we therefore recommend follow-up ultrasound examinations of these patients.


**Vascular endothelial growth factor (VEGF), produced by feline infectious peritonitis (FIP) virus-infected monocytes and macrophages, induces vascular permeability and effusion in cats with FIP.**
Feline infectious peritonitis virus (FIPV) causes a fatal disease called FIP in Felidae. The effusion in body cavity is commonly associated with FIP. However, the exact mechanism of accumulation of
effusion remains unclear. We investigated vascular endothelial growth factor (VEGF) to examine the relationship between VEGF levels and the amounts of effusion in cats with FIP. Furthermore, we examined VEGF production in FIPV-infected monocytes/macrophages, and we used feline vascular endothelial cells to examine vascular permeability induced by the culture supernatant of FIPV-infected macrophages. In cats with FIP, the production of effusion was related with increasing plasma VEGF levels. In FIPV-infected monocytes/macrophages, the production of VEGF was associated with proliferation of virus. Furthermore, the culture supernatant of FIPV-infected macrophages induced hyperpermeability of feline vascular endothelial cells. It was suggested that vascular permeability factors, including VEGF, produced by FIPV-infected monocytes/macrophages might increase the vascular permeability and the amounts of effusion in cats with FIP.


**4-Methylpyrazole as a treatment in naturally occurring ethylene glycol intoxication in cats.**

Objective - To describe the clinical experience and therapeutic use of fomepizole (4-methylpyrazole [4-MP]) in 3 cats with naturally occurring ethylene glycol (EG) toxicity. Case or Series Summary - All cats were documented to be EG positive by an ethylene glycol test kit. This report describes the dose of 4-MP used, available clinicopathological data, and clinical progression during hospitalization. All patients survived to discharge. New or Unique Information Provided - IV use of 4-MP at 125 mg/kg as an initial dose and 31.25 mg/kg at 12, 24, and 36 hours is safe and effective for treatment of naturally occurring EG toxicity in cats. Increased HCO(3) concentrations were noted after IV use of 4-MP. This is the first report documenting the successful treatment of naturally occurring EG intoxication in cats with 4-MP.


**Isolation and partial characterization of Brazilian samples of feline immunodeficiency virus.**

Feline immunodeficiency virus (FIV) causes a slow progressive degeneration of the immune system which eventually leads to a disease comparable to acquired immune deficiency syndrome (AIDS) in humans. FIV has extensive sequence variation, a typical feature of lentiviruses. Sequence analysis showed that diversity was not evenly distributed throughout the genome, but was greatest in the envelope gene, env. The virus enters host cells via a sequential interaction, initiated by the envelope glycoprotein (env) binding the primary receptor molecule CD134 and followed by a subsequent interaction with chemokine co-receptor CXCR4. The purpose of this study was to isolate and characterize isolates of FIV from an open shelter in Sao Paulo, Brazil. The separated PBMC from 11 positive cats were co-cultured with MYA-1 cells. Full-length viral env glycoprotein genes were amplified and determined. Chimeric felinexhuman CD134 receptors were used to investigate the receptor utilization of 17 clones from Brazilian isolates of FIV. Analyses of the sequence present of molecular clones showed that all clones grouped within subtype B. In contrast to the virulent primary isolate FIV-GL8, expression of the first cysteine-rich domain (CRD1) of feline CD134 in the context of human CD134 was sufficient for optimal receptor function for all Brazilian FIV isolates tested.
RADIOGRAPHIC DIAMETER OF THE COLON IN NORMAL AND CONSTIPATED CATS AND IN CATS WITH MEGACOLON.
Radiographs of 50 cats with no history of gastrointestinal disease were evaluated to establish a normal reference range for radiographic diameter of the feline colon. Thirteen cats with constipation and 26 with megacolon were also evaluated and compared with the normal cats to characterize the accuracy of the reference range and to identify a cutoff to distinguish constipation from megacolon. A ratio of maximal diameter of the colon to L5 length was the most repeatable and accurate measurement. A ratio <1.28 is a strong indicator of a normal colon (sensitivity 96%, specificity 87%). A value >1.48 is a good indicator of megacolon (sensitivity 77%, specificity 85%).

A cross-sectional study of Tritrichomonas foetus infection among healthy cats at shows in Norway.
ABSTRACT: BACKGROUND: In recent years, the protozoan Tritrichomonas foetus has been recognised as an important cause of chronic large-bowel diarrhoea in purebred cats in many countries, including Norway. The aim of this cross-sectional study was to determine the proportion of animals with T. foetus infection among clinically healthy cats in Norway and to assess different risk factors for T. foetus infection, such as age, sex, former history of gastrointestinal symptoms and concurrent infections with Giardia duodenalis and Cryptosporidium sp. METHODS: The sample population consisted of 52 cats participating in three cat shows in Norway in 2009. Samples were examined for motile T. foetus by microscopy, after culturing and for T. foetus-DNA by species-specific nested PCR, as well as for Giardia cysts and Cryptosporidium oocysts by immunofluorescent antibody test (IFAT). RESULTS: By PCR, T. foetus-DNA was demonstrated in the faeces of 11 (21%) of the 52 cats tested. DNA-sequencing of five positive samples yielded 100% identity with previous isolates of T. foetus from cats. Only one sample was positive for T. foetus by microscopy. By IFAT, four samples were positive for Giardia cysts and one for Cryptosporidium oocysts, none of which was co-infected with T. foetus. No significant associations were found between the presence of T. foetus and the various risk factors examined. CONCLUSIONS: T. foetus was found to be a common parasite in clinically healthy cats in Norway.

Cat genotype Tritrichomonas foetus survives passage through the alimentary tract of two common slug species.
Tritrichomonas foetus has recently been recognised as the cause of large bowel diarrhoea in cats (feline trichomoniasis), for which the epidemiology is largely unknown. We tested whether garden slugs common in Sydney, Australia can pass viable T. foetus in their faeces after oral intake. First, Leopard slugs (Limax maximus) were offered cat food with 10(4) of T. foetus per gram, 63% (5/8) of slugs consumed food with T. foetus and subsequently 20% (1/5) shed T. foetus in their faeces. Furthermore,
63% (5/8) and 75% (6/8) of the Leopard slugs and the Yellow cellar slugs (Limacus flavus) consumed food with 10(6) of T. foetus per gram and subsequently 100% (5/5) and 83% (5/6) shed T. foetus in their faeces, respectively. These results suggest that slugs may facilitate passive transmission of T. foetus between cats. We speculate that cats may become infected with T. foetus should they consume food contaminated with faeces from slug(s) infected with T. foetus.


Transmission of methicillin-resistant Staphylococcus pseudintermedius between infected dogs and cats and contact pets, humans and the environment in households and veterinary clinics. The objective of this study was to investigate the prevalence of methicillin-resistant Staphylococcus pseudintermedius (MRSP) in people, pets and the environment in households with a pet with a clinical MRSP-infection within the past year. Personnel and the environment at veterinary clinics were also screened. Nasal swabs (humans), nasal and perineal swabs (pets) and environmental wipes were examined using selective culturing. Twenty households were enrolled; 10/20 index cases still had clinical signs of infection at the start of the study and all were MRSP-positive. Of the remaining 10 index cases five were MRSP-positive in nasal and/or perineal samples. Five of 14 (36%) contact dogs and four of 13 (31%) contact cats were found MRSP-positive. In the households with an index case with clinical signs of infection 6/7 (86%) contact animals were MRSP-positive. MRSP was cultured from 2/45 (4%) human nasal samples. Domestic contamination was widespread as positive samples were found in 70% of the households and 44% of all environmental samples were MRSP-positive. In all but one of these MRSP-positive households the index case was still MRSP positive. Among the personnel in veterinary clinics 4/141 (3%) were MRSP-positive. MRSP was cultured from 31/200 environmental samples in 7/13 clinics at the first sampling and in 3/6 clinics the environment remained MRSP-positive after cleaning and disinfection indicating that current cleaning procedures often were unable to eliminate MRSP. These results show that transmission of MRSP between infected or colonized dogs and cats and healthy people does occur but is relatively uncommon, while transmission to contact pets occurs frequently, especially when the index case still has clinical signs of MRSP-infection.


(99m)Tc - DMSA absolute and relative renal uptake in cats: procedure and normal values. In this study we investigated the influence of technical factors (positioning, background (BG) correction and attenuation correction) on qualitative and quantitative (absolute (AU) and relative (RU) uptake) assessment of feline kidneys with (99m)technetium labelled dimercaptosuccinic acid ((99m)Tc-DMSA). Eleven healthy adult cats were included. Influence of BG and depth correction on quantitative assessment was evaluated. Depth correction was based on the geometric mean method (using dorsal and ventral images) and the use of two standards placed over each individual kidney. Visual evaluation showed superiority of dorsal and ventral over lateral positioning due to increased separation of the kidneys permitting region of interest (ROI) placement without overlap. No apparent
influence of BG correction was found for RU. However, AU was systematically overestimated without BG correction. Depth correction did not seem to affect RU in most cases, however, in some cats the differences were not negligible. The values for AU without depth correction were lower compared to depth corrected values.


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

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


An overview of glomerular filtration rate testing in dogs and cats.

Determination of glomerular filtration rate (GFR) is a valuable, yet underused, diagnostic tool for evaluating renal function in dogs and cats. This article first reviews the hormonal and hemodynamic factors which contribute to GFR, followed by a description of considerations when selecting a pharmacokinetic model and methods of animal-to-animal standardization. The best-characterized existing GFR markers, including creatinine, radiolabeled markers, and iohexol, are reviewed in depth, as well as alternative but lesser used techniques. A weighted means analysis of reported GFR measurements in healthy dogs and cats and a review of selected studies that have examined GFR alterations in animals with naturally occurring and experimental diseases provide the reader with preliminary guidelines on expected GFR results in these species and disease conditions.
**Histopathologic features, immunophenotyping, clonality, and eubacterial fluorescence in situ hybridization in cats with lymphocytic cholangitis/cholangiohepatitis.**

Feline lymphocytic cholangitis is a poorly characterized disease complex with respect to histologic lesions, immunophenotype, and etiopathogenesis. Seventy-eight cases of feline lymphocytic cholangitis (n = 51) and feline hepatic lymphoma (n = 27) were reviewed using standardized histopathology, immunophenotyping (B cell and T cell), polymerase chain reaction for T-cell receptor (TCR) gene rearrangement, and fluorescence in situ hybridization (FISH) for eubacteria. Five histopathologic features in cases of lymphocytic cholangitis assisted in its differentiation from hepatic lymphoma: bile duct targeting (n = 32, 62.7%), ductopenia (n = 9, 17.6%), peribiliary fibrosis (n = 37, 72.5%), portal B-cell aggregates (n = 36, 70.6%), and portal lipogranulomas (n = 38, 74.5%). The majority of lymphocytic cholangitis cases (n = 35, 68.6%) were T cell predominant; 15 (29.4%) had an equal mix of B cells and T cells, and 1 (1.9%) had a B cell-predominant infiltrate; 66.6% of hepatic lymphoma cases were T-cell lymphomas. TCR clonality results were unexpected, with 17.1% of cases of lymphocytic cholangitis having clonal or oligoclonal populations and with T-cell lymphomas having variable TCR clonality (63.6% clonal or oligoclonal, 36.3% polyclonal). The majority of lymphocytic cholangitis (n = 32 of 36, 88.8%) and all hepatic lymphoma cases had no detectable eubacteria using FISH. As demonstrated here, bile duct targeting, ductopenia, peribiliary fibrosis, portal B-cell aggregates, and portal lipogranulomas are lymphocytic cholangitis features that, along with polyclonal TCR (83%), help differentiate it from hepatic lymphoma. No strong evidence was found implicating in situ bacterial colonization as an etiopathogenesis of lymphocytic cholangitis.

**Influence of a high-protein diet on energy balance in obese cats allowed ad libitum access to food.**

The influence of a high-protein [HP, 47% of metabolizable energy (ME)] diet on energy balance was evaluated in obese cats allowed ad libitum access to food. Energy intake, body weight, body composition, energy expenditure, and concentrations of hormones and metabolites associated with carbohydrate and lipid metabolism (glucose, insulin, free fatty acids, triglycerides and leptin) were measured in cats after consuming either a moderate protein (MP, 27% of ME) or HP diet for 4 months. Indirect respiration calorimetry showed that resting and total energy expenditure (kJ/day) adjusted for either body weight or lean body mass was increased in cats consuming the HP in relation to MP diets. However, voluntary energy intake also was increased in the HP treatment and, thus, there was no difference in body weight between animals consuming the two diets. Body composition measurements using deuterium oxide dilution showed that dietary protein content did not alter amounts of either lean body mass or fat mass. No significant differences (p > 0.05) were observed between the two treatment groups for blood glucose, free fatty acid or leptin concentrations, although there was a trend (p = 0.054) towards an increase of serum insulin concentrations in the cats eating the HP diet. This study showed that short-term ad libitum feeding of an HP diet did not reduce food intake or promote weight loss in obese cats. However, energy expenditure was increased in the HP diet group and it is possible that this effect of HP might help promote weight loss when energy intake is restricted.
Retention of provided identification for dogs and cats seen in veterinary clinics and adopted from shelters in Oklahoma City, OK, USA.
Personalized identification (ID) tags that contain contact information for the dog or cat owner can help assure lost animals are quickly reunited with their owners. The authors have previously reported that while the majority of pet owners stated that ID tags were very important, only a third responded that their pet wears an ID tag. The objective of this study was to evaluate if providing and putting on the pet a free collar and ID tag during an owner’s visit to a veterinary hospital or spay/neuter facility increased the likelihood that the pet owners would actually keep the identification on their pet at least 6-8 weeks after they were placed on the pet. A second population of dogs and cats that were adopted from animal control and humane society shelters were also studied to assess retention of a collar and personalized ID tag. Telephone follow-up occurred a mean of 8 weeks after the tag was applied. Retaining and using the tag significantly increased for the veterinary group with 13.8% reporting their pets were currently wearing an ID tag pre-intervention, and 84.3% reporting their pets were currently wearing and ID tag post-intervention. Of the dogs and cats that were adopted, at follow-up 94% of owners reported their pets were currently wearing an ID tag. Approximately 5% of those who participated in the post-intervention survey lost a pet and recovered that pet because of the ID tag. This suggests that ID tagging is an effective method to potentially decrease stray intake into shelters and return pets home. The data also support placing tags and collars directly on pets as a method to retain those ID tags and collars on the animals, thus increasing the likelihood they will be returned home if lost or during a disaster.

Expression of interferon gamma in the brain of cats with natural Borna disease virus infection.
Borna disease virus (BDV) is a neurotropic, negative-stranded RNA virus, which causes a non-suppurative meningoencephalomyelitis in a wide range of animals. In cats, BDV infection leads to staggering disease. In spite of a vigorous immune response the virus persists in the central nervous system (CNS) in both experimentally and naturally infected animals. Since the CNS is vulnerable to cytotoxic effects mediated via NK-cells and cytotoxic T-cells, other non-cytolytic mechanisms such as the interferon (IFN) system is favourable for viral clearance. In this study, IFN-gamma expression in the brain of cats with clinical signs of staggering disease (N=12) was compared to the expression in cats with no signs of this disease (N=7) by quantitative RT-PCR. The IFN-gamma expression was normalised against the expression of three reference genes (HPRT, RPS7, YWHAZ). Cats with staggering disease had significantly higher expression of IFN-gamma compared to the control cats (p-value <= 0.001). There was no significant difference of the IFN-gamma expression in BDV-positive (N=7) and -negative (N=5) cats having clinical signs of staggering disease. However, as BDV-RNA still could be detected, despite an intense IFN-gamma expression, BDV needs to have mechanisms to evade this antiviral immune response of the host, to be able to persist.
Utility of measuring plasma N-terminal pro-brain natriuretic peptide in detecting hypertrophic cardiomyopathy and differentiating grades of severity in cats.

Background: Cats with hypertrophic cardiomyopathy (HCM) often have no clinical signs or subtle signs. Measurement of N-terminal pro-brain natriuretic peptide (NT-proBNP) has been demonstrated in people to be highly specific for heart disease and also correlates with severity of HCM. NT-proBNP may also be valuable in detecting and grading HCM in cats, but results to date have been equivocal.

Objectives: The aims of this study were to evaluate NT-proBNP as a screening test for diagnosis of HCM in cats and determine an appropriate cut-off value and to determine if NT-proBNP concentrations correlated with severity of HCM in cats. Methods: Plasma NT-proBNP concentrations were measured in 201 cats using an ELISA designed for use in cats. Cats were classified using echocardiography as clinically healthy controls (n=99) or cats with equivocal (n=9), mild (n=15), moderate (n=17), or severe (n=61) HCM. Results: NT-proBNP concentrations (median; 25th-75th interquartile percentiles) in mildly (216.1; 87.6-392.5 pmol/L), moderately (282.7; 131.9-466.6 pmol/L), and severely (839.5; 655.3-1046.4 pmol/L) affected cats were significantly higher than those in healthy controls (18.9; 3.4-62.4 pmol/L). Concentrations in severely affected cats were significantly higher than in cats from other HCM groups. There was no significant difference between mild and moderate HCM. Cut-off values >49 pmol/L had a sensitivity of 97.8% and specificity of 66.7%; >100 pmol/L had a sensitivity of 92.4% and specificity of 93.9%; and >150 pmol/L had a sensitivity of 88% and a specificity of 100%.

Conclusions: NT-proBNP with a cut-off value of >100 pmol/L was useful in detecting even mild HCM. Cats with increased NT-proBNP concentrations should be examined by echocardiography.

First morphological characterization of ‘Candidatus Mycoplasma turicensis’ using electron microscopy.

At least three haemotropic mycoplasmas have been recognized in cats: Mycoplasma haemofelis (Mhf), ‘Candidatus Mycoplasma haemominutum’ (CMhm) and ‘Candidatus M. turicensis’ (CMt). The latter was originally identified in a Swiss pet cat with haemolytic anaemia and shown to be prevalent in domestic cats and wild felids worldwide using molecular methods. So far, there has been no confirmatory morphological evidence of the existence of CMt presumably due to low blood loads during infection while CMhm has only been characterized by light microscopy with discrepant results. This study aimed to provide for the first time electron microscopic characteristics of CMt and CMhm and to compare them to Mhf. Blood samples from cats experimentally infected with CMt, CMhm and Mhf were used to determine copy numbers in blood by real-time PCR and for transmission and scanning electron microscopy. High resolution scanning electron microscopy revealed CMt and CMhm to be discoid-shaped organisms of 0.3 mum in diameter attached to red blood cells (RBCs). In transmission electron microscopy of CMt, an oval organism of about 0.25 mum with several intracellular electron dense structures was identified close to the surface of a RBC. CMhm and CMt exhibited similar morphology to Mhf but had a smaller diameter. This is the first study to provide morphological evidence of CMt thereby confirming its status as a distinct haemoplasma species, and to
present electron microscopic features of CMhm.

Insulin Responses to Administrations of Amino Acids and Fatty Acids in Healthy Cats.
In order to compare the stimulation ability of insulin secretion, we determined changes in plasma glucose and insulin concentrations after intravenous administration of various amino acids and essential fatty acids in clinically healthy adult cats. Plasma glucose concentrations were within the normal ranges after injection of amino acids and fatty acids. Plasma insulin concentrations increased rapidly 2 to 4 min after injection of arginine, then decreased to the basal levels at 20 min in all five cats. Insulin peak responses were significantly greater in arginine injections than in normal saline (P<0.01). Areas under the curve (AUC) of plasma insulin concentrations from 0 to 10 min after injection of arginine were significantly larger than after injection of normal saline (P<0.01) and glucose (P<0.05). Increases in AUC of plasma insulin concentration from 0 to 60 min were observed after injection of arginine, leucine, alanine, and fat emulsion. Arginine had a strong insulinotropic effect, and leucine, alanine, and fatty acids had weak ones. Besides, valine, methionine, taurine and glutamine had no stimulant activity of insulin. Given the risk of glucose toxication and required time for testing, the intravenous arginine tolerance test may be useful for estimation of insulin responses in cats.

Differences between vocalization evoked by social stimuli in feral cats and house cats.
To investigate how socialization can affect the types and characteristics of vocalization produced by cats, feral cats (n=25) and house cats (n=13) were used as subjects, allowing a comparison between cats socialized to people and non-socialized cats. To record vocalization and assess the cats’ responses to behavioural stimuli, five test situations were used: approach by a familiar caretaker, by a threatening stranger, by a large doll, by a stranger with a dog and by a stranger with a cat. Feral cats showed extremely aggressive and defensive behaviour in most test situations, and produced higher call rates than those of house cats in the test situations, which could be attributed to less socialization to other animals and to more sensitivity to fearful situations. Differences were observed in the acoustic parameters of feral cats in comparison to those of house cats. The feral cat produced significantly higher frequency in fundamental frequency, peak frequency, 1st quartile frequency, 3rd quartile frequency of growls and hisses in agonistic test situations. In contrast to the growls and hisses, in meow, all acoustic parameters like fundamental frequency, first formant, peak frequency, 1st quartile frequency, and 3rd quartile frequency of house cats were of significantly higher frequency than those of feral cats. Also, house cats produced calls of significantly shorter in duration than feral cats in agonistic test situations. These results support the conclusion that a lack of socialization may affect usage of types of vocalizations, and the vocal characteristics, so that the proper socialization of cat may be essential to be a suitable companion house cat.