Small Animal Article Summaries –
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Risk factors for urate uroliths in cats.

OBJECTIVE: To identify demographic factors associated with urate urolithiasis in cats and determine whether the rate of urolith submission to a laboratory had changed over time. DESIGN: Case series and case-control study. ANIMALS: Cases consisted of 5,072 cats with urate uroliths submitted to the Minnesota Urolith Center between January 1, 1981, and December 31, 2008. Controls consisted of 437,228 cats without urinary tract diseases identified in records of the Veterinary Medical Database during the same period. PROCEDURES: Information on cat breed, age, sex, reproductive status, and location of uroliths was used to identify risk factors. Changes in annual urolith submission rates were evaluated. RESULTS: Purebred cats had significantly higher odds of developing urate uroliths than did cats of mixed breeding (reference group). On the other hand, cats of the Abyssinian, American Shorthair, Himalayan, Manx, and Persian breeds had significantly lower odds of developing urate uroliths than did mixed breeds. Neutered cats were 12 times as likely to develop urate uroliths as were sexually intact cats. Cats in all age groups had significantly increased odds of developing urate uroliths, compared with cats < 1 year of age (reference group). Cats >/= 4 but < 7 years of age had the highest odds of all groups and were 51 times as likely to develop urate uroliths as were cats < 1 year of age. Urolith submission rates did not change significantly with time. CONCLUSIONS AND CLINICAL RELEVANCE: Findings of this study suggested that the typical cat with urate uroliths was a purebred neutered cat, 4 to 7 years old, with uroliths in the bladder or urethra. This information may be helpful in predicting mineral composition of uroliths in vivo. However, no conclusions can be made regarding cause-and-effect relationships.


Comparison of intraocular pressure measurements between the Tono-Pen XL(R) and Perkins(R) applanation tonometers in dogs and cats.

OBJECTIVE: To compare the accuracy between two applanation tonometers, Tono-Pen XL(R) and Perkins(R), in ophthalmoscopically normal dogs and cats. ANIMALS: Both eyes of 25 conscious and healthy dogs and cats were evaluated. Both eyes of five dogs and cats immediately after sacrifice were used as controls for the postmortem study. PROCEDURE: In conscious animals, the tonometry was performed with topical anesthesia using 0.5% proxymetacaine eye drops for both tonometers and 1% fluorescein eye drops for the Perkins tonometer. Readings of intraocular pressure (IOP) in the postmortem study were taken using manometry and tonometry by Tono-Pen XL(R) and Perkins(R). RESULTS: The correlation coefficient (r(2)) in dogs between manometry and applanation tonometers Tono-Pen XL(R) and Perkins(R) were, respectively, 0.896 and 0.981 and in cats were 0.905 and 0.988. The mean IOP values in conscious dogs with Tono-Pen XL(R) and Perkins(R) were, respectively, 17.5 +/- 3.7 mmHg (10.0-25.0 mmHg) and 15.3 +/- 2.1 mmHg (12.0-19.8 mmHg) and in conscious cats were 16.8 +/- 3.6 mmHg (10.5-24.5 mmHg) and 15.5 +/- 1.3 mmHg (13.0-18.5 mmHg). CONCLUSION: There was a strong correlation between the IOP values obtained by direct ocular manometry and the Tono-Pen XL(R) and Perkins(R) tonometers in dogs and cats. There was no statistically significant difference between the mean IOP obtained with both tonometers in conscious animals, there was, however, a difference between the minimum and mainly in the maximum values that were on average 5-6 mmHg higher with Tono-Pen XL(R) than those measured with Perkins(R), which justifies a table of normal values differentiated for each tonometer.


Prevalence of Bartonella species, hemoplasmas, and Rickettsia felis DNA in blood and fleas of cats in Bangkok, Thailand.

Flea infestations are common in Thailand, but little is known about the flea-borne infections. Fifty flea pools and 153 blood samples were collected from client-owned cats between June and August 2009 from veterinary hospitals in Bangkok, Thailand. Total DNA was extracted from all samples, and then assessed by conventional PCR assays. The prevalence rates of Bartonella spp. in blood and flea samples were 17% and 32%, respectively, with DNA of Bartonella henselae and Bartonella clarridgeiae being amplified most commonly. Bartonella koehlerae DNA was amplified for the first time in Thailand. Hemoplasma DNA was amplified from 23% and 34% of blood samples and flea pools, respectively, with ‘Candidatus Mycoplasma haemominutum’ and Mycoplasma haemofelis being detected most frequently. All samples were negative for Rickettsia felis. Prevalence rate of B. henselae DNA was increased 6.9 times in cats with flea infestation. Cats administered flea control products were 4.2 times less likely to be Bartonella-infected.


Twenty-two cases of feline histoplasmosis seen at the Virginia-Maryland Regional College of Veterinary Medicine Teaching Hospital between 1986 and 2009 were reviewed. The median age of affected cats was 9 yr (mean, 8.8 yr). Female domestic shorthairs were more commonly affected. The clinical presentation of most cases was nonspecific. The most common presenting complaints included weakness, lymphadenopathy, weight loss, and anorexia. Less frequent clinical signs included vomiting, diarrhea, blindness, and lameness. Less than half of the cats had clinical evidence of pulmonary
in stem cell permissive conditions, we isolated, from 13 FMCs, a CD44
classified and characteri
renewal, long
mammary carcinoma (FMC) is an aggressive cancer, which shows biological similarities to the human tumor counterpart.

CD44 (TICs), are responsible for tumor formation and progression. Human breast cancer
Current carcinogenesis theory states that only a small subset of tumor cells, the cancer stem cells or tumor initiating cells
tumorigenic potential.
Isolation of stem
Exp Cell Res
Int 61:60-64.

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

Prevalence and risk factors of feline leukaemia virus and feline immunodeficiency virus in peninsular Malaysia.
ABSTRACT: BACKGROUND: Feline leukaemia virus (FeLV) and feline immunodeficiency virus (FIV) are major causes
of morbidity and mortality in domestic and wild felids. Despite the clinical importance of feline retroviruses and the
growing interest in cats as pets, information about FeLV and FIV in Malaysia is presently insufficient to properly advise
veterinarians and pet owners. A cross-sectional study was carried out from January 2010 to December 2010 to determine the
prevalence and risk factors associated with FeLV and FIV among domestic cats in peninsular Malaysia. Plasma samples
were harvested from the blood of 368 domestic cats and screened for evidence of FeLV p27 antigen and FIV antibodies,
using an immunochromatographic kit. Additionally, data on cat demographics and health were collected using a structured
questionnaire, and were evaluated as potential risk factors for FeLV or FIV status. RESULTS: Of the 368 cats that were
evaluated in this study, 12.2% (45/368; 95% CI = 8.88 - 15.58) were positive for FeLV p27 antigen, 31.3%, (115/368; 95%
CI = 26.51 - 35.99) were seropositive to FIV antibodies, and 4.3% (16/368; 95% CI = 2.27 - 6.43) had evidence of both
viruses. Factors found to significantly increase the risk for FeLV seropositivity include sex, age, behaviour, sickness, and
living in a multi-cat household. Seropositive response to FIV was significantly associated with sex, neuter status, age,
behaviour, and health status. CONCLUSIONS: The present study indicates that FeLV and FIV are common among
domestic cats in peninsular Malaysia, and that factors related to cat demographics and health such as age, sex, behaviour,
health status and type of household are important predictors for seropositive status to FeLV or FIV in peninsular Malaysia.
High prevalence of FeLV or FIV observed in our study is of concern, in view of the immunosuppressive potentials of the
two pathogens. Specific measures for control and prevention such as screening and routine vaccination are needed to ensure
that FeLV and FIV are controlled in the cat population of peninsular Malaysia.

Isolation of stem-like cells from spontaneous feline mammary carcinomas: phenotypic characterization and
tumorigenic potential.
Current carcinogenesis theory states that only a small subset of tumor cells, the cancer stem cells or tumor initiating cells
(TICs), are responsible for tumor formation and progression. Human breast cancer-initiating cells have been identified as
CD44-expressing cells, which retain tumorigenic activity and display stem cell-like properties. Spontaneous feline
mammary carcinoma (FMC) is an aggressive cancer, which shows biological similarities to the human tumor counterpart.
We report the isolation and phenotypic characterization of FMC-derived stem/progenitor cells, showing in vitro self-
renewal, long-lasting proliferation and in vivo tumorigenicity. Twenty-one FMC samples were collected, histologically
classified and characterized for the expression of Ki67, EGFR, ER-alpha and CD44, by immunohistochemistry. By culture
in stem cell permissive conditions, we isolated, from 13 FMCs, a CD44-positive subpopulation able to survive and
PRACTICAL RELEVANCE: In cats, three species of demodex mites have been identified as causes of demodicosis, which is a consideration in the itchy or overgrooming cat. Beale, K. (2012) J Feline Med Surg


Feline alimentary lymphoma: 2. Further diagnostics, therapy and prognosis. PRACTICAL RELEVANCE: Accurate diagnosis of the distinct subtypes of alimentary lymphoma (AL) that occur in cats is important as there are major differences between them in clinical presentation, treatment and prognosis. Unlike intermediate- and high-grade alimentary lymphoma (I/HGAL) and large granular lymphocyte lymphoma (LGLL), which can often be diagnosed by aspiration cytology, full-thickness intestinal biopsies are usually required for the diagnosis of low-grade alimentary lymphoma (LGAL). CLINICAL CHALLENGES: LGAL is an increasingly recognised clinical problem and it can be challenging to differentiate from inflammatory disease. Where there is ambiguity on histology, further diagnostics (immunophenotyping and clonality analysis) may be required. The diagnosis of LGLL requires an index of suspicion as it may be missed with routine diagnostics. While cats with LGAL typically achieve durable remissions with oral prednisolone and chlorambucil, I/HGAL runs a more aggressive clinical course and requires multi-agent chemotherapeutic protocols. Information on the treatment of LGAL is limited and this form of AL has the poorest prognosis. Preliminary studies suggest that abdominal irradiation may potentially be of benefit in cats with AL and further investigations are warranted. EVIDENCE BASE: The evidence supporting this review is derived from grade II, III and IV prospective studies, retrospective case series, reviews, extrapolation from other species, pathophysiological justification and the combined clinical experience of those working in the field.


Feline alimentary lymphoma: 1. Classification, risk factors, clinical signs and non-invasive diagnostics. PRACTICAL RELEVANCE: Alimentary lymphoma (AL) occurs commonly in cats and exists as distinct subtypes that differ in their clinical course, response to treatment and prognosis. Accurate diagnosis is important to guide appropriate treatment. CLINICAL CHALLENGES: Differentiation of low-grade alimentary lymphoma from lymphoplasmacytic enteritis can be challenging, especially where endoscopic intestinal biopsies, which sample only the mucosa and submucosa, are used. The major differentials for intermediate- and high-grade alimentary lymphoma are other neoplastic and non-neoplastic intestinal mass lesions. The diagnosis of large granular lymphocyte lymphoma requires vigilance as it may be missed with routine diagnostics. PATIENT GROUP: AL affects predominantly middle- to old-aged domestic crossbred cats (median age 10-13 years). EVIDENCE BASE: The evidence supporting this review is derived from prospective studies, retrospective case series, reviews, extrapolation from other species, pathophysiological justification and the combined clinical experience of those working in the field.


Renal disease in cats infected with feline immunodeficiency virus. BACKGROUND: Feline immunodeficiency virus (FIV) and human immunodeficiency virus (HIV) infection cause similar clinical syndromes of immune dysregulation, opportunistic infections, inflammatory diseases, and neoplasia. Renal disease is the 4th most common cause of death associated with HIV infection. OBJECTIVE: To investigate the association between FIV infection and renal disease in cats. ANIMALS: Client-owned cats (153 FIV-infected, 306 FIV-noninfected and specific-pathogen-free (SPF) research colony cats (95 FIV-infected, 98 FIV-noninfected). METHODS: A mixed retrospective/prospective cross-sectional study. Blood urea nitrogen (BUN), serum creatinine, urinary specific gravity (USG), and urine protein:creatinine ratio (UPC) data were compared between FIV-infected and FIV-noninfected cats. In FIV-infected cats, total CD4+ and CD8+ T lymphocytes were measured using flow cytometry, and CD4+:CD8+ T lymphocyte ratio was calculated. Renal azotemia was defined as a serum creatinine >/= 1.9 mg/dL with USG <1.035. Proteinuria was defined as a UPC > 0.4 with an inactive urine sediment. RESULTS: Among the client-owned cats, no association was detected between FIV infection and renal azotemia (P =.24); however, a greater proportion of FIV-infected cats were proteinuric (25.0%, 16 of 64 cats) compared to FIV-noninfected cats (10.3%, 20 of 195 cats) (P <.01). Neither neuter status nor health status were risk factors for proteinuria in FIV-infected cats, but UPC was positively correlated with the CD4+:CD8+ T lymphocyte ratio (Spearman’s rho = 0.37, P =.01). Among the SPF research colony cats, no association was detected between FIV infection and renal azotemia (P =.21) or proteinuria (P =.25). CONCLUSIONS AND CLINICAL IMPORTANCE: Proteinuria but not azotemia was associated with natural FIV infection.


Feline demodicosis: a consideration in the itchy or overgrooming cat. PRACTICAL RELEVANCE: In cats, three species of demodex mites have been identified as causes of demodicosis, which
may manifest as pruritus, mililiary dermatitis and/or self-induced alopecia. The condition has been recognized in various countries but does seem to show regional preferences. CLINICAL CHALLENGES: Diagnosis of feline demodicosis can be a challenge as mites are not always readily found within scrapings of the skin examined microscopically. One or more species of demodeX mite may be involved in an infestation. Furthermore, the condition can be difficult to treat effectively. AUDIENCE: This review is intended as a clinical update for veterinary surgeons in practice who rarely encounter demodicosis.


Prevalence of endoparasites in stray and fostered dogs and cats in Northern Germany.

To get an overview of the current state of endoparasite prevalences in stray and not well-cared dogs and cats, faecal samples of 445 stray and foster dogs and 837 stray and foster cats were collected at their arrival at animal shelters in Lower Saxony (Germany). They were investigated for infections with endoparasites by the use of sedimentation-floatation method. Additionally, 341 canine and 584 feline samples were investigated by IDEXX SNAP(R) Giardia test. Stages of endoparasites were found coproscopically in 9.4 % (n = 42) of the canine samples, 4.0 % were positive for Toxocara canis, 0.9 % for hookworms, 0.4 % for Toxascaris leonina and 0.2 % for Hammondia-like oocysts. Giardia-coproantigen was detected in 11.4 % of the canine samples. In cats, 33.6 % (n = 281) were coproscopically positive for helminths and/or protozoa. Toxocara cati was found in 27.1 %, Isospora spp. in 7.5 %, Capillaria spp. 5.0 %, Taeniidae in 2.0 %, hookworms in 1.1 %, Giardia sp. in 0.7 %, Aelurostrongylus abstrusus in 1.0 % and Toxoplasma-like oocysts in 0.1 %. Coproantigen specific for Giardia sp. was detected in 6.8 % of the feline samples. Dogs and cats up to 1 year of age were more frequently infected with endoparasites than animals over 1 year of age (p < 0.001). Toxocara spp. and Isospora spp. were detected significantly more often in younger dogs and cats, respectively (p < 0.05 and p < 0.001). Stray dogs or cats older than 1 year were significantly more frequently infected with endoparasites than dropped off animals of the same age group (p < 0.05). Using the faecal egg count reduction test, the therapeutic efficacy of some anthelminetics was tested. All tested anthelmintics showed high efficacy and no suspected anthelmintic resistance was found. However, endoparasite-infected stray and free-roaming cats and dogs may contribute considerably to the contamination of public parks, playgrounds and sandpits with zoonotic parasites and therefore have to be considered a public health problem.


Bartonella vinsonii subsp. berkhoffii and Bartonella henselae as potential causes of proliferative vascular diseases in animals.

Bartonella species are highly fastidious, vector borne, zoonotic bacteria that cause persistent intraerythrocytic bacteremia and endotheilotropic infection in reservoir and incidental hosts. Based upon prior in vitro research, three Bartonella sp., B. bacilliformis, B. henselae, and B. quintana can induce proliferation of endothelial cells, and each species has been associated with in vivo formation of vasoproliferative tumors in human patients. In this study, we report the molecular detection of B. vinsonii subsp. berkhoffii, B. henselae, B. koehlerae, or DNA of two of these Bartonella species simultaneously in vasoproliferative hemangiopericytomas from a dog, a horse, and a red wolf and in systemic reactive angioendothielomatosis lesions from cats and a steer. In addition, we provide documentation that B. vinsonii subsp. berkhoffii infections induce activation of hypoxia inducible factor-1 and production of vascular endothelial growth factor, thereby providing mechanistic evidence as to how these bacteria could contribute to the development of vasoproliferative lesions. Based upon these results, we suggest that a fourth species, B. vinsonii subsp. berkhoffii, should be added to the list of Bartonellae that can induce vasoproliferative lesions and that infection with one or more Bartonella sp. may contribute to the pathogenesis of systemic reactive angioendothielomatosis and hemangiopericytomas in animals.


Plasma ACTH Precursors in Cats with Pituitary-Dependent Hyperadrenocorticism.

BACKGROUND: Diagnosis of pituitary-dependent hyperadrenocorticism (PDH) in cats is challenging because there is no specific diagnostic test. HYPOTHESIS/OBJECTIVE: The determination of plasma ACTH precursor (POMC and pro-ACTH) concentration might facilitate the diagnosis of PDH in cats. The aim of the study was to evaluate prospectively the plasma concentrations of ACTH precursors in a small cohort of cats with PDH and to estimate the value of this approach for diagnosis. ANIMALS: Four groups of cats were included: group 1 (cats with PDH), group 2 (cats with diabetes mellitus but not hyperadrenocorticism (HAC)), group 3 (cats with diabetes mellitus and confirmed acromegaly but not HAC), and group 4 (healthy cats). METHODS: PDH diagnosis was based on clinical data, low-dose dexamethasone suppression test (LDDST), and adrenal and pituitary gland computed tomography (CT) scan. For groups 2, 3, and 4, hyperadrenocorticism was excluded by LDDST or urine cortisol:creatinine ratio (UCCR). An immunoluminometric assay was used to determine plasma concentrations of ACTH precursors in the 4 groups of cats. RESULTS: Group 1 contained 9 cats (enlarged pituitary gland in 7/9). Plasma ACTH precursor concentrations ranged from <53 to >1010 pmol/L with 8/9 concentrations >/=229 pmol/L. Groups 2, 3, and 4 included 13, 7, and 13 cats, respectively. Plasma ACTH precursor concentrations ranged from...
<53 to 96 pmol/L in group 2, <53 to 72 pmol/L in group 3, and <53 to 99 pmol/L in group 4. CONCLUSION AND CLINICAL IMPORTANCE: High plasma concentration of ACTH precursors in cats (>100 pmol/L) is highly suggestive of PDH.


Seasonal and age effects on energy requirements in domestic short-hair cats (Felis catus) in a temperate environment.

There is little information known about the energy requirements of cats in temperature climates. Energy requirement of domestic short-haired cats was determined using three groups of mixed gender - old kept outside (approximately 9.9 years of age; 4.8 kg; n = 9), young kept outside (approximately 3.1 years of age; 3.9 kg; n = 8) or young kept inside (approximately 3.1 years of age; 3.9 kg; n = 8). Cats were housed individually for 5 weeks during summer (18.5 +/- 0.5 degrees C) and winter (8.5 +/- 0.4 degrees C) and were fed a commercially available maintenance diet ad libitum. In both periods, energy expenditure was determined from the rates of (2) H and (18) O elimination for blood H(2) O over a 12 day period, from a doubly labelled water bolus (2) H(2) O (0.7 g/kg BW) and H(2) (18) O (0.13 g/kg BW) administered intravenously. During the summer period, macronutrient digestibility was determined. Older cats had a reduction (p < 0.05) in apparent digestibility of dry matter (approximately 9%), energy (approximately 8%) and protein (6%). There was a significant effect of age and season on energy intake and energy expenditure. While lean mass was affected by age and season, there was no effect of age or season on energy expenditure when expressed as a proportion of lean mass. Possible seasonal differences in nutrient digestibility may explain these results.


Bromide-associated lower airway disease: a retrospective study of seven cats.

Seven cats were presented for mild-to-moderate cough and/or dyspnoea after starting bromide (Br) therapy for neurological diseases. The thoracic auscultation was abnormal in three cats showing increased respiratory sounds and wheezes. Haematology revealed mild eosinophilia in one cat. The thoracic radiographs showed bronchial patterns with peribronchial cuffing in most of them. Bronchoalveolar lavage performed in two cats revealed neutrophilic and eosinophilic inflammation. Histopathology conducted in one cat showed endogenous lipid pneumonia (EnLP). All cats improved with steroid therapy after Br discontinuation. Five cats were completely weaned off steroids, with no recurrence of clinical signs. In one cat, the treatment was discontinued despite persistent clinical signs. The cat presenting with EnLP developed secondary pneumothorax and did not recover. Br-associated lower airway disease can appear in cats after months of treatment and clinical improvement occurs only after discontinuing Br therapy.


Sedative, cardiovascular, haematologic and biochemical effects of four different drug combinations administered intramuscularly in cats.

OBJECTIVE: To compare effects of four drug combinations on sedation, echocardiographic, haematologic and biochemical variables and recovery in cats. STUDY DESIGN: Experimental randomized ‘blinded’ cross-over study. ANIMALS: Six healthy cats. MATERIALS AND METHODS: Treatments were administered intramuscularly: midazolam 0.4 mg kg(-1) and butorphanol 0.4 mg kg(-1) (MB); midazolam 0.4 mg kg(-1), butorphanol 0.4 mg kg(-1) and ketamine 3 mg kg(-1) (MBK); midazolam 0.4 mg kg(-1), butorphanol 0.4 mg kg(-1) and dexmedetomidine 5 mug kg(-1) (MBD); ketamine 3 mg kg(-1) and dexmedetomidine 5 mug kg(-1) (KD). Sedation was evaluated at time-points over 10 minutes post injection. Echocardiography, systolic arterial blood pressure (SAP) measurement and blood sampling were performed at baseline and from 10 minutes after treatment. Quality of recovery was scored. Data were analysed by anova for repeated measures. p < 0.05 was considered significant. RESULTS: The lowest sedation score was obtained by MB, (median 10.5 [7; 20]), highest by KD (36.5 [32; 38]). Quality of recovery was best with KD (0.5 [0; 2]), and worst with MB (7.5 [4; 11]). Relative to baseline measurements, treatments decreased SAP by 17%, 25%, 13%, 5% in MB, MBK, MBD and KD, respectively. Heart rate decreased (p < 0.05) after MBD (44%) and KD (34%). All treatments decreased stroke volume by 24%, 21%, 24%, 36%, and cardiac output by 23%, 34%, 34%, 53% in MB, MBK, MBD and KD, respectively. Packed cell volume was decreased (p < 0.05) by 20%, 31%, 29% in MBK, MBD and KD, respectively. Plasma glucose was increased after MBD (31%) and KD (52%) and lactate concentration was decreased (p < 0.05) after MBK (58%), MBD (72%) and KD (65%). CONCLUSIONS AND CLINICAL RELEVANCE: The MB combination did not produce sedation in healthy cats. Treatment MBK led to acceptable sedation and minimal cardiovascular changes. Both treatments with dexmedetomidine produced excellent sedation and recovery but induced more cardiovascular depression and haematologic changes.


Pet food recalls and pet food contaminants in small animals.

Most pet foods are safe, but incidents of chemical contamination occur and lead to illness and recalls. There were 11 major pet food recalls in the United States between 1996 and 2010 that were due to chemical contaminants or misformulations: 3
aflatoxin, 3 excess vitamin D3, 1 excess methionine, 3 inadequate thiamine, and 1 adulteration with melamine and related compounds and an additional 2 warnings concerning a Fanconilike renal syndrome in dogs after ingesting large amounts of chicken jerky treat products. This article describes clinical findings and treatment of animals exposed to the most common pet food contaminants.


**Evaluation of thrombelastographic platelet-mapping in healthy cats.**

**BACKGROUND:** Thrombelastography (TEG) permits analysis of clot formation but it is not specific for platelet activity. TEG PlateletMapping (TEG-PM) is a modification of TEG that uses adenosine diphosphate (ADP) and arachidonic acid (AA) as platelet agonists to define the contribution of platelets to clot formation. **OBJECTIVES:** The objectives of this study were to determine values for TEG-PM in healthy cats and the interassay variation of TEG-PM. **METHODS:** TEG-PM analysis was performed on blood specimens collected from 12 healthy cats and was repeated using a second blood specimen collected 2 hours later. Maximum amplitudes generated by thrombin (MA(thrombin)), fibrin (MA(fibrin)), ADP-stimulated platelet activity (MA(ADP)), and AA-stimulated platelet activity (MA(AA)) were recorded. **RESULTS:** Mean +/- SD for MA(thrombin) was 51.1 +/- 8.5 mm, for MA(fibrin) was 32.3 +/- 17.7 mm, for MA(ADP) was 32.3 +/- 15.0 mm, and for MA(AA) was 24.5 +/- 12.2 mm. Mean MA(ADP) and MA(fibrin) were not significantly different, whereas mean MA(AA) was significantly lower than mean MA(fibrin). Results from the first and second specimens were not significantly different. Correlation between the first and second specimens was moderate for MA(thrombin), MA(fibrin), and MA(ADP), but was poor for MA(AA). A high degree of variability (coefficient of variation 47.7-60.0%) was observed for MA(fibrin), MA(ADP), and MA(AA). **CONCLUSIONS:** As MA(ADP) and MA(AA) (AA) were the same as or lower than MA(fibrin), a valid baseline to determine platelet-stimulated clot formation could not be established. Considerable interassay variation and wide intervals for MA(fibrin), MA(ADP), and MA(AA) values in this study indicate that TEG-PM should be used cautiously in feline patients. Several preanalytical factors should be examined in further detail.


**Small animal cardiopulmonary resuscitation requires a continuum of care: proposal for a chain of survival for veterinary patients.**


**Clinical features, survival times and COX-1 and COX-2 expression in cats with transitional cell carcinoma of the urinary bladder treated with meloxicam.**

Records of 11 cats with transitional cell carcinoma of the urinary bladder, which had been treated with meloxicam, were reviewed for signalment, duration of clinical signs prior to diagnosis, results of diagnostic imaging, whether or not concurrent surgery was performed and survival. Immunohistochemical expression of cyclo-oxygenase-1 (COX-1) and cyclo-oxygenase-2 (COX-2) was assessed in the tumours of seven cats. Tumour location varied greatly. The cats had a mean age of 13 years. Three cats had a previous diagnosis of feline idiopathic cystitis of up to 2008 days duration. Ten of the cats showed clinical improvement (reduction of haematuria and/or dysuria), with a mean survival time (MST) of 311 days (range 10-1064); 1-year survival of 50%. All seven bladders assessed for COX staining were COX-1 positive and five were COX-2 positive. The MST for the COX-2-positive cats was 123 days, the MST for the COX-2-negative cases was 375 days.


**Osteoclast progenitors from cats with and without tooth resorption respond differently to 1,25-dihydroxyvitamin D and interleukin-6.**

Both vitamin D and inflammatory cytokines can stimulate osteoclast formation and activity. We studied the effect of 1,25-dihydroxycholecalciferol (1,25(OH)(2)D), and interleukin-6 (IL-6), on the formation and activity of feline osteoclasts, using peripheral blood mononuclear cells (PBMCs) from cats with and without tooth resorption (TR(+)) and TR(-)) as a source of osteoclast precursors. The formation of osteoclast-like cells (defined as multinucleated, tartrate-resistant acid phosphatase-positive cells) was assessed at 7 and 14 days. In the presence of M-CSF and RANKL, with and without IL-6, more osteoclasts were formed from TR(-) PBMCs than from TR(+) PBMCs on plastic. More osteoclasts were formed from TR(+) PBMCs on bone slices in the presence of M-CSF/RANKL with 1,25(OH)(2)D. This opposite effect may be due to a higher expression of the vitamin D receptor (VDR) in TR(+) osteoclasts and precursors on bone. Formation of resorption pits was analyzed and confirmed with scanning electron microscopy. In conclusion, we propose that TR(+) PBMCs when cultured on bone are sensitive to 1,25(OH)(2)D, whereas the differentiation of TR(-) PMBCs on bone seem more sensitive to IL-6, suggesting that osteoclast precursors from cats with and without tooth resorption respond differently to osteoclast stimulating factors.

Comparison of two formulations of buprenorphine in cats administered by the oral transmucosal route.

This randomised, blinded, cross-over study investigated the ease of oral transmucosal administration of two formulations of buprenorphine using glucose as a control in 12 cats. The cats received three treatments: buprenorphine multi-dose, buprenorphine and the equivalent volume of glucose 5%. Ease of treatment administration, observation of swallowing, changes in pupil size, sedation, salivation, vomiting, behaviour and food intake were assessed. The data were analysed using MLwiN and multi-level modelling. Ease of administration of buprenorphine multi-dose was statistically different from glucose (P <0.001), and the administration of all treatments became easier over the study periods. Swallowing was not statistically different between groups (P >0.05). Mydriasis was evident after the administration of both formulations of buprenorphine. Sedation, salivation, vomiting, behavioural changes orin-appetence were not observed after any treatment. Cats tolerated oral transmucosal administration of glucose better than buprenorphine multi-dose, while buprenorphine administration was tolerated as well as glucose.


Ehrlichiosis is a tick-borne disease that affects both humans and animals. The few existing reports on ehrlichiosis in Brazilian cats have been based on observation of morulae in leukocytes and, more recently, on molecular detection of Ehrlichia sp. In this study, we assessed occurrences of Ehrlichia sp. in the blood of 200 domestic cats in Sao Luis, Maranhao. Of the 200 animals tested, 11 (5.5%) were seropositive for Ehrlichia sp. and two (1%) were positive for Ehrlichia sp. in PCR. We also performed DNA sequence alignment to establish the identity of the parasite species infecting these animals, using the gene 16S rRNA. One cat presented infection with Ehrlichia sp. with 98% identity with E. canis, and another cat infected with Ehrlichia sp. showed 97% identity with E. chaffeensis. This is the first study on molecular detection of Ehrlichia sp. among domestic cats in Sao Luis, Maranhao.


BACKGROUND: Reversible antioxidant depletion is found in hyperthyroid humans, and antioxidant depletion increases the risk of methimazole toxicity in rats. OBJECTIVES: To determine whether abnormalities in concentrations of blood antioxidants or urinary isoprostanes were present in hyperthyroid cats, and were reversible after radioiodine treatment. To determine whether or not antioxidant abnormalities were associated with idiosyncratic methimazole toxicity. ANIMALS: Hyperthyroid cats presented for radioiodine treatment (n = 44) and healthy mature adult control cats (n = 37). METHODS: Prospective, controlled, observational study. Red blood cell glutathione (GSH), plasma ascorbate (AA), plasma free retinol (vitamin A), alpha-tocopherol (vitamin E), and urinary free 8-isoprostanes in hyperthyroid cats were compared to healthy cats and to hyperthyroid cats 2 months after treatment. RESULTS: Blood antioxidants were not significantly different in hyperthyroid cats (mean GSH 1.6 +/- 0.3 mM; AA 12.8 +/- 4.9 mM, and vitamin E, 25 +/- 14 mug/mL) compared to controls (GSH 1.4 +/- 0.4 mM; AA 15.0 +/- 6.6 mM, and vitamin E, 25 +/- 17 mug/mL). Urinary isoprostanes were increased in hyperthyroid cats (292 +/- 211 pg/mg creatine) compared to controls (169 +/- 82 pg/mg; P =.006), particularly in hyperthyroid cats with a USG < 1.035. Plasma free vitamin A was higher in hyperthyroid cats (0.54 +/- 0.28 mug/mL versus 0.38 +/- 0.21 in controls; P =.007). Both abnormalities normalized after radioiodine treatment. No association was found between oxidative status and prior idiosyncratic methimazole toxicity. CONCLUSION AND CLINICAL IMPORTANCE: Increased urinary isoprostane could reflect reversible renal oxidative stress induced by hyperthyroidism, and this requires additional evaluation.


The current study evaluated the diagnostic value of electroencephalographic recordings (EEG) in cats with epilepsy under special consideration of photic stimulation and hyperventilation. EEGs in six healthy cats were recorded under light (mean dose of 0.23 mg/kg/min) and deep (mean dose of 0.7 mg/kg/min) propofol anaesthesia, whereas EEGs in 13 diseased cats were recorded under a propofol anaesthesia which was kept as light as possible (mean dose of 0.39 mg/kg/min). Paroxysmal discharges were detected in six of 13 cats suffering from seizures (two cats with idiopathic epilepsy and four cats with symptomatic epilepsy). Activation techniques did not enhance the diagnostic value of the EEGs. Photic driving was detected in one of six healthy cats under light, in five of six healthy cats under deep propofol anaesthesia and in 11 of 13 cats with seizures. Systematic use of activation techniques does not seem to increase the diagnostic yield of the recorded EEGs and should not be used in a clinical setting until future studies indicate value. Further investigations into the origin of photic driving under propofol anaesthesia are needed and could lead to the development of a reliable animal model to research into drug effects on the EEG.

Relaxin acts as a pregnancy-specific signal in feline species, but specific information about protein structure and binding is essential for the improvement of pregnancy diagnosis in endangered feline species, like the Iberian lynx. To generate a felid-specific relaxin antibody, the DNA and protein sequences of lynx and cat were determined and peptides were chosen for antibody generation. In addition, relaxin and relaxin receptor (RXFP1) mRNA expressions were measured in uterus and ovaries of pregnant domestic cats and lynx placentae. Using real-time PCR and immunohistochemistry, it was established that feline placenta is the main source of relaxin during pregnancy. In other tested tissues, relaxin mRNA expression was weak. The RXFP1 mRNA expression was found mainly in cat uterine tissue and feline placentae. It was assumed that these tissues were main targets for relaxin. In the ovary, relaxin immunostaining was associated with blood vessels, signifying its role in vascularization.


Successful treatment of permethrin toxicosis in two cats with an intravenous lipid administration.

The present work describes successful treatment of permethrin toxicosis in two cats with a novel therapy of intravenous lipid administration. Two cats presented in lateral recumbency and with generalized tremor after they had been incidentally treated with permethrin for flea control by their owners. Initial therapy consisted of diazepam, propofol, bathing, and intravenous fluids. After an initial bolus of 2mg/kg BW pentobarbital a pentobarbital continuous rate infusion (CRI) was started. Both cats received an emulsion of 20% soybean oil and 80% olive oil, commonly used as fat component of total parenteral nutrition in humans, later in the course of therapy. A bolus of 2ml/kg BW of the emulsion followed by a CRI of 4ml/kg BW/h for 4 hours was administered via a jugular catheter as reported previously. One cat received two cycles of therapy with intravenous lipid whereas the other cat needed just one application. Both cats recovered completely without requiring any further treatment. In conclusion, administration of intravenous lipids for permethrin toxicosis in cats is a novel treatment approach which seems to be highly effective in shortening the recovery time for permethrin toxicosis and possibly other fat-soluble toxins.


New program helps practices become cat-friendly: Program offers educational resources, certification at silver or gold level.

Guidelines promote preventive care.


**Congenital supravalvular mitral stenosis in 14 cats.**

**OBJECTIVES:** To describe the clinical features of congenital supravalvular mitral stenosis (SVMS) in cats.

**BACKGROUND:** Supravalvular mitral stenosis is an uncommon congenital cardiac defect that has not been previously reported in a series of cats. ANIMALS: 14 cats with SVMS. METHODS: Medical records, relevant diagnostic studies and preserved pathology specimens were reviewed. RESULTS: Cats were presented over a wide age range (5 months-10 years; median 3 years); males (n = 9) and the Siamese breed were over-represented. Presenting complaints included respiratory distress (n = 6), hindlimb paralysis due to aortic thromboembolism (n = 5) and asymptomatic heart murmur (n = 3). Echocardiographic examination often identified pulmonary hypertension (PHT) (n = 7) and concurrent cardiac abnormalities (n = 7), especially partial atrioventricular septal defect (PAVSD) (n = 4). Status 12 months following diagnosis was known for 9 cats; 8 of these had died or were euthanized. CONCLUSIONS: Cats with SVMS are usually presented as young adults for respiratory signs attributable to congestive heart failure, aortic thromboembolism or incidental murmur identification. Congestive heart failure, PHT and concurrent congenital cardiac abnormalities (specifically PAVSD) are common. Long-term prognosis for symptomatic cats is poor.


**Clinicopathological variables predicting progression of azotemia in cats with chronic kidney disease.**

**BACKGROUND:** Chronic kidney disease (CKD) is common in geriatric cats, but often appears to be stable for long periods of time. **OBJECTIVES:** To describe CKD progression and identify risk factors for progression in newly diagnosed azotemic cats. ANIMALS: A total of 213 cats with CKD (plasma creatinine concentration > 2 mg/dL, urine specific gravity < 1.035) were followed up until progression occurred or for at least 1 year; 132, 73, and 8 cats were in International Renal Interest Society (IRIS) stages 2, 3, and 4, respectively. METHODS: Progression was defined as a 25% increase in plasma creatinine concentration. Logistic regression was used to assess variables at diagnosis that were associated with progression within 1 year. Changes in IRIS stage during follow-up also were described. Cases that remained in stages 2 or 3, but did not have renal function assessed in the last 60 days of life, were excluded from analysis of the proportion reaching stage 4. RESULTS: Of the cats, 47% (101) progressed within 1 year of diagnosis. High plasma phosphate concentration and high urine protein-to-creatinine ratio (UPC) predicted progression in all cats. Low PCV and high UPC independently predicted progression in stage 2 cats, whereas higher plasma phosphate concentration predicted progression in stage 3 cats; 19% (18/94) of cats diagnosed in stage 2; and 63% (34/54) of cats diagnosed in stage 3 reached stage 4 before they died. CONCLUSIONS: Proteinuria, anemia, and hyperphosphatemia may reflect more progressive kidney disease. Alternatively, they may be markers for mechanisms of progression such as tubular protein overload, hypoxia, and nephrocalcinosis.


**The use of darbepoetin to stimulate erythropoiesis in anemia of chronic kidney disease in cats: 25 cases.**

**BACKGROUND:** Anemia is present in 30-65% in cats with chronic kidney disease (CKD) and few long-term treatment options exist. Darbepoetin is effective in treating anemia of kidney disease in humans and may be used in cats.

**HYPOTHESIS/OBJECTIVE:** To evaluate the use of darbepoetin, a recombinant analog of human erythropoietin, to stimulate erythropoiesis, and to effectively treat anemia of kidney disease in cats. ANIMALS: Twenty-five of 66 cats that received >/= 2 doses of darbepoetin at the Animal Medical Center between January 2005 and December 2009 were included in this study. METHODS: Cats were included in the study if they received darbepoetin and follow-up data were available for at least 56 days and had CKD as a primary clinical diagnosis. Cats were excluded if they were treated with darbepoetin but did not have kidney disease. Response to treatment was defined as reaching or exceeding a target packed red blood cell volume or hematocrit of 25%. RESULTS: Fourteen of 25 cats responded. Thirteen of those 14 cats received a dosage of 1 mcg/kg/wk or higher. Presumptive adverse effects included vomiting, hypertension, seizures, and fever. CONCLUSIONS AND CLINICAL RELEVANCE: Darbepoetin is effective for treatment of anemia of kidney disease in cats. Pure red cell aplasia appears to be less common with darbepoetin than with epoetin usage.


**Molecular and functional interactions of cat APOBEC3 and feline foamy and immunodeficiency virus proteins: different ways to counteract host-encoded restriction.**

Defined host-encoded feline APOBEC3 (feA3) cytidine deaminases efficiently restrict the replication and spread of exogenous retroviruses like Feline Immunodeficiency Virus (FIV) and Feline Foamy Virus (FFV) which developed different feA3 counter-acting strategies. Here we characterize the molecular interaction of FFV proteins with the diverse feA3 proteins. The FFV accessory protein Bet is the virus-encoded defense factor which is shown here to bind all feA3 proteins independent of whether they restrict FFV, a feature shared with FIV Vif that induces degradation of all feA3s including those that do not inactivate FIV. In contrast, only some feA3 proteins bind to FFV Gag, a pattern that in part
Post-trauma inguinal seroma formation in the cat.
Seven cats presented with large caudoventral abdominal or inguinal swellings following road traffic accidents. No case had evidence of disruption to the body wall or inguinal ring and the inguinal swellings may have been the result of either shear or compressive injury to soft tissues of the inguinal or disruption of the regional lymphatics. Six cases resolved completely following strict rest or simple Penrose drain placement with no recurrence reported. Recurrence of seroma was seen in one case but which then fully resolved following omentalisation of the inguinum.


Disorders of sexual development in dogs and cats.
Determination of a mammal’s sex begins at conception with the establishment of genotype and continues from there as the expression of specific genes directs the bipotential gonad to develop. The gonad further directs the sexual differentiation of the individual. Deviations from either of these pathways at any stage results in disorders of sexual development. Definitive diagnosis minimally requires a karyotype, histopathologic evaluation of the gonads, and gross description of the genital anatomy, with more complete diagnostic answers achieved through other diagnostic tests. This article covers normal and abnormal development of the reproductive organs with emphasis on diagnosis and treatment.

Prevalence of feline leukemia virus infection in domestic cats in Rio de Janeiro.
Peripheral blood smears of 1094 domestic cats were collected and tested by indirect immunofluorescence antibody assay for p27 antigen in cells to study the prevalence and risk factors for feline leukemia virus (FeLV) in the state of Rio de Janeiro. Sex, age, breed, outdoor access, neutering status, type of habitation (household, shelter, veterinary clinics and other places), number of household cats and clinical signs were registered on a form. Among the tested samples, 11.52% were positive. Risk factors for FeLV infection included outdoor access, age range between 1 and 5 years old, and cohabitation with numerous cats.

Slowly progressive lymphohistiocytic meningoencephalomyelitis in 21 adult cats presenting with peculiar neurological signs.
Twenty-one cats presented with a history of slowly progressive neurological signs characterised by a stiff extended tail, behavioural changes, and spastic and ataxic gait. All cats had outdoor access and lived in the same geographical rural area in north-east Scotland. Histological findings were consistent with lymphohistiocytic meningoencephalomyelitis. Immunohistochemistry ruled out 15 pathogens and showed a significant expression of the interferon-inducible Mx protein, suggesting an as yet unidentified infective or environmental immunogenic trigger as the possible causative agent. The late age at onset (mean 9 years), the very slow progression of clinical signs (mean 11 months) and the peculiar clinical presentation (particularly the posture of the tail) have not been reported previously in cats with lymphohistiocytic meningoencephalomyelitis.

Dean, R. S., D. U. Pfeiffer, and V. J. Adams (2012) Vet J
Feline vaccination practices and protocols used by veterinarians in the United Kingdom.
Vaccination is an important aspect of disease control in the feline population, as it prevents disease or reduces its severity in individual cats. However, the types of antigens that should be administered to cats, the frequency of administration of certain antigens and the anatomical location at which vaccines should be administered are controversial. Various groups have developed guidelines to help veterinarians decide vaccine protocols for cats in their care. The aim of this study was to survey veterinarians in the United Kingdom about the vaccination protocols used in 2007-2008. A questionnaire about aspects of feline vaccination was distributed to a 431 veterinary practices taking part in a case-control study of feline injection site sarcomas. A response rate of 72% was achieved. The majority of veterinarians who responded administered the commonly used antigens annually (84-96% of practices). Most of the veterinarians administered most vaccines in the interscapular region (90-96% of practices depending on the antigen). The vaccination practices of the veterinarians were not consistent with the published vaccination guidelines at that time.


Viral reproductive pathogens of dogs and cats.
This article reviews the current literature on the viral agents that cause reproductive failures in domestic carnivores (dogs and cats). A meaningful update is provided on the etiologic, clinical, pathologic, diagnostic, and prophylactic aspects of the viral infections impacting canine and feline reproduction as a consequence of either direct virus replication or severe debilitation of pregnant animals.


Common rodenticide toxicoses in small animals.
This article focuses on the 3 most commonly used rodenticide types: anticoagulants, bromethalin, and cholecalciferol. It is important to verify the active ingredient in any rodenticide exposure. Many animal owners may use the term “D-con” to refer to any rodenticide regardless of the actual brand name or type of rodenticide. The EPA released their final ruling on rodenticide risk mitigation measures in 2008 and all the products on the market had to be compliant by June 2011, changing to consumer products containing either first-generation anticoagulants or nonanticoagulants including bromethalin and cholecalciferol. These regulations are likely to cause an increase in the number of bromethalin and cholecalciferol cases.


Molecular Detection of Capillaria aerophila, an Agent of Canine and Feline Pulmonary Capillariosis.
Capillaria aerophila, a trichuroid nematode causing pulmonary infections in wild and domestic carnivores, is occasionally and potentially poorly recognized in infections of humans due to clinicopathological mimicry and a lack of accurate, robust laboratory diagnostics. The present work evaluated the efficiency of a DNA-based assay amplifying a partial cytochrome c oxidase subunit 1 (cox1) gene of C. aerophila in the diagnosis of lung capillariosis. Fecal samples from 34 dogs and 10 cats positive at parasitological examination for C. aerophila and other endoparasites (i.e., other lungworms, whipworms, roundworms, hookworms, tapeworms, and/or coccidia) and from 44 animals negative for C. aerophila but positive for other endoparasites were molecularly examined. Of the 44 samples positive for C. aerophila at copromicroscopy, 43 scored positive (i.e., 33/34 dogs and 10/10 cats) in seminested PCR, resulting in a sensitivity of 97 to 100%. Samples that were copromicroscopy negative for C. aerophila although positive for other endoparasites never produced a PCR product or nonspecific amplicons. The specific PCR amplification of C. aerophila (i.e., specificity of 100%) was confirmed by a nucleotide sequence analysis of the cox1 amplicons. The potential implications of the molecular diagnosis of lung capillariosis are discussed.


Occurrence and characteristics of extended-spectrum-beta-lactamase- and AmpC-producing clinical isolates derived from companion animals and horses.
OBJECTIVES: To investigate the occurrence and characteristics of extended-spectrum beta-lactamase (ESBL)- and AmpC-producing Enterobacteriaceae isolates in clinical samples of companion animals and horses and compare the results with ESBL/AmpC-producing isolates described in humans. METHODS: Between October 2007 and August 2009, 2700 Enterobacteriaceae derived from clinical infections in companion animals and horses were collected. Isolates displaying inhibition zones of <=25 mm for cefotaxime and/or ceftazidime by disc diffusion were included. ESBL/AmpC production was confirmed by combination disc tests. The presence of resistance genes was identified by microarray, PCR and sequencing. Escherichia coli genotypes by multilocus sequence typing and antimicrobial susceptibility by broth microdilution. RESULTS: Sixty-five isolates from dogs (n = 38), cats (n = 14), horses (n = 12) and a turtle were included. Six Enterobacteriaceae species were observed, mostly derived from urinary tract infections (n = 32). All except 10 isolates tested resistant to cefotaxime and ceftazidime by broth microdilution using clinical breakpoints. ESBL/AmpC genes observed were bla(CTX-M-1,-2,-9,-14,-15) bla(TEM-52), bla(CMY-2) and bla(CMY-39). bla(CTX-M-1) was
In vitro glucuronidation of the angiotensin II receptor antagonist telmisartan in the cat: a comparison with other species.


In vitro glucuronidation of the angiotensin II receptor antagonist telmisartan in the cat: a comparison with other species.


Glucuronidation of telmisartan comprises nearly its entire metabolic clearance in several mammalian species including human. However, data were lacking for the cat, a species noted for its inability to glucuronidate some drugs. Therefore, the glucuronidation of telmisartan was investigated using feline liver microsomes and compared to liver microsomes of rats, dogs, and human, intestinal human microsomes and cell lines expressing human UDG-glucuronosyltransferases (UGT). Incubation of telmisartan with cat liver microsomes readily yielded telmisartan glucuronide, and pooled (N = 3 for each gender) cat liver microsomes even showed the highest glucuronidation rate (cat > dog >> human > rat). Michaelis Menten
kinetics were observed with K(m) of 7.5 and 10 mum and V(max) of 3.9 and 3.3 nmol/min/mg for male and female cats, respectively. Confirming the in vitro data, telmisartan glucuronide was detected as the major circulating metabolite in cat plasma. To elucidate which UGT enzymes are involved, telmisartan was incubated with cell lines expressing human UGTs. The highest glucuronidation activity was observed for UGT1A8, UGT1A7, and UGT1A9. In conclusion, telmisartan was effectively glucuronidated in cats. Defects of the UGT1A6 gene in cats do not affect the glucuronidation of telmisartan as it is not a substrate of human UGT1A6.


Survey of the feline leukemia virus infection status of cats in Southern Germany.

Most studies that investigate the prevalence of infections with feline leukemia virus (FeLV) are based on the detection of p27 antigen in blood, but they do not detect proviral DNA to identify the prevalence of regressive FeLV infections. The aim of the present study was to assess the prevalence and status of FeLV infection in cats in Southern Germany. P27 antigen enzyme-linked immunosorbent assay (ELISA), anti-p45 antibody ELISA, DNA polymerase chain reaction (PCR) of blood and RNA PCR of saliva were performed. Nine out of 495 cats were progressively (persistently) infected (1.8%) and six were progressively (latently) infected (1.2%). Cats with regressive infections are defined as cats that have been able to overcome antigenemia but provirus can be detected by PCR. Twenty-two unvaccinated cats likely had abortive infections (regressor cats), testing FeLV antigen- and provirus-negative but anti-p45 antibody-positive. Most of the FeLV-vaccinated cats did not have anti-FeLV antibodies. Both progressive, as well as regressive infections seem to be rare in Germany today.


Effect of dexmedetomidine on the minimum alveolar concentration of isoflurane in cats.

This study reports the effects of dexmedetomidine on the minimum alveolar concentration of isoflurane (MAC(iso)) in cats. Six healthy adult female cats were used. MAC(iso) and dexmedetomidine pharmacokinetics had previously been determined in each individual. Cats were anesthetized with isoflurane in oxygen. Dexmedetomidine was administered intravenously using target-controlled infusions to maintain plasma concentrations of 0.16, 0.31, 0.63, 1.25, 2.5, 5, 10, and 20 ng/mL. MAC(iso) was determined in triplicate at each target plasma dexmedetomidine concentration. Blood samples were collected and analyzed for dexmedetomidine concentration. The following model was fitted to the concentration-effect data: [Formula in text] where MAC(iso.c) is MAC(iso) at plasma dexmedetomidine concentration C, MAC(iso.0) is MAC(iso) in the absence of dexmedetomidine, I(max) is the maximum possible reduction in MAC(iso), and IC(50) is the plasma dexmedetomidine concentration producing 50% of I(max). Mean +/- SE MAC(iso.0), determined in a previous study conducted under conditions identical to those in this study, was 2.07 +/- 0.04. Weighted mean +/- SE I(max), and IC(50) estimated by the model were 1.76 +/- 0.07%, and 1.05 +/- 0.08 ng/mL, respectively. Dexmedetomidine decreased MAC(iso) in a concentration-dependent manner. The lowest MAC(iso) predicted by the model was 0.38 +/- 0.08%, illustrating that dexmedetomidine alone is not expected to result in immobility in response to noxious stimulation in cats at any plasma concentration.


Dose determination of fondaparinux in healthy cats.

OBJECTIVE: To establish practical doses and administration frequencies of fondaparinux for cats that would approximate human therapeutic peak and trough plasma anti-factor Xa activities for thromboprophylaxis (TP) and thrombosis treatment (TT) protocols. ANIMALS: 6 healthy adult purpose-bred cats. PROCEDURES: Dosage protocols for TP and TT were selected on the basis of a single compartment pharmacokinetic model incorporating data from humans but modified to account for the higher body weight-normalized cardiac output of cats. Fondaparinux was administered at 0.06 mg/kg, SC, every 12 hours (TP) for 7 days in one session, and 0.20 mg/kg, SC, every 12 hours (TT) for 7 days in another, with a minimum of 1 week separating the sessions. Plasma anti-factor Xa activity was measured before fondaparinux administration (day 1) and at 2 (peak) and 12 (trough) hours after drug administration on days 1 and 7. Platelet aggregation and thrombelastographic (TEG) parameters were also measured 2 hours after drug administration on day 7. RESULTS: Peak plasma anti-factor Xa activities on day 7 for TP (median, 0.59 mg/L; range, 0.36 to 0.77 mg/L) and TT (median, 1.66 mg/L; range, 1.52 to 2.00 mg/L) protocols were within therapeutic ranges for humans. However, only the TP protocol achieved trough anti-factor Xa activity considered therapeutic in humans (median, 0.19 mg/L; range, 0.00 to 0.37 mg/L) on day 7. There were significant changes in the TEG parameters at peak for the TT protocol, suggesting a hypocoagulable state. No significant changes in platelet aggregation were evident for either protocol. CONCLUSIONS AND CLINICAL RELEVANCE: A fondaparinux dosage of 0.06 or 0.20 mg/kg, SC, every 12 hours, was sufficient to achieve a peak plasma anti-factor Xa activity in cats that has been deemed therapeutic in humans. This study provided preliminary data necessary to perform fondaparinux dose-determination and clinical efficacy studies.


The contribution of cat owners’ attitudes and behaviours to the free-roaming cat overpopulation in Tel Aviv, Israel.
The attitudes and behaviours of cat owners in regard to treatment of cats may have a cumulative effect on the food availability, reproduction, density and welfare of the free-roaming cat population and thus also on the extent of cat overpopulation. Understanding this is thus a vital step in the a priori planning of cat management programs on any scale, as well as in developing public education programs on this issue. Although recent years have seen an accumulation of knowledge in regard to cat owners’ attitudes and behaviours, the findings vary among countries and locations and in Israel this has never been investigated systematically. Using a questionnaire provided to cat owners in veterinary clinics, this study aimed at identifying those attitudes and behaviours that may be contributing to cat overpopulation in Tel Aviv, Israel, and at exploring the socio-economic factors that influence this problem. The findings show that the influential factors can be predicted from the cat owners’ socio-economic status, mainly education and income, as well as gender and age. A consistency in those cat owner behaviours that contribute to cat overpopulation was also uncovered, revealing a sub-population of individuals who persist in the undesirable behaviours. Finally, a strong relationship between attitude and consequent behaviour was demonstrated, indicating the importance of education and targeted publicity as a means to influence attitudes and thereby change behaviours in this respect. We propose several measures by which to reduce the current extent of cat owners’ contribution to the cat overpopulation: discouraging unwanted owner behaviours such as abandonment of their cats and allowing them to breed; promoting awareness of the neutering option among cat caretakers; and increasing pre-adoption neutering rates in shelters. Regional and national laws promoting responsible pet ownership need to be enacted. By improving the current level of knowledge and awareness among cat owners regarding cat overpopulation issues, and encouraging a more responsible attitude, cat owners’ bond with their cats could be strengthened, as well as their bond with and contribution to their environment.

Treatment-related toxicities in tumor-bearing cats treated with temozolomide alone or in combination with doxorubicin: a pilot assessment.
A retrospective study assessing treatment-related toxicities in tumor-bearing cats treated with temozolomide (TMZ) alone or in combination with doxorubicin was conducted. TMZ was administered orally once a day for 5 days every 3 weeks at a dose of 20 mg/cat. Tumor response was evaluated with standard World Health Organization criteria and toxicity was monitored using veterinary co-operative oncology group-common terminology criteria for adverse events (VCOG-CTCAE) criteria. Ten tumor-bearing cats with various types of malignancies were treated with TMZ-based chemotherapy. Eight cats were evaluable for response. Two cats achieved a complete response, one achieved stable disease and five achieved a partial response. Four grade III and one grade IV hematological toxicities, and one grade IV gastrointestinal toxicity were observed. Four cats were euthanased as a result of apparent toxicity. One cat was euthanased as a result of severe and prolonged myelosuppression with fever. Three were euthanised for grade III pleural and pericardial effusions. Effusion was seen in cats treated with higher cumulative dose of TMZ (P = 0.0046). Planned additional case accrual was discontinued because of unacceptable levels of toxicity despite evidence of efficacy in some of the cats. Additional investigation is needed to elucidate this unexpected apparent cumulative toxicity.

Toxicology of explosives and fireworks in small animals.
Intoxication with explosives or fireworks in dogs or cats is not common, but serious toxicosis can result from exposure to different types of explosives depending on the chemical class of explosive involved. This article will discuss the different types of materials/chemicals, clinical signs of toxicosis, and their treatment. Despite the complexities of explosives and plethora of different devices currently in use worldwide, the toxic potential is more easily explained by looking at the relatively short list of chemical classes used to produce these materials. This article combines structurally similar explosives into different groups and focuses on the toxicity of the most commonly available explosives.

Taurine deficiency damages retinal neurones: cone photoreceptors and retinal ganglion cells.
In 1970s, taurine deficiency was reported to induce photoreceptor degeneration in cats and rats. Recently, we found that taurine deficiency contributes to the retinal toxicity of vigabatrin, an antiepileptic drug. However, in this toxicity, retinal ganglion cells were degenerating in parallel to cone photoreceptors. The aim of this study was to re-assess a classic mouse model of taurine deficiency following a treatment with guanidoethane sulfonate (GES), a taurine transporter inhibitor to determine whether retinal ganglion cells are also affected. GES treatment induced a significant reduction in the taurine plasma levels and a lower weight increase. At the functional level, photopic electroretinograms were reduced indicating a dysfunction in the cone pathway. A change in the autofluorescence appearance of the eye fundus was explained on histological sections by an increased autofluorescence of the retinal pigment epithelium. Although the general morphology of the retina was not affected, cell damages were indicated by the general increase in glial fibrillary acidic protein expression. When cell quantification was achieved on retinal sections, the number of outer/inner segments of cone photoreceptors was reduced (20 %) as the number of retinal ganglion cells (19 %). An abnormal synaptic plasticity of rod
bipolar cell dendrites was also observed in GES-treated mice. These results indicate that taurine deficiency can not only lead to photoreceptor degeneration but also to retinal ganglion cell loss. Cone photoreceptors and retinal ganglion cells appear as the most sensitive cells to taurine deficiency. These results may explain the recent therapeutic interest of taurine in retinal degenerative pathologies.


**Transcoelomic spread and metastasis of a squamous cell carcinoma of presumed pancreatic duct origin in a cat.**

CASE HISTORY: A 13-year-old female spayed domestic shorthaired cat was examined because of lethargy, inappetance and weight loss. CLINICAL FINDINGS: No clinically significant haematological or biochemical abnormalities were detected, but an abdominal mass was palpated. Abdominal examination using ultrasonography revealed soft tissue masses in the cranial abdomen, involving the spleen, as well as the liver and abdominal wall; the pancreas was not identified. Despite supportive therapy the condition of the cat rapidly deteriorated and euthanasia was performed. PATHOLOGICAL FINDINGS: Cytological preparations from the cranial abdominal mass revealed a population of pleomorphic epithelial cells consistent with a squamous cell carcinoma. On post-mortem examination, firm creamy white to yellow nodular masses were present in the region of the pancreatic left limb, spleen, liver, diaphragm, right abdominal wall and in the left lung. Sections of all masses were examined histopathologically and demonstrated infiltration by neoplastic epithelial cells indicative of squamous cell carcinoma (SCC). DIAGNOSIS: Squamous cell carcinoma of presumed pancreatic duct origin. CLINICAL RELEVANCE: There are few reports of haematogenous or lymphatic metastasis of SCC in cats, and none reporting transcoelomic spread. This report describes the clinical and pathological features of a case of presumed primary pancreatic ductal SCC, and should alert veterinarians to the potential for metastasis and carcinomatosis.


**Radiological investigation of an over 2000-year-old Egyptian mummy of a cat.**

A radiographical study of a cat mummy from the Egyptian collection of the National Archeological Museum in Parma, Italy was carried out in order to evaluate the content and to describe how cats were wrapped and mummified. The mummy contained the complete skeleton of a 4-5-month-old cat. Radiology revealed the position of the cat’s body; it was wrapped to occupy the smallest space possible. In order to better position the cat, the ribs of the thorax were compressed cranio-caudally and the fore limbs were then positioned very close to the thorax. The hind limbs were flexed close to the lumbar spine and the tibio-tarsal joints were subluxated to allow the repositioning of the tarsal, metatarsal and phalanx bones cranio-caudally near the tibiae. A coccygeal vertebra was fractured in order to reposition the tail as close as possible to the body. Atlanto-occipital subluxation and a fracture/hole was present in the occipital region of the skull: whether this was made for draining skull contents as a mummification process and/or to euthanase the cat remains open for discussion.


**Feline lung-digit syndrome: unusual metastatic patterns of primary lung tumours in cats.**

PRACTICAL RELEVANCE: Feline ‘lung-digit syndrome’ describes an unusual pattern of metastasis that is seen with various types of primary lung tumours, particularly bronchial and bronchioalveolar adenocarcinoma. Tumour metastases are found at atypical sites, notably the distal phalanges of the limbs; the weightbearing digits are most frequently affected, and multiple-digit and multiple-limb involvement is common. Often primary lung tumours in cats are not detected because of clinical signs referable to the primary tumour; rather, many cases present with signs referable to distant metastases. Other sites of metastases from feline primary lung tumours include the skin, eyes, skeletal muscle and bone, as well as multiple thoracic and abdominal organs. These lesions are thought to arise from direct arterial embolisation from the tumour. Indeed tumour embolisation to the aortic trifurcation is possible. PATIENT GROUP: Primary lung neoplasms are uncommon in the cat. Older animals are most affected (mean age at presentation 12 years, range 2-20 years). There is no apparent sex or breed predilection. CLINICAL CHALLENGES: Feline lung-digit syndrome presents a diagnostic challenge. Typically there is swelling and reddening of the digit, purulent discharge from the nail bed, and dysplasia or fixed exsheathment of the associated nail. While these signs might be suggestive of infection, this could be secondary to a digital metastatic lesion, particularly in a middle-aged or elderly cat. Radiographic evidence of extensive bony lysis of the distal phalanx, which can be trans-articular to the second phalanx, raises the index of clinical suspicion for metastasis of a primary pulmonary tumour. Thoracic radiography is warranted prior to any surgery or digital amputation as the prognosis is generally grave for cats with this syndrome, with a mean surgical time of only 58 days after presentation. EVIDENCE BASE: This article reviews the previous literature and case reports of feline lung-digit syndrome and feline primary pulmonary neoplasia in general, discussing the course of this disease and the varying clinical presentations associated with different sites of metastasis.


**Impact of fine needle aspiration (FNA) and of the number of punctures on the feline testis: clinical, gross anatomy and histological assessment.**

The safety of testicular fine needle aspiration (FNA) has been proven in dogs but has not been fully established in men, while studies in rats have given contradictory results. Furthermore, the extent of damage inflicted by multiple punctures is...
unknown. The aim of this study was to determine the impact of FNA and of the number of punctures on the feline testis with clinical, gross anatomy and histological examinations. Twenty-seven sexually mature healthy laboratory Domestic Shorthair cats were randomly assigned to two groups: 5 cats in which no FNA was performed (control group), and 22 cats which had their left and right testis punctured with a 26 ga needle towards 3 and 8 directions, respectively (experimental group). Two cats at a time were orchietomized 5 or 30 min, 1, 2, 4, 7 or 14 days or 1, 2, 3 or 4 mo post-aspiration. The cats of the control group were also orchietomized. During the first week post-aspiration clinical examination revealed vaginal cavity hematoma (8/44 testes), while the histological findings were focal hemorrhagic areas (20/24 testes), erythrocytes inside the seminiferous tubules’ lumen (9/24 testes), and germinal cell degeneration in <1.94% of the seminiferous tubules (15/24 testes). After the first week the histological findings were germinal cell degeneration in <2.14% of the seminiferous tubules (19/20 testes) and enlargement of the lumen of <5.16% of the seminiferous tubules (7/20 testes). The germinal epithelium and interstitium had an overall normal appearance. No significant differences were observed between the left and right testis. The results of the study indicate that testicular FNA should be considered a safe procedure in the cat when up to 8 punctures are performed.


**Pyometra in dogs and cats following ovarioectomy.**


**Discovery of drugs that possess activity against feline leukemia virus.**

Feline leukemia virus (FeLV) is a gammaretrovirus that is a significant cause of neoplastic-related disorders affecting cats worldwide. Treatment options for FeLV are limited, associated with serious side effects, and can be cost-prohibitive. The development of drugs used to treat a related retrovirus, human immunodeficiency virus type 1 (HIV-1), has been rapid, leading to the approval of five drug classes. Although structural differences affect the susceptibility of gammaretroviruses to anti-HIV drugs, the similarities in mechanism of replication suggest that some anti-HIV-1 drugs may also inhibit FeLV.

This study demonstrates the anti-FeLV activity of four drugs approved by the US FDA (Food and Drug Administration) at non-toxic concentrations. Of these, tenofovir and raltegravir are anti-HIV-1 drugs, while decitabine and gemcitabine are approved to treat myelodysplastic syndromes and pancreatic cancer, respectively, but also have anti-HIV-1 activity in cell culture. Our results indicate that these drugs may be useful for FeLV treatment and should be investigated for mechanism of action and suitability for veterinary use.


**Evaluation of Osteoarthritis in Cats: Novel Information from a Pilot Study.**

OBJECTIVE: To describe structural changes associated with osteoarthritis (OA) in cats and to quantify OA-associated disability using functional evaluations. STUDY DESIGN: Cross-sectional pilot study with longitudinal data. ANIMALS: Normal cats (n = 2) and coxofemoral joint OA cats (n = 4) were evaluated by physical examination, radiography, and magnetic resonance imaging (MRI). METHODS: Structural changes related to OA were scored using computed radiographs (CR) and MRI. Functional evaluation consisted of podobarometric gait analyses performed using a pressure-sensitive mattress and motor activity assessments using collar-attached, accelerometer-based activity sensors. RESULTS: Structural scores for the coxofemoral joint OA-related lesions were lower in normal cats than OA cats for MRI (P = .07). Use of MRI allowed for whole-organ assessment of the coxofemoral joint. Pelvic limb peak vertical ground reaction force (PVF) was higher in normal cats than OA cats (P = .10). During the night, motor activity was greater in normal cats than OA cats (P = .04). PVF was positively correlated with mean motor activity (Spearman coefficient [Rho] = 0.83, P = .04) and negatively correlated with age and MRI structural score (Rho = -0.93 and -0.79, P < .01 and .06, respectively). CONCLUSIONS: This study provides the first description of OA-related lesions in cats using MRI. Gait analysis and accelerometry should be considered as objective tools to characterize OA-associated disability, although these assessments were weakly correlated with structural changes.


**Use of intravenous lipid emulsions for treating certain poisoning cases in small animals.**

Intravenous lipid emulsion (ILE) infusions have become an emerging treatment modality in managing intoxications of veterinary patients. The advantages of ILE include an apparent wide margin of safety, relatively low cost, long shelf-life, and ease of administration. Based on limited case and anecdotal reports, ILEs have shown promise in the management of toxicoses from a variety of lipophilic agents, including drugs and pesticides. More studies are needed to determine optimum dosing regimens and identify potential adverse effects from the antidotal use of ILE in veterinary medicine.


**Functionality of implanted microchips following magnetic resonance imaging.**

OBJECTIVE: To determine the functionality of implanted microchips following magnetic resonance imaging (MRI).

DESIGN: Prospective clinical trial. ANIMALS: 53 client-owned patients implanted with a microchip undergoing MRI of
various areas of the body for a variety of medical conditions. PROCEDURES: General anesthesia was induced, and each patient’s microchip was scanned with a universal microchip scanner; the chip number was recorded. Patients were transported to the MRI suite, and MRI was completed. Patients were moved out of the magnetic environment, and microchips were scanned again. Patient information and chip number were recorded. Chip numbers before and after MRI were compared. RESULTS: For all 53 microchips scanned from 53 patients, the same number was read accurately following MRI of a variety of sites. CONCLUSIONS AND CLINICAL RELEVANCE: These data indicated that MRI did not interfere with the functionality of these microchips. This information is valuable for practitioners recommending MRI for their patients and for clients who have invested in implanting a microchip in their pets.


Effect of pimobendan on the clinical outcome and survival of cats with non-taurine responsive dilated cardiomyopathy.

This retrospective study was designed to assess the effect of pimobendan on the median survival time (MST) of cats with non-taurine responsive dilated cardiomyopathy (DCM). Thirty-two client-owned cats with a left ventricular internal dimension at end systole (LVIDs) >14 mm, a fractional shortening (FS) <28% and a lack of response to taurine therapy were included over a 9-year period (2001-2010). These cats were divided into pimobendan (n=16) and non-pimobendan (n=16) treatment groups. All cats received standard treatment with frusemide, taurine and benazepril or enalapril. Nine cats in the non-pimobendan group also received digoxin. The MST of the pimobendan group (49 days; range 1 to >502 days) was four times that of the non-pimobendan group (12 days; 1 to 244 days). The difference in survival between the two groups was statistically significant (P = 0.048). Hypothermia and FS <20% were associated with a poor prognosis. No adverse effects to pimobendan were noted.


Lung lobe torsion in association with a chronic diaphragmatic hernia and haemorrhagic pleural effusion in a cat.

CLINICAL SUMMARY: This report describes torsion of the right cranial lung lobe in a cat with haemorrhagic pleural effusion and a chronic diaphragmatic hernia. Surgical treatment comprising lung lobectomy without de-rotation, and repair of the diaphragmatic defect, led to an uneventful recovery. PRACTICAL RELEVANCE: Lung lobe torsion is a rare condition in cats. While spontaneous lung lobe torsions may occur, a frequent association with underlying thoracic disease has been recognised in cats. However, neither haemorrhagic pleural effusion nor diaphragmatic hernia have been previously described in cats with lung lobe torsions, although they have been documented in dogs and humans. In a cat with suspected lung lobe torsion, a thorough search for an underlying disease should be undertaken.


Seroprevalence and bacteriamea of Anaplasma phagocytophilum in cats from Bavaria and Lower Saxony (Germany).

Anaplasma (A.) phagocytophilum is a tick-transmitted obligate intracellular bacterium and has been identified in a wide range of mammalian species, causing febrile disease in some. Few reports show that it can also cause granulocytic anaplasmosis in cats. As data on the occurrence of A. phagocytophilum in cats from Germany is limited, a total of 326 blood samples from cats Germany were screened by direct (Giemsa-stained blood/buffy coat smears, real-time PCR) and indirect (IFAT) methods. Of 274 Giemsa-stained blood smears which could be evaluated none was positive for morulae, but one blood sample (< or = 0.1%; 1/306) was positive for A. < or = phagocytophilum-DNA in PCR. Antibodies (cutoff > or = 1:64) were detected in 53 out of 326 samples (16.2%). Altogether, the results show a high seroprevalence rate of anti-A. phagocytophilum antibodies in cats in Germany while the low detection rate of this bacterial agent by direct methods is similar to those of other studies on A. phagocytophilum infections in cats.


Renal transitional-cell carcinoma in two cats with chronic kidney disease.

Two 12-year-old cats were diagnosed with chronic kidney disease (CKD) based on physical examination, clinicopathologic data and, in one case, abdominal ultrasound findings. Approximately 1 year after the initial diagnosis of CKD both cats developed renal transitional cell carcinoma (TCC)--bilateral in one cat. Based on post-mortem examination, one cat had no evidence of metastasis and the other had metastasis to the large intestine, heart and lungs. This is the first report of de novo bilateral renal TCC in a cat, as well as the first report of renal TCC developing in cats with previous history of confirmed CKD.


Prevalence of antimicrobial resistance in relation to virulence genes and phylogenetic origins among urogenital Escherichia coli isolates from dogs and cats in Japan.

OBJECTIVE: To assess the status of antimicrobial resistance (AMR), identify extraintestinal virulence factors (VF) and phylogenetic origins, and analyze relationships among these traits in extraintestinal pathogenic Escherichia coli (ExPEC)
isolates from companion animals. SAMPLE: 104 E coli isolates obtained from urine or genital swab samples collected between 2003 and 2010 from 85 dogs and 19 cats with urogenital infections in Japan. PROCEDURES: Antimicrobial susceptibility of isolates was determined by the agar dilution method; a multiplex PCR assay was used for VF gene detection and phylogenetic group assignment. Genetic diversity was evaluated via randomly amplified polymorphic DNA analysis. RESULTS: Of the 104 isolates, 45 (43.3%) were resistant to > 2 antimicrobials. Phylogenetically, 64 (61.5%), 22 (21.2%), 13 (12.5%), and 5 (4.8%) isolates belonged to groups B2, D, B1, and A, respectively. Compared with other groups, group B2 isolates were less resistant to all tested antimicrobials and carried the pap, hly, and cnf genes with higher frequency and the aer gene with lower frequency. The aer gene was directly associated and the pap, sfa, hly, and cnf genes were inversely associated with AMR. Randomly amplified polymorphic DNA analysis revealed 3 major clusters, comprised mainly of group B1, B2, and D isolates; 2 subclusters of group B2 isolates had different VF and AMR status.

CONCLUSIONS AND CLINICAL RELEVANCE: Prevalences of multidrug resistance and human-like phylogenetic origins among ExPEC isolates from companion animals in Japan were high. It is suggested that VFs, phylogenetic origins, and genetic diversity are significantly associated with AMR in ExPEC.

This study was conducted to validate an ultrasound-guided technique to block the sciatic nerve in cats. An anatomical study was first carried out in four feline cadavers to evaluate the feasibility of the glutea (cranial and caudal), femoris and poplitea ultrasonographical approaches for the sciatic nerve block. The results showed that the femoris approach was optimal because the region was free of vascular and bony structures, and the needle was easily visualised in-plane. Then, the efficacy of the femoris ultrasonographical approach to block the sciatic nerve was tested in six healthy adult experimental cats. A dose of 2 mg/kg lidocaine 2% diluted in saline to a final volume of 1 ml was administered in all cats. The blockade was successful in all cases and the cats recovered uneventfully. This study shows the usefulness of the femoris approach in performing an ultrasound-guided blockade of the sciatic nerve in cats.

This study was designed to test the hypothesis that in cats with chronic diarrhea the daily administration of a proprietary symbiotic (Proviable-DC) would result in an improvement in stool character, as assessed by the owner. Adult cats with chronic diarrhea were recruited for the study and screened for systemic diseases. Fecal flotation, wet mount, immunofluorescence assay (IFA) for Giardia and Cryptosporidium species, and Tritrichomonas species polymerase chain reactions (PCRs) were used to screen for intestinal parasitism. The symbiotic was administered for 21 days; otherwise, no changes were made to ongoing treatment(s) or diet. The severity of the diarrhea was assessed using a standardized fecal scoring system and the owner’s subjective perception before, and after, supplementation. The mean fecal score for the 53 cats completing the study decreased from 6.0 to 4.4, representing a significantly (P <0.001) firmer stool character. Seventy-two percent of owners perceived an improvement in their cat’s diarrhea following a 21-day course of symbiotic supplementation.

BACKGROUND: Bicyclam derivatives inhibit feline immunodeficiency virus (FIV) replication through selective blockage of chemokine receptor CXCR4. HYPOTHESIS/OBJECTIVES: CXCR4 antagonist plerixafor (AMD3100, 1,1'-bis-(1,4,8,11-tetraazacyclotetradekan) alone or combination with adefovir (PMEA, 9-(2-phosphonylmethoxyethyl)adenine) safe and effective for treating FIV-infected cats. ANIMALS: Forty naturally FIV-infected, privately owned cats. MATERIALS AND METHODS: Prospective, placebo-controlled, double-blind clinical trial. Cats randomly classified into 4 treatment groups. Received AMD3100, PMEA, AMD3100 in combination with PMEA, or placebo for 6 weeks. Clinical and laboratory parameters, including CD4(+) and CD8(+) cell counts, FIV proviral and viral load measured by quantitative polymerase chain reaction (qPCR) evaluated. Additionally, FIV isolates from cats treated with AMD3100 tested for drug resistance. RESULTS: FIV-infected cats treated with AMD3100 caused significant decrease in proviral load compared to placebo group (2.3 +/- 3.8% to 1.9 +/- 3.1%, of blood lymphocytes P <.05), but did not lead to improvement of clinical or immunological variables; it caused a decrease in serum magnesium concentration without clinical signs. No development of resistance of FIV isolates to AMD3100 found during treatment period. PMEA administration improved stomatitis (stomatitis score [degree 1 - 100] PMEA group: 23 +/- 19 to 11 +/- 10, P <.001; AMD3100 + PMEA group: 12 +/- 17 to 3 +/- 5, P <.05), but did not decrease proviral or viral load and caused anemia (RBC [x10(6) /muL] PMEA group: 9.07 +/- 1.60 to 6.22 +/- 2.16, P <.05; AMD3100 +/- PMEA group: 8.80 +/- 1.23 to 5.84 +/- 1.58, P <.001). CONCLUSIONS AND CLINICAL IMPORTANCE: Administration of CXCR4 antagonists, as AMD3100, can induce reduction of proviral load and may represent viable treatment of FIV-infected cats. Combination treatment with PMEA not recommended.

Calcium channel blocker toxicity in dogs and cats.
The widespread use and availability of calcium channel blockers in human and veterinary medicine pose a risk for inadvertent pet exposure to these medications. Clinical signs can be delayed by many hours after exposure in some cases, with hypotension and cardiac rhythm changes (bradycardia, atrioventricular block, or tachycardia) as the predominant signs. Prompt decontamination and aggressive treatment using a variety of modalities may be necessary to treat patients exposed to calcium channel blockers. The prognosis of an exposed patient depends on the severity of signs and response to treatment.

Identification of parvovirus in the bone marrow of eight cats.
OBJECTIVE: To determine if canine parvovirus (CPV) or feline panleucopenia virus (FPV) genomic sequences are present in adult feline bone marrow samples. DESIGN: Bone marrow samples were obtained from 32 semi-feral cats that were euthanased at an animal shelter. DNA was extracted and subjected to conventional polymerase chain reaction (PCR) designed to determine if CPV or FPV DNA was present. Positive PCR products were purified, cloned and sequenced to differentiate between CPV and FPV. RESULTS: Eight of the bone marrow samples contained parvoviral DNA (7 CPV, 1 FPV). CONCLUSION: CPV and FPV DNA can be found in the bone marrow of healthy adult cats.

[Epidemiological data of urinary stones in cats between 1981 and 2008].
Objective: Evaluation of urinary stones analysed between 1981 and 2008 in cats and comparison with data submitted, such as breed, age, sex and body weight. Material and methods: Over the given years 5173 feline uroliths from cats in Germany and some neighbouring countries were analysed. From the forms submitted the following data was obtained for most cats: breed, age, sex, body weight, obesity status and location of the urinary stone(s). All uroliths were analysed by infrared spectroscopy. Uroliths containing at least 70% of a single mineral were classified as being of that type. Results: The cats with urolithiasis belonged to 25 different breeds. The most common breed was the European shorthair (64.3%) followed by Persian (15.2%), British shorthair (3.9%), Chartreux (1.7%), Maine Coon (1.5%) and Siamese (1.1%). Most animals were neutered or castrated (81.8%). Tom cats were significantly more frequently affected than female cats. The mean age (7 years) was virtually identical between both sexes, but varied between different stone types. Cats with struvite stones were significantly younger than cats with calcium oxalate stones (6.6 versus 7.6 years). Most urinary stones were retrieved from the bladder and/or urethra (93%). Over the entire time period (1981-2008) struvite (51.2%) and calcium oxalate (38.7%) stones were the two most common urolith types. Percent calcium oxalate stones increased significantly over time and were seen more often in 2008 than struvite stones (48.6% versus 43.4%). Amongst other urinary stones, ammonium urate (1.7%), carbonate apatite (1.7%), cystine (0.5%) and xanthine (0.3%) uroliths were analysed. Conclusion and clinical relevance: While struvite and calcium oxalate stones are presently found at approximately equal frequency in cats, various different urinary stones types can also occur in this species. Epidemiological knowledge of urinary stones is crucial as a basis for adequate therapy and prevention.

Prevalence of intestinal parasites in private-household cats in Japan.
The present study is the first national investigation of intestinal parasites in private-household cats in Japan. A total of 942 faecal samples were collected from private-household cats. Giardia species was assessed using an enzyme-linked immunosorbent assay kit and other intestinal parasites were identified microscopically. The overall prevalence of intestinal parasites was 10.1%; two protozoan parasites (Giardia species and Cystoisospora species) and five helminths (Toxocara cati, Toxascaris leonina, Anclylostoma tubaeforme, Taenia species and Spirometra erinacei) were detected. The total prevalence of intestinal parasite infection was significantly higher in cats aged <6 months old than in cats older than 6 months because of a significantly higher prevalence of Cystoisospora species and T cati. The total infection prevalence was higher among outdoor cats as a result of the significantly higher prevalence of T cati and S erinacei. Sex and faecal condition were not related to intestinal parasite infections. Regional differences were observed in Cystoisospora species and A tubaeforme.

Microsporidia in household dogs and cats in Iran: a zoonotic concern.
Microsporidia in dogs and cats is primarily caused by the obligate, intracellular parasite Encephalitozoon cuniculi, which is a member of the phylum Microsporidia. The aim of the current study is the detection of this parasite in stool samples of small animals of Iran, by polymerase chain reaction. Microsporidia spp. was found in 31% (31/100) of dogs (E. cuniculi (18/100), Encephalitozoon bieneusi (8/100) and Encephalitozoon intestinalis (5/100)), and 7.5% (3/40) of the specimens obtained from cats were infected with E. bieneusi. Sequencing of PCR products confirmed these results. In conclusion, Microsporidia infection seems to be fairly common in pet animals of Iran, especially in dogs. This finding could indicate the...
importance of pet animals as zoonotic reservoirs of microsporidial human infections.


**Major taste loss in carnivorous mammals.**

Mammalian sweet taste is primarily mediated by the type 1 taste receptor Tas1r2/Tas1r3, whereas Tas1r1/Tas1r3 act as the principal umami taste receptor. Bitter taste is mediated by a different group of G protein-coupled receptors, the Tas2rs, numbering 3 to approximately 66, depending on the species. We showed previously that the behavioral indifference of cats toward sweet-tasting compounds can be explained by the pseudogenization of the Tas1r2 gene, which encodes the Tas1r2 receptor. To examine the generality of this finding, we sequenced the entire coding region of Tas1r2 from 12 species in the order Carnivora. Seven of these nonfeline species, all of which are exclusive meat eaters, also have independently pseudogenized Tas1r2 caused by ORF-disrupting mutations. Fittingly, the purifying selection pressure is markedly relaxed in these species with a pseudogenized Tas1r2. In behavioral tests, the Asian otter (defective Tas1r2) showed no preference for sweet compounds, but the spectacle bear (intact Tas1r2) did. In addition to the inactivation of Tas1r2, we found that sea lion Tas1r1 and Tas1r3 are also pseudogenized, consistent with their unique feeding behavior, which entails swallowing food whole without chewing. The extensive loss of Tas1r receptor function is not restricted to the sea lion: the bottlenose dolphin, which evolved independently from the sea lion but displays similar feeding behavior, also has all three Tas1rs inactivated, and may also lack functional bitter receptors. These data provide strong support for the view that loss of taste receptor function in mammals is widespread and directly related to feeding specializations.


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

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


**Omentisation of the head in cats: a cadaver study.**

The involvement of the greater omentum in reconstructive, abdominal and thoracic surgery is based on its manifold qualities, which include immunological support, lymphatic drainage, angiogenesis, adhesion, haemostasis and fat storage. The purpose of this study was to determine whether the greater omentum could be extended to the head. In addition, we evaluated the surgical procedures necessary for this extension. Our study reveals that specific surgical lengthening techniques of the greater omentum, such as dorsal extension and inverted L-shape elongation, are necessary to successfully transpose the omentum to the head in cats. As the survival of the omentum after transposition procedures is still unknown, its application in chronic non-healing wounds of the head in cats warrants further investigation.


**Interaction of clarithromycin with cyclosporine in cats: pharmacokinetic study and case report.**

Clarithromycin (CLM) has been known to increase the cyclosporine (CsA) trough levels in human transplant patients. However, the interaction of CLM with CsA has not been reported in cats. In this study, the effects of oral dosing of CLM on the pharmacokinetics and dosing of CsA in cats were investigated. Co-administration of CLM with CsA resulted in significant increases of oral bioavailability of CsA. In addition, CLM reduced the CsA dosage required to maintain the therapeutic CsA trough levels to almost 35% of the initial CsA therapy and the dose frequency was successfully replaced from a twice a day schedule to once a day in a feline kidney transplant patient. The addition of CLM to the regular CsA-based immunosuppression could be used as an effective alternative to classical ketoconazole treatment in feline kidney transplant patients and may result in substantial cost saving and convenience for the cat owners.


**Common reversal agents/antidotes in small animal poisoning.**

Different antidotes counteract the effect of a toxicant in several different ways. Antidotes can reverse, decrease, or prevent
action of a toxicant. They can also help in achieving stabilization of vital signs, directly or indirectly, and promote excretion of a toxicant. However, overreliance on an antidote can be unrealistic and dangerous. While expectations of rapid recovery from antidotes are usually high, in a real life situation, there are many impediments in achieving this goal. The timing of its use, availability, cost, and sometimes adverse effects from the antidote itself can influence the results and outcome of a case. The majority of toxicants do not have a specific antidote therapy indicated and patients in these cases equally benefit from supportive care. In this chapter, commonly used antidotes and reversal agents in small animals are listed in a table form. The table lists generic name along with brand name of an antidote/reversal agent whenever available, main indications for their use, and provides comments or cautions in their use as needed. After stabilizing the patient and establishing the etiology, the clinicians must review more detailed management of that particular toxicant discussed here or in other references.


**Differential diagnosis of common acute toxicologic versus nontoxicologic illness.**

This table outlines common toxicologic versus nontoxicologic rule outs based on clinical abnormalities seen in an acutely ill animal. The purpose is to provide an initial guideline for considering toxicologic versus nontoxicologic rule outs when a patient is presented to a practicing veterinarian. Major clinical abnormalities followed by common toxicologic rule outs and non-toxicologic rule outs have been listed so that practicing veterinarians can narrow down an etiology quickly. Based on history, physical examination findings, and blood work changes, once a reasonable etiology has been narrowed down or established, the reader is encouraged to review a more detailed discussion on management of the particular poisoning or disease listed in this or other references.


**Common toxicologic issues in small animals.**


**Toxicology of frequently encountered nonsteroidal anti-inflammatory drugs in dogs and cats.**

Nonsteroidal anti-inflammatory drugs (NSAIDs) are a group of heterogeneous compounds extensively used in both human and veterinary medicine for their antipyretic, anti-inflammatory, and analgesic properties. NSAIDs consist of a wide range of pharmacologically active agents with different chemical structures, with similar therapeutic and adverse effects. The ASPCA Animal Poison Control Center received 22,206 NSAID incidents in dogs and cats (3% of total cases; dogs [15,823] and cats [1244]) during 2005 to 2010. This is roughly equivalent to 4% NSAID incidents reported in humans. The most common NSAID involved was ibuprofen, followed by aspirin, naproxen, deracoxib, meloxicam, diclofenac, piroxicam, indomethacin, nabumetone, and etodolac. This article provides a brief overview of classification, mechanism of action, pharmacologic and toxicologic properties, and treatment information involving frequently encountered human and veterinary NSAIDs in dogs and cats.


**[The use of fluoroquinolones in bacterial urinary tract infections in cats].**

Older cats (>10 years) with FLUTD (Feline Lower Urinary Tract Disease) symptoms are often affected by urinary tract infections. In most of these cats organ diseases (e.g. chronic renal failure, diabetes mellitus) or iatrogenic factors (immunosuppressive drugs, indwelling catheter) are found that clearly predispose cats to this kind of infection. From a diagnostic point of view, urinalysis and urine culture are the most important tools in detecting bacteriuria. The microbiological spectrum is thereby comparable to that found in dogs, revealing Escherichia (E.) coli but also Staphylococcus spp. and Enterococcus spp./ Streptococcus spp. Antibiotic therapy should be based on the results of susceptibility testing. If this kind of information is not available, drug selection has to be decided on an empirical basis unless it is a complicated urinary tract infection. Preferred antibiotics should have a high renal excretion rate and thus ensure therapeutically effective drug levels in the urine. In this respect, the fluoroquinolones belong to the group of appropriate drugs to be used in cats. The relevance of therapeutical drug concentrations achievable in the urine is discussed for the example of marbofloxacin, a third-generation fluoroquinolone. New pharmacokinetic data showed that marbofloxacin concentrations of >/=2microg/ml are maintained in the urine of healthy cats for 72 and 103 hours after administration of 2 and 4mg/kg BW s.c., respectively.


**Evaluation of recipes for home-prepared diets for dogs and cats with chronic kidney disease.**

OBJECTIVE: To evaluate recipes of diets recommended for animals with chronic kidney disease (CKD), compare nutritional profiles for those recipes to requirements for adult dogs and cats, and assess their appropriateness for the management of CKD. DESIGN: Evaluation study. SAMPLE: Recipes of 67 home-prepared diets promoted for use in dogs (n = 39 recipes) and cats (28) with CKD. PROCEDURES: Recipes were analyzed with computer software to determine calories, macronutrient calorie distribution, and macronutrient concentrations and were assessed for appropriateness for the management of CKD. RESULTS: Assumptions were required for the analysis of every recipe, and no recipe met all
National Research Council nutrient recommended allowances (RA) for adult animals. Compared with RAs, concentrations of crude protein or at least 1 amino acid were low in 30 of 39 (76.9%) canine recipes and 12 of 28 (42.9%) feline recipes. Choline was most commonly below the RA in both canine (37/39 [94.9%]) and feline (23/28 [82.1%]) recipes; selenium (34/39 [87.2%] canine and 9/28 [32.1%] feline recipes), zinc (24/39 [61.5%] canine and 19/28 [67.9%] feline recipes), and calcium (22/39 [56.4%] canine and 7/28 [25.0%] feline recipes) concentrations were also frequently below recommendations. The median phosphorus concentration in canine and feline recipes was 0.58 and 0.69 g/1,000 kcal, respectively. CONCLUSIONS AND CLINICAL RELEVANCE: Many problems with nutritional adequacy were detected, and use of the recipes could result in highly variable and often inappropriate diets. Many recipes would not meet nutritional and clinical needs of individual patients and should be used cautiously for long-term feeding.

Lau, S. K., P. C. Woo, H. C. Yeung, J. L. Teng, Y. Wu, R. Bai, R. Y. Fan, K. H. Chan, and K. Y. Yuen (2012) J Gen Virol Identification and characterization of bocoviruses in cats and dogs revealed a novel feline bocavirus and a novel genetic group of canine bocavirus. We report the identification and genome characterization of a novel bocavirus, feline bocavirus (FBoV), and novel bocoviruses closely related to canine bocavirus (CBoV) strain Con-161 in stray cats and dogs in Hong Kong, respectively. FBoV was detected in 7.2%, 0.3%, 1.6%, 2% and 0.8% of fotal, nasal, urine, kidney and blood samples from 364 cats, while CBoV was detected in 4.6%, 5.1%, 6.3% and 0.3% of fotal, nasal, urine and blood samples from 351 dogs by PCR respectively. Three FBoV genomes sequenced revealed the presence of three ORFs, characteristic of bocoviruses. Phylogenetic analysis showed that FBoVs were only distantly related to other bocoviruses, forming a distinct cluster within the genus, with <35.7% nucleotide identities to the genome of minute virus of canine. The four CBoV genomes sequenced shared 87.4% to 89.2% nucleotide identities to that of CBoV strain Con-161. In addition to the three bocavirus ORFs, they encoded an additional ORF, ORF4, immediately downstream to NS1, which was not found in other bocoviruses including CBoV strain Con-161. They also possessed a putative second exon encoding the C-terminal region of NS1 and conserved RNA splicing signals, previously described in human bocoviruses. Partial VP1/VP2 sequence analysis of 23 FBoV and 25 CBoV strains demonstrated host-genetic diversity, with two potential genetic groups of FBoV and a novel CBoV group, CBoV-HK, distinct from the three groups, CBoV-A to C, found in USA. Although the pathogenicity of FBoV and CBoV remains to be determined, their presence in different host tissues suggested wide tissue tropism.

Lee, Y. J., J. P. Chan, W. L. Hsu, K. W. Lin, and C. C. Chang (2012) J Vet Intern Med 26:500-505. Prognostic factors and a prognostic index for cats with acute kidney injury. BACKGROUND: The clinical manifestations of acute kidney injury (AKI) range from mild to fatal in cats; however, prognosis factors have been rarely studied. HYPOTHESIS/OBJECTIVES: To find the clinical factors significantly correlated with the outcome among cats with AKI and to develop a simple prognostic index. ANIMALS: Seventy cats with AKI were recruited. METHODS: Demographic and clinicopathological data obtained from 70 cats with AKI were retrospectively collected. Student’s t-test or Mann-Whitney U-test and Pearson chi-square test or Fisher’s exact were applied to determine the factors associated with survival in cats with AKI. Using logistic regression, the statistically significant factors associated with prognosis were identified and a new prediction model was generated. RESULTS: The overall case fatality rate was 64% (45/70). The results showed that nonsurviving cats had significantly lower levels of PCV, WBC, RBC, LDH and albumin, a lower albumin/globulin ratio, lower blood glucose, and a reduced body temperature, as well as being older. Serum urea and creatinine concentrations were not statistically significant as prognostic factors, but a decrease in these 2 variables in 3 days was significantly related to a reduction in death. A summary prognostic index including body temperature and LDH and albumin concentrations had area under the receiver-operating characteristic curve (AUROC) for predicting death of 0.86 (P <.05) and a cut-off value of 0.82, a sensitivity of 77% and a specificity of 90%. CONCLUSIONS: The prognosis in cats with AKI is quite different from that found for human and dogs.

Lee-Fowler, T. M., V. Guntur, J. Dodam, L. A. Cohn, A. E. Declue, and C. R. Reiner (2012) Int Arch Allergy Immunol 158:369-374. The Tyrosine Kinase Inhibitor Masitinib Blunts Airway Inflammation and Improves Associated Lung Mechanics in a Feline Model of Chronic Allergic Asthma. Background: Blockade of tyrosine kinase signaling by masitinib, a c-kit/PDGF receptor tyrosine kinase inhibitor, can modulate allergic airway inflammation, but effects on lung mechanics have not been well characterized. We hypothesized masitinib would decrease airway eosinophilia and consequently improve pulmonary mechanics in a feline allergic asthma model. Methods: Asthma was induced in 12 cats using Bermuda grass allergen (BGA). Cats received 50 mg/day oral masitinib or placebo. Bronchoalveolar lavage fluid (BALF) was analyzed for eosinophils, total protein (TP) and BGA-specific IgE. Ventilator-acquired mechanics after methacholine (MCh) challenge determined MCh concentration needed to increase baseline airway resistance by 200% (EC200%R), positive end expiratory occlusion pressure (PEEP) and end inspiratory breath hold pressure (Pplat). An inverse correlate of respiratory system compliance Pplat-PEEP was also calculated. Data were analyzed using the Wilcoxon test, with one-tailed significance set at p < 0.1. Results: After 4 weeks, percent eosinophils in BALF was lower in masitinib-treated cats (7 +/- 9%) versus controls (30 +/- 27%, p = 0.023). BALF
TP significantly differed ($p = 0.047$) between groups, decreasing with masitinib and increasing with placebo. BALF BGA-specific IgE was unaffected by masitinib. Both groups showed an improvement in EC(200)R(aw) (masitinib, $p = 0.015$; control, $p = 0.078$) but no significant change in PEEP after 4 weeks. Masitinib-treated cats demonstrated decreased $P(\text{plat})$ ($p = 0.033$) and $P(\text{plat})$-PEEP ($p = 0.075$) at week 4, suggesting an improvement in respiratory compliance. Conclusions: Masitinib reduced BALF eosinophilia and TP, indicating improved airway inflammation and edema, and improved $P(\text{plat})$ and $P(\text{plat})$-PEEP, suggesting benefit to respiratory compliance influenced by airway inflammation/edema. Masitinib deserves further study in humans with chronic allergic asthma.


Salmeterol or doxycycline do not inhibit acute bronchospasm and airway inflammation in cats with experimentally-induced asthma.

The objective of this study was to determine if inhaled salmeterol, a long-acting beta(2)-adrenergic agonist, and oral doxycycline, a tetracycline antibiotic displaying matrix metalloproteinase (MMP) inhibitory activity, reduce airway inflammation and obstruction in cats with experimentally-induced asthma. Eight Ascaris suum (AS)-sensitised cats were enrolled in a prospective study in which they underwent four AS-challenges at 1 month intervals. The challenged animals were given no treatment or were treated on 4 consecutive days with either: (1) oral prednisolone (1 mg/kg twice daily), (2) inhaled salmeterol (50 μg twice daily), or (3) oral doxycycline (5 mg/kg twice daily), according to a randomised cross-over design. Inhibition of allergen-induced early (EAR) and late (LAR) asthmatic reactions were assessed by barometric whole-body plethysmography. Cytology and measurement of MMP-2 and -9 activities were carried out on bronchoalveolar lavage fluid (BALF). Although none of the treatments prevented the EAR, prednisolone treatment inhibited the LAR. Relative to untreated cats, the eosinophil percentage and MMP-2 activity in BALF were significantly reduced following prednisolone treatment ($P < 0.05$). Short-term therapy with either salmeterol or doxycycline had no effect on the EAR or LAR or on airway inflammation. Given the chronic nature of this disease in cats, long-term therapy may be required to produce more favourable functional and clinical outcomes.


Effect of short-term oral and inhaled corticosteroids on airway inflammation and responsiveness in a feline acute asthma model.

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


Lack of evidence for perinatal transmission of Cytauxzoon felis in domestic cats.

Cytauxzoon felis is a hemoprotozoan parasite of cats capable of causing severe, often fatal disease during acute infection, but cats that survive the acute stage of disease become chronic carriers. These otherwise healthy carriers are capable of transmitting the infection to other cats via the bite of a vector tick. A variety of other hemoprotozoan parasites are capable of vertical transmission from mother to offspring. If this were possible for C. felis, it could be an important part of the explanation for the apparent emergence of this disease with an increased incidence in an expanding geographic area. We investigated the possibility of perinatal transmission of C. felis from chronically infected cats to their offspring. Two queens produced a total of 14 healthy kittens in three litters. All kittens tested negative for C. felis by microscopic slide review and PCR until they were adopted to private homes at approximately 12 weeks of age. While this does not rule out the possibility of perinatal transmission, it is unlikely to be a common phenomenon.


Prevalence of Ancylostoma braziliense in Cats in Three Northern Counties of Florida, United States.

Abstract A convenience sampling of fecal specimens from 40 cats in northern Florida were examined for the presence of
Ancylostoma braziliense eggs using centrifugal sugar flotation and PCR-RFLP. Of the 40 samples, 26 (65%) contained hookworm eggs. DNA from 24 samples was successfully amplified using PCR; using RFLP, 10 were identified as containing DNA of A. braziliense (41.7% of the 24 samples that successfully amplified). Of these, 6 samples contained DNA of both A. tubaeforme and A. braziliense, and 4 contained only DNA of A. braziliense. The remaining samples (n=14) contained only the DNA of A. tubaeforme, except for 1 sample, which had no discernible bands after RFLP.


Abstract The establishment of cat- and dog-derived laboratory strains of Ancylostoma braziliense allowed for a morphological comparison of the eggs of A. braziliense, A. caninum, and A. tubaeforme. The length, width, and perimeter were determined for images of 10 eggs each of A. braziliense from the feces of a dog infected with a canine isolate and a cat infected with a feline isolate, A. caninum from dog feces, and A. tubaeforme from cat feces. The specific identity of the eggs was verified by PCR and RFLP using Hinf I and Rsal restriction digests followed by gel electrophoresis and sequencing. The mean (+/- SD) length, width, and perimeter in mum and the length-width ratio (+/- SD) for the eggs of each species were: A. braziliense eggs (combined cat and dog source) 53.03 +/- 2.33, 36.37 +/- 1.35, 140.43 +/- 2.56, and 1.46 +/- 0.11; A. caninum eggs 63.92 +/- 5.28, 39.21 +/- 1.52, 161.99 +/- 9.30, and 1.63 +/- 0.13; and A. tubaeforme eggs 61.44 +/- 3.05, 39.14 +/- 1.40, 157.98 +/- 5.81, and 1.57 +/- 0.08. The eggs of A. braziliense were significantly (P<0.001) smaller than the eggs of A. caninum and A. tubaeforme in all dimensions. Thus, the eggs appear to be readily distinguishable using light microscopy, which should aid in identification in fecal samples for a more comprehensive clinical picture and assessment of zoonotic risk.

Effects of a urolith prevention diet on urine compositions of glycosaminoglycans, Tamm-Horsfall glycoprotein, and nephrocalcin in cats with calcium oxalate urolithiasis.

OBJECTIVE: To evaluate urine concentrations of glycosaminoglycans, Tamm-Horsfall glycoprotein, and nephrocalcin in cats fed a diet formulated to prevent calcium oxalate uroliths. ANIMALS: 10 cats with calcium oxalate urolithiasis. PROCEDURES: In a previous study conducted in accordance with a balanced crossover design, cats were sequentially fed 2 diets (the diet each cat was consuming prior to urolith detection and a diet formulated to prevent calcium oxalate uroliths). Each diet was fed for 8 weeks. At the end of each 8-week period, a 72-hour urine sample was collected. Concentrations of glycosaminoglycans, Tamm-Horsfall glycoprotein, and the 4 isoforms of nephrocalcin in urine samples collected during that previous study were measured in the study reported here. RESULTS; Diet had no effect on the quantity of Tamm-Horsfall glycoprotein and nephrocalcin in urine. However, the urine concentration of glycosaminoglycans was significantly higher during consumption of the urolith prevention diet. CONCLUSIONS AND CLINICAL RELEVANCE: Feeding a urolith prevention diet increased the urine concentration of glycosaminoglycans, which are glycoprotein inhibitors of growth and aggregation of calcium oxalate crystals.


Varieties of genetic tests are currently available for the domestic cat that support veterinary health care, breed management, species identification, and forensic investigations. Approximately thirty-five genes contain over fifty mutations that cause feline health problems or alterations in the cat’s appearance. Specific genes, such as sweet and drug receptors, have been knocked-out of Felidae by evolution and can be used along with mtDNA markers for species identification. Both STR and SNP panels differentiate cat race, breed, and individual identity, as well as gender-specific markers to determine sex of an individual. Cat genetic tests are common offerings for commercial laboratories, allowing both the veterinary clinician and the private owner to obtain DNA test results. This article will review the genetic tests for the domestic cat, and their various applications in different fields of science. Highlighted are genetic tests specific to the individual cat, which are a part of the cat’s genome.

Epidemiological findings and laboratory evaluation of sporotrichosis: a description of 103 cases in cats and dogs in southern Brazil.

Sporotrichosis is a subcutaneous mycosis, which affects mainly small animals, and is considered an important public health disease. This paper describes the epidemiological and laboratory characteristics of 103 clinical cases of sporotrichosis diagnosed over a 10-year period in southern Brazil. The 92 cats and 11 dogs from eight municipalities in Rio Grande do Sul State developed especially the disseminated cutaneous and fixed cutaneous forms of the disease. Respiratory signs such as sneezing, serous nasal discharge and dyspnea were found in about 57% of the animals. The detection of Sporothrix schenckii in different clinical samples showed highest isolation in testicles (46.6%), oral cavity (45.2%) and conjunctival mucosa (38.1%). A differentiated histological pattern was found between the fixed cutaneous and disseminated cutaneous
(DC) manifestations of the disease; well-organized granulomas of nodular distribution and various fungal structures prevailed in the DC form in cats. Melanin detection in S. schenckii cells by the Fontana-Masson technique was positive in 45.4% of the samples. The study revealed that the State of Rio Grande do Sul is an endemic sporotrichosis area and demonstrated the possibility of involvement of other pathways in the infection and spread of the disease. In addition, it emphasized the importance of laboratory tests for mycosis confirmation, especially in dogs that develop clinical manifestations without the presence of cutaneous lesions.


Feline head and neck squamous cell carcinoma (SCC) is a loco-regional disease harbouring a poor prognosis. The complex anatomic location precludes aggressive surgical resection and tumours recur within weeks to few months. Response to chemotherapy and local control after radiation therapy has been disappointing. In this study, a multimodal approach including medical treatment (thalidomide, piroxicam and bleomycin), radiation therapy (accelerated, hypofractionated protocol) and surgery was attempted in six cats. Treatment was well tolerated. Three cats with sublingual SCC were alive and in complete remission at data analysis closure after 759, 458 and 362 days. One cat with laryngeal SCC died of renal lymphoma after 51 days and the other with maxillary SCC died of a primary lung tumour 82 days after diagnosis. In both cats, the SCC was in complete remission. Only one cat developed metastases after 144 days. These encouraging preliminary results merit further evaluation in future trials.


BACKGROUND: Serosurveys of cats for exposure to or infection with leptospires have been published from other geographic areas, but none for cats in the United States in the past 4 decades. HYPOTHESIS/OBJECTIVES: The purpose of this pilot study was to determine the prevalence of leptosporal antibodies in a population of free roaming cats in Worcester County, (central) Massachusetts. ANIMALS: Sixty-three free roaming cats presenting to a trap-neuter-return (TNR) program. METHODS: Prospective study. Serum was collected from 63 free roaming cats presented to a university associated TNR. Microagglutination titers to Leptospira interrogans serovars Autumnalis, Hardjo, Bratislava, Icterohaemorrhagiae, Canicola, Pomona, and L kirshneri Grippotyphosa were determined. RESULTS: A total of 3 of 63 cats (4.8%) had a titer of 1 : 100 or greater to one or more serovars, with Autumnalis being the most common. None of the cats were seropositive to Hardjo, Grippotyphosa, or Canicola. CONCLUSIONS AND CLINICAL IMPORTANCE: These results are consistent with previously published seroprevalence rates in feral cats. Additional studies are required to determine the role of leptosporosis in clinical disease in the domestic cat.


Objective To assess the quality and length of recovery from anaesthesia induced with either propofol or alfaxalone and maintained with isoflurane, in cats undergoing short procedures in private veterinary practice. Study design Prospective, blinded, randomized study. Animals Ninety-three healthy mixed breed cats. Methods After premedication with intramuscular acepromazine (0.05 mg kg(-1)) and buprenorphine (0.01 mg kg(-1)), cats were randomly allocated to receive either propofol (Group P) or alfaxalone (Group A) for induction of anaesthesia. Following endotracheal intubation, anaesthesia was maintained with isoflurane vaporized in oxygen. The quality of induction, physiological parameters throughout anaesthesia and the duration of both surgery and anaesthesia were recorded. The level of ambient noise, recovery times, number of attempts to stand, reaction of the cat to touch 15 minutes after extubation, and other relevant characteristics of the recovery period were noted and a video recording of the recovery was made. The videos were assessed by a second, blinded anaesthetist, using simple descriptive and visual analogue scales. Results No statistically significant differences between groups with respect to preoperative data, premedication, surgery, anaesthesia and recovery times and scores were observed. There was a statistically significant difference in the number of patients paddling and trembling on recovery in Group A (p = 0.032) even though there was no statistically significant difference in the level of ambient noise in the recovery ward or in the overall quality of recovery. Conclusions Both propofol and alfaxalone provide good recovery characteristics in premedicated cats undergoing short procedures in clinical settings. Alfaxalone induction was associated with more episodes of paddling and trembling during recovery. Clinical relevance Both agents would appear appropriate for induction of anaesthesia in cats for short procedures.


Laboratory rats display pronounced defensive behaviors when confronted with a range of cat-derived stimuli, including collars worn by a cat, cloths rubbed on a cat, and cat fur. One possible explanation of this phenomenon (the “kairomone hypothesis”) is that rats derive a survival advantage by eavesdropping on signals used by cats to communicate with each
other. Cats are known to rub their bodies on objects at strategic environmental locations to signal their identity and mating potential to other cats. The current study assessed the sensitivity of laboratory rats to these body rubbings. In Experiment 1, food deprived Sprague-Dawley rats were trained to consume food pellets in one arm of a Y maze. On test day a damp cloth was placed near the food pellets that had been rubbed on a location (wall) where a cat had recently engaged in body rubbing. A control cloth and a collar worn by the cat were also tested. The presence of both the body rubbing residue and the cat collar increased latency to eat and decreased amount of food eaten. The disruption of consummatory behavior in the test environment was still evident 24h later in the absence of odor stimuli. Experiment 2 tested the reaction of naïve Wistar rats to body rubbings using a paradigm in which rats were given the opportunity to hide. Relative to a control condition, rats exposed to a cotton pad wiped on a cat body rubbing location showed increased hiding behavior, decreased exploration and reduced stimulus approach and investigation. These defensive responses persisted for up to 4 days following a single stimulus exposure. These results suggest that rats eavesdrop readily on body rubbings cats use for identification purposes, providing further support for a kairomone hypothesis of predator odor avoidance.

An overview of trends in animal poisoning cases in the United States: 2002-2010.
Veterinary toxicology is a constantly evolving field. The authors use the ASPCA Animal Poison Control Center’s medical record database to examine recent trends in veterinary toxicology/animal poisoning incidents received from 2002 to 2010. The demographics of animals exposed to potentially harmful substances, the types of substances ingested, changes/emerging trends in substance exposures, and trends in therapies used to treat exposures are discussed.

Stress versus fear in cats.

ABCG2 transporter: therapeutic and physiologic implications in veterinary species.
Drug transporters significantly influence drug pharmacokinetics and pharmacodynamics. While P-glycoprotein, the product of the MDR1 (ABCB1) gene, is the most well-characterized ABC transporter, the pharmacological importance of a related transporter, ABCG2, is starting to be realized in veterinary medicine. Based primarily on human and rodent studies, a number of clinically relevant, structurally and functionally unrelated drugs are substrates for ABCG2. ABCG2 is expressed by a variety of normal tissues including the intestines, renal tubular cells, brain, and retinal capillary endothelial cells, biliary canalicular cells, and others, where it functions to actively extrude substrate drugs. In this capacity, ABCG2 limits oral absorption of substrate drugs and restricts their distribution to privileged sites such as the brain and retina. ABCG2 is also expressed by tumor cells where it functions to limit the intracellular accumulation of cytotoxic agents, contributing to multidrug resistance. Several ABCG2 polymorphisms have been described in human patients, some of which result in altered drug disposition, increasing susceptibility to adverse drug reactions. Additionally, ABCG2 polymorphisms in humans have been associated with disease states such as gout. Feline ABCG2 has recently been demonstrated to have several amino acid differences at conserved sites compared with 10 other mammalian species. These amino acid differences adversely affect transport function of feline ABCG2 relative to that of human ABCG2. Furthermore, these differences appear to be responsible for fluoroquinolone-induced retinal toxicity in cats and may play a role in acetaminophen toxicity as well. Studies in rodents and sheep have determined that ABCG2 expressed in mammary tissue is responsible for the secretion of many compounds (both therapeutic and toxic) into milk. Finally, data in rodent models suggest that ABCG2 may play an important role in regulating a number of physiologic pathways involved in protecting erythrocytes from oxidative damage.

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 --> infinity) (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.
The validity of these PCR assays in FIV vaccinates, the sensitivities of combinations of these serological and PCR tests interpreted in series are low. Assessment of uncertain with one of these serological tests and then testing positive sensitivities of the two serological tests we assessed. We do not recommend screening cats whose FIV vaccination status is Simplify((R)) test; specificities were similar in both populations. We conclude that the sensitivities of the two PCR tests interpreted in series were low; medians of posterior sensitivity distributions ranged from 0.75 to 0.83. Relative t based on one region of the gag gene h specificity distributions for these PCR tests were 0.94

Validation of real-time polymerase chain reaction tests for diagnosing feline immunodeficiency virus infection in domestic cats using Bayesian latent class models.

The objectives of the current study were to estimate the sensitivity and specificity of three real-time polymerase chain reaction (PCR) tests for diagnosis of feline immunodeficiency virus (FIV) infection in domestic cats, both individually and when interpreted in series with one of two serological tests, separately in populations of cats at low and high risk of being infected with FIV. One PCR test targeted the pol gene and two targeted the gag gene of FIV. For comparison, sensitivities and specificities of the individual serological tests (IDEXX SNAP((R)) test and AGEN Simplify((R)) test) were also estimated. The study populations consisted of domestic cats thought to be not vaccinated against FIV. Low-risk (males aged 4 years or less and females; n=128) and high-risk (males over 4 years; n=128) cats were selected from those where blood samples were submitted to a commercial clinical pathology service. Bayesian latent class models were used to obtain posterior probability distributions for sensitivity and specificity for each test, based on prior distributions obtained from three experts. Medians of the posterior sensitivity distributions for the PCR tests based on the pol gene and two regions of the gag gene tests ranged from 0.85 to 0.89, compared to 0.89-0.97 for the two serological tests. The medians of posterior specificity distributions for these PCR tests were 0.94-0.96, and 0.95-0.97 for the serological tests. In contrast, the PCR based on one region of the gag gene had lower median sensitivity. Sensitivities of combinations of these serological and PCR tests interpreted in series were low; medians of posterior sensitivity distributions ranged from 0.75 to 0.83. Relative to the low-risk population, median sensitivities in the high-risk population were lower for all tests other than the AGEN Simplify((R)) test; specificities were similar in both populations. We conclude that the sensitivities of the two PCR tests based on the pol gene and two regions of the gag gene, respectively, in non-vaccinated cats are probably lower than the sensitivities of the two serological tests we assessed. We do not recommend screening cats whose FIV vaccination status is uncertain with one of these serological tests and then testing positives with one of these PCR tests because in non-vaccinates, the sensitivities of combinations of these serological and PCR tests interpreted in series are low. Assessment of the validity of these PCR assays in FIV-vaccinated cats is required.
Therapeutic efficacy of milbemycin oxime/praziquantel oral formulation (Milbemax(R)) against Thelazia callipaeda in naturally infested dogs and cats.

ABSTRACT: BACKGROUND: Over the last decades, canine and feline thelazioses caused by Thelazia callipaeda (Spirurida, Thelaziidae) eye worms gained the attention of the veterinary community due to the spread of this ocular infestation in geographical areas previously regarded as non endemic. The therapeutic efficacy of milbemycin oxime/praziquantel tablets (Milbemax(R)) against T. callipaeda was tested in naturally infested dogs (n = 56) and cats (n = 31). METHODS: From January 2009 to July 2011 a placebo controlled, multicentric, blinded and randomized field study was conducted in T. callipaeda endemic areas of Switzerland (CH) and Italy (ITA) involving client-owned animals. Dogs (n = 56) and cats (n = 31) were physically examined by the veterinarian at enrolment (D0) and twice afterwards (D7 and D14). Infested animals were orally treated with Milbemax(R) or with placebo tablets on D0 and, if an animal was found still infested with T. callipaeda, also on D7. On D14 (final visit) nematodes were flushed from the conjunctiva, identified and counted. RESULTS: Out of 56 dogs 43 (19 CH, 23 ITA) were included in the statistical analysis, whereas 13 were excluded because the investigational products were not administered with food, as required by the label. On D7 and D14, 72.7% and 90.9% of treated dogs were eye worm free, whereas in the placebo group 95.2% and 76.2% still harbored nematodes, resulting in a mean percentage worm count reduction for the Milbemax(R) group of 86.1% and 96.8%, respectively. Both results were significantly higher (p = 0.0001) than the placebo group. Out of the 31 cats (11 CH, 20 ITA) included in the study at D7 and D14, 53.3% and 73.3% treated with Milbemax(R) were free of T. callipaeda, while 81.3% and 73.3 in the placebo group were still harboring eye worms, resulting in a mean percentage worm count reduction for the treated group of 62.2% and 80.0%, respectively. Both results were significantly higher (p = 0.0106 and p = 0.0043) than the placebo group. CONCLUSIONS: The commercial formulation Milbemax(R), at the minimal dose of 0.5 mg/kg and 2 mg/kg milbemycin oxime for dogs and cats, respectively, showed a high therapeutic efficacy in curing T. callipaeda infestations. The advantages of an oral application of Milbemax(R) are additionally increased by the large spectrum of activity of praziquantel and milbemycin oxime against cestodes and nematodes infesting dogs and cats.


Characterization of the partial VP2 gene region of canine parvoviruses in domestic cats from Turkey.

Canine parvoviruses (CPVs) is a category comprising three closely related viruses, CPV, feline panleukopenia virus (FPLV), and mink enteritis virus, all of which cause serious diseases, especially in young cats. In this study, molecular detection and genetic analysis of a partial VP2 gene region of CPVs from domestic cats living in Turkey between 2006 and 2010 was performed by PCR amplification and sequence analysis. The results indicated that CPV-2a, CPV-2c, and FPLV were circulating in vaccinated and unvaccinated cats. This is the first description of molecular characterization of CPVs in domestic cats from Turkey.


The usefulness of immunohistochemistry to differentiate between nasal carcinoma and lymphoma in cats: 140 cases (1986-2000).

A retrospective evaluation of 232 feline nasal biopsies initially diagnosed as either carcinoma or lymphoma was performed by two pathologists. One or both pathologists disagreed with the original diagnosis in 15 cases (7%), 14 of which had original diagnoses of carcinoma. Out of the 232 cases, 140, including the disputed ones, were subjected to immunohistochemical staining with epithelial and lymphoid markers. Immunohistochemical staining of the 15 disputed cases showed that the original diagnoses were incorrect in 67% (10/15), unverified in 13% (2/15) and correct in 20% (3/15). Among the consensual diagnoses, immunohistochemistry revealed that 3% (4/125) of diagnoses were unverified because they did not stain for any of the markers evaluated. This report demonstrates the importance of immunohistochemistry in establishing a correct histologic diagnosis for nasal neoplasms in cats.


Pharyngeal pouch and cleft remnants in the dog and cat: a case series and review.

Remnants of the pharyngeal apparatus can (rarely) form cysts. This retrospective case series describes clinical and histologic findings of such lesions. Clinical and histology databases were searched for cases of pharyngeal remnants. Eight patients were diagnosed with cysts located subcutaneously in the head and neck, adjacent to the submandibular salivary gland, near the thyroid, and in the mediastinum. Cyst linings included ciliated epithelium, and surgical excision was curative. Knowledge of pharyngeal development is useful for their characterization. Clinicians should consider pharyngeal remnants as differentials for cystic lesions in small animals.


Oral administration of lanthanum dioxycarbonate does not alter bone morphology of normal cats.
**Primary care veterinary usage of systemic glucocorticoids in cats and dogs in three UK practices.**  
OBJECTIVES: To describe systemic glucocorticoid usage in cats and dogs by three primary care-veterinary practices in England and to ascertain risk factors for clinical use. To evaluate consistency of prescribing patterns across clinics. To validate a merged database of primary veterinary clinical data as a functional tool for clinical epidemiological research. METHODS: A merged database was established from clinical data on 31,273 cat and dog consultations with pharmacotherapy from three veterinary practices in England. Descriptive statistics described systemic glucocorticoid drug use in cats and dogs while mixed-effects logistic regression modelling evaluated risk factors. Individual clinic usage was compared. RESULTS: Overall, 1877 (16.68%) cat consultations and 2913 (14.55%) dog consultations resulted in systemic glucocorticoid therapy. Cats received higher parenteral (P<0.0001) and oral (P<0.0001) dose levels than dogs. Pathophysiological indication, age, skin condition, sex and clinic attended were significant risk factors for glucocorticoid prescription. Clinics varied widely in their odds of systemic glucocorticoid usage (P<0.0001). CLINICAL SIGNIFICANCE: An evidence base for systemic glucocorticoid prescribing by primary care small animal practices in England is provided. Clinic attended was a significant risk factor, indicating wide variation in prescribing patterns between clinics. A merged primary care veterinary clinical database was effective for epidemiological research.

**Detection of bacterial DNA in bile of cats with lymphocytic cholangitis.**  
In this study, we have successfully used molecular methods based on the amplification of the 16S ribosomal RNA gene on feline bile samples to show that bile of cats with LC is not sterile. This is probably due to the fact that the inflammatory process in the biliary tree causes dilatations. As a result, bacteria can easily migrate from the intestines via the common bile duct. The diversity of species identified and the presence of Helicobacter spp. DNA in both patients and controls suggests that bacteriobilia is secondary to the disease and is not the cause of LC.

**Serum D-Lactate Concentrations in Cats with Gastrointestinal Disease.**  
BACKGROUND: Increased D-lactate concentrations cause neurological signs in humans with gastrointestinal disease. HYPOTHESIS/OBJECTIVES: To determine if serum D-lactate concentrations are increased in cats with gastrointestinal disease compared to healthy controls, and if concentrations correlate with specific neurological or gastrointestinal abnormalities. ANIMALS: Systematically selected serum samples submitted to the Gastrointestinal Laboratory at Texas A&M University from 100 cats with clinical signs of gastrointestinal disease and abnormal gastrointestinal function tests, and 50 healthy cats. METHODS: Case-control study in which serum D- and L-lactate concentrations and retrospective data on clinical signs were compared between 50 healthy cats and 100 cats with gastrointestinal disease. Association of D-lactate concentration with tests of GI dysfunction and neurological signs was evaluated by multivariate linear and logistic regression analyses, respectively. RESULTS: All 100 cats had a history of abnormal gastrointestinal signs and abnormal gastrointestinal function test results. Thirty-one cats had definitive or subjective neurological abnormalities. D-lactate concentrations of cats with gastrointestinal disease (median 0.36, range 0.04-8.33 mmol/L) were significantly higher than those in healthy controls (median 0.22, range 0.04-0.87 mmol/L; P = 0.022). L-lactate concentrations were not significantly different between the 2 groups of cats with gastrointestinal disease and healthy controls. D-lactate concentrations were not significantly associated with PPL, rTL, cobalamin, folate, or neurological abnormalities (P > 0.5). CONCLUSIONS AND CLINICAL IMPORTANCE: D-lactate concentrations can be increased in cats with gastrointestinal disease. These findings warrant additional investigations into the role of intestinal microbiota derangements in cats with gastrointestinal disease, and the association of D-lactate and neurological abnormalities.

**Malignant peripheral nerve sheath tumour of the urinary bladder in a cat.**  
A 14-year-old domestic shorthair cat presented with a 5-month history of urinary incontinence and inappetence. Ultrasonography revealed a well-marginated, vascular mass of mixed echogenicity ex-tending from the dorsal wall of the urinary bladder into the lumen. Partial cystectomy was performed for re-moval of the urinary bladder mass; histopathological evaluation revealed a spindle cell neoplasm with a prominent palisading pattern. Histomorphologic features and immunohistochemical demonstration of vimentin, glial fibrillary acidic protein and S-100 protein, combined with negativity for smooth muscle actin and desmin were consistent with malignant peripheral nerve sheath tumour. This case report describes a novel location of malignant peripheral nerve sheath tumour; to the authors’ knowledge, the bladder has not been described as a site of origin in the cat or any other domestic species.

**Feline infectious peritonitis: role of the feline coronavirus 3c gene in intestinal tropism and pathogenicity based upon**
isolates from resident and adopted shelter cats.
Feline infectious peritonitis virus (FIPV) was presumed to arise from mutations in the 3c of a ubiquitous and largely nonpathogenic feline enteric coronavirus (FECV). However, a recent study found that one-third of FIPV isolates have an intact 3c and suggested that it is not solely involved in FIP but is essential for intestinal replication. In order to confirm these assumptions, 27 fecal and 32 FIP coronavirus isolates were obtained from resident or adopted cats from a large metropolitan shelter during 2008-2009 and their 3a-c, E, and M genes sequenced. Forty percent of coronavirus isolates from FIP tissues had an intact 3c gene, while 60% had mutations that truncated the gene product. The 3c genes of fecal isolates from healthy cats were always intact. Coronavirus from FIP diseased tissues consistently induced FIP when given either oronasally or intraperitoneally (i.p.), regardless of the functional status of their 3c genes, thus confirming them to be FIPVs. In contrast, fecal isolates from healthy cats were infectious following oronasal infection and shed at high levels in feces without causing disease, as expected for FECVs. Only one in three cats shed FECV in the feces following i.p. infection, indicating that FECVs can replicate systemically, but with difficulty. FIPVs having a mutated 3c were not shed in the feces following either oronasal or i.p. inoculation, while FIPVs with intact 3c genes were shed in the feces following oronasal but not i.p. inoculation. Therefore, an intact 3c appears to be essential for intestinal replication. Although FIPVs with an intact 3c were shed in the feces following oronasal inoculation, fecal virus from these cats was not infectious for other cats. Attempts to identify potential FIP mutations in the 3a, 3b, E, and M were negative. However, the 3c gene of FIPVs, even though appearing intact, contained many more non-synonymous amino acid changes in the 3’ one-third of the 3c protein than FECVs. An attempt to trace FIPV isolates back to enteric strains existing in the shelter was only partially successful due to the large region over which shelter cats and kittens originated, housing conditions prior to acquisition, and rapid movement through the shelter. No evidence could be found to support a recent theory that FIPVs and FECVs are genetically distinct.

Analgesia after feline ovariohysterectomy under midazolam-medetomidine-ketamine anaesthesia with buprenorphine or butorphanol, and carprofen or meloxicam: a prospective, randomised clinical trial.
One hundred female cats undergoing routine ovariohysterectomy under midazolam-medetomidine-ketamine anaesthesia were included in a blinded, randomised, prospective clinical study to compare postoperative analgesia produced by four analgesic drug combinations given preoperatively (n = 25 per group). A secondary aim was to assess the effects in kittens and pregnant animals. Buprenorphine 180 microg/m(2) or butorphanol 6 mg/m(2) were given with either carprofen 4 mg/kg (groups BUPC and BUTC, respectively) or meloxicam 0.3 mg/kg (groups BUPM or BUTM, respectively). Medetomidine was not antagonised. A simple, descriptive scale (SDS; 0-4), a dynamic and interactive visual analogue scale (DIVAS; 0-100 mm) and mechanical nociceptive thresholds (MT; 2.5-mm diameter probe) were used to evaluate postoperative pain. All pain scores were low (DIVAS <10 mm, SDS <2 and MT >10 N) and there were no significant differences between the groups. It was concluded that all protocols provided adequate analgesia and when used with midazolam-medetomidine-ketamine are effective for routine feline ovariohysterectomy.

Neonatal Gene Therapy With a Gamma Retroviral Vector in Mucopolysaccharidosis VI Cats.
Mucopolysaccharidosis (MPS) VI is due to a deficiency in the activity of N-acetylgalactosamine 4-sulfatase (4S), also known as arylsulfatase B. Previously, retroviral vector (RV)-mediated neonatal gene therapy reduced the clinical manifestations of MPS I and MPS VII in mice and dogs. However, sulfatases require post-translational modification by sulfatase-modifying factors. MPS VI cats were injected intravenously (i.v.) with a gamma RV-expressing feline 4S, resulting in 5 +/- 3 copies of RV per 100 cells in liver. Liver and serum 4S activity were 1,450 +/- 1,720 U/mg (26-fold normal) and 107 +/- 60 U/ml (13-fold normal), respectively, and were directly proportional to the liver 4S protein levels for individual cats. This study suggests that sulfatase-modifying factor (SUMF) activity in liver was sufficient to result in active enzyme despite overexpression of 4S. RV-treated MPS VI cats achieved higher body weights and longer appendicular skeleton lengths, had reduced articular cartilage erosion, and reduced aortic valve thickening and aortic dilatation compared with untreated MPS VI cats, although cervical vertebral bone lengths were not improved. This demonstrates that therapeutic expression of a functional sulfatase protein can be achieved with neonatal gene therapy using a gamma RV, but some aspects of bone disease remain difficult to treat.

Toggle rod stabilisation of coxofemoral luxation in 14 cats.
Objectives: To describe the surgical technique and to report outcomes in cats with coxofemoral luxation treated with open reduction and toggle rod stabilisation. Methods: Retrospective study of cats with coxofemoral luxation stabilised via the toggle rod method. Short-term follow-up included clinical examination and radiographs. Long-term follow-up was via owner questionnaire. Results: Fourteen cats were included. All of the cats had reported unilateral craniodorsal hip luxation. Nine cats (64.3%) had additional orthopaedic abnormalities. Luxations were stabilised with a 3.2-mm toggle rod (2.7-mm toggle...
between cat and cattle isolates but showed full sequence identity within strains from either cat or cattle isolates.

Genetic markers were suited to define both genetic loci confirmed that T. suis and T. mobilensis are phylogenetically very close to T. foetus. Moreover, these two sufficiently variable to allow unambiguous genetic discrimination between different trichomonad species. Comparison of both genetic loci confirmed that T. suis and T. mobilensis are phylogenetically very close to T. foetus. Moreover, these two genetic markers were suited to define host-specific genotypes of T. foetus. Both loci showed single base differences allowing unambiguous genetic discrimination between different trichomonad species. Comparisons of both genetic loci confirmed that T. suis and T. mobilensis are phylogenetically very close to T. foetus. Moreover, these two genetic markers were suited to define host-specific genotypes of T. foetus. Both loci showed single base differences between cat and cattle isolates but showed full sequence identity within strains from either cat or cattle isolates.


Mushroom poisoning cases in dogs and cats: diagnosis and treatment of hepatotoxic, neurotoxic, gastroenterotoxic, nephrotoxic, and muscarinic mushrooms.

Of the several thousand species of mushrooms found in North America, less than 100 are toxic. Species in the genus Amanita are responsible for the vast majority of reported mushroom poisonings. In general, the number of reported mushroom poisonings in animals is low, most likely because toxicology testing is available for a limited number of mushroom toxins and thus many cases are not confirmed or reported. Also, only a limited number of mushrooms are submitted for identification purposes. Mushroom intoxications require tremendous efforts from clinicians and toxicologists in terms of making a diagnosis and treatment, and management is challenging.

Adrenal function in cats with hyperthyroidism.

Adrenal function may be altered in animals with hyperthyroidism. The aim of the study was to assess adrenal function of hyperthyroid cats (n = 17) compared to healthy cats (n = 18) and cats with chronic diseases (n = 18). Adrenal function was evaluated by adrenocorticotropic hormone (ACTH) stimulation test and the urinary cortisol to creatinine ratio (UCCR) was determined. Length and width of both adrenal glands were measured via ultrasound. Hyperthyroid cats had significantly higher cortisol levels before and after stimulation with ACTH than the other groups. However, the UCCR was not elevated in hyperthyroid cats. The size of the adrenal glands of hyperthyroid cats was not significantly different from the size of those of healthy cats. The results indicate that cats with hyperthyroidism have a higher cortisol secretory capacity in a hospital setting. The normal size of the adrenal glands suggests that cortisol levels may not be increased permanently.


Pasteurella canis Isolation following Penetrating Eye Injury: A Case Report.

A 3-year-old boy presented with history of trauma to the left eye after he accidentally injured his eye with a broom stick made up from coconut skewers. There was history of cats as their pets but not dogs. Ocular examination revealed left superonasal conjunctival laceration and scleral perforation with prolapsed vitreous. Fundus examination showed minimal vitreous haemorrhage and flat retina. Conjunctiva swab at the wound site was sent for gram staining, culture, and sensitivity. He underwent scleral suturing, vitreous tap, and intravitreal injection of Ceftazidime and Amikacin. Vitreous tap was sent for gram stained, culture and sensitivity. Postoperatively, he was started empirically on IV Ciprofloxacin 160 mg BD, Guttac Ciprofloxacin, and Guttac Ceftazidime. Conjunctiva swab grew Pasteurella canis which was sensitive to all Beta lactams, Ciprofloxacin, Chloramphenicol, and Aminoglycoside. Post-operative was uneventful, absent signs of endophthalmitis or orbital cellulitis.


Tritrichomonas foetus isolates from cats and cattle show minor genetic differences in unrelated loci ITS-2 and EF-1alpha.

The protozoan parasite Tritrichomonas foetus is well known as an important causative agent of infertility and abortion in cattle (bovine trichomoniasis). This World Organisation for Animal Health (O.I.E.) notifiable disease is thought to be under control in many countries including Switzerland. In recent studies, however, T. foetus has also been identified as an intestinal parasite that causes chronic large-bowel diarrhoea in cats. Since the feline isolates were considered indistinguishable from bovine isolates, the possibility and risk of parasite transmission from cats to cattle and vice versa has been intensively discussed in current literature. Therefore, we investigated if cat and cattle isolates are genetically distinct from each other or in fact represent identical genotypes. For this purpose, two independent genetic loci were selected that turned out to be well-suited for a PCR sequencing-based genotyping of trichomonad isolates: (i) previously published internal transcribed spacer region 2 (ITS-2) and (ii) a semi-conserved sequence stretch of the elongation factor-1 alpha (EF-1alpha) gene used for the first time in the present study. Respective comparative analyses revealed that both loci were sufficiently variable to allow unambiguous genetic discrimination between different trichomonad species. Comparison of both genetic loci confirmed that T. suis and T. mobilensis are phylogenetically very close to T. foetus. Moreover, these two genetic markers were suited to define host-specific genotypes of T. foetus. Both loci showed single base differences between cat and cattle isolates but showed full sequence identity within strains from either cat or cattle isolates.
Furthermore, an additional PCR with a forward primer designed to specifically amplify the bovine sequence of EF-1alpha was able to discriminate bovine isolates of T. foetus from feline isolates and also from other trichomonads. The implications these minor genetic differences may have on the biological properties of the distinct isolates remain to be investigated.


**Potassium iodide capsule treatment of feline sporotrichosis.**

Sporotrichosis is a mycosis caused by Sporothrix schenckii. The most affected animal is the cat; it has played an important role in the zoontic transmission of this disease, especially in Rio de Janeiro, Brazil, since 1998. In order to evaluate the treatment of feline sporotrichosis with potassium iodide, an observational cohort was conducted in 48 cats with sporotrichosis at Instituto de Pesquisa Clinica Evandro Chagas, Fiocruz. All cats received potassium iodide capsules, 2.5 mg/kg to 20 mg/kg q24h. The cure rate was 47.9%, treatment failure was 37.5%, treatment abandonment was 10.4% and death was 4.2%. Clinical adverse effects were observed in 52.1% of the cases. Thirteen cats had a mild increase in hepatic transaminase levels during the treatment, six of them presented clinical signs suggestive of hepatotoxicity. Compared to previous studies with itraconazole and iodide in saturated solution, potassium iodide capsules are an alternative for feline sporotrichosis treatment.


**Jugular venipuncture for blood sample collection in cats.**


**Survival of a feline isolate of Tritrichomonas foetus in water, cat urine, cat food and cat litter.**

Feline intestinal trichomoniasis caused by Tritrichomonas foetus is associated with large bowel diarrhea in cats from many parts of the world. It has long been recognized as an economically important sexually transmitted disease that causes early abortion in cattle. Isolates of T. foetus from cattle are infectious for the large intestine of cats and isolates of T. foetus from cats are infectious for the reproductive system of cattle. The parasite is maintained by fecal-oral transmission in cats. The present study was conducted to examine the survival of a feline isolate of T. foetus, AUTF-12, under various conditions that are relevant to fecal-oral transmission in cats. Trophozoites were grown in TYM medium and then exposed to water, cat urine, dry cat food, canned cat food, clumping cat litter, or filter paper for various lengths of time and then re-cultured in TYM medium. Trophozoites survived exposure to distilled or tap water for 30 but not 60 min, while they survived for at least 180 min in urine. Trophozoites survived for 30 min on dry cat food but survived for 120-180 min in canned cat food. No survival of trophozoites was observed on cat litter but trophozoites survived for 15 min when placed on filter paper. Our results indicate that T. foetus can survive and be potentially infectious in water, urine, dry cat food and canned cat food.


**First isolation in Argentina of a highly virulent Shiga toxin-producing Escherichia coli O145:NM from a domestic cat.**

INTRODUCTION: Hemolytic uremic syndrome (HUS) is distributed worldwide. In Argentina, more than 450 cases of HUS, mostly sporadic, are reported annually. The main serotype isolated is O157:H7, and among non-O157 STEC, O145:NM is the most frequent strain. We studied the relationship of companion animals living in contact with a child with sporadic HUS, as carriers of Shiga toxin-producing Escherichia coli (STEC) strains. METHODOLOGY: Duplicate rectal swab samples were taken weekly from the household cat and dog at the home of a patient with HUS. Samples were plated on MacConkey and sorbitol MacConkey-CT agar. Confluent growth from each plate was screened for the presence of stx1, stx2 and rfbO157 gene by PCR assays. Up to 300 individual colonies taken from positive plates at screening were retested by PCR. RESULTS: The strain from the cat belonged to the highly virulent serotype O145:NM. Although this strain differed antigenically from the strain isolated from a child with HUS living in the same house, both carried the stx2, eae and ehxA virulence genes. The strain isolated from the dog belonged to the serotype O178:H19. CONCLUSIONS: An asymptomatic household cat may harbour the high virulence STEC strain, such as O145:NM, the second most frequently STEC serotype associated with HUS in Argentina. Companion animals are probably exposed to the same sources as the humans. More studies are needed to establish dogs and cats as sources of infection in the epidemiological cycle of infections caused by STEC strains, and to develop effective control strategies for this pathogen.


**Herpesvirus dermatitis in two cats without facial lesions.**

BACKGROUND: Cats with feline herpesvirus (FeHV-1)-associated dermatitis typically present with ulcerative lesions on the rostral muzzle and nasal planum. This report describes FeHV-1 dermatitis in the flank region, in the absence of facial lesions. HYPOTHESIS/OBJECTIVES: Clinicians should be aware of this unusual manifestation of FeHV-1 dermatitis to prevent potential misdiagnosis. ANIMALS: A 12-year-old male castrated Bengal cat and a 3-year-old male castrated
Siamese cat with plaques and ulcers in the flank region are described. METHODS: Formalin-fixed biopsy samples were obtained from lesional skin. Histopathology and FeHV-1 immunohistochemistry were performed. RESULTS: Each sample had epidermal and follicular necrosis with a dense dermal infiltrate of eosinophils. Few to moderate numbers of intranuclear inclusion bodies were present in keratinocytes. The presence of FeHV-1 in the lesions was confirmed with immunohistochemistry. CONCLUSIONS AND CLINICAL IMPORTANCE: Feline herpesvirus-associated dermatitis should not be ruled out based on the location of the lesion, because a correct diagnosis is imperative for proper treatment. Future studies to assess the cause of lesions at this unusual site are warranted.

Comparison of oral robenacoxib and ketoprofen for the treatment of acute pain and inflammation associated with musculoskeletal disorders in cats: A randomised clinical trial.
The objective of the study was to evaluate the efficacy and tolerability of robenacoxib, a selective cyclooxygenase-2 inhibitor, for the treatment of acute pain and inflammation associated with musculoskeletal disorders in cats. The study was a prospective, multi-centre, randomised, blinded, non-inferiority design clinical trial comparing robenacoxib to ketoprofen. A total of 68 cats presenting with pain and inflammation associated with acute musculoskeletal disorders were recruited and allocated randomly to receive, orally once daily for 5-6 days, either 1.0-2.4 mg/kg robenacoxib (n=47) or 1 mg/kg ketoprofen (n=21). The primary efficacy endpoint was the total clinician score, which was the sum of clinician numerical rating scale scores for pain, inflammation and mobility. Assessments were made at baseline, on day 2, and day 4 or 5. For the total clinician score, non-inferior efficacy of robenacoxib was demonstrated with a relative efficacy of 1.151 (95% confidence interval 0.872-1.494). Non-inferior efficacy of robenacoxib was also demonstrated for the secondary endpoint of the total owner score. Robenacoxib was superior (P<0.05) to ketoprofen for the owner’s assessment of activity and human/animal relationship. The tolerability of both treatments was good as assessed by monitoring adverse events, clinical signs and haematology and serum biochemistry variables.

Population Genetic Structures of Staphylococcus aureus Isolates from Cats and Dogs in Japan.
We determined the population genetic structures of feline and canine Staphylococcus aureus strains in Japan by multilocus sequence typing (MLST). Ecological analyses suggested that multiple feline-related S. aureus clones, including ST133, naturally occur as commensals and can cause endogenous infections in felines. In contrast, S. aureus populations do not likely include any clone that exhibits tropism in domestic dogs. Even if S. aureus infections occur in dogs, the pathologies are likely exogenous infections.

Comparison of glomerular filtration rate determined by use of single-slice dynamic computed tomography and scintigraphy in cats.
Objective: To compare estimation of glomerular filtration rate determined via conventional methods (ie, scintigraphy and plasma clearance of Technetium Tc 99m pentetate) and dynamic single-slice computed tomography (CT). ANIMALS: 8 healthy adult cats. PROCEDURES: Scintigraphy, plasma clearance testing, and dynamic CT were performed on each cat on the same day; order of examinations was randomized. Separate observers performed GFR calculations for scintigraphy, plasma clearance testing, or dynamic CT. Methods were compared via Bland-Altman plots and considered interchangeable and acceptable when the 95% limits of agreement (mean difference between methods +/- 1.96 SD of the differences) were <= 0.7 mL/min/kg. RESULTS: Global GFR differed < 0.7 mL/min/kg in 5 of 8 cats when comparing plasma clearance testing and dynamic CT; the limits of agreement were 1.4 and -1.7 mL/min/kg. The mean +/- SD difference was -0.2 +/- 0.8 mL/min/kg, and the maximum difference was 1.6 mL/min/kg. The mean +/- SD difference (absolute value) for percentage filtration by individual kidneys was 2.4 +/- 10.5% when comparing scintigraphy and dynamic CT; the maximum difference was 20%, and the limits of agreement were 18% and 23% (absolute value). CONCLUSIONS AND CLINICAL RELEVANCE: GFR estimation via dynamic CT exceeded the definition for acceptable clinical use, compared with results for conventional methods, which was likely attributable to sample size and preventable technical complications. Because 5 of 8 cats had comparable values between methods, further investigation of dynamic CT in a larger sample population with a wide range of GFR values should be performed.

Examination of the anterior uveoscleral pathway in domestic species.
OBJECTIVE: To investigate the uveoscleral (US) pathway in the normal eyes of four domestic spp.: the cat, pig, cow and horse by examining the comparative anatomical structure of anterior US pathway. ANIMALS STUDIED: Four cats, ten pigs, four cows, eight horses. PROCEDURES: Formalin-preserved specimens from anterior uveas of the cat, pig, cow and horse were embedded and serially sectioned sagittally and tangentially and stained with H&E, Masson’s trichrome, smooth...
muscle actin immunolabel, or elastin stain. RESULTS: Spaces between the endings of the outer anterior ciliary body musculature (CBM) formed avenues for the beginning of the US pathway and varied in the amount of extracellular matrix (ECM) material being most developed in the pig. In the cow, other anterior muscle bundles attached the CBM to the sclera concomitant with the presence of an anterior elastic sheath. In the horse, these muscle bundles were connected to branching connective tissue trabeculae within the US pathway that were attached radially to the sclera. In the cat, muscle bundles were more abundant and formed a fine meshwork of trabecular associations with the posterior ICA. Supraciliary development was most pronounced in the horse and least in the pig. CONCLUSION: All species possessed clearly developed and unique US pathways. The outermost muscle bundles of the CBM appeared to have close interaction with the US pathway and the degree of these muscle associations differed with species. The species specific anatomical variations within the US pathway could play a pivotal role in the variability of aqueous outflow along this pathway.


**Effect of amantadine on oxymorphone-induced thermal antinociception in cats.**
This study examined the effect of amantadine, an N-methyl-d-aspartate receptor antagonist, on the thermal antinociceptive effect of oxymorphone in cats. Six adult healthy cats were used. After baseline thermal threshold determinations, oxymorphone was administered intravenously to maintain plasma oxymorphone concentrations of 10, 20, 50, 100, 200, and 400 ng/mL. In addition, amantadine, or an equivalent volume of saline, was administered intravenously to maintain a plasma amantadine concentration of 1100 ng/mL. Thermal threshold and plasma oxymorphone and amantadine concentrations were determined at each target plasma oxymorphone concentration. Effect maximum models were fitted to the oxymorphone concentration-thermal threshold data, after transformation in % maximum response. Oxymorphone increased skin temperature, thermal threshold, and thermal excursion (i.e., the difference between thermal threshold and skin temperature) in a concentration-dependent manner. No significant difference was found between the amantadine and saline treatments. Mean +/- SE oxymorphone EC(50) were 14.2 +/- 1.2 and 24.2 +/- 7.4 ng/mL in the amantadine and saline groups, respectively. These values were not significantly different. Large differences in oxymorphone EC(50) in the saline and amantadine treatment groups were observed in two cats. These results suggest that amantadine may decrease the antinociceptive dose of oxymorphone in some, but not all, cats.


**Hypertrophic cardiomyopathy in the Sphynx cat: a retrospective evaluation of clinical presentation and heritable etiology.**
Hypertrophic cardiomyopathy is an inherited disease in some feline breeds including the Maine Coon and Ragdoll. In these breeds, distinct causative genetic mutations have been identified. The two breeds appear to have slightly different clinical presentations, including age of diagnosis. The observation that these two breeds may have different clinical presentations, as well as different genetic mutations, suggests that hypertrophic cardiomyopathy is a diverse disease in the cat. Hypertrophic cardiomyopathy is poorly described in the Sphynx. The objective of this study was to phenotypically characterize Sphynx hypertrophic cardiomyopathy and to evaluate for a familial etiology. Records of 18 affected cats (11 female, seven male) were evaluated. Age of affected cats ranged from 0.5 to 7 years (median, 2 years). Four affected cats were from a single family and included an affected cat in each of four generations (three females, one male). Further studies are warranted to evaluate for a causative mutation and better classify the phenotypic expression.


**Effect of NT-pro-BNP Assay on Accuracy and Confidence of General Practitioners in Diagnosing Heart Failure or Respiratory Disease in Cats with Respiratory Signs.**
BACKGROUND: N-terminal pro-B-type natriuretic peptide (NT-proBNP) can distinguish congestive heart failure (CHF) from primary respiratory disease in cats with respiratory signs with approximately 90% diagnostic accuracy, but the additive benefit of NT-proBNP to improve the diagnosis obtained from conventional testing in individual cases remains unknown. HYPOTHESIS: NT-proBNP will improve the diagnostic accuracy and confidence of general practice veterinarians in assessing cats with respiratory signs. ANIMALS: Ten cats with respiratory signs. METHODS: History, physical examination, thoracic radiographs, electrocardiogram (ECG), and biochemical analysis of 10 cats presented to the University of Pennsylvania or Tufts University with a history of respiratory signs were evaluated by 50 general practice veterinarians using an online survey tool. Participants were asked to provide (1) diagnosis of CHF or primary respiratory disease, and (2) level of confidence in their diagnosis (1, lowest to 10, highest) before and after disclosure of NT-proBNP results. Diagnoses (CHF, n = 5; primary respiratory, n = 5) were compared to the gold standard defined as consensus opinion of 3 board-certified cardiologists blinded to the NT-proBNP results. RESULTS: Overall correctness of the practitioners was 69.2%, and significantly increased after practitioners were provided NT-proBNP results (87.0%, P =.0039). Median practitioner confidence before NT-proBNP disclosure was 6 (IQR, 5-8) and significantly increased after disclosure (8; IQR, 6-10; P =.0039). CONCLUSIONS: These data indicate a relatively low accuracy and level of confidence in the diagnosis of feline respiratory signs. Use of NT-proBNP assay in conjunction with conventional evaluation by general practitioners significantly improved their diagnostic accuracy and confidence.

**Radiographic characterization of enlarged sternal lymph nodes in 71 dogs and 13 cats.**

In this retrospective study, radiographically enlarged sternal lymph nodes (LNs) were evaluated in 71 dogs and 13 cats for average size, location, and most representative radiographic view. Concurrent clinical diagnoses were also noted and grouped into one of three following categories: neoplastic, inflammatory, or hematologic. There were no statistically significant differences in LN size between lateral views within each species. Enlarged sternal LNs were more cranially positioned in dogs than cats. No statistical difference was noted between right and left laterals, as to on which projection the enlarged sterna lymph nodes was seen best. Neoplastic disease (78.9%) was the most prevalent condition seen in association with LN enlargement in dogs, followed by primary infectious or inflammatory diseases (14.1%) and various hematologic conditions (7.0%). In cats, neoplasia was also most common (69.2%), followed by inflammatory diseases (30.8%). No hematologic conditions were noted in cats. The most common etiologic agent seen concurrently with enlarged sternal LNs in both dogs (33.8%) and cats (38.5%) was malignant lymphoma. The results of this study provide a clinically useful representation of the average size and location of radiographically enlarged sternal LNs for dogs and cats. The diseases represented demonstrate the wide spectrum of potential causes of sternal lymphadenopathy.


**The synergistic action of imidacloprid and flumethrin and their release kinetics from collars applied for ectoparasite control in dogs and cats.**

**ABSTRACT:** BACKGROUND: The control of tick and flea burdens in dogs and cats has become essential to the control of important and emerging vector borne diseases, some of which are zoonoses. Flea worry and flea bite hypersensitivity are additionally a significant disease entity in dogs and cats. Owner compliance in maintaining the pressure of control measures has been shown to be poor. For these reasons efforts are continuously being made to develop ectoparasiticides and application methods that are safe, effective and easy to apply for pet owners. A new polymer matrix collar has recently been developed which is registered for 8 months use in cats and dogs. The basic properties of this collar have been investigated in several in vitro and in vivo studies. METHODS: The effects of imidacloprid, flumethrin and the combination were evaluated in vitro by means of whole cell voltage clamp measurement experiments conducted on isolated neuron cells from Spodoptera frugiperda. The in vitro efficacy of the two compounds and the combination against three species of ticks and their life stages and fleas were evaluated in a dry surface glass vial assay. The kinetics of the compounds over time in the collar were evaluated by the change in mass of the collar and measurement of the surface concentrations and concentrations of the actives in the collar matrix by HPLC. Hair clipped from collar treated dogs and cats, collected at various time points, was used to assess the acaricidal efficacy of the actives ex vivo. RESULTS: An in vitro isolated insect nerve model demonstrated the synergistic neurotoxic effects of the pyrethroid flumethrin and the neonicotinoid imidacloprid. An in vitro glass vial efficacy and mortality study against various life stages of the ticks Ixodes ricinus, Rhipicephalus sanguineus and Dermacentor reticulatus and against the flea (Ctenocephalides felis) demonstrated that the combination of these products was highly effective against these parasites. The release kinetics of these actives from a neck collar (composed with 10% imidacloprid and 4.5% flumethrin) was extensively studied in dogs and cats under laboratory and field conditions. Acaricidal concentrations of the actives were found to be consistently released from the collar matrix for 8 months. None of the collar studies in dogs or cats were associated with any significant collar related adverse event. CONCLUSION: Here we demonstrated the synergism between the pyrethroid flumethrin and the neonicotinoid imidacloprid, both provided in therapeutically relevant doses by a slow release collar matrix system over 8 months. This collar is therefore a convenient and safe tool for a long-term protection against ectoparasites.


**Efficacy of an imidacloprid/flumethrin collar against fleas and ticks on cats.**

**ABSTRACT:** BACKGROUND: The objectives of the studies listed here were to ascertain the therapeutic and sustained efficacy of 10% imidacloprid (w/w) and 4.5% flumethrin (w/w) incorporated in a slow-release matrix collar, against laboratory-infestations of fleas and ticks on cats. Efficacy was evaluated against the flea Ctenocephalides felis felis, and the ticks Ixodes ricinus, Amblyomma americanum and Rhipicephalus turanicus. The number of studies was so large that only a general overview can be presented in this abstract. METHODS: Preventive efficacy was evaluated by infesting groups of cats (n = 8-10) with C. felis felis and/or I. ricinus, A. americanum or R. turanicus at monthly intervals at least, for a period of up to 8 months. Efficacy against fleas was evaluated 24 to 48 h after treatment and 24 h after infestation, and against ticks at 6 h (repellent) or 48 h (acaricidal) after infestation. Efficacy against flea larvae was evaluated over a period of 8 months by incubating viable flea eggs on blanket samples after cat contact. In all cases efficacy was calculated by comparison with untreated negative control groups. RESULTS: Efficacy against fleas (24 h) generally exceeded 95% until study termination. In vitro efficacy against flea larvae exceeded 92% until Day 90 and then declined to 67% at the conclusion of the study on Day 230. Sustained acaricidal (48 h) efficacy over a period of eight months was consistently 100% against I. ricinus from Day 2 after treatment, 100% against A. americanum, except for 98.5% and 97.7% at two time-points, and between 94% and
100% against R. turanicus. From Day 2 until 8 months after treatment the repellent (6 h), efficacy was consistently 100% against I. ricinus, and between 54.8% and 85.4% against R. turanicus. CONCLUSION: The rapid insecticidal and acaricidal properties of the medicated collars against newly-acquired infestations of fleas and ticks and their sustained high levels of preventive efficacy have been clearly demonstrated. Taking into account the seasonality of fleas and ticks, the collars have the potential to prevent the transmission of vector-borne diseases and other conditions directly associated with infestation throughout the season of parasite abundance.


ABSTRACT: BACKGROUND: The objective of these two GCP multicentre European clinical field studies was to evaluate the long-term efficacy and safety of a new imidacloprid/flumethrin collar (Seresto(R), Bayer AnimalHealth, Investigational Veterinary Product(IPV)) in dogs and cats naturally infested with fleas and/or ticks in comparison to a dimpylalat collar ("Ungezieferband fuer Hunde/fuer Katzen", Beaphar, Control Product (CP)). METHODS: 232 (IPV) and 81 (CP) cats and 271(IPV) and 129 (CP) dogs were treated with either product according to label claims and formed the safety population. Flea and tick counts were conducted in monthly intervals for up to 8 months in the efficacy subpopulation consisting of 118 (IPV) + 47 (CP) cats and 197 (IPV) + 94 (CP) dogs. Efficacy was calculated as reduction of infestation rate within the same treatment group and statistically compared between the two treatment groups. RESULTS: Preventive efficacy against fleas in cats/dogs varied in the IVP group between 97.4%/94.1% and 100%/100% (overall mean: 98.3%/96.7%) throughout the 8 month period and in the CP group between 57.1%/28.2% and 96.1%/67.8% (overall mean: 79.3%/57.9%). Preventive efficacy against ticks in cats/dogs varied in the IVP group between 94.0%/91.2% and 100%/100% (overall mean: 98.4%/94.7%) throughout the 8 month period and in the CP group between 90.7%/79.9% and 100%/88.0% (overall mean: 96.9%/85.6%). The IVP group was statistically non-inferior to the CP group, and on various assessment days, statistical superiority was proven for flea and tick count reduction in dogs and cats. Both treatments proved to be safe in dogs and cats with mainly minor local observations at the application site. There was moreover, no incidence of any mechanical problem with the collar in dogs and cats during the entire study period. CONCLUSIONS: The imidacloprid/flumethrin collar proved to reduce tick counts by at least 90% and flea counts by at least 95% for a period of at least 7-8 months in cats and dogs under field conditions. Therefore, it can be used as sustainable long-term preventative, covering the whole flea and tick season.


The seroprevalence of Toxoplasma gondii, Dirofilaria immitis, Feline Immunodeficiency Virus (FIV) and Feline Leukemia Virus (FeLV) infections was examined using serum or plasma samples from 746 pet cats collected between May and July 2009 from clinics and hospitals located in and around Bangkok, Thailand. The samples were tested for heartworm, FIV, and FeLV using a commercial ELISA. Of the 746 samples, 4.6% (34/746) were positive for heartworm antigen, 24.5% (183/746) had circulating FeLV antigen, and 20.1% (150/746) were positive for FIV antigen. In addition, the first 348 submitted samples were tested for T. gondii antibodies using a modified agglutination test (MAT, cut off 1:25); 10.1% (35/348) were seropositive. Of the 348 cats sampled for all four pathogens, 11, 10, and 1 were positive for T. gondii antibodies and FIV antibodies, FeLV antigen, or D. immitis antigen, respectively. Of the 35 T. gondii-seropositive cats, 42.9% (15/35) were co-infected with at least one of the other three pathogens. The presence of antibodies to FIV was significantly associated with both age and gender, while FeLV antigen presence was only associated with age. In the case of FIV, males were twice as likely to be infected as females, and cats over 10 years of age were 13.5 times more likely to be infected than cats less than 1 year of age. FeLV antigen was more common in younger cats, with cats over 10 years of age being 10 times less likely to be FeLV positive than cats under 1 year of age. This is the first survey for these four pathogens affecting feline health in Thailand.


OBJECTIVE: To identify associations among change in body weight, behavioral stress score, food intake score, and development of upper respiratory tract infection (URI) among cats admitted to an animal shelter. DESIGN: Prospective cohort study. Animals-60 adult cats admitted to an animal shelter. PROCEDURES: Body weight was measured on days 0 (intake), 7, 14, and 21. Behavioral stress and food intake were scored daily for the first 7 days; cats were monitored daily for URI. RESULTS: 49 of the 60 (82%) cats lost weight during at least 1 week while in the shelter. Fifteen (25%) cats lost >10% of their body weight while in the shelter. Thirty-five of the 60 (58%) cats developed URI prior to exiting the shelter, and only 4 cats remained at least 21 days without developing URI. Cats with high stress scores during the first week were 5.6 times as likely to develop URI as were cats with low stress scores. Food intake and stress scores were negatively
correlated (r = -0.98). CONCLUSIONS AND CLINICAL RELEVANCE: Results indicated that cats admitted to an animal shelter were likely to lose weight while in the shelter and likely to develop URI, and that cats that had high stress scores were more likely to develop URI.

Tanaka, Y., Y. Sato, S. Osawa, M. Inoue, S. Tanaka, and T. Sasaki (2012) Vet Res 43:41. Suppression of feline coronavirus replication in vitro by cyclosporin A. ABSTRACT: The feline infectious peritonitis virus (FIPV) is a member of the feline coronavirus family that causes FIP, which is incurable and fatal in cats. Cyclosporin A (CsA), an immunosuppressive agent that targets the nuclear factor pathway of activated T-cells (NF-AT) to bind cellular cyclophilins (CyP), dose-dependently inhibited FIPV replication in vitro. FK506 (an immunosuppressors of the pathway that binds cellular FK506-binding protein (FKBP) but not CyP) did not affect FIPV replication. Neither cell growth nor viability changed in the presence of either CsA or FK506, and these factors did not affect the NF-AT pathway in fcrf-4 cells. Therefore, CsA does not seem to exert inhibitory effects via the NF-AT pathway. In conclusion, CsA inhibited FIPV in vitro and further studies are needed to verify the practical value of CsA as an anti-FIPV treatment in vivo.

Taylor, P. M., C. P. Chengelis, W. R. Miller, G. A. Parker, T. R. Gleason, and E. Cozzi (2012) J Feline Med Surg Evaluation of propofol containing 2% benzyl alcohol preservative in cats. Propofol emulsion containing benzyl alcohol preservative (BA) was evaluated in cats. Eight (PB) received 1% propofol containing 2% benzyl alcohol and eight (PC) preservative-free propofol. In phase 1, cats were anaesthetised (8 mg/kg) three times at 48 h intervals. In phase 2, cats underwent three anaesthetic procedures at 48 h intervals where anaesthesia was maintained until 24 mg/kg had been administered. Clinical examination and haematological and biochemical analyses were performed regularly. Cardiorespiratory function was monitored throughout anaesthesia. Neurological examination was performed daily for 7 days after phase 2. All cats were euthanased 7 days after phase 2 and examined post mortem to determine any organ toxicity and to comply with regulatory requirements. Anaesthesia was as expected for propofol in cats and no clinically relevant differences between PB and PC were detected. The addition of BA has no additional effect when propofol is used at normal-to-high clinical doses in healthy cats.

Teixeira, B. M., M. K. Hagiwara, J. C. Cruz, and M. J. Hosie (2012) Viruses 4:383-396. Feline immunodeficiency virus in South America. The rapid emergence of AIDS in humans during the period between 1980 and 2000 has led to extensive efforts to understand more fully similar etiologic agents of chronic and progressive acquired immunodeficiency disease in several mammalian species. Lentiviruses that have gene sequence homology with human immunodeficiency virus (HIV) have been found in different species (including sheep, goats, horses, cattle, cats, and several Old World monkey species). Lentiviruses, comprising a genus of the Retroviridae family, cause persistent infection that can lead to varying degrees of morbidity and mortality depending on the virus and the host species involved. Feline immunodeficiency virus (FIV) causes an immune system disease in domestic cats (Felis catus) involving depletion of the CD4+ population of T lymphocytes, increased susceptibility to opportunistic infections, and sometimes death. Viruses related to domestic cat FIV occur also in a variety of nondomestic felids. This is a brief overview of the current state of knowledge of this large and ancient group of viruses (FIVs) in South America.

Tekes, G., D. Spies, B. Bank-Wolf, V. Thiel, and H. J. Thiel (2012) J Virol A Reverse Genetic Approach to Study Feline Infectious Peritonitis. Feline infectious peritonitis (FIP) is a lethal immunopathological disease caused by feline coronaviruses (FCoVs). Here, we describe a reverse genetic approach to study FIP by assessing the pathogenicity of recombinant type-I, type-II and chimeric type-I/type-II FCoVs. All recombinant FCoVs established productive infection in cats, and recombinant type-II FCoV (strain 79-1146) induced FIP. Virus sequence analyses from FIP-diseased cats revealed that the 3c gene stop codon of strain 79-1146 has changed to restore a full-length ORF.

Teske, E., A. J. van Lankveld, and G. R. Rutteman (2012) Vet Comp Oncol Intraperitoneal antineoplastic drug delivery: experience with a cyclophosphamide, vincristine and prednisolone protocol in cats with malignant lymphoma. In this retrospective study, the efficacy and safety were examined for an intraperitoneal chemotherapy protocol-cyclophosphamide, vincristine and prednisolone (IP-COP) in 26 cats with malignant lymphoma. Certainly in cats fiercely resisting IV administration the IP route is a more practical method, safer for the administrator and less stressful for the cat. Complete remission (CR) rate was 76.9% (n = 20). Median duration of first remission was 421 days. Estimated 1- and 2-year disease free period were 67.1 and 48.0%, respectively. Median duration of survival was 388 days and estimated overall 1- and 2-year survival periods were 54.7 and 46.9% respectively. Young cats had a more favourable prognosis. Reaching CR was essential for long-term survival. No specific IP-related adverse events (AE) were seen. AE were generally scored as mild and were not excessively abundant. These results indicate that the IP route is a safe and effective alternative for the...
administration of COP protocol chemotherapeutics.


Doppler echocardiographic diagnosis and surgical therapy of constrictive pericarditis in a cat.
A 4-year-old Ragdoll cat presented for dyspnea secondary to chylous pleural effusion to the University of Georgia Veterinary Teaching Hospital. Physical examination, complete blood count, serum chemistries, urinalysis, thoracic radiographs, abdominal radiographs, and thoracic fluid cytology and culture failed to identify an etiology for the chylous effusion. The patient tested negative for feline leukemia virus, feline immunodeficiency virus and heartworm disease. Respiration phasic influences on early diastolic trans-mitral, trans-tricuspid and pulmonary vein blood flow velocities during Doppler echocardiography were consistent with constrictive pericarditis. The cat underwent subtotal pericardectomy. The patient recovered without complication and is overtly healthy without radiographic or echocardiographic abnormalities 6-months post-surgery. Constrictive pericarditis should be considered in cats with idiopathic pleural effusion, with or without ascites, in which standard echocardiographic assessment is not suggestive of structural heart disease. If constrictive pericarditis is present, the Doppler characteristics outlined here may allow for this diagnosis to be made. Pericardectomy may be highly rewarding, although the specific etiology of the constrictive pericarditis may remain unknown.


Comparative echocardiographic and clinical features of hypertrophic cardiomyopathy in 5 breeds of cats: a retrospective analysis of 344 cases (2001-2011).
BACKGROUND: Primary hypertrophic cardiomyopathy (HCM) is the most common feline heart disease and has been demonstrated to be inherited in some breeds. However, few studies have compared HCM phenotypes and survival according to breed. OBJECTIVES: To compare epidemiological characteristics, clinical findings, left ventricular (LV) geometric patterns, and survival in several breeds of cats with HCM. ANIMALS: Three hundred and forty-four cats from 5 different breeds (Persian, Domestic Shorthair [DS], Sphynx, Maine coon [MC], and Chartreux) with primary HCM diagnosed by conventional echocardiography. METHODS: Retrospective study. Cats were classified according to breed and clinical status. RESULTS: Age at the time of diagnosis was lower (P <.001) in MC (median age, 2.5 years) and Sphynx (3.5 years) than in other breeds (OB), ie, 8.0, 8.0, and 11.0 years for DS, Chartreux, and Persians, respectively. The prevalence of LV outflow tract obstruction was higher (P <.01) in Persians (23/41; 56%) than in OB (115/303; 38%). Age at the first cardiac event was lower (P <.01) in MC (median age, 2.5 years) than in OB (7.0 years). All cats surviving > 15 years of age were DS, Persians, or Chartreux. Sudden death (representing 24% of all cardiac deaths) was observed only in 3 breeds (DS, MC, and Sphynx). CONCLUSION AND CLINICAL IMPORTANCE: As in humans, feline HCM is characterized by marked phenotypic variability with several breed-dependent features regarding epidemiology, LV geometric patterns, and clinical course (ie, age at diagnosis, 1st cardiac event, and cause of death).


Maintenance of arachidonic acid and evidence in cats fed gamma-linolenic and linoleic acid enriched diets.
Cats have limited Delta6 desaturase activity. However, gamma-linolenate (GLA) feeding may by-pass the Delta6 desaturase step allowing arachidonate (ARA) accumulation via Delta5-desaturation. Alternatively, high dietary linoleate (LNA) may induce limited Delta6 desaturase also resulting in ARA accumulation. Fatty acid profiles were determined after feeding high LNA, high GLA, or adequate LNA diets. Adult female cats (n = 29) were assigned to one of three groups and fed for 8 weeks. Plasma samples were collected at weeks 0, 2, 4 and 8 for plasma triacylglycerol (TAG), total cholesterol (TC), lipoprotein (LP), and plasma and red blood cell membrane phospholipid fatty acid determinations. Time, but no diet, effects were observed for TAG, TC, and LP fractions at weeks 2 and 4 with significant increases likely due to increased dietary fat. However, all values were within feline normal limits. The GLA diet resulted in increased dihomo-gamma-linolenic acid (DGLA) and ARA as early as week 2, supporting a 5 desaturase. Further evidence of Delta5 desaturase was found at high dietary LNA with the appearance of a novel fatty acid, 20:3 7, 11, 14, apparently formed via 5 desaturation and chain elongation of LNA. However, Delta6 desaturase induction at high dietary LNA concentration was not observed. Cats are able to maintain plasma and red blood cell ARA when fed a practical diet containing GLA using what appears to be an active Delta5 desaturase enzyme.


Effects of weight loss in obese cats on biochemical analytes related to inflammation and glucose homeostasis.
The aim of the current study was to measure circulating metabolic and inflammation-related biochemical analytes in obese cats before and after weight loss. Thirty-seven overweight neutered cats were studied, median body weight 6.85 kg (range, 4.70 to 10.30 kg), representing a range of ages and both sexes. An individualized weight-loss program was devised for each
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cat and monitored until completion. Body fat mass was determined by dual-energy x-ray absorptiometry, whereas plasma concentrations of acute-phase proteins (APPs; eg, haptoglobin and serum amyloid A), hormones (eg, insulin, IGF-1, and adiponectin), and enzymes (eg, butyrylcholinesterase and paraoxonase type I [PON-1]) associated with inflammation and metabolic compounds (eg, glucose) were also measured. No significant changes were found in APPs after weight loss (P > 0.3), but significant increases in plasma adiponectin (P = 0.021) and IGF-1 (P = 0.036) were seen, whereas insulin (P < 0.001) and homeostasis model assessment (P = 0.005) decreased significantly. Plasma concentrations before weight loss of PON-1 (P = 0.004), adiponectin (P = 0.02), and IGF-1 (P = 0.048) were less in cats that failed to complete weight loss than cats that were successful, whereas glucose concentration was greater. Finally, multivariable linear regression analysis showed that lean tissue loss during weight management was associated with percentage weight loss (greater weight loss, greater lean tissue loss; R = 0.71, P < 0.001) and plasma adiponectin concentration before weight loss (lesser adiponectin, more lean tissue loss; R = -0.52, P = 0.023). In conclusion, various metabolic abnormalities occur in feline obesity, and these can be linked to outcomes of weight-loss programs. The changes that occur with weight loss suggest an improved metabolic status.


A percutaneous/transdiaphragmatic core needle biopsy technique was developed in cats to obtain serial biopsies from different locations of the left ventricle, through which morphological and molecular changes within the same individual can be studied to unravel the mechanisms of feline cardiomyopathies. Transmural left ventricular myocardial samples were obtained from 29 anesthetized, healthy, adult cats with ultrasound guidance. An 18G automatic biopsy needle was inserted between the last left rib and the sternum through the diaphragm into the thorax. Biopsies were obtained from the left ventricular wall. In five cats, three single biopsies were taken with 4-week intervals. Autopsy was performed on six cats, of which three cats had serial biopsies. In total, 87 biopsies were obtained without long-term effects on cardiac function or structure. The biopsies caused transient single ventricular premature complexes and mild pericardial effusion without tamponade. Necropsy revealed a minimal amount of fibrous connective tissue in the diaphragm and the heart without any significant microscopic lesions in the adjacent muscle tissue. The high quality biopsy material was suitable for morphological and molecular studies. This minimally invasive, ultrasound-guided cardiac biopsy technique thus allows for the safe collection of serial biopsies to study feline cardiomyopathies in an experimental setting.


BACKGROUND: Various treatments of osteoarthritis (OA) have been described, including use of nutraceuticals. OBJECTIVES: To review systematically the literature about the effects of nutraceuticals on clinical signs of pain or abnormal locomotion in horses, dogs, and cats, and to discuss methodological aspects of trials and systematic reviews. METHODS: A systematic search of controlled trials evaluating the impact of nutraceuticals on OA in horses, dogs, and cats was performed, using Medline, CAB Abstracts, and Google Scholar. Scientific evidence was evaluated by means of criteria proposed by the Food and Drug Administration (FDA), and a scoring system adapted from both the CONsolidated Standards of Reporting Trials (CONSORT) statement and recommendations for assessing trials by the Center of Evidence Based Medicine of Oxford. RESULTS: Twenty-two papers were selected and reviewed, with 5 studies performed in horses, 16 in dogs, and 1 in cats. The strength of evidence was low for all nutraceuticals except for omega-3 fatty acid in dogs. There were limited numbers of rigorous randomized controlled trials and of participants in clinical trials. CONCLUSIONS AND CLINICAL IMPORTANCE: The evidence of efficacy of nutraceuticals is poor, with the exception of diets supplemented with omega-3 fatty acids in dogs. Greater access to systematic reviews must be part of the objectives of the veterinary science in the future. Their reporting would be improved by internationally agreed-upon criteria for standards and guidelines.


In this study an in vitro assay was optimized to detect feline proliferating lymphocytes as an assessment for the cell-mediated immune response. For this purpose, 5-bromo-2'-deoxyuridine (BrdU) labeling was chosen because of its sensitivity and the possibility of further characterization of proliferating cells. The assay was optimized by selecting the best batch and concentration of fetal bovine serum, beta-mercaptoethanol concentration, cell density, BrdU incubation time and antigen presenting cell type. Cats were vaccinated with the attenuated Nobivac vaccine Tricat and the peripheral blood lymphocyte proliferation responses were quantified upon in vitro restimulation with inactivated and infectious feline panleukopenia virus (FPV), feline calicivirus (FCV) and feline herpesvirus 1 (FeHV-1). Proliferation signals were detected
with inactivated FeHV-1 in the CD8(+) but not in the CD8(-) T lymphocyte population, with inactivated FCV and FPV in both CD8(-) and CD8(+) T lymphocyte populations. Restimulation with infectious FCV caused significant proliferation in the CD8(-) T lymphocyte population only while infectious FPV and FeHV-1 seemed to suppress lymphocyte proliferation in both T cell populations. Additional IFN-gamma quantification in the culture supernatant revealed a large correlation between the proliferation signals and IFN-gamma production, indicating that BrdU labeling is a very reliable technique to assess and characterize feline lymphoproliferative responses to viral antigens in vitro.

Cowpox virus infection of humans is an uncommon, potentially fatal, skin disease. It is largely confined to Europe, but is not found in Eire, or in the USA, Australasia, or the Middle or Far East. Patients having contact with infected cows, cats, or small rodents sporadically contract the disease from these animals. We report here clinical aspects of 8 patients from the Munich area who had purchased infected pet rats from a local supplier. Pet rats are a novel potential source of local outbreaks. The morphologically distinctive skin lesions are mostly restricted to the patients’ necks, reflecting the infected animals’ contact pattern. Individual lesions vaguely resemble orf or Milker’s nodule, but show marked surrounding erythema, firm induration and local adenopathy. Older lesions develop eschar, leaving slow-healing, deep ulcerative defects after eschar separation. Severe flu-like illness may be present in the acute phase. Smallpox-vaccinated patients tend to develop less severe reactions and heal more quickly. The differential diagnosis may include other localized orthopoxvirus infections, herpes simplex, bacterial infection, anthrax, foreign body granuloma, and primary tuberculosis. Dermatologists should be aware of the diagnostic and therapeutic algorithms for handling this disease.

Adverse drug reactions (ADRs) can be dose dependent or idiosyncratic. Most idiosyncratic reactions are believed to be immune-mediated; such drug hypersensitivities and allergies are unpredictable. Cutaneous reactions are the most common presentation of drug allergies. In veterinary medicine it can be difficult to assess the true prevalence of adverse drug reactions, although reports available suggest that they occur quite commonly. There are multiple theories that attempt to explain how drug allergies occur, because the pathogenesis is not yet well understood. These include the (pro)-hapten hypothesis, the Danger Theory, the pi concept, and the viral reactivation theory. Cutaneous drug allergies in veterinary medicine can have a variety of clinical manifestations, ranging from pruritus to often fatal toxic epidermal necrolysis. Diagnosis can be challenging, as the reactions are highly pleomorphic and may be mistaken for other dermatologic diseases. One must rely heavily on history and physical examination to rule out other possibilities. Dechallenge of the drug, histopathology, and other diagnostic tests can help to confirm the diagnosis. New diagnostic tools are beginning to be used, such as antibody or cellular testing, and may be used more in the future. There is much yet to learn about drug allergies, which makes future research vitally important. Treatment of drug allergies involves supportive care, and additional treatments, such as immunosuppressive medications, depend on the manifestation of the disease. Of utmost importance is to avoid the use of the incriminating drug in future treatment of the patient, as subsequent reactions can be worse, and ultimately can prove fatal.

The pharmacokinetics of terbinafine was studied in six healthy fasted cats following a single intravenous and oral administration at a dose of 10 mg/kg and 30 mg/kg, respectively, according to a two-period crossover design. Plasma terbinafine concentrations were determined using a reverse phase liquid chromatographic method. The pharmacokinetic parameters were calculated by non-compartmental analysis with WinNonlin 5.2.1 software. After intravenous administration, the terminal half-life and area under the curve from time 0 to infinity were 10.40 +/- 4.56 h, 15.20 +/- 3.61 h, 13.77 +/- 4.99 h. microg/ml, respectively. After oral dosing, the mean maximum concentration was 3.22 +/- 0.60 microg/ml, reached at 1.33 +/- 0.41 h. The terminal half-life, area under the curve from time 0 to infinity and apparent volume of distribution were 8.01 +/- 3.46 h, 13.77 +/- 4.99 h. microg/ml, respectively. The absolute bioavailability of terbinafine hydrochloride tablets after oral administration was 31.00 +/- 10.85%. Although bioavailability was low, excellent penetration at the site of infection and low minimum inhibitory concentrations values provided terbinafine with good efficacy against dermatophyte infections.

Diabetic ketoacidosis (DKA) is a life-threatening complication of diabetes mellitus (DM). The standard method of detection of ketone bodies is the dipstick method, which detects semiquantitatively acetoacetate, but not beta-hydroxybutyrate (beta-HB). The objectives of the current study were to assess the diagnostic utility of beta-HB to diagnose diabetic ketosis (DK)
and DKA in cats and to establish a cut-off value for the diagnosis of DKA. Sixty-two cats were included in the study. Eleven cats were healthy (group 1); in the remainder of cats (51), a diagnosis of DM was based on hyperglycemia, glucosuria, and increased fructosamine concentrations. Nineteen of 51 cats suffered from nonketotic diabetes mellitus (group 2). In 11 cats, plasma ketone bodies were detected with the dipstick method (diabetic ketosis, group 3). In 21 cats, plasma ketone bodies and metabolic acidosis were present (DKA, group 4). Plasma beta-HB was measured in all cats by an enzymatic method (spectrophotometry). A cut-off value for the diagnosis of DKA was calculated based on the receiver operating characteristic curve. In healthy cats, the beta-HB concentration ranged from 0 to 0.1 mmol/l; in cats of group 2, from 0 to 0.9 mmol/l (median: 0.1 mmol/l); in cats of group 3, from 0.6 to 6.8 mmol/l (median: 1.7 mmol/l); and in cats of group 4, from 3.8 to 12.2 mmol/l (median: 7.9 mmol/l). A cut-off value of 2.4 mmol/l revealed 100% sensitivity and 87% specificity to diagnose DKA. Beta-hydroxybutyrate is a useful parameter for the diagnosis of diabetic ketosis and DKA in cats.

Validation of a portable hand-held whole-blood ketone meter for use in cats. 

BACKGROUND: Urinary dipsticks are the most frequent method used for screening of ketones in animals, but this method has many drawbacks. In human medicine, portable meters that measure ketones in whole blood have largely replaced urinary dipsticks. OBJECTIVE: The aim of this prospective study was to validate a portable whole-blood ketone meter for use in cats. METHODS: Sixty-two cats (11 clinically healthy, 51 with diabetes mellitus) were included in the study. The concentration of beta-hydroxybutyrate (beta-HB) was measured in venous and capillary blood with a hand-held ketone meter (Precision Xceed; assay range 0-8 mmol/L) and compared with a spectrophotometric method. Precision, accuracy, and the effects of hematocrit and anticoagulants were evaluated. RESULTS: Between-run precision using low- and high-concentration control solutions was 8.1% and 2.6%, respectively; within-run coefficient of variation determined using 12 feline blood samples was 2.8%. In the 62 cats, beta-HB concentrations measured with the portable ketone meter ranged from 0-7.4 mmol/L (median 0.9 mmol/L). When beta-HB concentrations measured by the portable meter were < 4.0 mmol/L there was good agreement with the reference method, but concentrations > 4.0 mmol/L were lower than those obtained by the reference method in 20 of 24 cats (83%). There was good correlation between capillary and venous measurements. Results were not affected by hematocrits from 0.17 to 0.50 L/L, but EDTA was not a suitable anticoagulant. CONCLUSION: Measurement of beta-HB concentration in peripheral or capillary blood by an easy-to-use portable ketone meter was suitable for detecting ketonemia in cats. Underestimation of beta-HB concentration was observed at higher values, but results were sufficiently high to aid in diagnosing diabetic ketoacidosis.

Bartonella species antibodies and hyperglobulinemia in privately owned cats. 

BACKGROUND: Bartonella species are zoonotic agents and primary pathogens in cats. Hyperglobulinemia has been associated with bartonellosis in humans and cats. HYPOTHESIS/OBJECTIVES: To evaluate for associations between Bartonella species immunoglobulin G (IgG) antibodies and serum biochemistry panel results in privately owned cats. ANIMALS: 1,477 privately owned cats. METHODS: Residual sera were collected after biochemical evaluation for this prospective, cross-sectional serosurvey. Bartonella species IgG ELISA was performed with a cutoff value of >/=1 : 64. Stepwise logistic regression analysis was performed with the endpoint titer as the outcome variable. The final statistical model included age, albumin, ALP activity, ALT activity, bilirubin, creatinine, glucose, and globulin as covariates. Serum protein electrophoresis was performed with serum from 50 cats with and without antibodies to Bartonella species and hyperglobulinemia. Sera from cats seropositive to Bartonella species and with hyperglobulinemia were assessed for evidence of exposure to other infectious agents associated with hyperglobulinemia. RESULTS: Risk of seropositivity to Bartonella species was positively associated with the natural log of globulin concentration (OR = 11.90, 95% CI 6.15-23.02, P <.0001), and inversely associated with the natural log of glucose concentration (OR = 0.66, 95% CI 0.50-0.87, P = .004). Another explanation for hyperglobulinemia was not identified for most cats with Bartonella species antibodies. Hyperglobulinemia was primarily caused by polyclonal gammapathy in cats that were seronegative and seropositive for Bartonella species. CONCLUSIONS AND CLINICAL IMPORTANCE: Hyperglobulinemia was significantly associated with seropositivity to Bartonella species. Testing for bartonellosis is warranted in cats with unexplained hyperglobulinemia and clinical or laboratory findings suggestive of bartonellosis.

Response of feline eosinophilic plaques and lip ulcers to amoxicillin trihydrate-clavulanate potassium therapy: a randomized, double-blind placebo-controlled prospective study. 

In this study, we evaluated the treatment of feline eosinophilic plaques and lip ulcers with amoxicillin trihydrate-potassium clavulanate (Clavamox(R); Pfizer Animal Health). Nineteen cats with clinical and cytological findings consistent with eosinophilic plaques and/or lip ulcers were enrolled. Lesions were photographed and their areas measured in square centimetres before and after 21 days of therapy with either flavoured amoxicillin-clavulanate suspension or flavoured placebo suspension. Sixteen cats completed the study, with nine plaque lesions (four treatment and five placebo) and eight
lip ulcer lesions (four treatment and four placebo) included in the analysis. All lesions were shown to have infection, with bacterial phagocytosis present on cytological examination. Coagulate-positive staphylococci were the most commonly isolated bacteria. The amoxicillin-clavulanate-treated eosinophilic plaque group had a statistically significant 96.2% reduction in mean lesion size (-7.60 cm², P = 0.0078) and an 80% reduction in mean percentage of microscopic fields demonstrating evidence of bacterial infection (P < 0.0001), whereas the placebo group did not. The amoxicillin-clavulanate-treated lip ulcer group had a 42.6% decrease in mean lesion size (-0.25 cm², P = 0.4125) and the placebo group a 36.6% increase (±0.49 cm², P = 0.1575), although neither change was statistically significant. The amoxicillin-clavulanate-treated lip ulcer group had a statistically significant 65.0% reduction in mean percentage of microscopic fields demonstrating evidence of bacterial infection (P < 0.0001), while no significant reduction was observed in the placebo group. A suspension of amoxicillin trihydrate-potassium clavulanate is an effective monotherapy for the treatment of feline eosinophilic plaques.


Toxicology of newer insecticides in small animals.
In the broadest definition, a pesticide (from fly swatters to chemicals) is a substance used to eliminate a pest. Newer insecticides are much safer to the environment, humans and non target species. These insecticides are able to target physiologic differences between insects and mammals, resulting in greater mammalian safety. This article briefly reviews toxicity information of both older insecticides like organophosphates (OPs), carbamates, pyrethrins, and pyrethroids, as well as some newer insecticides.


Primary Nasal Histiocytic Sarcoma of Macrophage-Myeloid Cell Type in a Cat.
A 16-year-old neutered male Burmese cat was presented with a locally invasive nasal mass. The cytological and histological findings on incisional biopsy of this mass were suggestive of histiocytic sarcoma. Tumour cells expressed CD18, major histocompatibility complex class II, lysozyme and alpha-naphthyl acetate esterase; and lacked expression of CD3, CD79a, CD1a, CD1b, calprotectin, CD11c and E-cadherin. These findings are consistent with a myeloid-macrophage lineage. Metastasis to the bone marrow was present on necropsy examination. Histiocytic sarcoma should be considered in cats presented with primary round cell neoplasia of the nasal cavity.


Feline morbillivirus, a previously undescribed paramyxovirus associated with tubulointerstitial nephritis in domestic cats.
We describe the discovery and isolation of a paramyxovirus, feline morbillivirus (FmoPV), from domestic cat (Felis catus). FmoPV RNA was detected in 56 (12.3%) of 457 stray cats (53 urine, four rectal swabs, and one blood sample) by RT-PCR. Complete genome sequencing of three FmoPV strains showed genome sizes of 16,050 bases, the largest among morbilliviruses, because of unusually long 5′ trailer sequences of 400 nt. FmoPV possesses identical gene contents (3′-N-P/V/C-M-F-H-L-5′) and is phylogenetically clustered with other morbilliviruses. IgG against FmoPV N protein was positive in 49 sera (76.7%) of 56 RT-PCR-positive cats, but 78 (19.4%) of 401 RT-PCR-negative cats (P < 0.0001) by Western blot. FmoPV was isolated from CRFK feline kidney cells, causing cytopathic effects with cell rounding, detachment, lysis, and syncytia formation. FmoPV could also replicate in subsequent passages in primate Vero E6 cells. Infected cell lines exhibited finely granular and diffuse cytoplasmic fluorescence on immunostaining for FmoPV N protein. Electron microscopy showed enveloped virus with typical “herringbone” appearance of helical N in paramyxoviruses. Histological examination of necropsy tissues in two FmoPV-positive cats revealed interstitial inflammatory infiltrate and tubular degeneration/necrosis in kidneys, with decreased cauxin expression in degenerated tubular epithelial cells, compatible with tubulointerstitial nephritis (TIN). Immunohistochemical staining revealed FmoPV N protein-positive renal tubular cells and mononuclear cells in lymph nodes. A case-control study showed the presence of TIN in seven of 12 cats with FmoPV infection, but only two of 15 cats without FmoPV infection (P < 0.05), suggesting an association between FmoPV and TIN.


Isometric responses of isolated intrapulmonary bronchioles from cats with and without adult heartworm infection.
OBJECTIVE: To determine the isometric responses of isolated intrapulmonary bronchioles from cats with and without adult heartworm infection. ANIMALS: 13 purpose-bred adult cats. PROCEDURES: Cats were infected with 100 third-stage larvae or received a sham inoculation, and the left caudal lung lobe was collected 278 to 299 days after infection. Isometric responses of intrapulmonary bronchiolar rings were studied by use of a wire myograph. Three cycles of contractions induced by administration of 10 muM acetylcholine were followed by administration of the contractile agonists acetylcholine, histamine, and 5-hydroxy-tryptamine. To evaluate relaxation, intrapulmonary bronchiolar rings were constricted by administration of 10 muM 5-hydroxytryptamine, and concentration-response curves were generated from
administration of sodium nitroprusside, isoproterenol, and substance P. RESULTS: Compared with tissues from control cats, contractile responses to acetylcholine and 5-hydroxytryptamine were reduced in tissues from heartworm-infected cats. Relaxation to isoproterenol was significantly reduced in tissues from heartworm-infected cats. Relaxation to substance P was increased in tissues from heartworm-infected cats, but relaxation to sodium nitroprusside was unchanged. CONCLUSIONS AND CLINICAL RELEVANCE: Results suggested that despite increased bronchiolar wall thickness in heartworm-infected cats, a hyperreactive response of the bronchiolar smooth muscle is not the primary mechanism of respiratory tract clinical signs. Reduced response of the airway to isoproterenol may indicate refractoriness to bronchiolar relaxation in heartworm-infected cats.


**Risk factors for feline infectious peritonitis in Australian cats.**

The objective of this study was to determine whether patient signalment (age, breed, sex and neuter status) is associated with naturally-occurring feline infectious peritonitis (FIP) in cats in Australia. A retrospective comparison of the signalment between cats with confirmed FIP and the general cat population was designed. The patient signalment of 382 FIP confirmed cases were compared with the Companion Animal Register of NSW and the general cat population of Sydney. Younger cats were significantly over-represented among FIP cases. Domestic crossbred, Persian and Himalayan cats were significantly under-represented in the FIP cohort, while several breeds were over-represented, including British Shorthair, Devon Rex and Abyssinian. A significantly higher proportion of male cats had FIP compared with female cats. This study provides further evidence that FIP is a disease primarily of young cats and that significant breed and sex predilections exist in Australia. This opens further avenues to investigate the role of genetic factors in FIP.


**Canine ASCT1 and ASCT2 are functional receptors for RD-114 virus in dogs.**

All domestic cats carry an infectious endogenous retrovirus termed RD-114 virus. Recently, we and others found that several live-attenuated vaccines for dogs were contaminated with infectious RD-114 virus. In this study, we confirmed that the RD-114 virus efficiently infected and proliferated well in canine primary kidney cells, as well as three tested canine cell lines. Further, we identified canine ASCT1 and ASCT2, sodium-dependent neutral amino acid transporters, as RD-114 virus receptors. Canine ASCT2 also acts as a functional receptor for simian retrovirus 2, a pathogenic retrovirus that induces immunodeficiency in rhesus macaques. Identification of the canine receptor for RD-114 virus will help in evaluating the risk from vaccines contaminated by the virus.


**Point-of-care beta-hydroxybutyrate measurement for the diagnosis of feline diabetic ketoacidemia.**

Objectives: To evaluate accuracy and precision of a hand-held ketone meter measuring beta-hydroxybutyrate and to determine its diagnostic performance to rule out ketoacidemia in diabetic cats. Methods: The ketone meter was validated by calculating within-day precision at different beta-hydroxybutyrate concentrations and by comparison with a laboratory method. To determine its diagnostic performance to diagnose ketoacidemia, 217 sets of data (venous blood gas analysis and beta-hydroxybutyrate measurements) were retrospectively analysed. Sensitivities and specificities were calculated with the help of receiver-operating characteristic curves. Results: The ketone meter reliably detected beta-hydroxybutyrate at concentrations >0.1 mmol/L and reproducibility was acceptable. Measurements highly correlated with laboratory results (r=0.97; P<0.001), but a significant negative bias was found at high concentrations. A beta-hydroxybutyrate concentration of >2.55 mmol/L had a sensitivity of 94% and a specificity of 68% for diagnosing ketoacidemia. Many cats with high beta-hydroxybutyrate concentrations and normal blood pH had an elevated chloride gap suggestive of superimposed hypochloraeic metabolic alkalosis. Clinical Significance: The commercially available point-of-care ketone meter Precision Xtra is a valid tool to measure beta-hydroxybutyrate in diabetic cats. Concentration <2.55 mmol/L enable ketoacidemia to be excluded and should lead to redirection of differential diagnoses.


**Intravesical application of lidocaine and sodium bicarbonate in the treatment of obstructive idiopathic lower urinary tract disease in cats.**

BACKGROUND: In human patients with interstitial cystitis, intravesical instillation of alkalinized lidocaine sometimes is associated with sustained amelioration of symptoms beyond the acute treatment phase. Interstitial cystitis shares many features in common with feline idiopathic cystitis. OBJECTIVE: To evaluate whether intravesical instillation of alkalinized lidocaine decreases recurrence of urethral obstruction and severity of clinical signs in cats with obstructive idiopathic LUTD. ANIMALS: Twenty-six cats with obstructive idiopathic LUTD. Twelve cats in case group (treatment with alkalinized lidocaine) and 14 control cats (treatment with placebo or standard treatment). METHODS: Cats were randomly assigned to treatment (2 or 4 mg/kg lidocaine and sodium bicarbonate) or placebo groups (0.2 mL/kg saline solution and sodium bicarbonate). The intravesical instillation was done once a day for 3 days. Some cats underwent standard treatment
Recurrence of urethral obstruction was 58% (7/12) in the case group and 57% (8/14) in the control group. Amelioration scores were similar between the 2 groups. CONCLUSION AND CLINICAL IMPORTANCE: Intravesical administration of lidocaine for up to 3 consecutive days had no apparent beneficial effect on decreasing recurrence rate and severity of clinical signs in cats with obstructive idiopathic LUTD.

Zhang, F., A. D. Mally, P. D. Ogagan, B. Shen, J. Wang, J. R. Roppolo, W. C. de Groat, and C. Tai (2012) Am J Physiol Renal Physiol Inhibition of Bladder Overactivity by a Combination of Tibial Neuromodulation and Tramadol Treatment in Cats. Our recent study in cats revealed that inhibition of bladder overactivity by tibial nerve stimulation (TNS) depends on activation of opioid receptors. TNS is a minimally invasive treatment for overactive bladder (OAB) but its efficacy is low. Tramadol (an opioid receptor agonist) is effective in treating OAB but elicits significant adverse effects. This study is to determine if a low dose of tramadol (expected to produce fewer adverse effects) can enhance the TNS inhibition of bladder overactivity. Bladder overactivity was induced in alpha-chloralose anesthetized cats by intravesical infusion of 0.25% acetic acid (AA) during repeated cystometrograms (CMGs). TNS (5 Hz) at 2-4 times the threshold intensity for inducing toe movement was applied during CMGs before and after tramadol (0.3-7 mg/kg, i.v.) to examine the interaction between the two treatments. AA irritation significantly reduced bladder capacity to 24.8+/-3.3% of the capacity measured during saline infusion. TNS alone reversibly inhibited bladder overactivity and significantly increased bladder capacity to 50-60% of the saline control capacity. Tramadol administered alone in low doses (0.3-1 mg/kg) did not significantly change bladder capacity, while larger doses (3-7 mg/kg) increased bladder capacity (50-60%). TNS in combination with tramadol (3-7 mg/kg) completely reversed the effect of AA. Tramadol also unmasked a prolonged (>2 hours) TNS inhibition of bladder overactivity that persisted after termination of the stimulation. The results suggest a novel treatment strategy for OAB by combining tibial neuromodulation with a low dose of tramadol, which is minimally invasive with a potentially high efficacy and less adverse effects.

Zordan, M., S. L. Deem, and C. R. Sanchez (2012) Zoo Biol 31:181-188. Focal palatine erosion in captive and free-living cheetahs (Acinonyx jubatus) and other felid Species. We examined 1,092 skulls of captive and free-living individuals, representing 33 felid species, to determine the prevalence of focal palatine erosion (FPE). FPE was detected in 3.2% of cats evaluated, including cheetah (Acinonyx jubatus) and 14 other felid species. The prevalence of FPE between cheetah (9.4%; n = 64) and non-cheetah species (2.8%; n = 1,028) (chi(2) test; P = 0.004) and between captive (5.7%; n = 246) and free-living (2.4%; n = 824) individuals (chi(2) test; P = 0.010) were significantly different, with prevalence between captive (19%; n = 21) and free-living (2.9%; n = 34) cheetahs approaching significance (Fisher’s exact test; P = 0.064). FPE was diagnosed with equal prevalence in skulls from individuals in which the lower molar did not meet the palatine bone (60.6%) and individuals in which it did (39.4%; n = 33) (chi(2) test; P = 0.139). In cheetahs with FPE, one was a captive animal in Germany, one a free-living cheetah from Mali, one captive cheetah from Kenya, and three captive cheetahs of unknown origin. Additionally, we evaluated the medical records of 49 captive cheetahs in Namibia. Of these cheetahs, 48 (98.0%) had clinical signs consistent with FPE, although only 16 of these 48 (39.6%) had perforation of the palatine bone. Based on physical examinations, FPE was diagnosed in two caracals (Caracal caracal) and one fishing cat (Prionailurus viverrinus) from a North American Zoo. Results from this study confirm FPE in cheetahs outside of Namibia, in a minimum of 15 felid species, and a higher FPE prevalence in captive individuals than free-living ones. Clinical implications of these findings and recommendations for future studies are provided. Zoo Biol 31: 181-188, 2012. (c) 2011 Wiley Periodicals, Inc.