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The International Society of Feline Medicine (ISFM) was established in 1996 as the veterinary focus for the work of the charity and, together with the American Society of Feline Practitioners, it publishes the Journal of Feline Medicine and Surgery.
Occurrence of extended spectrum beta-lactamase-producing Enterobacteriaceae among pet dogs and cats: an emerging public health threat outside health care facilities.


Abdel-Moein, K. A., and A. Samir

We aimed to investigate the potential role of pet dogs and cats in the epidemiology of extended spectrum beta-lactamase-producing Enterobacteriaceae. Twenty bacterial isolates were recovered from rectal swabs obtained from 110 dogs and cats. The occurrence of extended spectrum beta-lactamase-producing Enterobacteriaceae in pets spotlights the emergence of a significant public health threat.

Metaphyseal osteopathy in a British Shorthair cat.


Adagra, C., D. Spielman, A. Adagra, and D. J. Foster

Metaphyseal osteopathy, otherwise known as hypertrophic osteodystrophy, is a disease that causes pyrexia and lethargy accompanied by pain in the thoracic and pelvic limbs of rapidly growing large-breed dogs. While metaphyseal osteopathy has been described in association with slipped capital femoral epiphysis in cats, it has not previously been reported as a cause of limb pain and pyrexia in this species. A 7-month-old British Shorthair cat presented with a 1 month history of pyrexia, lethargy and pain in all limbs. Investigation included radiographs of the limbs and chest, abdominal ultrasound, serum biochemical analysis, haematology, bone biopsy, joint fluid aspiration and cytology. Findings were consistent with a diagnosis of metaphyseal osteopathy. The cat’s clinical signs resolved following the administration of prednisolone. Symptoms recurred 1 month after the cessation of prednisolone therapy, but resolved when administration was resumed.

Analgesic effects of maxillary and inferior alveolar nerve blocks in cats undergoing dental extractions.


Aguiar, J., A. Chebroux, F. Martinez-Taboada, and E. A. Leece

The aim of this study was to evaluate the analgesic effects of maxillary and/or inferior alveolar nerve blocks with lidocaine and bupivacaine in cats undergoing dental extractions. Twenty-nine cats were enrolled. Using an adapted composite pain scale, cats were pain scored before the dental procedure and 30 mins, and 1, 2 and 4 h after isoflurane disconnection. Cats were sedated with buprenorphine (20 microg/kg), medetomidine (10 microg/kg) and acepromazine (20 microg/kg) intramuscularly. Anaesthesia was induced using alfaxalone (1-2 mg/kg) intravenously and maintained with isoflurane in oxygen. Each cat was randomly assigned to receive maxillary and/or inferior alveolar nerve blocks or no nerve blocks prior to dental extractions. Each nerve block was performed using lidocaine (0.25 mg/kg) and bupivacaine (0.25 mg/kg). Heart rate, systolic arterial blood pressure, respiratory rate, end tidal carbon dioxide and isoflurane vaporiser settings were recorded 5 mins before and after the dental extractions, and the difference calculated. Group mean differences (mean +/- SD) for heart rate (-9.7 +/- 10.6 vs 7.6 +/- 9.5 beats/min [nerve block vs control group, respectively], P <0.0001), systolic arterial blood pressure (-10.33 +/- 18.44 vs 5.21 +/- 15.23 mmHg, P = 0.02) and vaporiser settings (-0.2 +/- 0.2 vs 0.1 +/- 0.4, P = 0.023) were significantly different between groups. The control group had higher postoperative pain scores (median [interquartile range]) at 2 h (3 [1.75-4.00] vs 1 [0-2], P = 0.008) and 4 h (4 [2-6] vs 2 [1-2], P = 0.006) after the dental extractions. Maxillary and inferior alveolar nerve blocks with lidocaine and bupivacaine administered prior to dental extractions resulted
in a reduction in heart rate and blood pressure while allowing for a reduction in isoflurane. Cats receiving nerve blocks had lower postoperative pain scores than the group without nerve blocks.

**Owner Experiences in Treating Dogs and Cats Diagnosed With Diabetes Mellitus in the United States.**


*Aptekmann, K. P., J. Armstrong, M. Coradini, and J. Rand*

The objective of this study was to report owner experiences and satisfaction in treating a pet with diabetes mellitus using a descriptive report from an Internet-based survey. Descriptive analysis of results was performed, chi2 tests were used to detect differences in responses between dog and cat owners, and correlations were assessed using the nonparametric Spearman rank correlation. A total of 834 owners participated in the survey. More diabetic dogs (97%) than cats (82%) were treated with insulin injections. Insulin was administered twice daily in 87% of dogs and 73% of cats. Porcine lente and neutral protamine Hagedorn were the most commonly administered insulins in dogs. In cats, glargine and protamine zinc insulin were the most commonly used insulins. Most pets were not fed a prescribed diabetes diet. More cat (66%) than dog (50%) owners were satisfied with the diabetic control achieved. Cat owners were more likely to use home blood glucose monitoring. Treatment was considered expensive by the majority of owners. Few published reports follow diabetic pets after diagnosis or report owner satisfaction. The results of this study provide useful information that may help veterinarians better educate owners and set expectations regarding diabetes treatment and quality of life for diabetic pets.

**Ultrasonographic appearance of histoplasmosis identified in the spleen in 15 cats.**


*Atiee, G., H. Kvitko-White, K. Spaulding, and M. Johnson*

Histoplasmosis is the second most common fungal infection reported in the cat. The disseminated form involving lung, liver, lymph nodes, spleen, and bone marrow is a frequent manifestation of the disease. Limited information is available in the literature regarding the ultrasonographic appearance of the spleen in cats with disseminated or splenic histoplasmosis. A retrospective review of splenic ultrasound images from 15 cats confirmed to have histoplasmosis by splenic aspirates was performed. Size, echotexture, echogenicity, margin appearance, presence of nodules, and the overall shape of the spleen were reported in each case. Splenomegaly was documented in all cases (15/15) and a hypoechoic appearance of the spleen was documented in 14/15 of cases. The spleen was diffusely and uniformly affected in 14/15 (six homogenous and eight with a subtle mottled appearance) and had discrete nodules in 1/15 cats. Histoplasmosis should be included in the differential list for an enlarged and hypoechoic spleen in cats with consistent clinical findings. Additionally, ultrasound guided splenic aspirate may be a useful method to obtain a cytology sample for diagnosis.

**Seroprevalence of Toxoplasma gondii (Nicole & Manceaux, 1909) and retroviral status of client-owned pet cats (Felis catus, Linnaeus, 1758) in Rio de Janeiro, Brazil.**


*Bastos, B. F., B. Brener, L. Gershony, L. Willi, N. Labarthe, C. Pereira, and F. Mendes-De-Almeida*
Cats, as definitive host, play an important role in the transmission of Toxoplasma gondii. This study aimed to establish the seroprevalence of anti-T. gondii immunoglobulins G and M, and determine the frequency of oocysts in the feces of the domestic cat population in Rio de Janeiro, Brazil. We also aimed to study the association between T. gondii infection and age, sex, breed, lifestyle, diet and retroviral infection. A total of 108 cats were included in the study and fecal samples of 54 of those cats were obtained. Only 5.6% of the cats were seropositive for anti-T. gondii immunoglobulins using the indirect hemagglutination test. None of the 54 cats presented oocysts in their fecal samples. Although not statistically significant, males, mixed-breed, free-roaming and cats aged two years and older were found to be more exposed. Age, lifestyle and the use of litter boxes were found to play an important role as risk factors. Anemia and retroviral infections were independent of T. gondii infection. No antibodies were detected in the majority of cats (94.4%), indicating that those cats had never been exposed to the parasite and, therefore, once infected, they could present the risk of shedding large numbers of oocysts into the environment.

Pancreatitis in cats: is it acute, is it chronic, is it significant?
Bazelle, J., and P. Watson

PRACTICAL RELEVANCE: Pancreatitis is a frequent finding in cats, the chronic form being more common than the acute form. Despite the large number of diseases or conditions that may be associated with feline pancreatitis, in most cases no cause is diagnosed and the pancreatitis is said to be idiopathic. The chronic form can be mild and asymptomatic, and has a high prevalence in apparently healthy cats. This has generated debate concerning the clinical significance of chronic feline pancreatitis. However, several reports have demonstrated the severity of clinical signs in certain forms of acute feline pancreatitis, while other studies have reported a strong association between chronic pancreatitis and the development of comorbidities such as hepatic lipidosis, diabetes mellitus, inflammatory bowel disease or exocrine pancreatic insufficiency. This suggests that feline pancreatitis should not be overlooked.

CLINICAL CHALLENGES: Diagnosis of feline pancreatitis is complicated by the non-specific clinical signs and poor diagnostic value of basic biochemistry and haematology or imaging techniques. Development of a feline-specific pancreatic lipase immunoassay has improved our diagnostic ability in the past decade, but may have more limited application for mild and chronic forms of pancreatitis. Moreover, histopathology (the ‘gold standard’ diagnostic test) can be associated with false-negative results due to multifocal distribution of lesions or mild forms of the disease. With respect to treatment, it is important to take into account the idiosyncrasies of the feline species when considering medical therapies. EVIDENCE BASE: This article reviews the literature on feline pancreatitis, focusing on the different forms and their relative clinical significance, while explaining difficulties inherent in the diagnosis of this disease. An overview of current recommendations for the management of cats with pancreatitis is also provided.

Felis catus gammaherpesvirus 1; a widely endemic potential pathogen of domestic cats.

Felis catus gammaherpesvirus 1 (FcaGHV1), recently discovered in the USA, was detected in domestic cats in Australia (11.4%, 95% confidence interval 5.9-19.1, n=110) and Singapore (9.6%, 95%
Confidence interval 5.9-14.6, n=176) using qPCR. FcaGHV1 qPCR positive cats were 2.8 times more likely to be sick than healthy. Risk factors for FcaGHV1 detection included being male, increasing age and coinfection with pathogenic retroviruses, feline immunodeficiency virus (FIV) or feline leukaemia virus. FcaGHV1 DNA was detected in multiple tissues from infected cats with consistently high virus loads in the small intestine. FcaGHV1 viral load was significantly higher in FIV-infected cats compared with matched controls, mimicking increased Epstein-Barr virus loads in human immunodeficiency virus-infected humans. FcaGHV1 is endemic in distant geographic regions and is associated with being sick and with coinfections. Horizontal transmission of FcaGHV1 is supported, with biting being a plausible route. A pathogenic role for FcaGHV1 in domestic cats is supported.

**Recurrent hemorrhage caused by type 3 von Willebrand disease in a domestic long-haired cat.**


*Bebar, K. N., V. Sinnott, and M. B. Brooks*

OBJECTIVE: To describe a case of spontaneous epistaxis in a cat with type 3 von Willebrand disease (VWD) and detail the successful management of hemorrhagic episodes on 2 occasions. CASE SUMMARY: A 3.6 kg, 1-year-old, female mixed-breed domestic long-haired cat presented for spontaneous epistaxis. Hemostasis testing at presentation revealed normal prothrombin and activated partial thromboplastin times, a slightly decreased platelet count of 168 x 10⁹/L (168 x 10³/μL) (reference interval 200-500 x 10⁹/L [200-500 x 10³/μL]) and prolonged buccal mucosal bleeding time of 168 seconds (reference interval <150 s). Specific activities of coagulation factors VIII, IX, XI, and XII were all within reference intervals. Plasma von Willebrand factor concentration, however, was markedly reduced at <0.1% of normal. These findings are compatible with a diagnosis of severe type 3 VWD. The initial occurrence of epistaxis resolved spontaneously soon after admission; however, the cat required a packed RBC transfusion for blood loss anemia. Desmopressin acetate was administered, but failed to arrest hemorrhage during a second episode of epistaxis 12 months later. The second episode was successfully controlled by transfusion of 6.7 mL/kg feline fresh frozen plasma. NEW AND UNIQUE INFORMATION: This is the first description of severe type 3 VWD in a domestic cat and only the second report of VWD in this species. Unlike human beings and primates with type 3 VWD, the affected cat did not have a concomitant deficiency of coagulation factor VIII or consistent prolongation of activated partial thromboplastin time. Clinicians should therefore include VWD in the list of differentials for cats with signs of abnormal hemorrhage and confirm the diagnosis with specific measurement of plasma von Willebrand factor concentration.

**Molecular Characterization of Cat Factor XII Gene and Identification of a Mutation Causing Factor XII Deficiency in a Domestic Shorthair Cat Colony.**

*Vet Pathol* (2014)

*Bender, D. E., M. T. Kloos, J. U. Pontius, M. E. Hinsdale, and D. A. Bellinger*

Coagulation factor XII (FXII) may be important in cardiovascular and inflammatory diseases. We have identified and characterized a naturally occurring mutation in the feline FXII gene that results in a mutant protein and enzymatic loss of activity. Feline intron/exon gene structure and sequence were acquired by comparing DNA sequences obtained from a fragmented Felis catus genomic sequence and the National Center for Biotechnology Information’s Cross Species Megablast of multiple species’ FXII gene sequences. Fourteen exons ranging in size from 57 to 222 base pairs were confirmed spanning 8 Kb on chromosome A1. The 1828-base pair feline FXII messenger RNA (mRNA) sequence
contains an open reading frame that encodes a protein of 609 amino acids with high homology to human FXII protein. Total RNA and mRNA purified from liver tissue of 4 wild-type/normal and 8 FXII-deficient cats confirmed the predicted mRNA sequence and identified one important single-nucleotide polymorphism (SNP). A single base deletion in exon 11 of the FXII coding gene in our colony of cats results in deficient FXII activity. Translation of the mRNA transcript shows a frame shift at L441 (C441fsX119) resulting in a nonsense mutation and a premature stop codon with a predicted 560-amino acid protein. The mutant FXII protein is truncated in the 3’ proteolytic light chain region of the C-terminus, explaining its loss of enzymatic activity. This study is the first molecular characterization of the feline FXII gene and the first identification of an FXII mutation in the domestic cat, providing insights into the origin and nature of feline FXII deficiency.

Comparative palatability of five supplements designed for cats suffering from chronic renal disease.
Bernachon, N., S. Fournel, H. Gatto, P. Monginoux, and D. McGahie
BACKGROUND: Intestinal phosphate binders, uremic toxin binders and some other types of supplements are an integral part of the management of chronic kidney disease (CKD) in various species, including cats. This pathology in domestic carnivores requires life-long nutritional and medical management. In this context, the compliance of owners and patients cannot be achieved without an adequate level of palatability for oral medication or supplementation. Knowing that hyporexia and anorexia are among the most commonly seen clinical signs in cats suffering from CKD this is already, in itself, a serious obstacle to acceptable compliance in sick animals. The aim of the present study was to investigate the palatability of four commercially available products designed for cats suffering from CKD: Ipakitine(R) (Vetoquinol, France), Azodyl(R) (Vetoquinol, USA), Renalzin(R) (Bayer, France), Rubenal(R) (Vetoquinol, France) and an additional recently developed product: Pronefra(R) (Virbac, France). The study was performed with a group of previously-characterised cats, all living in an enriched and well-being securing environment of an independent centre housing panels of pets expert in palatability measurement. In total 172 monadic testings were performed. The palatability of each product was assessed by measuring their rates of prehension and consumption, and the consumption proportions were also analysed. RESULTS: The most palatable presentation (based on useful consumption) was Pronefra(R), which was significantly higher than Azodyl(R) (p = 0.046), Ipakitine(R) (p < 0.0001), Renalzin(R) (p < 0.0001) and Rubenal(R) (p < 0.0001). The product with the highest rate of prehension was also Pronefra(R), which was significantly higher than Azodyl(R) (p = 0.0019), Ipakitine(R) (p = 0.0023), Renalzin(R) (p = 0.0008) and Rubenal(R) (p < 0.0001).
CONCLUSION: Pronefra(R) was the most palatable presentation tested, meaning it may be useful for improving ease of supplementation in CKD cats.

Accuracy of cytology in distinguishing adrenocortical tumors from pheochromocytoma in companion animals.
Vet Clin Pathol (2014)
BACKGROUND: The distinction between adrenocortical tumors and pheochromocytoma can be challenging using clinical findings, diagnostic imaging and laboratory tests. Cytology might be a
simple, minimally invasive method to reach a correct diagnosis. OBJECTIVES: The purpose of this study was to assess the accuracy of cytology in differentiating cortical from medullary tumors of the adrenal glands in dogs and cats. METHODS: Cytologic key features of adrenocortical tumors and pheochromocytoma were defined by one reference author. Cytologic specimens from primary adrenal tumors were submitted to 4 cytopathologists who were asked to classify the tumors based on the previously defined key features without knowledge of previous classification. RESULTS: Twenty specimens from histologically confirmed adrenal tumors (Group 1) and 4 specimens from adrenal tumors causing adrenal-dependent Cushing’s syndrome (Group 2) were evaluated by the 4 cytopathologists. Accuracy in differentiating cortical from medullary origin ranged from 90% to 100%, with a Kappa coefficient of agreement between cytopathologists of 0.95. CONCLUSIONS: The origin of an adrenal tumor can be easily determined by cytology alone in many cases. However, cytology was not reliable in distinguishing benign from malignant neoplasia. Additional studies are needed to assess possible risks and complications associated with fine-needle biopsy of adrenal tumors in dogs and cats.

Occurrence of Dipylidium caninum in fleas from client-owned cats and dogs in Europe using a new PCR detection assay.

Ctenocephalides fleas are not only the most prevalent ectoparasites of dogs and cats but also the intermediate host of the cestode Dipylidium caninum. Due to the poor sensitivity of coproscopy to diagnose cat and dog infestation by Dipylidium, few epidemiological data are available on its prevalence among pet populations. A new PCR method was developed to specifically identify D. caninum rDNA inside single fleas. The PCR test was then applied to 5529 fleas of Ctenocephalides genus, 2701 Ctenocephalides felis fleas (1969 collected on 435 cats and 732 on 178 dogs) and 2828 Ctenocephalides canis fleas collected from 396 dogs. Precisely, 4.37% of cats were infested by a flea population infected with D. caninum. Out of the 1969 C. felis from cats, 2.23% were found to be infected with Dipylidium. From the 396 dogs infested with C. canis, 9.11% were infected with the Dipylidium infected fleas, which is significantly higher than the observation made in cats (p=0.03). Moreover, 3.1% of the C. canis fleas were found to be infected with Dipylidium, which is not significantly different than in C. felis. Looking at the number of infected fleas in the positive samples (at least one PCR positive flea in a sample), the infestation rate in samples was varied from 3 to 100% with an average of 19.7% which is in favour of easy and regular Dipylidium reinfestations of both cats and dogs in households. For the first time, the spread of D. caninum between fleas and dogs and cats is confirmed throughout Europe.

Parasites of domestic owned cats in Europe: co-infestations and risk factors.

BACKGROUND: Domestic cats can be infested by a large range of parasite species. Parasitic infestations may cause very different clinical signs. Endoparasites and ectoparasites are rarely explored in the same study and therefore multiparasitism is poorly documented. The present survey aimed to improve knowledge of the prevalence and risk factors associated with ecto- and endoparasite
infestations in owned cats in Europe. METHODS: From March 2012 to May 2013, 1519 owned cats were included in a multicenter study conducted in 9 veterinary faculties throughout Europe (Austria, Belgium, France, Hungary, Italy, Romania and Spain). For each cat, ectoparasites were checked by combing of the coat surface associated with otoscopic evaluation and microscopy on cerumen samples. Endoparasites were identified by standard coproscopical examinations performed on fresh faecal samples. Risk factors and their influence on parasitism were evaluated by univariate analysis followed by a multivariate statistical analysis (including center of examination, age, outdoor access, multipet status, and frequency of treatments as main criteria) with logistic regression models. RESULTS: Overall, 50.7% of cats resulted positive for at least one internal or one external parasite species. Ectoparasites were found in 29.6% of cats (CI95 27.3-32.0%). Otodectes cynotis was the most frequently identified species (17.4%), followed by fleas (15.5%). Endoparasites were identified in 35.1% of the cats (CI95 32.7-35.7%), including gastro-intestinal helminths in 25.7% (CI95 23.5-28.0), respiratory nematodes in 5.5% (CI95 4.2-7.0%) and protozoans in 13.5% (CI95 11.8-15.3%). Toxocara cati was the most commonly diagnosed endoparasite (19.7%, CI95 17.8-21.8%). Co-infection with endoparasites and ectoparasites was found in 14.0% of the cats, and 11.9% harbored both ectoparasites and gastro-intestinal helminths. Age, outdoor access, living with other pets, and anthelmintic or insecticide treatments were significantly associated with the prevalence of various parasites. CONCLUSIONS: This survey demonstrates that parasitism is not a rare event in European owned cat populations. The prevalence of multi-parasitism is significantly greater than expected by chance and hence there is tendency for some individual cats to be more prone to infestation by both endo- and ectoparasites due to common risk factors.

Localized demodicosis due to Demodex cati on the muzzle of two cats treated with inhalant glucocorticoids.


Bizikova, P.

BACKGROUND: Feline demodicosis due to Demodex cati is a rare skin disease often associated with concurrent disease and generalized immunosuppression. Local immunosuppression due to the application of topical immunomodulatory drugs, such as glucocorticoids and tacrolimus, or by tumour cells has been suggested as a potential trigger for development of localized demodicosis in humans and animals. OBJECTIVES: The goal was to describe two cats with asthma that developed localized demodicosis on the muzzle as a result of chronic therapy with a glucocorticoid administered via dispensing inhaler mask. RESULTS: In both cats, the muzzle area exposed to the fluticasone-dispensing chamber exhibited patchy alopecia, mild erythema, crusting and scaling. Deep skin scraping revealed D. cati. Discontinuation or reduction of fluticasone and administration of milbemycin resulted in resolution of clinical signs within 2 months in both cats. A negative skin scrape was obtained after 7 months of milbemycin in one of the cats. CONCLUSIONS AND CLINICAL IMPORTANCE: Demodicosis should be considered as a possible differential diagnosis in cats with primary alopecia or other skin lesions on the face exposed to inhalant glucocorticoids. Minimization of contact between the inhalant glucocorticoid and the skin can be achieved by wiping residual powder from the face and by keeping the mask tightly pressed to the skin to avoid contact with the surrounding area.

Acute effects of ivabradine on dynamic obstruction of the left ventricular outflow tract in cats with preclinical hypertrophic cardiomyopathy.

BACKGROUND: Ivabradine is a negative chronotropic drug with minimal effects on central hemodynamics. Its effect on dynamic obstruction of the left ventricular outflow tract (LVOT) in cats with hypertrophic cardiomyopathy (HCM) remains unknown.

HYPOTHESIS/OBJECTIVES: Ivabradine reduces dynamic obstruction of the LVOT in cats with HCM.

ANIMALS: Twenty-eight client-owned cats with preclinical HCM and dynamic LVOT obstruction.

METHODS: Randomized, double-blind, active-control single dose study. Cats received a single dose of either ivabradine (0.3 mg/kg PO) or atenolol (2 mg/kg PO). Heart rate, echocardiographic variables, and systolic blood pressure (SBP) were recorded before and 3 hours after drug administration. Statistical comparisons were made using ANCOVA.

RESULTS: Peak velocity in the LVOT was significantly decreased compared to baseline for both drugs; however, the effect was more prominent with atenolol (mean reduction 2.53 m/s; 95% CI 2.07-3.13 m/s) compared to ivabradine (mean reduction 0.32 m/s; 95% CI 0.04 to 0.71 m/s; P <.0001). Echocardiographic indices of systolic function were largely unchanged by ivabradine, but significantly reduced by atenolol.

CONCLUSIONS AND CLINICAL IMPORTANCE: A single dose of ivabradine decreases dynamic LVOT obstruction in cats with HCM, but the clinical effect is negligible and inferior compared to that achieved by atenolol.

Detection of antibodies to the feline leukemia Virus (FeLV) transmembrane protein p15E: an alternative approach for serological FeLV detection based on antibodies to p15E.


The aim of this report was to investigate whether the diagnosis of feline leukemia virus (FeLV) infection by serology might be feasible and useful. Among the various viral proteins, the FeLV env-gene product (SU) and the envelope transmembrane protein p15E were considered promising candidates for the serological diagnosis of FeLV infection. Thus, we evaluated p15E and three other FeLV antigens, namely, a recombinant env-gene product, whole FeLV, and a short peptide from the FeLV transmembrane protein, for their potential to detect FeLV infection. To evaluate possible exposure of cats to FeLV, we tested serum and plasma samples from experimentally and naturally infected and vaccinated cats for the presence of antibodies to these antigens by enzyme-linked immunosorbent assays (ELISAs). The serological results were compared with the p27 and proviral real-time PCR results. We found that p15E displayed a diagnostic sensitivity of 95.7% and a specificity of 100% in experimentally infected cats. In naturally infected cats, p15E showed a diagnostic sensitivity of 77.1% and a specificity of 85.6%. Vaccinated cats displayed minimal antibody levels to p15E, suggesting that anti-p15E antibodies indicate infection rather than vaccination. The other antigens turned out to be too unspecific. The lower specificity in cats exposed to FeLV under field conditions may be explained by the fact that some cats become infected and seroconvert in the absence of detectable viral nucleic acids in plasma. We conclude that p15E serology may become a valuable tool for diagnosing FeLV infection; in some cases, it may replace PCR.

Association of the myosin binding protein C3 mutation (MYBPC3 R820W) with cardiac death in a survey of 236 Ragdoll cats.


Borgeat, K., D. Casamian-Sorrosal, C. Helps, V. Luis Fuentes, and D. J. Connolly
OBJECTIVES: A mutation identified in the myosin binding protein C3 gene (MYBPC3 R820W) has been associated with hypertrophic cardiomyopathy (HCM) in Ragdoll cats. Ragdolls with HCM are reported to have a poor prognosis and homozygous cats seem particularly likely to develop severe HCM, although the outcome in Ragdolls tested for the MYBPC3 mutation has not been reported. We aimed to determine the influence of genotype on survival in Ragdoll cats using a questionnaire, and hypothesized that homozygous Ragdolls had shorter lifespans and were more likely to suffer cardiac death than heterozygous or wild-type (WT) cats. ANIMALS: 251 client owned Ragdoll cats. METHODS: A questionnaire for breeders/owners of MYBPC3 genotyped Ragdolls included items related to genotype, age, sex, current status (alive/dead), and date and circumstances of death. Death was categorized as cardiac or non-cardiac. Survival was analyzed using Kaplan-Meier curves and log rank tests. RESULTS: Completed questionnaires were received for 236 cats (156 WT, 68 heterozygous, 12 homozygous). Median survival time for homozygous cats was 5.65 years (95%CI 0.4-10.9 years) compared to heterozygous (>16.7 years) or WT (>15.2 years). Homozygous cats were more likely to die from cardiac death (p = 0.004 vs. WT; p = 0.003 vs. heterozygous) and had significantly shorter time to cardiac death (vs. WT p < 0.001; vs. heterozygous p < 0.001). CONCLUSIONS: Ragdoll cats homozygous for the MYBPC3 R820W mutation have a shorter survival time than WT or heterozygous cats. This suggests a mode of inheritance that follows an incomplete dominance pattern.

The association between landscape and climate and reported tick paralysis cases in dogs and cats in Australia.
Vet Parasitol (2014)
Brazier, I., M. Kelman, and M. P. Ward
The aim of this study was to describe the association between landscape and climate factors and the occurrence of tick paralysis cases in dogs and cats reported by veterinarians in Australia. Data were collated based on postcode of residence of the animal and the corresponding landscape (landcover and elevation) and climate (precipitation, temperature) information was derived. During the study period (October 2010-December 2012), a total of 5560 cases (4235 [76%] canine and 1325 [24%] feline cases) were reported from 341 postcodes, mostly along the eastern seaboard of Australia and from the states of New South Wales and Queensland. Significantly more cases were reported from postcodes which contained areas of broadleaved, evergreen tree coverage (P=0.0019); broadleaved, deciduous open tree coverage (P=0.0416); and water bodies (P=0.0394). Significantly fewer tick paralysis cases were reported from postcodes which contained areas of sparse herbaceous or sparse shrub coverage (P=0.0297) and areas that were cultivated and managed (P=0.0005). No significant (P=0.6998) correlation between number of tick paralysis cases reported per postcode and elevation was found. Strong positive correlations were found between number of cases reported per postcode and the annual minimum (rSP=0.9552, P<0.0001) and maximum (rSP=0.9075; P=0.0001) precipitation. Correlations between reported tick paralysis cases and temperature variables were much weaker than for precipitation, rSP<0.23. For maximum temperature, the strongest correlation between cases was found in winter (rSP=0.1877; P=0.0005) and for minimum temperature in autumn (rSP=0.2289; P<0.0001). Study findings suggest that tick paralysis cases are more likely to occur and be reported in certain eco-climatic zones, such as those with higher rainfall and containing tree cover and areas of water. Veterinarians and pet owners in these zones should be particularly alert for tick paralysis cases to maximize the benefits of early treatment, and to be vigilant to use chemical prophylaxis to reduce the risk of tick parasitism.
Lungworms of the genus Troglostrongylus (Strongylida: Crenosomatidae): neglected parasites for domestic cats.
Brianti, E., S. Giannetto, F. Dantas-Torres, and D. Otranto
Feline lungworms belonging to the Troglostrongylus genus have been neglected for a long time. However, recent reports of Troglostrongylus brevior and Troglostrongylus subcrenatus in domestic cats have stimulated the interest of the scientific community on these lungworms. Troglostrongylus spp. have an indirect life cycle, which overlaps that of the better known Aelurostrongylus abstrusus. Nonetheless, adult worms of both genera have a distinct morphology and localization within the respiratory system of definitive hosts and, potentially, a different epidemiology and pathogenicity. As copromicroscopy has a low specificity for metastrongyloids due to the similarities of first-stage larvae, specific morphometrical keys and/or PCR diagnostic tools are advocated. Accordingly, more clinical studies and necropsy data are needed to elucidate the impact of Troglostrongylus spp. on the health of domestic cats. This article reviews current information on Troglostrongylus spp. as well as data on their occurrence in Europe and reports specific key morphological characters for the identification of adults and larvae, which is important to refine their diagnosis and for a better understanding of the feline lungworm infections.

Burr, H. D., J. H. Keating, C. A. Clifford, and K. E. Burgess
OBJECTIVE: To determine features of lymphoma of the tarsus in cats. DESIGN: Multi-institutional retrospective study. ANIMALS: 23 cats with cutaneous lymphoma of the tarsus. PROCEDURES: Veterinary oncologists were requested to submit cases fitting the following criteria: histologically or cytologically confirmed lymphoma with a location at or near the tarsus and described as subcutaneous or mass-like. Data regarding breed, sex, age, FeLV and FIV status, and reason for evaluation were collected. Results of staging tests, location of the tumor, immunophenotype, and histopathologic description were recorded. Type of treatments, outcome, survival time, presence or absence of progressive disease, and cause of death or reason for euthanasia were also recorded. RESULTS: Most cats were older, with a median age of 12 years (range, 7 to 18 years). No association with positive retroviral status was found. Popliteal lymph node involvement at diagnosis was reported in 5 cats, and a suspicion of lymphoma at a different site on the basis of results of abdominal ultrasonography was reported in 4 cats. Treatments were variable and included corticosteroids alone (n = 2), chemotherapy (9), radiation and chemotherapy (7), or surgery with or without chemotherapy (5). Thirteen cats were reported to have lymphoma at a different site at the time of last follow-up, death, or euthanasia. Median survival time for all cats in the study was 190 days (range, 17 to 1,011 days). CONCLUSIONS AND CLINICAL RELEVANCE: Results suggested that tarsal lymphoma is an uncommon manifestation of lymphoma in cats, and in this study was most commonly nonepitheliotropic and of high grade as determined on histologic evaluation. Systemic involvement was identified; therefore, thorough staging is recommended prior to initiating treatment. Future studies are warranted to evaluate effective treatment protocols.

Degenerative left shift as a prognostic tool in cats.
Burton, A. G., L. A. Harris, S. D. Owens, and K. E. Jandrey

BACKGROUND: A degenerative left shift (DLS) is reported to be a poor prognostic indicator in dogs and cats. Limited data in dogs and no studies in cats have been published to investigate this claim.

HYPOTHESIS/OBJECTIVES: To characterize the feline population affected by DLS and to determine if the presence and severity of DLS are associated with increased risk of euthanasia or death.

ANIMALS: One hundred and eight cats with DLS (cases) and 322 cats without DLS (controls) presented to the University of California, Davis Veterinary Medical Teaching Hospital between April 1, 1995 and April 1, 2010. METHODS: Retrospective case-control study. All cases had a CBC performed within 24 hours of presentation in which immature granulocytic precursors exceeded mature neutrophils. Controls were matched by year of presentation and primary diagnosis. Survival analysis was used to determine risk of death or euthanasia from DLS and other potential predictors of outcome.

RESULTS: Cases were more likely to die or be euthanized in hospital compared to controls (60/108 [56%] versus 107/322 [33%]). DLS was a significant predictor of death or euthanasia in hospitalized cats in both univariate and multivariate analysis (hazard ratio, 1.57; 95% confidence interval, 1.13-2.18). Trend analysis showed an increasing trend in the hazard of euthanasia or death with increasing severity of DLS.

CONCLUSIONS AND CLINICAL IMPORTANCE: Cats with DLS are 1.57 times more likely to die or be euthanized in hospital than cats without DLS. In addition, increasing severity of DLS is associated with increased likelihood of death or euthanasia.

Factors Influencing Wound Healing Complications After Wide Excision of Injection Site Sarcomas of the Trunk of Cats.

Vet Surg (2014)


OBJECTIVE: Wide surgery is the mainstay of the multimodal treatment of injection site sarcomas (ISS) in cats. The aim of the study was to analyze potential factors influencing the development of wound healing complications (WHC) in cats undergoing wide excision of ISS. STUDY DESIGN: Retrospective case series. ANIMALS: Forty-nine cats with ISS located on the trunk underwent wide excision after contrast-enhanced computed tomography planning. METHODS: The prognostic effect of covariates (sex, age, weight, body condition score (BCS), site, clinical dimension (CD), computed tomographic dimension (CTD), histotype, duration of surgery, surgical margin status, local anesthesia) on total, major and minor WHC was evaluated by univariate and bivariate analysis. Cox model was used for total WHC and Fine and Gray model was used for major and minor WHC. The relationship between duration of surgery and clinical and imaging variables was evaluated. RESULTS: The main factor associated to the risk of total and major WHC was surgical time. Based on univariate analysis, pattern of reconstruction, CDT, CD, weight, and BCS were significant prognostic factors for major WHC, but this was not confirmed when adjusted for other clinical variables in bivariate analysis. The duration of surgery was influenced by excision pattern and tumor CTD width. CONCLUSIONS: An increased duration of surgery as the consequence of complex surgical procedures represented the best predictor for the development of WHC.

AAFP and ISFM Guidelines for Diagnosing and Solving House-Soiling Behavior in Cats.


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RATIONALE: These Guidelines have been developed by the American Association of Feline Practitioners (AAFP) and the International Society of Feline Medicine (ISFM) as a resource for veterinary practitioners who want to better understand and manage the important clinical condition of house-soiling in their feline patients. The Guidelines offer straightforward, practical solutions that, in most cases, will help veterinarians and cat owners prevent, manage or entirely remediate feline house-soiling behavior. EVIDENCE BASE: The Guidelines include scientifically documented information when it is available. However, because research is often lacking, some recommendations reflect the accumulated clinical experience of the authors.

Prevalence and demographics of the MYBPC3-mutations in ragdolls and Maine coons in the British Isles.
Casamian-Sorrosal, D., S. K. Chong, S. Fonfara, and C. Helps
OBJECTIVES: To determine prevalence and demographics of two myosin-binding protein C (MYBPC3) mutations that affect ragdolls (R820W) and Maine coons (A31P) in the British Isles.
METHODS: From the database of a genetic testing laboratory samples from 2018 ragdolls and 742 Maine coons were analysed with respect to mutation status, age, sex and county of origin. The actual prevalence was compared to the expected Hardy-Weinberg prevalence by chi-squared test. RESULTS: The prevalence of the R820W mutation in ragdolls was 27% (25.6% heterozygous, 1.4% homozygous), and that of the A31P mutation in Maine coons was 39.4% (36.4% homozygous, 3% heterozygous). There were more female cats (69.5% ragdoll, 70.3% Maine coon). The median age was 6.4 months (ragdolls) and 5.9 months (Maine coons). Cats from more than 60 counties were represented for each breed. The difference between the expected and observed allele frequency was significant in Maine coons (P=0.047) but not in ragdolls (P=0.092). CLINICAL SIGNIFICANCE: This is the first report of prevalence and demographics of the R820W and A31P mutations in ragdolls and Maine coons, respectively, in the British Isles. The prevalence is high, which is of relevance for breeding and screening programmes. The significant difference in genetic distribution may suggest early death of homozygous Maine coons.

Effects of physiologic concentrations of l-lysine on in vitro replication of feline herpesvirus 1.
Cave, N. J., K. Dennis, G. Gopakumar, and M. Dunowska
OBJECTIVE: To evaluate the effects of various concentrations of l-lysine on in vitro replication of feline herpesvirus 1 (FHV-1). SAMPLE: Cultures of Crandell-Rees feline kidney (CRFK) cells.
PROCEDURES: CRFK cells were inoculated with FHV-1 and maintained in media with 20 combinations of l-arginine and l-lysine concentrations. Changes in cell viability were monitored by continuous measurement of electrical impedance of cultured cells and by observation of viral cytopathic effects. Viral load was determined by use of quantitative PCR assay in supernatants obtained from infected cultures at specified time points. RESULTS: Increases in l-lysine concentration had no effect on the kinetics of cell death in FHV-1-infected cultures. There was also no significant effect (r(2) < 0.1) on viral DNA load for l-arginine concentrations >/= 12 mug/mL. There was a significant effect of increases in l-lysine concentration on viral DNA load in media supplemented with
6 mug of l-arginine/mL (mean +/- SD slope, -4.641 +/- 1.626 units; adjusted r(2) = 0.45). However, the difference between the lowest (1 x 10(6.28) copies/μL) and highest (1 x 10(6.86) copies/μL) FHV-1 DNA load in these media was < 1 logarithm. CONCLUSIONS AND CLINICAL RELEVANCE: The difference in FHV-1 DNA load was unlikely to be biologically important. Various l-lysine concentrations did not inhibit in vitro replication of FHV-1 at l-arginine concentrations sufficient to maintain cell growth. This conclusion was consistent with results of other studies in which investigators have not detected a consistently beneficial effect when l-lysine is administered to FHV-1-infected cats.

Four Human Cases of Acanthotrema felis (Digenea: Heterophyidae) Infection in Korea.
Chai, J. Y., J. L. Kim, and M. Seo
Acanthotrema felis is an intestinal trematode of cats originally reported from the Republic of Korea. Only 1 human case infected with a single adult worm has been previously recorded. In the present study, we report 4 human cases infected with a total of 10 worms recovered after anthelmintic treatment and purging. All 4 patients reside in coastal areas of Jeollanam-do, Korea, and have consumed brackish water fish including the gobies, Acanthogobius flavimanus. The worms averaged 0.47 mm in length and 0.27 mm in width, and had 3 sclerites on the ventrogenital sac; 1 was short and thumb-like, another was long and blunt-ended, and the 3rd was long and broad-tipped. They were identified as A. felis Sohn, Han, & Chai, 2003. Surveys on coastal areas to detect further human cases infected with A. felis are required.

Cytological and molecular detection of Leishmania infantum in different tissues of clinically normal and sick cats.
Natural infection of domestic cats by Leishmania infantum (synonym: L. chagasi) has been demonstrated in several European, Latin American, and Asian countries, and the estimated prevalence of infection, based mainly on blood PCR, ranges from 0.3% up to 60.6%. In this study we aimed to: (a) estimate the prevalence of the infection by L. infantum in clinically normal cats (group A; n=50) and in cats with various clinical signs (group B; n=50), living in an endemic region, by both cytological examination of four different tissues (lymph node, skin, bone marrow, and conjunctiva) and by PCR in four different tissues (blood, skin biopsies, bone marrow, and conjunctiva); (b) compare the diagnostic sensitivity of the above methods and evaluate for possible associations between their results; and (c) investigate the possible associations between infection by L. infantum and signalment, living conditions, season of sampling, and health status of the cats. The prevalence of the infection in the study population was 41% and did not differ (P=0.839) between group A (42%) and B (40%) cats. Lymph node, skin, bone marrow and conjunctiva cytology was always negative. Therefore, the diagnosis of the infection was based only on PCR in blood, skin biopsy, bone marrow and conjunctiva, which was positive in 13%, 18.2%, 16% and 3.1% of the cats, respectively. PCR was positive in only one of the four tissues in 80.5% of the infected cats. The results differed (P=0.014) among the four tissues and were less frequently positive in conjunctiva compared to skin biopsies and bone marrow (P=0.007 for both comparisons), thus highlighting the need for multiple tissue PCR testing in order to
minimize false-negative results. More PCR-positive cats were found when sampling was performed during the period of sandfly activity (odds ratio: 2.44; P=0.022). Also, in group B cats, the likelihood of PCR-positivity was higher (odds ratio: 3.93; P=0.042) among those presenting at least one systemic clinical sign that had been previously reported in cats with leishmaniosis.

**Cardiovascular effects of dietary salt intake in aged healthy cats: a 2-year prospective randomized, blinded, and controlled study.**


*Chetboul, V., B. S. Reynolds, E. Trehiou-Sechi, P. Nguyen, D. Concordet, C. C. Sampedrano, I. Testault, J. Elliott, J. Abadie, V. Biourge, and H. P. Lefebvre*

High salt dry expanded diets are commercially available for cats to increase water intake and urine volume, as part of the prevention or treatment of naturally occurring urinary stone formation (calcium oxalates and struvites). However, chronic high salt intake may have potential cardiovascular adverse effects in both humans, especially in aging individuals, and several animal models. The objective of this prospective, randomized, blinded, and controlled study was to assess the long-term cardiovascular effects of high salt intake in healthy aged cats. Twenty healthy neutered cats (10.1 +/- 2.4 years) were randomly allocated into 2 matched groups. One group was fed a high salt diet (3.1 g/Mcal sodium, 5.5 g/Mcal chloride) and the other group a control diet of same composition except for salt content (1.0 g/Mcal sodium, 2.2 g/Mcal chloride). Clinical examination, systolic and diastolic arterial blood pressure measurements, standard transthoracic echocardiography and conventional Doppler examinations were repeatedly performed on non-sedated cats by trained observers before and over 24 months after diet implementation. Radial and longitudinal velocities of the left ventricular free wall and the interventricular septum were also assessed in systole and diastole using 2-dimensional color tissue Doppler imaging. Statistics were performed using a general linear model. No significant effect of dietary salt intake was observed on systolic and diastolic arterial blood pressure values. Out of the 33 tested imaging variables, the only one affected by dietary salt intake was the radial early on late diastolic velocity ratio assessed in the endocardium of the left ventricular free wall, statistically lower in the high salt diet group at 12 months only (P = 0.044). In conclusion, in this study involving healthy aged cats, chronic high dietary salt intake was not associated with an increased risk of systemic arterial hypertension and myocardial dysfunction, as observed in some elderly people, salt-sensitive patients and animal models.

**Experimental infection of cats with *Afipia felis* and various Bartonella species or subspecies.**


Based upon prior studies, domestic cats have been shown to be the natural reservoir for Bartonella henselae, Bartonella clarridgeiae and Bartonella koehlerae. However, other Bartonella species, such as Bartonella vinsonii subsp. berkhoffii, Bartonella quintana or Bartonella bovis (ex weissii) have been either isolated from or Bartonella DNA sequences PCR amplified and sequenced. In the late 1980s, before B. henselae was confirmed as the etiological agent of cat scratch disease, *Afipia felis* had been proposed as the causative agent. In order to determine the feline susceptibility to *A. felis*, *B. vinsonii subsp. berkhoffii*, *Bartonella rochalimae*, *B. quintana* or *B. bovis*, we sought to detect the presence of bacteremia and seroconversion in experimentally-inoculated cats. Most of the cats seroconverted, but
only the cats inoculated with B. rochalimae became bacteremic, indicating that cats are not natural hosts of A. felis or the other Bartonella species or subspecies tested in this study.

**Metabolic determinants of body weight after cats were fed a low-carbohydrate high-protein diet or a high-carbohydrate low-protein diet ad libitum for 8 wk.**

Domest Anim Endocrinol (2014) 49C:70-79.

Coradini, M., J. S. Rand, J. M. Morton, and J. M. Rawlings

Overweight and obese conditions are common in cats and are associated with the development of a number of diseases. Knowledge of metabolic determinants and predictors of weight gain may enable better preventative strategies for obesity in cats. Lean, healthy cats were fed either a low-carbohydrate high-protein diet (n 16) or a high-carbohydrate low-protein (n 16) diet ad libitum for 8 wk. Potential determinants and predictors of final body weight assessed were body fat and lean masses, energy required for maintenance, energy requirements above maintenance for each kilogram of weight gain, insulin sensitivity index, fasting, mean 24-h and peak plasma glucose, insulin, and leptin concentrations, and fasting and mean 24-h serum adiponectin concentrations. In cats fed the low-carbohydrate high-protein diet, after adjusting for initial body weight, those with higher energy requirements for weight gain and higher fasting glucose concentration had higher final body weights (P <= 0.01). Predicted final body weights using initial body weight, fasting glucose and mean 24-h insulin concentrations (partial R2 37.3%) were imprecise. An equation using just initial body weight and fasting glucose concentration would be of more practical value, but was marginally less precise. In cats fed the high-carbohydrate low-protein diet, those with lower fasting leptin concentration initially had higher final body weights (P = 0.01). Predicted final body weights using initial body weight, energy requirements for maintenance, total body fat percentage and fasting leptin concentration (partial R2 39.2%) were reasonably precise. Further studies are warranted to confirm these findings and to improve the precision of predicted final body weights.

**Palatability evaluation study of a new oral formulation of marbofloxacin in cats.**


Cron, M., C. Zemirline, J. Beranger, and V. Privat

At a time when antimicrobial resistance is a global concern in human and animal health, it is of primary importance to draw attention to the problem of compliance with antibiotic therapy in animals hard to medicate such as cats. Resistance may develop because of poor patient compliance with the prescribed course of antibiotic therapy. Increasing palatability might enhance administration compliance. We assessed the acceptability of EFEX tablets, a new oral marbofloxacin formulation for cats. The objective of this study was to compare EFEX to two commercial formulations of marbofloxacin: MARBOCYL P palatable tablets and MARBOCYL Vet tablets. Acceptance tests were run in experimental conditions in 24 cats to compare the spontaneous intake and full consumption of the three pharmaceutical products. The results indicated that EFEX was more palatable than MARBOCYL Vet (0.001<P <0.01) and equally comparable with MARBOCYL P in palatability. There was no difference in the short-term adverse effects between the products.

**Measuring level of agreement between values obtained by directly measured blood pressure and ultrasonic Doppler flow detector in cats.**

OBJECTIVE: To determine if blood pressure measured with an ultrasonic Doppler flow detector (Doppler) is in good agreement with directly measured blood pressures in anesthetized cats. DESIGN: Prospective observational study. SETTING: University veterinary teaching hospital. ANIMALS: Thirty-nine cats undergoing routine neutering. INTERVENTIONS: Cats were divided into 2 groups; 19 cats enrolled in Group A had a 24-Ga catheter inserted into a dorsal pedal artery; 20 cats in Group B had a 20-Ga catheter placed in a femoral artery. In both groups, systolic, diastolic, and mean arterial pressures were directly measured using a validated pressure measurement system. Indirect values were compared against direct blood pressure measurements. RESULTS: There was no difference between groups. Overall, there was poor agreement with a significant bias observed between Doppler and directly measured blood pressures. For the systolic arterial pressure the bias was -8.8 with limits of agreements (LOA) of -39.3 and 21.7. For the mean arterial pressure, the bias was 14.0 with LOA of -13.9 and 41.9. For the diastolic arterial pressure, the bias was 27.9 with LOA of -4.4 and 60.2. Methodology, weight, sex, and replicates did not have a significant effect on the difference between indirect and direct measurements in any model. CONCLUSIONS: Results suggest poor agreement between Doppler values and directly measured blood pressures in anesthetized cats. Use of Doppler in cats could be misleading and readings should be interpreted with caution in a clinical context.

Pregeneral anaesthetic blood screening of dogs and cats attending a UK practice.
Davies, M., and S. Kawaguchi

Antibiotics used most commonly to treat animals in Europe.
Vet Rec (2014)
The Heads of Medicines Agencies and the Federation of Veterinarians of Europe undertook a survey to gain an insight into European prescribing of antibiotics for animals, in particular to highlight the diseases for which antibiotics are most commonly said to be prescribed and which different classes, including human critically important antibiotics (CIAs). The survey was completed by 3004 practitioners from 25 European countries. Many older antibiotics (eg, penicillins, tetracyclines) are cited most frequently as the prescribed classes to treat the main food producing species. The frequency of citation of non-CIAs predominates. CIAs are mostly frequently cited to be prescribed for: urinary diseases in cats (62 per cent), respiratory diseases in cattle (45 per cent), diarrhoea in cattle and pigs (respectively 29 per cent and 34 per cent), locomotion disorders in cattle (31 per cent), postpartum dysgalactia syndrome complex in pigs (31 per cent) and dental disease in dogs (36 per cent). Clear ‘preferences’ between countries can be observed between antibiotic classes. The use of national formularies and guidance helps to drive responsible use of antibiotics and can significantly reduce the extent of use of CIAs. A more widespread introduction of veterinary practice antibiotic prescribing policies and monitoring obedience to these should ensure more widespread compliance with responsible use guidelines.

Treatment of acquired nasopharyngeal stenosis using a removable silicone stent.
De Lorenzi, D., D. Bertoncello, S. Comastri, and E. Bottero

The aim of this prospective study was to characterise patient characteristics and the histories of cats with acquired nasopharyngeal stenosis (ANS), and to describe the use of a removable silicone stent for treatment. ANS was diagnosed in 15 cats with clinical signs present for a median of 4 months. Clinical signs included stertor and inspiratory difficulty, nasal discharge, sneezing, dysphagia, regurgitation, vomiting and anorexia. Radiographs revealed a dorsal deviation or deformation of the caudal part of the soft palate in 10 of the cats, a soft tissue density across the cranial nasopharynx in four and no abnormality in one. The stenosis was initially dilated with a Kelly forceps in 10 of the cats and by balloon dilatation in five. A segment of a 24 Fr silicone thoracic catheter was used for the stent in five cats; in the other 10 cats a segment of a 28 Fr catheter was used. The stent was removed after 3 weeks in 12 cats and after 4 weeks in the other three. Endoscopy revealed an adequate nasopharyngeal diameter in all of the cats. At both 3 and 10 months after surgery the response was considered to be satisfactory, with complete resolution of clinical signs in 14 cats and improvement in the remaining cat. The treatment of ANS by stenosis dilatation followed by temporary stenting with a silicone stent is a rapid, safe, economical and effective procedure.

Pharmacokinetic profiles of the analgesic drug flupirtine in cats.

Vet J (2014)
De Vito, V., B. Lebkowska-Wieruszewska, H. Owen, C. J. Kowalski, and M. Giorgi

Flupirtine (FLU) is a non-opioid analgesic drug with no antipyretic or antiphlogistic effects, used in the treatment of a wide range of pain states in human beings. There is a substantial body of evidence on the efficacy of FLU in humans but this is inadequate to recommend its off-label use in veterinary clinical practice. The aim of this study was to evaluate the pharmacokinetic profiles of FLU after IV and PO administration in healthy cats. Six mixed breed adult cats were randomly assigned to two treatment groups using an open, single-dose, two-treatment, two-phase, paired, cross-over design (2 x 2 Latin-square). Group 1 (n = 3) received a single dose of 5 mg/kg of FLU injected IV into the jugular vein. Group 2 (n = 3) received the same dose via PO route. The wash out period was 1 week. Blood samples (1 mL) were collected at assigned times and plasma was then analysed by a validated HPLC method. No adverse effects at the point of injection and no behavioural changes or alterations in health parameters were observed in the animals during or after the study (up to 7 days after the full study). After IV administration, FLU was detectable in plasma up to 36 h. After PO administration, FLU plasma concentrations were lower than those following IV administration, but they were detectable over the same time range. The terminal part of both mean pharmacokinetic curves showed a similar trend of elimination. The oral bioavailability was approximately 40%. This is the first study of FLU in an animal species of veterinary interest and it could pave the way for the use of this active ingredient in the veterinary field.

Treatment of Troglostrongylus brevior (Metastrongyloidea, Crenosomatidae) in mixed lungworm infections using spot-on emodepside.

Di Cesare, A., R. Iorio, P. Crisi, B. Paoletti, R. Di Costanzo, C. F. Dimitri, and D. Traversa

Feline lungworms have long been known as pathogens of cats. However, an increased incidence of clinical cases in some areas has been the focus of a number of recent epidemiological and clinical studies. While Aelurostrongylus abstrusus causes respiratory signs in cats all over the world,
Troglostrongylus brevior has recently been found in domestic cats from Spain and Italy (where it often causes severe clinical signs). Capillaria aerophila, a parasite that infects many wild carnivores may cause respiratory distress in cats. A variety of treatment options are known for A abstrusus, while almost no information is available on the treatment of troglostrongylosis and capillariosis. This series describes two mixed infections in clinically affected kittens with T brevior, one with concurrent A abstrusus and the other with C aerophila. In both cases, the nematodes were identified and confirmed by copromicroscopic examination and specific DNA-based assays. Kittens showed respiratory signs that resolved after one or two administrations of a spot-on solution containing emodepside. Larval (T brevior and A abstrusus) and egg (C aerophila) shedding was also eliminated 2-4 weeks after treatment. New clinical insights into these parasitoses are discussed.

**Use of visual and permanent identification for pets by veterinary clinics.**

It is estimated that more than 5 million stray dogs and cats enter animal shelters in the USA each year, but less than half are ever reunited with their owners. Lost pets with identification microchips are up to 21 times more likely to be reunited than those without. Finders of lost pets are more likely to consult veterinarians than shelters for assistance, and pet owners look first to veterinarians for advice regarding pet health, protection, and welfare. An online survey of 1086 veterinary clinics in the South-Eastern USA was conducted to evaluate how veterinary clinics functioned as a part of the pet identification network. Scanning and microchip implants were offered by 91% of surveyed clinics and 41% used ‘global’ scanners capable of detecting all currently used microchip brands. Clinics more frequently relied on pet owners to register contact information rather than providing this service for clients (52% vs. 43%, respectively). Even though lost dogs are more likely to be reunited with owners than lost cats, microchips and collars were more likely to be recommended for all dogs (85% and 93%, respectively) than for all cats (67% and 61%, respectively). Only half of clinics that recommended identification collars made them available to their clients. Veterinarians can protect animals, pet owners and the human-animal bond by integrating pet identification into preventive health care.

**Double-outlet right atrium in a 9 year-old cat.**
Durham, J., and H. Maisenbacher

Double-outlet right atrium (DORA) is a type of atrioventricular septal defect that is described as an extreme leftward deviation of the lower portion of the interatrial septum, resulting in insertion into the atrial wall left and posterior to the mitral orifice. This rare anomaly, which has been reported in humans and only just recently in cats, was identified by transthoracic echocardiography in a 9 year-old cat that was presented for further evaluation of a tachyarrhythmia and cardiomegaly. This case report describes the diagnostic findings in this cat and summarizes the anatomy, classification and clinical consequences of this rare congenital heart defect.

**The European wildcats (Felis silvestris silvestris) as reservoir hosts of Troglostrongylus brevior (Strongylida: Crenosomatidae) lungworms.**
Vet Parasitol (2014)

The increasing reports of Troglostrongylus brevior lungworm in domestic cats from Italy and Spain raised questions on its factual distribution and on the role wildcats play as reservoirs of these parasites. Carcasses of 21 wildcats were collected in natural parks of southern Italy (i.e., Catania, Sicily n=5 and Matera, Basilicata n=16) and biometrically and genetically identified as Felis silvestris silvestris, but two as hybrids. Troglostrongylus brevior and Eucoleus aerophilus lungworms were found in 15 (71.4%) and 7 (33.3%) individuals, respectively, being five (23.8%) co-infected by the two species. Both lungworms showed an aggregated distribution in the host population, assessed by k-index (i.e., 0.69 for T. brevior and 0.42 for E. aerophilus). Although no statistical significant difference was recorded among age, gender and geographical location of wildcats, a larger rate of infection by T. brevior was assessed in yearlings (85.7%) than adults (64.3%). This is the first epidemiological study reporting T. brevior infection in the European wildcat and discusses the potential threat this may represent for the conservation of this endangered species of felids. In addition, given the large frequency of lungworm infection herein recorded, the role of wildcats as reservoir hosts of these parasites to domestic cats is discussed.

Veterinary provision of analgesia for domestic cats (Felis catus) undergoing gonadectomy: a comparison of samples from New Zealand, Australia and the United Kingdom.
Farnworth, M., N. Adams, A. Keown, N. Waran, and K. Stafford
AIM: To compare the use and provision of analgesia to cats undergoing gonadectomy by a sample of veterinarians in New Zealand, Australia and the United Kingdom (UK). METHODS: Small animal veterinarians’ views and practices on provision of analgesia to cats at three different time phases (pre/intra-operatively, post-operatively and post-discharge) were gathered using an on-line questionnaire. Respondents were also asked to state the pharmacological agent(s) used and the dosage rate(s). Differences in provision of analgesia were assessed relative to the respondent using binary logistic regression. The effects of gender of the patient and time of provision were explored using McNewar’s Test and Cochran’s Q, respectively. Differences between drug types used amongst countries were tested using chi(2) analysis. RESULTS: There were 717 responses to the survey. Of these 249 (34.7%) were from New Zealand, 269 (37.5%) were from the UK and 199 (27.8%) from Australia. The prevalence of analgesia provision declined across the three different time phases for spaying and castration (both p<0.001). Provision of analgesia for castration was less than for spaying at each of the pre/intra-operative (p=0.002), post-operative (p<0.001) and after discharge (p<0.001) phases. Post-operative provision of analgesia following both castration (p<0.001) and spaying (p<0.001) differed amongst countries of practice. Veterinarians in Australia and New Zealand were more likely to provide post-operative analgesia for both castration and spaying than those from the UK (p<0.001). Veterinarians from the UK more commonly used non-steroidal anti-inflammatory drugs (NSAID) in the pre/intra-operative phase (p<0.001) than veterinarians from either New Zealand or Australia. CONCLUSIONS AND CLINICAL RELEVANCE: Contemporary use of analgesics for cats appears focused on provision at clinic and may not address the effects of surgery beyond the first 24 hours. The UK, Australia and New Zealand clearly differ in the types of analgesia administered, possibly reflecting differing professional considerations of the risks associated with the use of NSAID. In the interests of animal welfare, pain relief should perhaps be provided or offered more frequently for owner administration.
A SURVEY OF VETERINARY RADIATION FACILITIES IN 2010.
Vet Radiol Ultrasound (2014)
Farrelly, J., and M. C. McEntee
A survey of veterinary radiation therapy facilities in the United States, Canada, and Europe was done in 2010, using an online survey tool, to determine the type of equipment available, radiation protocols used, caseload, tumor types irradiated, as well as other details of the practice of veterinary radiation oncology. The results of this survey were compared to a similar survey performed in 2001. A total of 76 facilities were identified including 24 (32%) academic institutions and 52 (68%) private practice external beam radiation therapy facilities. The overall response rate was 51% (39/76 responded). Based on this survey, there is substantial variation among facilities in all aspects ranging from equipment and personnel to radiation protocols and caseloads. American College of Veterinary Radiology boarded radiation oncologists direct 90% of the radiation facilities, which was increased slightly compared to 2001. All facilities surveyed in 2010 had a linear accelerator. More facilities reported having electron capability (79%) compared to the 2001 survey. Eight facilities had a radiation oncology resident, and academic facilities were more likely to have residents. Patient caseload information was available from 28 sites (37% of radiation facilities), and based on the responses 1376 dogs and 352 cats were irradiated in 2010. The most frequently irradiated tumors were soft tissue sarcomas in dogs, and oral squamous cell carcinoma in cats.

Polyostotic hyperostosis in a domestic shorthair cat.
CLINICAL PRESENTATION: An 11-year-old male neutered domestic shorthair cat was presented for investigation of weight loss and inappetence. On physical examination there was palpable enlargement and thickening of many bones, and this finding was confirmed radiographically. PROPOSED DIAGNOSIS: Based on clinical, radiological and histopathological findings, a polyostotic bone disease, best described as generalised idiopathic hyperostosis, was diagnosed. This condition has not been reported in cats previously. Canine and human diseases with similarities to this presentation are discussed.

Analytical performance of a dry chemistry analyzer designed for in-clinic use.
Flatland, B., L. C. Breickner, and M. M. Fry
BACKGROUND: The Heska Dri-Chem 4000 uses dry slide technology to evaluate serum or plasma. No previous independent performance evaluation is published to the authors’ knowledge. OBJECTIVES: The objectives were to (1) characterize analytical performance of a Dri-Chem 4000 by measuring precision and bias, (2) compare analytical performance of that Dri-Chem 4000 unit with a predetermined quality requirement, and (3) determine whether statistical QC of the Dri-Chem 4000 is possible using the 13s control rule. METHODS: Sixteen analytes were measured using plasma from dogs, cats, and horses. Coefficient of variation (CV), bias, and observed total error (TEobs) were calculated. TEobs was compared with allowable total error (TEa). Sigma metric and quality goal index were calculated where relevant. QC validation was performed. RESULTS: Bias and TEobs calculated using quality control material (QCM) data were smaller than those calculated using method comparison
data. Using \( TE_{obs} \) calculated from species-specific CV and QCM-based bias, 100% of analytes in each species met ASVCP-recommended \( TE_a \). Desired error detection and false rejection rates were achievable using the 13s control rule and ASVCP-recommended \( TE_a \) values for 9/16 (56%) of analytes in dogs, 9/14 (64%) of analytes in cats, and 8/13 (62%) of analytes in horses. CONCLUSIONS:

Analytical performance of the Dri-Chem 4000 is comparable to that reported by other authors for other small benchtop biochemistry analyzers. Statistical QC using a simple control rule is possible for most analytes in dogs, cats, and horses.

**A randomized study assessing the effect of diet in cats with hypertrophic cardiomyopathy.**


**Freeman, L. M., J. E. Rush, S. M. Cunningham, and B. J. Bulmer**

BACKGROUND: Diet might influence progression of hypertrophic cardiomyopathy (HCM).

OBJECTIVE: To investigate whether diet composition could alter clinical, biochemical, or echocardiographic variables in cats with HCM.

ANIMALS: Twenty-nine cats with HCM (International Small Animal Cardiac Health Council stage 1b) examined at a university teaching hospital.

METHODS: Randomized, placebo-controlled trial. After physical examination, echocardiogram, and blood collection, cats were randomized to 1 of 3 diets, which varied in carbohydrate and fat content and ingredients. Measurements were repeated after 6 months.

RESULTS: There were no significant differences among the 3 groups at baseline. After 6 months, there were no significant changes in the primary endpoints, left ventricular free wall (Group A, \( P = .760 \); Group B, \( P = .475 \); Group C, \( P = .066 \)) or interventricular septal thickness in diastole (Group A, \( P = .528 \); Group B, \( P = .221 \); Group C, \( P = .097 \)). Group A had significant increases in BUN (\( P = .008 \)) and cholesterol (\( P = .021 \)), while Group B had significant increases in BUN (\( P = .008 \)), cholesterol (\( P = .007 \)), and triglycerides (\( P = .005 \)), and significant decreases in NT-proBNP (\( P = .013 \)) and hs-troponin I (\( P = .043 \)). Group C had significant decreases in body weight (\( P = .021 \)), left atrial dimension (\( P = .035 \)), interventricular septal thickness in systole (\( P = .038 \)), and liver enzymes (\( P = .034-.038 \)).

CONCLUSIONS AND CLINICAL IMPORTANCE: These data suggest that diet might influence some clinical, biochemical, and echocardiographic variables in cats with HCM.

**Efficacy of passively transferred antibodies in cats with acute viral upper respiratory tract infection.**

Vet J (2014)

**Friedl, Y., B. Schulz, A. Knebl, C. Helps, U. Truyen, and K. Hartmann**

A commercial hyperimmune serum, containing antibodies against feline calicivirus (FCV), feline herpesvirus 1 (FHV-1), and feline panleukopenia virus, is available for treatment of cats with feline upper respiratory tract disease (FURTD), but its efficacy has not been rigorously evaluated in scientific studies. The aim of this randomised, placebo-controlled, double-blind clinical trial was to evaluate the efficacy of passive immunisation in cats with acute viral FURTD caused by FCV and/or FHV-1 infection. All cats received symptomatic treatment during the study period. Hyperimmune serum was administered to one group (\( n = 22 \)) and an equivalent amount of saline was administered to the control group (\( n = 20 \)) as placebo, for 3 consecutive days. In the treatment group, cats \( \leq 12 \) weeks old received 2 mL, cats >12 weeks old received 4 mL, subcutaneously once daily and topically into eyes, nostrils, and mouth every 8 h. Clinical signs, including a ‘FURTD score’ and general health status, were recorded daily for 8 days and again on day 21. FCV shedding was determined by quantitative
PCR on days 0 and 21. Clinical signs and health status in both groups improved significantly over time (P < 0.001). Cats receiving hyperimmune serum significantly improved in terms of ‘FURTD score’ (P = 0.046) and general health status (P = 0.032) by day 3, while cats in the placebo group only improved significantly by day 7. There was no significant difference in the number of cats shedding FCV between the two groups. Thus, administration of hyperimmune serum led to a more rapid improvement of clinical signs in cats with acute viral FURTD, but by day 7, clinical signs had improved equally in both groups.

A molecular study of hemotropic mycoplasmas (hemoplasmas) in cats in Iran.
Vet Clin Pathol (2014)
BACKGROUND: Three feline hemoplasma species are recognized: Mycoplasma haemofelis, ‘Candidatus Mycoplasma haemominutum’, and ‘Candidatus Mycoplasma turicensis’. These species can cause anemia in cats and have a worldwide distribution. OBJECTIVES: There was no previous information on hemotropic mycoplasma spp in cats in Iran and the Middle East. Accordingly, we investigated the molecular presence, and clinical signs and hematological profile in cats infected with these microorganisms in Iranian cats. METHODS: Polymerase chain reaction (PCR) assays and cytology were performed on 100 blood samples collected from Iranian Shorthair cats. ACBC and case history were also collected for each sample. RESULTS: By PCR, 22 (22%; 14-30%, 95% CI) samples were positive. The prevalence of M haemofelis, ‘Ca M haemominutum’, and ‘Ca M turicensis’ was 63.63% (14/22), 54.54% (12/22), and 18.18% (4/22), respectively. Some double and triple co-infections were also found. Using PCR as the reference method, cytology had poor sensitivity (27%) and reasonable specificity (89.74%). Male cats were at a higher risk of infection (P =.001). Cat's older than 8 years were more frequently infected than the younger cats (P =.0018). Lower HCT (P =.018), RBC count (P =.028) and HGB concentration (P =.003) were also associated with hemoplasma PCR-positive status. CONCLUSIONS: Based on this study, the most prevalent feline hemoplasma species in Iranian cats was M haemofelis, but double and triple co-infections are also documented. Age and sex, as well as reduced RBC parameters, were predisposing factors for hemoplasma infection.

Cystatin C: a new renal marker and its potential use in small animal medicine.
Ghys, L., D. Paepe, P. Smets, H. Lefebvre, J. Delanghe, and S. Daminet
The occurrence of chronic kidney disease is underestimated in both human and veterinary medicine. Glomerular filtration rate (GFR) is considered the gold standard for evaluating kidney function. However, GFR assessment is time-consuming and labor-intensive and therefore not routinely used in practice. The commonly used indirect GFR markers, serum creatinine (sCr) and urea, are not sufficiently sensitive or specific to detect early renal dysfunction. Serum cystatin C (sCysC), a proteinase inhibitor, has most of the properties required for an endogenous GFR marker. In human medicine, numerous studies have evaluated its potential use as a GFR marker in several populations. In veterinary medicine, this marker is gaining interest. The measurement is easy, which makes it an interesting parameter for clinical use. This review summarizes current knowledge about cystatin C (CysC) in humans, dogs, and cats, including its history, assays, relationship with GFR, and biological and clinical variations in both human and veterinary medicine.
Analytical validation of a human particle-enhanced nephelometric assay for cystatin C measurement in feline serum and urine.


BACKGROUND: In people and dogs, Cystatin C (CysC), a renal glomerular and tubular marker, seems superior to serum creatinine to estimate the glomerular filtration rate (GFR). A particle-enhanced nephelometric immunoassay is available to measure human CysC, but there are no reports in cats.
OBJECTIVE: The goal of this study was the validation of the human CysC nephelometric assay with feline serum and urine, and to perform a pilot study comparing serum and urine CysC between healthy cats and cats with chronic kidney disease (CKD).
METHODS: Western blot analysis was used to assess cross-reactivity between the polyclonal rabbit anti-human CysC antibody and feline CysC. Imprecision and linearity were determined for feline serum and urine CysC. Serum and urine CysC were measured in 10 healthy and 10 CKD cats.
RESULTS: Cross-reactivity between the polyclonal rabbit anti-human CysC antibody and feline CysC was demonstrated. Intra- and inter-assay coefficients of variation in feline serum and urine were 1.3% and 0.4%, and 12.5%, and 4.1%, respectively. Cats with CKD had a significantly higher serum CysC concentration (1.24 [0.63-2.99] vs 0.79 [0.43-1.05] mg/L; P = .02) and urine CysC/urinary Creatinine (uCr) ratio (565.6 [0-1311] vs < 0.049/uCr mg/mol; P = .005) compared with healthy cats.
CONCLUSIONS: The human nephelometric assay showed satisfactory validation results for feline CysC. Cats with CKD had a significantly higher sCysC concentration and uCysC/uCr ratio compared with healthy cats. Additional studies are necessary to evaluate CysC as an early marker of renal damage in cats.

Pathological and histological findings associated with the feline lungworm Troglostrongylus brevior.
Vet Parasitol (2014)


Troglostrongylus brevior is a neglected feline lungworm species, which has been increasingly reported in the Mediterranean area, although scant data are available on the respiratory alterations it causes in cats. Therefore, we describe the gross and histological lesions of a 20-week old kitten that succumbed due to the onset of a fulminant respiratory failure. At necropsy, a catarrhal exudate was observed in the airways, along with nematodes in the trachea and bronchi. The lungs were processed for histological examination and serial pulmonary sections were performed. A total of 14 nematodes were collected, being all morphologically and molecularly identified as T. brevior. Lungworms were histologically localized within the bronchial lumen, surrounded by an eosinophilic infiltrate. The presence of T. brevior in the airways has been histologically documented for the first time and its life-threatening potential is discussed.

Disinfection procedures and TB in cats.

Gibbens, N.
A comparison of anaesthetic recoveries in cats following induction with either alfaxalone or ketamine and diazepam.
Gieseg, M., H. Hon, J. Bridges, and V. Walsh

AIM: To determine if cats anaesthetised with alfaxalone have different recoveries to cats anaesthetised with a combination of ketamine and diazepam. METHODS: Anaesthesia for ovariohysterectomy was induced in cats with either alfaxalone (n=23) or a combination of ketamine and diazepam (n=22). All cats were premedicated with combinations of acepromazine and morphine. Recoveries were scored using a categorical grading scheme applied to 18 parameters over 60 minutes following extubation. The parameters scored covered movement, sensitivity to touch, sound and light, body position, sneezing and vocalisation. One person scored all recoveries and they were blinded to the induction drug used. Scores were compared between drugs at different times using the Kruskal-Wallis rank sum test.

RESULTS: Recovery scores were not normally distributed. Analysis of the data using the Kruskal-Wallis rank sum test revealed that cats induced with alfaxalone showed an increase in recovery scores at 5 minutes for pawing at the head (p=0.001). No parameters differed significantly at 10 and 20 minutes. For cats anaesthetised with ketamine and diazepam there was an increase at 30 minutes in pacing, jerky sudden movements, unsettledness and increased sensitivity to touch at the surgical site and on the head (p</=0.01). At 60 minutes cats anaesthetised with ketamine and diazepam still showed an increase in unsettledness compared to those cats anaesthetised with alfaxalone (p=0.005).

CONCLUSIONS: The results suggest that recoveries of cats following alfaxalone induction are significantly different to recoveries after induction with ketamine and diazepam. Overall, cats induced with ketamine and diazepam had more active and unsettled recoveries than alfaxalone over the 60-minute period observed. CLINICAL RELEVANCE: Cats recovering from alfaxalone anaesthesia have more settled recoveries than cats recovering from ketamine and diazepam anaesthesia. If a quiet settled recovery is desired following a surgical procedure, alfaxalone is likely to be a better choice than ketamine and diazepam.

Corneal anesthesia following application of 0.4% oxybuprocaine hydrochloride ophthalmic solution to normal feline eyes.
Vet Ophthalmol (2014)
Giudici, V., S. Baeza, J. Y. Douet, and A. Regnier

OBJECTIVE: To evaluate the loss and recovery of corneal sensitivity after instillation of 0.4% oxybuprocaine hydrochloride solution in the normal feline eye. ANIMAL STUDIED: Eighteen European shorthair cats free of ocular disease PROCEDURES: Baseline corneal touch threshold (CTT) readings were obtained bilaterally with a Cochet-Bonnet aesthesiometer prior to treatment. Subsequently, each cat received a single drop of 0.4% oxybuprocaine ophthalmic solution in the right eye and one drop of sterile 0.9% NaCl in the left eye to serve as control. The corneal touch threshold (CTT) of both eyes was then measured 1 min after drug administration and every 5 min for 60 min. The potential for ocular irritation following oxybuprocaine application was also evaluated. RESULTS: Baseline CTT readings were not significantly different (P > 0.05) between the control and oxybuprocaine-treated eyes with values of 1.75 +/- 0.31 cm and 1.75 +/- 0.30 cm, respectively. In control eyes, mean CTT did not significantly change (P > 0.05) during the study period. By contrast, after oxybuprocaine application mean CTT was significantly reduced from baseline (P < 0.05) for 45 min. Maximal corneal anesthesia, with a CTT value of 0, was achieved at 1 and 5 min in all treated eyes. A markedly reduced mean CTT of 0.14 +/- 0.23 cm was still present at 20 min. Age and gender
did not significantly affect corneal anesthesia. No clinically relevant ocular side effects occurred during the observation period. CONCLUSION: This is the first study that provides objective information on the depth and duration of corneal anesthesia following instillation of oxybuprocaine in healthy feline eyes.

Suppression of fertility in adult cats.

Goericke-Pesch, S., A. Wehrend, and P. Georgiev

Cats are animals with highly efficient reproduction, clearly pointing to a need for suppression of fertility. Although surgical contraception is highly effective, it is not always the method of choice. This is predominantly because it is cost-intensive, time-consuming and irreversible, with the latter being of major importance for cat breeders. This article reviews the use of progestins, scleroting agents, immunocontraception, melatonin, GnRH antagonists and finally, GnRH agonists, in adult male and female cats in detail, according to the present state of the art. By now, various scientific and clinical options are available for the suppression of fertility in adult cats and the decision as to which should be chosen - independent of the legal registration of any state - depends on different facts: (i) feral or privately owned animal? (ii) temporary or permanent suppression of fertility wanted/needed? (iii) sex of the animal? New effective and available methods for hormonal contraception include melatonin implants for short-term postponement of oestrus in adult queens and slow-release GnRH-agonist implants containing deslorelin (Suprelorin(R)) for short- and long-term contraception in male and female companion and breeding cats.

Comparison of rectal and axillary temperatures in dogs and cats.

Goic, J. B., E. L. Reineke, and K. J. Drobatz

OBJECTIVE: To compare rectal versus axillary temperatures in dogs and cats. DESIGN: Prospective observational study. ANIMALS: 94 dogs and 31 cats. PROCEDURES: Paired axillary and rectal temperatures were measured in random order with a standardized method. Animal signalment, initial complaint, blood pressure, blood lactate concentration, and variables associated with vascular perfusion and coat were evaluated for associations with axillary and rectal temperatures. RESULTS: Axillary temperature was positively correlated with rectal temperature (rho = 0.75 in both species). Median axillary temperature (38.4 degrees C [101.1 degrees F] in dogs, and 38.4 degrees C [101.2 degrees F] in cats) was significantly different from median rectal temperature in dogs (38.9 degrees C [102.0 degrees F]) but not in cats (38.6 degrees C [101.5 degrees F]). Median rectal-axillary gradient (difference) was 0.4 degrees C (0.7 degrees F; range, -1.3 degrees to 2.3 degrees C [-2.4 degrees to 4.1 degrees F]) in dogs and 0.17 degrees C (0.3 degrees F; range -1.1 degrees to 1.6 degrees C [-1.9 degrees to 3 degrees F]) in cats. Sensitivity and specificity for detection of hyperthermia with axillary temperature were 57% and 100%, respectively, in dogs and 33% and 100%, respectively, in cats; sensitivity and specificity for detection of hypothermia were 86% and 87%, respectively, in dogs and 80% and 96%, respectively, in cats. Body weight (rho = 0.514) and body condition score (rho = 0.431) were correlated with rectal-axillary gradient in cats. CONCLUSIONS AND CLINICAL RELEVANCE: Although axillary and rectal temperatures were correlated in dogs and cats, a large gradient was present between rectal temperature and axillary temperature, suggesting that axillary temperature should not be used as a substitute for rectal temperature.
Effects of high-fat and high-carbohydrate diets on fat and carbohydrate oxidation and plasma metabolites in healthy cats.


High-fat (HF) or high-carbohydrate (HC) diets (30% fat, 18.9% carbohydrate; HF and 10% fat, 46.3% carbohydrate; HC) and lengths of adaptation were investigated in cats (Felis catus; 10 +/- 2 months, 3.6 +/- 0.3 kg). Cats randomly received each treatment for 14 days in a crossover design with a 14-day washout period between each diet. Three 22-h indirect calorimetry studies were conducted after acute (day 0), semichronic (day 4) and chronic (day 13) dietary exposure. Blood samples were collected after a 24-h fast on days 1, 5 and 14. When cats consumed the HC and HF diet, oxidation of the restricted nutrient exceeded intake while oxidation of the nutrient in excess matched intake. Mean max energy expenditure (EE) of cats consuming the HF and HC diet were 107 and 102 kcal/kg(0.67)/day and occurred at a mean of 4 and 12 h post-feeding respectively. Maximal fat (0.90 g/h) and carbohydrate (carbohydrate; 1.42 g/h) oxidation were attained at 26 min and 10.4 h post-feeding respectively. The changes observed in macronutrient oxidation and EE suggest that cats adapt whole-body nutrient metabolism in response to changes in dietary macronutrient content, but may require longer than 14 day to adapt to a macronutrient that is present at a lower concentration in the diet.

Effect of gentle stroking and vocalization on behaviour, mucosal immunity and upper respiratory disease in anxious shelter cats.


Gourkow, N., S. C. Hamon, and C. J. Phillips

Emotional, behavioural, and health benefits of gentle stroking and vocalizations, otherwise known as gentling, have been documented for several species, but little is known about the effect of gentling on cats in stressful situations. In this study, 139 cats rated as anxious upon admission to an animal shelter were allocated to either a Gentled or Control group. Cats were gentled four times daily for 10min over a period of 10 days, with the aid of a tool for cats that were too aggressive to handle. The cats’ mood, or persistent emotional state, was rated daily for 10 d as Anxious, Frustrated or Content. Gentled cats were less likely to have negatively valenced moods (Anxious or Frustrated) than Control cats (Incidence Rate Ratio [IRR]=0.61 CI 0.42-0.88, P=0.007). Total secretory immunoglobulin A (S-IgA) was quantified from faeces by enzyme-linked immunosorbent assay. Gentled cats had increased S-IgA (6.9+-0.7logemug/g) compared to Control cats (5.9+-0.5logemug/g) (P<0.0001). Within the Gentled group of cats, S-IgA values were higher for cats that responded positively to gentling (7.03+-0.6, logemug/g), compared with those that responded negatively (6.14+-0.8, logemug/g). Combined conjunctival and oropharyngeal swab specimens were tested by quantitative real-time polymerase chain reaction (rPCR) for feline herpesvirus type 1 (FHV-1), feline calicivirus (FCV), Mycoplasma felis, Chlamyphila felis, and Bordetella bronchiseptica. There was a significant increase in shedding over time in Control cats (23%, 35%, 52% on days 1, 4 and 10, respectively), but not in gentled cats (32%, 26%, 30% on days 1, 4 and 10, respectively) (P=0.001). Onset of upper respiratory disease was determined by veterinary staff based on clinical signs, in particular ocular and/or nasal discharge. Control cats were 2.4 (CI: 1.35-4.15) times more likely to develop upper respiratory disease over time than gentled cats (P<0.0001). It is concluded that gentling anxious cats in animal shelters can induce positive affect (contentment), increase production of S-IgA, and reduce the incidence of upper respiratory disease.
Clinical Trials Involving Cats: What factors affect owner participation?
Gruen, M. E., K. N. Jiamachello, A. Thomson, and B. D. Lascelles
STUDY RATIONALE: Clinical trials are frequently hindered by difficulties in recruiting eligible participants, increasing the timeline and limiting generalizability of results. In veterinary medicine, where proxy enrollment is required, no studies have detailed what factors influence owner participation in clinical trials involving cats. We aimed to investigate these factors through a survey of owners at first opinion practices. PROTOCOL: The survey was designed using feedback from a pilot study and input from clinical researchers. Owners were asked demographic questions and whether they would, would not, or were unsure about participating in a clinical trial with their cat. They then ranked the importance and influence of various factors on participation using a five-point Likert-type scale, and incentives from most to least encouraging. A total of 413 surveys were distributed to cat owners at four hospitals, two feline-only and two multi-species; 88.6% were completed. Data for importance and influence factors as well as incentive rankings were analyzed overall, and by hospital type, location and whether owners would consider participating. FINDINGS: The most influential factors were trust in the organization, benefit to the cat and veterinarian recommendation. Importance and influence factors varied by willingness to participate. Ranked incentives were not significantly different across groups, with ‘Free Services’ ranked highest. RELEVANCE: This study provides a first look at what factors influence participation in clinical trials with cats. Given the importance placed in the recommendation of veterinarians, continued work is needed to determine veterinarian-related factors affecting clinical trial participation. The results provide guidance towards improved clinical trial design, promotion and education.

The use of flow cytometry for immunophenotyping lymphoproliferative disorders in cats: a retrospective study of 19 cases.
Vet Comp Oncol (2014)
Guzera, M., F. Cian, C. Leo, A. Winnicka, and J. Archer
Flow cytometric immunophenotyping is a useful step in the diagnosis of lymphoproliferative malignancies in human and veterinary medicine. The purpose of this study was to assess the usefulness of this technique for the diagnosis of lymphoproliferative disorders in cats. Nineteen cats were retrospectively enrolled in this study and allocated into two groups. Group 1 consisted of 13 cats with lymphoma, whereas group 2 consisted of 6 cats with non-neoplastic lymphoproliferative disorders. Fine-needle aspiration biopsies were analysed by flow cytometry in order to evaluate the immunophenotype. Flow cytometric analysis identified a neoplastic lymphoid population in 12 of the 13 cats of group 1, confirming the diagnosis of lymphoma and further characterizing it. The six cats in group 2 showed a mixed lymphoid population, which was not suggestive of a neoplastic disorder. Flow cytometry is a valuable and powerful tool for refining the diagnosis of feline lymphoproliferative disorders.

Felinine excretion in domestic cat breeds: a preliminary investigation.
Hagen-Plantinga, E. A., G. Bosch, and W. H. Hendriks
The aim of this study was to determine possible differences in felinine excretion between domesticated cat breeds. For this purpose, urine was collected from a total of 83 privately owned entire male cats from eight different breeds in the Netherlands during the period of November 2010 till November 2011. In the collected samples, free felinine and creatinine concentrations were measured. Free felinine concentrations were expressed relative to the urinary creatinine concentration to compensate for possible variations in renal output. The mean (+/-SD) felinine:creatinine (Fel:Cr) ratio as measured over all cats was 0.702 (+/-0.265). Both the Abyssinian and Sphynx breeds showed the highest Fel:Cr ratio (0.878 +/- 0.162 and 0.878 +/- 0.341 respectively) which significantly differed from the ratios of the British Shorthairs (0.584 +/- 0.220), Birmans (0.614 +/- 0.266), Norwegian Forest cats (0.566 +/- 0.296) and Siberian cats (0.627 +/- 0.124). The Fel:Cr ratios of the Persians (0.792 +/- 0.284) and Ragdolls (0.673 +/- 0.256) showed no statistical difference with either of the other breeds. A significant proportion of the observed variation between the different feline breeds could be explained by hair growth, as both hair growth and felinine production compete for available cysteine. Shorthaired and hairless cat breeds generally showed a higher Fel:Cr ratio compared to longhaired cat breeds, with the exception of Persian cats. Further research is warranted to more closely study the effect of hair growth on felinine production.

**Flea control failure? Myths and realities.**


**Halos, L., F. Beugnet, L. Cardoso, R. Farkas, M. Franc, J. Guillot, K. Pfister, and R. Wall**

Why is it that, despite the proliferation of research on their biology and control, fleas remain such a burden for companion animals and their owners? This review highlights a range of reasons for persistence and apparent treatment failures. It argues that a sustainable approach will require integrated pest management based upon a detailed understanding of the flea life cycle, targeting not only adult fleas but also the immature stages in the environment, combining several modes of control and limiting the risk of chemoresistance. Individual characteristics of the pet and its environment need to be considered. Control of fleas can be achieved, over a timescale of several months, if basic rules are respected.

**Corticotropin-releasing factor family peptide signaling in feline bladder urothelial cells.**


Corticotropin-releasing factor (CRF) plays a central role in the orchestration of behavioral and neuroendocrine responses to stress. The family of CRF-related peptides (CRF and paralogs: urocortin (Ucn)-I, -II, and -III) and associated receptors (CRFR1 and CRFR2) are also expressed in peripheral tissues such as the skin and gastrointestinal tract. Local signaling may exert multiple effects of stress-induced exacerbation of many complex syndromes, including psoriasis and visceral hypersensitivity. Interstitial cystitis/painful bladder syndrome (IC/PBS), a chronic visceral pain syndrome characterized by urinary frequency, urgency, and pelvic pain, is reported to be exacerbated by stress. Functional changes in the epithelial lining of the bladder, a vital blood-urine barrier called the urothelium, may play a role in IC/PBS. This study investigated the expression and functional activity of CRF-related peptides in the urothelium of normal cats and cats with feline interstitial cystitis (FIC), a chronic idiopathic cystitis exhibiting similarities to humans diagnosed with IC/PBS. Western blots analysis showed urothelial (UT) expression of CRFR1 and CRFR2. Enzyme immunoassay revealed release of
endogenous ligands (CRF and Ucn) by UT cells in culture. Evidence of functional activation of CRFR1 and CRFR2 by receptor-selective agonists (CRF and UCN3 respectively) was shown by i) the measurement of ATP release using the luciferin-luciferase assay and ii) the use of membrane-impermeant fluorescent dyes (FM dyes) for fluorescence microscopy to assess membrane exocytotic responses in real time. Our findings show evidence of CRF-related peptide signaling in the urothelium. Differences in functional responses between FIC and normal UT indicate that this system is altered in IC/PBS.

**Electroencephalographic features of familial spontaneous epileptic cats.**


A feline strain of familial spontaneous epileptic cats (FSECs) with typical limbic seizures was identified in 2010, and have been maintained as a novel animal model of genetic epilepsy. In this study, we characterized the electroencephalographic (EEG) features of FSECs. On scalp EEG under sedation, FSECs showed sporadic, but comparatively frequent interictal discharges dominantly in the uni- or bilateral temporal region. Bemegride activation was performed in order to evaluate the predisposition of epileptogenicity of FSECs. The threshold doses of the first paroxysmal discharge, clinical myoclonus and generalized convulsion in FSECs were significantly lower than those in control cats. Chronic video-intracranial EEG monitoring revealed subclinical or clinical focal seizures with secondarily generalization onset from the unilateral amygdala and/or hippocampus. Clinical generalized seizures were also recorded, but we were unable to detect the onset site. The results of the present study show that FSECs resemble not only feline kindling or the kainic acid model and El mouse, but also human familial or sporadic mesial temporal lobe epilepsy. In addition, our results indicate that FSECs are a natural and valuable model of mesial temporal lobe epilepsy.

**Canine and feline enrichment in the home and kennel: a guide for practitioners.**

Heath, S., and C. Wilson

As general veterinary practitioners, we have a duty of care that applies not only to the physical health needs of our patients but also to their mental well-being. Advising clients about how to enrich their home and kennel environments is an important part of fulfilling that duty of care and will also enrich the relationship between the veterinary practitioner and client. This article discusses how to optimize welfare for dogs and cats in the home and kenneled environments through appropriate environmental enrichment and understanding of species-typical behavioral requirements.

**Pharmacokinetics of buprenorphine following intravenous and buccal administration in cats, and effects on thermal threshold.**


This study reports the pharmacokinetics of buprenorphine, following i.v. and buccal administration, and the relationship between buprenorphine concentration and its effect on thermal threshold. Buprenorphine (20 mug/kg) was administered intravenously or buccally to six cats. Thermal threshold
was determined, and arterial blood sampled prior to, and at various times up to 24 h following drug administration. Plasma buprenorphine concentration was determined using liquid chromatography/mass spectrometry. Compartment models were fitted to the time-concentration data. Pharmacokinetic/pharmacodynamic models were fitted to the concentration-thermal threshold data. Thermal threshold was significantly higher than baseline 44 min after buccal administration, and 7, 24, and 104 min after i.v. administration. A two- and three-compartment model best fitted the data following buccal and i.v. administration, respectively. Following i.v. administration, mean +/- SD volume of distribution at steady-state (L/kg), clearance (mL.min/kg), and terminal half-life (h) were 11.6 +/- 8.5, 23.8 +/- 3.5, and 9.8 +/- 3.5. Following buccal administration, absorption half-life was 23.7 +/- 9.1 min, and terminal half-life was 8.9 +/- 4.9 h. An effect-compartment model with a simple effect maximum model best predicted the time-course of the effect of buprenorphine on thermal threshold. Median (range) ke0 and EC50 were 0.003 (0.002-0.018)/min and 0.599 (0.073-1.628) ng/mL (i.v.), and 0.017 (0.002-0.023)/min and 0.429 (0.144-0.556) ng/mL (buccal).

Venous air embolism detected on computed tomography of small animals.
Heng, H. G., J. D. Ruth, and K. Lee
OBJECTIVE: To describe the prevalence, location and clinical significance of abnormal gas accumulations in dogs and cats detected on computerised tomography images. METHODS: Retrospective evaluation of all canine and feline computed tomography examinations (292 pre-contrast and 219 post-contrast) performed in a 12-month time period. All studies were evaluated for the presence of venous air emboli. The location of intravenous gas was noted and the volume of intravenous air emboli was estimated visually. The medical records of animals with venous air embolism were reviewed for signs of cardiopulmonary complications. RESULTS: The overall prevalence of air embolism on pre- and incidence on post-contrast images was 4.5 and 2.3%, respectively. The prevalence of air embolism on pre-contrast and incidence on post-contrast thoracic images was 35.7 and 14.2%, respectively. The volume of venous air was generally small and the most common was in an axillary vein. None of the animals had any cardiopulmonary complications. CLINICAL SIGNIFICANCE: The presence of small volume venous air embolism on routine computed tomography examinations is a frequent incidental finding that does not appear to cause cardiopulmonary complications.

Insulin detemir treatment in diabetic cats in a practice setting.
Hoelmkjaer, K. M., E. M. Spodsberg, and C. R. Bjornvad
Insulin detemir is a long-acting insulin analogue and may represent a valuable treatment option for diabetic cats. So far, only one study addressing detemir treatment of diabetic cats has been published, and this was based on an intensive blood glucose monitoring protocol. The aim of the current, retrospective study was to evaluate the effect of detemir therapy in diabetic cats in a general clinical setting. Fourteen diabetic cats with a follow-up period of at least 3 months were included. Data were collected from medical records at the University Hospital for Companion Animals, University of Copenhagen, Denmark. Thirteen of 14 cats achieved moderate or excellent control of clinical symptoms within the initial 3 months of detemir therapy, including five cats previously treated unsuccessfully with other types of insulin. Clinical improvements were noted after 1 month of therapy
and continued over time. Three cats achieved remission within the initial 3 months and none experienced a diabetic relapse during the study period. One cat achieved remission after 13 months of therapy. Improvements in clinical symptoms were markedly better than indicated by blood glucose and serum fructosamine concentrations. The safety of detemir was very high, with only two reported episodes of clinical hypoglycaemia, neither of which required veterinary attention. Based on these results detemir can be recommended for the treatment of diabetic cats, including cats previously treated unsuccessfully with other types of insulin.

**Bovine lactoferrin and piroxicam as an adjunct treatment for lymphocytic-plasmacytic gingivitis stomatitis in cats.**


Feline lymphocytic-plasmacytic gingivitis/stomatitis (LPGS) or caudal stomatitis is an inflammatory disease that causes painfully erosive lesions and proliferations of the oral mucosa. The disease is difficult to cure and can affect cats at an early age, resulting in lifetime therapy. In this study, a new treatment using a combination of bovine lactoferrin (bLf) oral spray and oral piroxicam was investigated using a randomized double-blinded clinical trial in 13 cats with caudal stomatitis. Oral lesion grading and scoring of clinical signs were conducted during and after the trial to assess treatment outcome. Oral mucosal biopsies were used to evaluate histological changes during and after treatment. Clinical signs were significantly improved in 77% of the cats. In a 4-week study, clinical signs were considerably ameliorated by oral piroxicam during the first 2 weeks. In a 12-week study, the combined bLf oral spray and piroxicam, when compared with piroxicam alone, exhibited an enhanced effect that reduced the severity of the oral lesions (P = 0.059), while also significantly improving clinical signs (P <0.05), quality of life (P <0.05), and weight gain (P <0.05). The remission of oral inflammation was closely correlated with the decreased number of macrophages (OR = 4.719, P < 0.05). There was no detectable influence on liver or kidney function during a 12-week assessment. It was concluded that combining oral bLf spray and piroxicam was safe and might be used to decrease the clinical signs of caudal stomatitis in cats.

**Tramadol toxicity in a cat: case report and literature review of serotonin syndrome.**

*Indrawirawan, Y., and T. McAlees*

OVERVIEW: Tramadol toxicity has not previously been reported in a cat. CASE SUMMARY: This report describes the clinical signs, diagnosis and treatment of tramadol toxicity, manifesting as serotonin syndrome, in a cat in Australia. PRACTICAL RELEVANCE: For any cat with suspicion of serotonin syndrome, in particular secondary to tramadol overdose, it is recommended that decontamination, monitoring and supportive care are instituted as soon as clinical signs develop. Prolonged hospitalisation may be required in the event of a severe overdose. LITERATURE REVIEW: The literature relating to the pharmacology of tramadol and tramadol overdose, clinical manifestations of tramadol overdose, and serotonin syndrome in cats, humans and dogs is reviewed. Recommended treatment for tramadol overdose and serotonin syndrome is also discussed.

**Nutritional management of acute pancreatitis in dogs and cats.**

*Indrawirawan, Y., and T. McAlees*

OVERVIEW: Tramadol toxicity has not previously been reported in a cat. CASE SUMMARY: This report describes the clinical signs, diagnosis and treatment of tramadol toxicity, manifesting as serotonin syndrome, in a cat in Australia. PRACTICAL RELEVANCE: For any cat with suspicion of serotonin syndrome, in particular secondary to tramadol overdose, it is recommended that decontamination, monitoring and supportive care are instituted as soon as clinical signs develop. Prolonged hospitalisation may be required in the event of a severe overdose. LITERATURE REVIEW: The literature relating to the pharmacology of tramadol and tramadol overdose, clinical manifestations of tramadol overdose, and serotonin syndrome in cats, humans and dogs is reviewed. Recommended treatment for tramadol overdose and serotonin syndrome is also discussed.

Jensen, K. B., and D. L. Chan

OBJECTIVE: To review current and emerging nutritional approaches in the management of acute pancreatitis (AP) in people, dogs, and cats, and to provide a framework for further investigation in this field. DATA SOURCES: Veterinary retrospective studies and reviews, human prospective clinical trials and reviews, and experimental animal studies focusing on nutritional management during AP. SUMMARY: Nutritional management is an important part of the treatment plan for patients with AP. In human medicine, the general approach for providing nutrition in patients with AP has changed in recent years and favors enteral over parenteral nutrition with an emphasis on early enteral nutrition (EN). Although there are limited data available, there is increasing evidence in the veterinary literature that supports the beneficial role of EN in AP and contradicts previous assumptions about poor tolerance to enteral feeding in this patient population. Parenteral nutrition may be appropriate alone or in combination with EN as a temporary measure in malnourished patients that do not tolerate adequate EN; however, enteral feeding should be attempted first in most cases. Immunonutrition is being investigated for its positive role in modulating pancreatic inflammation and improving gut barrier function in cases of human AP. CONCLUSIONS: The nutritional management of veterinary patients with AP remains challenging. Based on clinical evidence in people, experimental animal studies, and preliminary studies in dogs and cats, the choice of EN over parenteral nutritional support during AP in dogs and cats appears to be beneficial and well tolerated. Optimization of nutritional therapies in dogs and cats including the use of immunonutrition during AP warrants further investigation.

Prevalence of desexed cats in relation to age in a convenience sample of Western Australian cats.

Johnson, J., and M. Calver

BACKGROUND: Desexing percentages for pet cats in Australia are nearly 95%, but the high numbers of unwanted kittens surrendered to animal shelters suggest that many pet cats breed before the owners consider desexing, or that the mothers of many of these kittens are stray or feral. METHODS AND RESULTS: A convenience sample of Western Australian pet cats of known age presented for microchipping (584 in 2012 and 316 in 2013) found that younger cats were less likely to be desexed. In 2012, 93.2% of cats aged >/=2 years were desexed compared with 49.4% of cats <2 years old, with the data for 2013 being 97.4% and 28%, respectively. CONCLUSION: If these results are reflected nationally, desexing of prepubescent cats up to 4 months old could significantly reduce the numbers of unwanted kittens born to pet cats.

Surveillance of diarrhoea in small animal practice through the Small Animal Veterinary Surveillance Network (SAVSNET).
Vet J (2014)


Using the Small Animal Veterinary Surveillance Network (SAVSNET), a national small animal disease-surveillance scheme, information on gastrointestinal disease was collected for a total of 76 days between 10 May 2010 and 8 August 2011 from 16,223 consultations (including data from 9115 individual dogs and 3462 individual cats) from 42 premises belonging to 19 UK veterinary practices. During that period, 7% of dogs and 3% of cats presented with diarrhoea. Adult dogs had a higher proportional morbidity of diarrhoea (PMD) than adult cats (P <0.001). This difference was not
observed in animals <1 year old. Younger animals in both species had higher PMDs than adult animals (P < 0.001). Neutering was associated with reduced PMD in young male dogs. In adult dogs, miniature Schnauzers had the highest PMD. Most animals with diarrhoea (51%) presented having been ill for 2-4 days, but a history of vomiting or haemorrhagic diarrhoea was associated with a shorter time to presentation. The most common treatments employed were dietary modification (66% of dogs; 63% of cats) and antibacterials (63% of dogs; 49% of cats). There was variability in PMD between different practices. The SAVNET methodology facilitates rapid collection of cross-sectional data regarding diarrhoea, a recognised sentinel for infectious disease, and characterises data that could benchmark clinical practice and support the development of evidence-based medicine.

**Antimicrobial Susceptibility of Enterococcal Species Isolated from Antibiotic-Treated Dogs and Cats.**

Kataoka, Y., Y. Umino, H. Ochi, K. Harada, and T. Sawada

In this study, we examined the antimicrobial susceptibility of the enterococci isolated from dogs and cats in Japan during 2011-2012. Fecal samples were collected from 84 dogs and 16 cats that underwent antibiotic treatment. Enterococci were detected in 70 of 84 dogs (83.3%) and 7 of 16 cats (43.8%). The most prevalent Enterococcus species was Enterococcus faecalis (64.9%); Enterococcus faecium and Enterococcus durans were also isolated from 14 of 77 (18.2%) and 5 of 77 (6.5%) of these animals, respectively. The most active resistance was observed for erythromycin (44.2%) and oxytetracycline (44.2%), and there was considerable resistance to lincomycin (41.6%), gentamicin (31.2%) and kanamycin (31.2%). Compared with the results of a similar study conducted in 2006 and 2007, enterococci susceptibility to enrofloxacain and ampicillin had significantly increased. Enterococcus gallinarum harboring vanC1 and Enterococcus casseliflavus harboring vanC2/3 were isolated from 4 of 77 enterococcal isolates. However, no enterococcal isolates were resistant to vancomycin. Multidrug resistance was found for as few as two and as many as nine antimicrobials regardless of the class. These results demonstrate that dogs and cats treated with antibiotics are commonly colonized with antimicrobial-resistant enterococci.

**Measurement of M-mode echocardiographic parameters in healthy adult Van cats.**

Kayar, A., C. Ozkan, O. Iskefli, A. Kaya, S. Kozat, Y. Akgul, R. Gonul, and M. E. Or

Cardiomyopathies are the most common type of cardiac diseases in cats. Although some normal echocardiographic values for cats have been published, there are variations based on breeds and gender. The objective of this study is to determine normal reference values for M-mode echocardiographic parameters in nonsedated healthy adult Van cats and to compare those values with data reported for nonsedated healthy cats of other breeds. A total of 40 clinically healthy Van cats of both sexes belonging to the Van Cat Research and Application Center of Yuzuncu Yil University were used. Body weight (BW) and 16 M-mode echocardiographic variables were measured in 40 healthy Van cats. The effect of gender and age on each echocardiographic parameter was analyzed and the relationship between BW and each parameter investigated. There was a significant relationship between gender and left atrial dimension during ventricular systole (LAD) and aortic root dimension at end-diastole (AOD) as well as between BW and interventricular septal thickness at end-diastole (IVSd) and end-systole (IVSs), left ventricular internal dimension at end-diastole (LVIDd), left ventricular posterior wall
thickness at end-diastole (LVPWd), LAD, AOD, the left ventricular end diastolic volume (EDV) and the stroke volume (SV). A relationship between age and the SV parameter alone was also established. This present study is the first work on cardiac reference values for Van cats highlighting the differences in some M-mode echocardiographic parameters of healthy adult Van cats and other cat breeds, which should be considered when interpreting echocardiographic findings, in order to draw the correct conclusions regarding cardiac health.

In vitro efficacy of cefovecin against anaerobic bacteria isolated from subgingival plaque of dogs and cats with periodontal disease.
Periodontal disease is a common disease of dogs and cats often requiring antimicrobial treatment as an adjunct to mechanical debridement. However, correct compliance with oral antimicrobial therapy in companion animals is often difficult. Cefovecin is a recently introduced veterinary cephalosporin that has demonstrated prolonged concentrations in extracellular fluid, allowing for dosing intervals of up to 14 days. Subgingival samples were collected from the oral cavity of 29 dogs and eight cats exhibiting grade 2 or grade 3 periodontal disease. Samples were cultivated on Wilkin Chalgrens agar and incubated in an anaerobic chamber for seven days. Selected anaerobic bacteria were isolated and identified to species level using 16S rRNA gene sequence analysis. Minimum inhibitory concentrations were determined for cefovecin and six additional antimicrobials using the agar dilution methodology recommended by the Clinical and Laboratory Standards Institute. The 65 clinical isolates were identified as Porphyromonas gulae (n = 45), Porphyromonas crevioricanis (n = 12), Porphyromonas macacae (n = 1), Porphyromonas caningivalis (n = 1) Fusobacterium nucleatum (n = 2), Fusobacterium russii (n = 1) and Solobacterium moorei (n = 3). This is the first report of S. moorei being isolated from companion animals with periodontal disease. All isolates were highly susceptible to cefovecin, with a MIC90 of </=0.125 μg/ml. Conversely, different resistance rates to ampicillin, amoxicillin and erythromycin between isolates were detected. Cefovecin is thus shown to be effective in vitro against anaerobic bacteria isolated from dogs and cats with periodontal disease.

Exploration of paclitaxel (Taxol) as a treatment for malignant tumors in cats: a descriptive case series.
Kim, J., M. Doerr, and B. E. Kitchell
Paclitaxel, an effective chemotherapeutic agent in human oncology, has received little evaluation in feline patients. The diluent used to solubilize paclitaxel, polyoxyethylated castor oil (Cremophor EL), causes anaphylactoid reactions in human and dogs, which limits enthusiasm for use of this agent in veterinary oncology. Nine feline patients with measurable malignant tumors were treated with paclitaxel at a dosage of 80 mg/m2 intravenously every 21 days for up to two doses. Adverse effects, including evidence of toxicity and anaphylactoid reactions, were assessed. Tumor response, progression and patient time to progression (TTP) were also recorded. Adverse effects included grade III and IV thrombocytopenia, grade III gastrointestinal signs (vomiting and constipation) and hypersensitivity reactions, seen in a total of five patients. Anaphylactoid reactions resolved with appropriate management. Stable disease and partial response were observed in 56% of feline patients. Median TTP was 28 days (range 15-45 days). Intravenous paclitaxel is a safe treatment option for
feline malignant tumor patients. Future investigation is warranted to explore the effectiveness and appropriate application of this agent for specific tumor types.

**Canine and feline blood transfusions: controversies and recent advances in administration practices.**


**Kisielewicz, C., and I. A. Self**

OBJECTIVES: To discuss and review blood transfusion practices in dogs and cats including collection and storage of blood and administration of products. To report new developments, controversial practices, less conventional blood product administration techniques and where applicable, describe the relevance to anaesthetists and anaesthesia. DATABASES USED: PubMed and Google Scholar using dog, cat, blood transfusion, packed red blood cells and whole blood as keywords. CONCLUSIONS: Blood transfusions improve oxygen carrying capacity and the clinical signs of anaemia. However there are numerous potential risks and complications possible with transfusions, which may outweigh their benefits. Storage of blood products has improved considerably over time but whilst extended storage times may improve their availability, a phenomenon known as the storage lesion has been identified which affects erythrocyte viability and survival. Leukoreduction involves removing leukocytes and platelets thereby preventing their release of cytokines and bioactive compounds which also contribute to storage lesions and certain transfusion reactions. Newer transfusion techniques are being explored such as cell salvage in surgical patients and subsequent autologous transfusion. Xenotransfusions, using blood and blood products between different species, provide an alternative to conventional blood products.

**Odontogenic keratocyst in a cat.**


**LaDouceur, E. E., K. S. Walker, F. C. Mohr, and B. Murphy**

Odontogenic cysts are derived from odontogenic epithelium, can be locally invasive and destructive and have been reported rarely in cats. A 16-year-old, male domestic shorthair cat had a 3-year history of a slowly progressive, right mandibular swelling. Intraoral dental radiographs revealed a multilocular, radiolucent, cystic mass within the right mandible that extended from the distal aspect of the canine tooth to the mesial aspect of the fourth premolar tooth. Radiographically, the mass was associated with distortion and regional destruction of the right mandibular bone and resorption of regional tooth roots. Histological examination of an incisional biopsy sample revealed multiple ruptured cysts lined by stratified squamous epithelium of odontogenic origin with luminal parakeratinization and a prominent palisading basal cell layer. The cyst contained abundant orthokeratotic and parakeratotic keratin. The clinical, radiographical and histological features were consistent with a diagnosis of odontogenic keratocyst, as seen in man. This is the first report of an odontogenic keratocyst in a cat.

**Serum Cardiac Troponin I concentrations in cats with anaemia - a preliminary, single-centre observational study.**


**Lalor, S. M., D. A. Gunn-Moore, R. Cash, A. Foot, N. Reed, and R. J. Mellanby**
OBJECTIVES: A range of cardiovascular abnormalities have been associated with anaemia. However, it remains unclear whether anaemia is associated with cardiac myocyte damage in cats. The aim of this study was to assess if cats with anaemia have an increased prevalence of cardiac myocyte damage, as assessed by serum concentrations of cardiac troponin I, compared to non-anaemic, ill cats. METHODS: Serum cardiac troponin I concentrations were measured in 18 anaemic cats and in 31 non-anaemic, ill cats with non-primary cardiac, non-renal and non-primary haematological disorders. RESULTS: The serum cardiac troponin I concentrations in the anaemic group (0.43 ng/mL) were significantly higher (P=0.0002) than in the non-anaemic ill group (0.04 ng/mL). Using a cut-off of less than 0.16 ng/mL, 12 of the 18 anaemic cats had an increased serum cardiac troponin I concentration, which was significantly higher (P=0.005) than the non-anaemic ill cats (7 of 31 cats). CLINICAL SIGNIFICANCE: Serum cardiac troponin I concentrations were higher in cats with anaemia in this study. Further studies are required to establish whether the anaemia or other confounding factors is the cause of the increased serum cardiac troponin I concentrations.

Feline respiratory disease: What is the role of Mycoplasma species?
Lee-Fowler, T.

PRACTICAL RELEVANCE: Non-hemotropic Mycoplasma species are frequently implicated in cases of respiratory disease, and also conjunctivitis, in cats. CLINICAL CHALLENGES: Mycoplasma species are considered commensal bacteria of the conjunctiva and the upper respiratory tract of cats, and hence their role as a primary pathogen is difficult to determine. These organisms certainly appear to play a significant role as a secondary pathogen in the upper airways, and there is increasing evidence that in some animals they may represent a primary infection. However, mycoplasmas have not been found in the lower airways of clinically healthy cats - suggesting that, when present, they likely represent a pathologic process. Diagnostic challenges exist as well; Mycoplasma species are not typically identified via cytology due to their small size, and culture of these organisms requires special media and handling. Although PCR has improved identification and allowed for speciation, conflicting culture and PCR results can create a dilemma regarding the clinical relevance of infection. EVIDENCE BASE: This article draws on original research and case reports to provide information about the role of Mycoplasma species in the feline upper and lower respiratory tract, diagnostic methods and associated challenges, and treatment options. AUDIENCE: The goal is to provide small animal practitioners with a current and organized review of the often-conflicting literature regarding the role of Mycoplasma species in feline respiratory infections.

Inflammatory joint disease in cats: Diagnostic approach and treatment.
Lemetayer, J., and S. Taylor

PRACTICAL RELEVANCE: Osteoarthritis, a degenerative non-inflammatory joint disease, is common in cats, usually causing gradual changes in behavior and lifestyle rather than severe lameness. Inflammatory arthritis occurs much less frequently and is nearly always associated with debilitating lameness. It may have an infectious or immune-mediated cause - but, unlike the canine disease, is much more likely to be infectious in origin. CLINICAL CHALLENGES: Cats with inflammatory joint disease are presented for evaluation of lethargy, anorexia, reluctance to walk or fever. Synovial fluid collection and analysis is required to confirm joint inflammation, but this is a procedure many
veterinarians are not comfortable performing in cats. Once inflammatory arthritis is confirmed, extensive testing is required to diagnose infectious causes and determine appropriate treatment. Immune-mediated polyarthritis can be treated with immunosuppressive drugs only after all infectious possibilities are eliminated. Radiographs are used to characterize the arthritis as erosive or nonerosive, but radiographic changes in cats are often subtle compared with those described in canine rheumatoid-like arthritis. AUDIENCE: This review, aimed at all veterinarians who treat cats, describes the general clinical approach to feline joint disease, the collection and analysis of synovial fluid, and the diagnosis and management of inflammatory joint diseases affecting cats. The diagnostic approach to an unusual case of erosive polyarthritis is discussed in the Case Notes. EVIDENCE BASE: To date, the veterinary literature on inflammatory joint disease in cats has been limited to older reviews of immune-mediated disorders and multiple single case reports or small case series describing infectious disorders. This article offers a current comprehensive review of these disorders.

Effect of high-impact targeted trap-neuter-return and adoption of community cats on cat intake to a shelter.
Vet J (2014)
Levy, J. K., N. M. Isaza, and K. C. Scott
Approximately 2-3 million cats enter animal shelters annually in the United States. A large proportion of these are unowned community cats that have no one to reclaim them and may be too unsocialized for adoption. More than half of impounded cats are euthanased due to shelter crowding, shelter-acquired disease or feral behavior. Trap-neuter-return (TNR), an alternative to shelter impoundment, improves cat welfare and reduces the size of cat colonies, but has been regarded as too impractical to reduce cat populations on a larger scale or to limit shelter cat intake. The aim of this study was to assess the effect of TNR concentrated in a region of historically high cat impoundments in a Florida community. A 2-year program was implemented to capture and neuter at least 50% of the estimated community cats in a single 11.9 km² zip code area, followed by return to the neighborhood or adoption. Trends in shelter cat intake from the target zip code were compared to the rest of the county. A total of 2366 cats, representing approximately 54% of the projected community cat population in the target area, were captured for the TNR program over the 2-year study period. After 2 years, per capita shelter intake was 3.5-fold higher and per capita shelter euthanasia was 17.5-fold higher in the non-target area than in the target area. Shelter cat impoundment from the target area where 60 cats/1000 residents were neutered annually decreased by 66% during the 2-year study period, compared to a decrease of 12% in the non-target area, where only 12 cats/1000 residents were neutered annually. High-impact TNR combined with the adoption of socialized cats and nuisance resolution counseling for residents is an effective tool for reducing shelter cat intake.

Diagnostic utility of CD4%:CD8 low% T-lymphocyte ratio to differentiate feline immunodeficiency virus (FIV)-infected from FIV-vaccinated cats.
Antibody testing based on individual risk assessments is recommended to determine feline immunodeficiency virus (FIV) status, but ELISA and Western blot tests cannot distinguish between anti-FIV antibodies produced in response to natural infection and those produced in response to FIV vaccination. The aim of this cross-sectional study was to test the hypothesis that FIV-infected cats
could be differentiated from FIV-vaccinated uninfected cats using lymphocyte subset results, specifically the CD4%:CD8(low)% T-lymphocyte ratio. Comparisons of the CD4%:CD8(low)% T-lymphocyte ratio were made among the following four groups: Group 1 - FIV-infected cats (n=61; FIV-antibody positive by ELISA and FIV PCR positive); Group 2 - FIV-uninfected cats (n=96; FIV-antibody negative by ELISA); Group 3 - FIV-vaccinated uninfected cats (n=31; FIV-antibody negative by ELISA before being vaccinated against FIV, after which they tested FIV ELISA positive); and Group 4 - FIV-uninfected but under chronic/active antigenic stimulation (n=16; FIV-antibody negative by ELISA; all had active clinical signs of either upper respiratory tract disease or gingival disease for >/= 21 days). The median CD4%:CD8(low)% T-lymphocyte ratio was lower in Group 1 (1.39) than in each of the other three groups (Group 2 - 9.77, Group 3 - 9.72, Group 4 - 5.64; P<0.05). The CD4%:CD8(low)% T-lymphocyte ratio was also the most effective discriminator between FIV-infected cats and the other three groups, and areas under ROC curves ranged from 0.91 (compared with Group 4) to 0.96 (compared with Group 3). CD4%:CD8(low)% shows promise as an effective test to differentiate between FIV-infected cats and FIV-vaccinated uninfected cats.

Use of ponazuril paste to treat coccidiosis in shelter-housed cats and dogs.


Cystoisospora (synonym Isospora) spp. infections are common in dogs and cats worldwide, especially in crowded or unsanitary environments. Ponazuril (toltrazuril sulfone) is a widely used oral treatment, but protocols that will produce oocyst excretion below the detection limit in shelter-housed animals have not been determined. The aim of this study was to determine the efficacy of ponazuril paste at each of three dosages (dosage 1, 50mg/kg q24 h for 3 days, dogs n=14, cats n=16; dosage 2, 50mg/kg as a single dose, dogs n=13, cats n=25; or dosage 3, 20mg/kg as a single dose, dogs n=16, cats n=23) in shelter-housed dogs (n=43) and cats (n=64) with confirmed coccidiosis. Fecal oocyst counts and identification and fecal consistency scoring was performed pre-treatment (Day 1) and again at Day 3-4 and Day 8. There were higher proportions of animals with oocyst excretion below the detection limit at both Day 3-4 and Day 8 in the dosage 1 group (dogs 92.9%, cats 87.5%) than in the other two groups (dosage 2, dogs 76.9%, cats 80.0%; dosage 3, dogs 68.8%, cats 47.8%). Animals with high fecal oocyst counts at Day 1 were significantly more likely to be infected at Day 3-4 (dogs, P<0.001; cats, P=0.013). Fecal consistency score at Day 3-4 was not significantly related to infection status (dogs, P=0.898; cats, P=0.136). Further studies are warranted to investigate a ponazuril protocol that can safely reduce fecal oocyst burdens in infected dogs and cats to levels below the detection limit. Environmental decontamination is also important to reduce the likelihood of re-infection.


Liu, D. T., and D. C. Silverstein

OBJECTIVE: To describe the demographics, clinical characteristics, diagnostic findings, underlying etiologies, treatment, and outcome associated with secondary spontaneous pneumothorax (SSP) in cats; and to identify clinical feature differences among cats with asthma associated secondary spontaneous pneumothorax (AASSP) versus nonasthma-associated secondary spontaneous pneumothorax (NAASSP). DESIGN: Retrospective case series. SETTING: University teaching hospital. ANIMALS: Sixteen client-owned cats with secondary spontaneous pneumothorax. INTERVENTIONS: None.
MEASUREMENTS AND MAIN RESULTS: Domestic short hair was the predominant breed in this study (n = 15). The median age was 8 years old (range: 7 weeks to 17 years) with no sex predilection. Fourteen cats were affected by multi-lobar pulmonary pathology of infectious, inflammatory, or neoplastic causes. Asthma was the most common cause of spontaneous pneumothorax (25%). Ten of 12 treated cats survived the initial episode of spontaneous pneumothorax to discharge with medical management, including all 4 cats with AASSP. Reoccurrence was documented in 4 cats. Pulmonary lobectomy was curative for 1 cat with congenital accessory lung lobe emphysema. No difference in clinical presentation was identified between cats with AASSP and cats with NAASSP.

CONCLUSIONS: Feline SSP is frequently associated with extensive pulmonary pathology. Supportive medical management is most appropriate, except in rare cases with focal congenital abnormalities that may benefit from surgical intervention. AASSP appears to carry a good prognosis for short-term outcome (survival to discharge). Clinical assessment, imaging, and invasive diagnostics were required to differentiate between AASSP and NAASSP.

The zoonotic risk of Ancylostoma ceylanicum isolated from stray dogs and cats in Guangzhou, South China.


Canine and feline hookworm infection is endemic in many countries with zoonotic transmission representing a potentially significant public health concern. However, there is limited data available on the zoonotic transmission of canine and feline hookworms in China. This study was conducted to evaluate the zoonotic risk of Ancylostoma ceylanicum isolated from stray dogs and cats in Guangzhou, south China. Primer pairs CAF/CAR were designed to amplify complete ITS sequences of obtained A. ceylanicum. The results were compared with fourteen ITS reference sequences of human-derived A. ceylanicum registered in GenBank, and phylogenetic trees were established by using NJ and ML methods. The sequence similarity of three dog-derived and five cat-derived A. ceylanicum with fourteen human-derived A. ceylanicum were 96.8%~100% and 97.8%~100%, respectively. Phylogenetic analysis placed A. ceylanicum isolated from dogs and cats in the same group with A. ceylanicum human isolates. Due to the ability of A. ceylanicum to cause a patent infection in humans, the zoonotic risk arising from dog and cat reservoirs to communities in this region should be determined.

Molecular detection of bacterial and parasitic pathogens in hard ticks from Portugal.


Ticks are important vector arthropods of human and animal pathogens. As information about agents of disease circulating in vectors in Portugal is limited, the aim of the present study was to detect bacteria and parasites with veterinary and zoonotic importance in ticks collected from dogs, cats, and field vegetation. A total of 925 ticks, comprising 888 (96.0%) adults, 8 (0.9%) nymphs, and 29 (3.1%) larvae, were collected in 4 geographic areas (districts) of Portugal. Among those, 620 (67.0%) were removed from naturally infested dogs, 42 (4.5%) from cats, and 263 (28.4%) were questing ticks obtained from field vegetation. Rhipicephalus sanguineus was the predominant tick species, and the only one collected from dogs and vegetation, while all Ixodes ricinus specimens (n=6) were recovered from cats. Rickettsia massiliae and Rickettsia conorii were identified in 35 ticks collected from cats and
dogs and in 3 ticks collected from dogs. Among ticks collected from cats or dogs, 4 Rh. sanguineus specimens were detected with Hepatozoon felis, 3 with Anaplasma platys, 2 with Hepatozoon canis, one with Anaplasma phagocytophilum, one with Babesia vogeli, one with Borrelia burgdorferi sensu lato and one with Cercopithifilaria spp. Rickettsia helvetica was detected in one I. ricinus tick collected from a cat. To the best of our knowledge, this was the first time that Cercopithifilaria spp., Ba. vogeli, H. canis, and H. felis have been detected in ticks from Portugal. The wide range of tick-borne pathogens identified, some of zoonotic concern, suggests a risk for the emergence of tick-borne diseases in domestic animals and humans in Portugal. Further studies on these and other tick-borne agents should be performed to better understand their epidemiological and clinical importance, and to support the implementation of effective control measures.

A retrospective molecular study of select intestinal protozoa in healthy pet cats from Italy.
The feline gut can harbour a number of protozoan parasites. Recent genetic studies have highlighted new epidemiological findings about species of Cryptosporidium, assemblages of Giardia duodenalis and Toxoplasma gondii. Furthermore, epidemiological studies suggest the occurrence of Tritrichomonas foetus in cats is on the increase worldwide. The prevalence of selected intestinal protozoa was determined by PCR using DNA previously extracted from the faeces of 146 privately owned healthy cats from Italy. Molecular genotyping on T gondii, G duodenalis and Cryptosporidium DNA was achieved. PCR assays were positive in 32 (22.9%) samples. Three animals (2.0%) were positive for T foetus and Cryptosporidium DNA, 15 specimens (10.3%) were positive for T gondii and 11 (7.5%) for G duodenalis. Co-infections were never observed. Results of the typing analysis allowed the identification of Cryptosporidium felis in all cases. The specimens positive for T gondii hinted at clonal genotype I (n = 7), genotype II (n = 1) and genotype III (n = 7). The G duodenalis isolates were referable to assemblages F (n = 9) and C (n = 2). In conclusion, the results obtained in this study add to the literature regarding the epidemiology of these parasites by confirming their presence in the faeces of healthy pet cats.

Immunohistochemical and morphometric analysis of intestinal full-thickness biopsy samples from cats with lymphoplasmacytic inflammatory bowel disease.
Marsilio, S., S. Kleinschmidt, I. Nolte, and M. Hewicker-Trautwein
The distribution and numbers of CD3(+) T lymphocytes, immunoglobulin(+) plasma cells and calprotectin (L1)(+) macrophages was analyzed in full-thickness, formalin-fixed biopsy samples from the small intestine (duodenum, jejunum and ileum) and from the colon from nine cats with clinical signs of inflammatory bowel disease (IBD). All animals had lymphoplasmacyct enteritis or lymphoplasmacytic enterocolitis. Equivalent samples from the same intestinal regions from 12 healthy pet cats served as controls. Labelled cells in the lamina propria were counted by computer-aided morphometry. The different cell types were similarly distributed in both groups, but there were differences in their numbers. There were more CD3(+) T cells in the duodenum and jejunum of cats with IBD; however, the difference was only significant for the duodenum. There were significantly more IgA(+) cells in the duodenal crypt region. There were significantly more IgG(+) cells in the lower jejunal crypt region. Plasma cells expressing IgM were decreased in cats with IBD, but the difference
was not significant. L1(+) macrophages were significantly decreased in the lower crypt area of the colon in cats with IBD and there was a trend to decreased L1(+) cells in the upper crypt area of the duodenum and jejunum. Comparison of the results of this study with previous findings on endoscopically-obtained duodenal biopsy samples from cats with IBD revealed some differences. These discrepancies might relate to differences between control cat populations, types of biopsy samples, methodological factors such as different counting techniques and the activity of the disease at the time of sampling.

Qualitative study of factors associated with antimicrobial usage in seven small animal veterinary practices in the UK.
Mateus, A. L., D. C. Brodbelt, N. Barber, and K. D. Stark
Responsible use of antimicrobials by veterinarians is essential to contain antimicrobial resistance in pathogens relevant to public health. Inappropriate antimicrobial use has been previously described in practice. However, there is scarce information on factors influencing antimicrobial usage in dogs and cats. We investigated intrinsic and extrinsic factors influencing decision-making of antimicrobial usage in first opinion small animal practices in the UK through the application of qualitative research methods. Semi-structured interviews were conducted with 21 veterinarians from seven veterinary first opinion practices in the UK in 2010. Topics investigated included: a) criteria used for selection of antimicrobials, b) influences by colleagues, c) influences by clients, d) pet characteristics, e) sources of knowledge, f) awareness of guidelines and g) protocols implemented in practice that may affect antimicrobial usage by veterinarians. Hypothetical scenarios selected to assess appropriateness of antimicrobial usage were: a) vomiting in a Yorkshire Terrier due to dietary indiscretion, b) deep pyoderma in a Shar-Pei, c) Feline Lower Urinary Tract disease in an 7 year-old male neutered cat and d) neutering of a 6-months dog. Interviews were recorded and transcribed by the interviewer. Thematic analysis was used to analyse content of transcribed interviews. Data management and analysis was conducted with qualitative analysis software NVivo8 (QSR International Pty Ltd). Antimicrobial usage by participants was influenced by factors other than clinical evidence and scientific knowledge. Intrinsic factors included veterinarian’s preference of substances and previous experience. Extrinsic factors influencing antimicrobial selection were; perceived efficacy, ease of administration of formulations, perceived compliance, willingness and ability to treat by pet owners, and animal characteristics. Cost of therapy was only perceived as an influential factor in low, mixed socioeconomic areas. Veterinarians had limited awareness of current recommendations for responsible use in small animal practice. Social norms, particularly verbally agreed protocols influenced veterinarians. Inappropriate antimicrobial usage was identified in the therapy of non-infectious diseases and prophylaxis of routine clean surgical procedures. Discussion of clinical cases with peers and effectiveness meetings in the workplace were useful to veterinarians to share scientific knowledge. Effectiveness meetings can be a common ground for veterinarians to discuss and agree protocols for clinical conditions and surgical procedures. Protocols should be evidence-based, follow current recommendations and take into account the resources available in the workplace. Targeted training of veterinarians in the workplace with peer support should be used to promote responsible antimicrobial usage.

Relationship among serum creatinine, serum gastrin, calcium-phosphorus product, and uremic gastropathy in cats with chronic kidney disease.
McLeland, S. M., K. F. Lunn, C. G. Duncan, K. R. Refsal, and J. M. Quimby

BACKGROUND: Chronic kidney disease (CKD) in cats is associated with gastrointestinal signs commonly attributed to uremic gastropathy. Consequently, patients often are treated with antacids and gastrointestinal protectants. This therapeutic regimen is based on documented gastric lesions in uremic humans and dogs, but the nature and incidence of uremic gastropathy in cats are unknown.

HYPOTHESIS/OBJECTIVES: Evaluate uremic gastropathy in CKD cats to facilitate refinement of medical management for gastrointestinal signs. ANIMALS: Thirty-seven CKD cats; 12 nonazotemic cats

METHODS: Stomachs were evaluated for the presence of classic uremic gastropathy lesions. Histopathologic lesions were compared with serum creatinine concentrations, calcium-phosphorus product (CPP), and serum gastrin concentrations. RESULTS: Gastric ulceration, edema, and vascular fibrinoid change were not observed. The most important gastric lesions in CKD cats were fibrosis and mineralization. Sixteen CKD cats (43%) had evidence of gastric fibrosis of varying severity and 14 CKD cats (38%) had gastric mineralization. CKD cats were more likely to have gastric fibrosis and mineralization than nonazotemic controls (P =.005 and P =.021, respectively). Only cats with moderate and severe azotemia had gastric mineralization. CPP was correlated with disease severity; severely azotemic CKD cats had significantly higher CPP when compared with nonazotemic controls, and to mildly and moderately azotemic cats (P <.05). Gastrin concentrations were significantly higher in CKD cats when compared with nonazotemic controls (P =.003), but increased concentrations were not associated with gastric ulceration. CONCLUSIONS AND CLINICAL IMPORTANCE: Uremic gastropathy in CKD cats differs from that described in other species and this difference should be considered when devising medical management.

Prevalence of upper respiratory pathogens in four management models for unowned cats in the Southeast United States.


Upper respiratory infection (URI) is a pervasive problem in cats and impacts the capacity and cost of sheltering programs. This study determined the pattern of respiratory pathogens in cats with and without clinical signs of URI in four different models for managing unowned cats, namely, (1) short-term animal shelters (STS), (2) long-term sanctuaries (LTS), (3) home-based foster care programs (FCP), and (4) trap-neuter-return programs for community cats (TNR). Conjunctival and oropharyngeal swabs from 543 cats, approximately half of which showed clinical signs of URI, were tested for feline herpes virus-1 (FHV), feline calicivirus (FCV), Chlamydia felis, Bordetella bronchiseptica, Mycoplasma felis, and canine influenza virus by real-time PCR. FHV (59%, 41%) and B. bronchiseptica (33%, 24%) were more prevalent in both clinically affected and nonclinical cats, respectively, in STS than other management models. FCV (67%, 51%) and M. felis (84%, 86%) were more prevalent in LTS than any other management model. Clinically affected cats in FCP were more likely to carry FHV (23%, 6%), C. felis (24%, 10%), or M. felis (58%, 38%) than were nonclinical cats. Clinically affected cats in TNR were more likely to carry FCV (55%, 36%) or C. felis (23%, 4%) than were nonclinical cats. The prevalence of individual pathogens varied between different management models, but the majority of the cats in each model carried one or more respiratory pathogens regardless of clinical signs. Both confined and free-roaming cats are at risk of developing infectious respiratory disease and their health should be protected by strategic vaccination, appropriate
antibiotic therapy, effective biosecurity, feline stress mitigation, and alternatives to high-density confinement.

**Enoxaparin: pharmacokinetics and treatment schedule for cats.**

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*Mischke, R., J. Schonig, E. Doderlein, S. Wolken, C. Bohm, and M. Kietzmann*

Detailed pharmacokinetic data are not available for subcutaneously (SC) administered enoxaparin in cats and this causes difficulties in establishing treatment protocols. The aims of this study were (1) to establish pharmacokinetic data of SC administered enoxaparin and (2) to establish a treatment schedule. Six healthy cats received a single SC injection of 1 mg enoxaparin/kg and blood samples were collected before and 1, 2, 3, 4, 6, 8, 10 and 12 h after the injection. Six further healthy cats received 0.75 mg/kg every 6 h for four consecutive days and blood samples were collected before and 2 h after the first and second injection on day 1, and the first injection on days 2 and 4. Anti-factor Xa (FXa) activity, coagulation tests and thromboelastometry assays were performed. Enoxaparin injection was well tolerated. Following the single SC injection Cmax was 0.83 +/- 0.08 anti-Xa IU/mL and in 5/6 cats was detected after 2 h (Tmax = 110 +/- 25 min). The total clearance was 23.4 +/- 4.8 mL/h/kg and the terminal half-life was 2.27 +/- 0.4 h. All cats receiving repeated injections reached the defined target peak range of 0.5-1.0 IU/mL by 2 h after the second injection (0.54 [0.50-0.61]; median, [minimum - maximum]) and there was no considerable accumulation subsequently. With the exception of thromboelastometry (especially non-activated), ratio values of coagulation times increased significantly although only slightly (e.g., the maximal value of median activated partial thromboplastin time ratio was 1.27). Significant, although only moderately close relationships with Spearman rank correlation coefficients between 0.424 and 0.558 were calculated between anti-FXa activities and ratios of different coagulation times. A dosage schedule of 0.75 mg/kg four times a day seems suitable for therapeutic use of enoxaparin in cats as it leads to reproducible peak anti-FXa activities within the target range for the treatment of thrombosis in humans. The low inter-individual variation may indicate that monitoring based on anti-FXa activities is not necessary.

**Alveolar macrophages are the main target cells in feline calicivirus-associated pneumonia.**


Feline calicivirus (FCV) is a pathogen of felids and one of the most common causative agents of feline upper respiratory disease (URD). Reports of natural FCV pneumonia in the course of respiratory tract infections are sparse. Therefore, knowledge on the pathogenesis of FCV-induced lung lesions comes only from experimental studies. The aim of the present study was to assess the type and extent of pulmonary involvement in natural respiratory FCV infections of domestic cats and to identify the viral target cells in the lung. For this purpose, histology, immunohistochemistry and RNA-in situ hybridisation for FCV and relevant cell markers were performed on diagnostic post-mortem specimens collected after fatal URD, virulent systemic FCV or other conditions. All groups of cats exhibited similar acute pathological changes, dominated by multifocal desquamation of activated alveolar macrophages (AM) and occasional type II pneumocytes with fibrin exudation, consistent with diffuse alveolar damage (DAD). In fatal cases, this was generally seen without evidence of epithelial regeneration. In cats without clinical respiratory signs, type II pneumocyte hyperplasia was present...
alongside the other changes, consistent with the post-damage proliferative phase of DAD. FCV infected and replicated in AM and, to a lesser extent, type II pneumocytes. This study shows that lung involvement is an infrequent but important feature of FCV-induced URD. AM are the main viral target cell and pulmonary replication site, and their infection is associated with desquamation and activation, as well as death via apoptosis.

Feline dermatophytosis: aspects pertinent to disease management in single and multiple cat situations.
Moriello, K.
PRACTICAL RELEVANCE: Dermatophytosis (ringworm) is a superficial fungal skin disease of cats that, depending on the geographic region and practice caseload, may be encountered uncommonly through to commonly. This is a self-curing disease in an immunocompetent cat. GLOBAL IMPORTANCE: Dermatophytosis is prevalent worldwide and is one of a number of zoonotic skin diseases that cat owners are at risk of contracting. CLINICAL CHALLENGES: Dermatophytosis causes non-specific signs of hair loss, erythema and scaling, making it a differential diagnosis for many skin diseases of cats. The fact that this disease is infectious and contagious, and does not have any one classic clinical presentation, makes knowledge of diagnostic tools important in detection. The veterinarian’s role is in early disease recognition and institution of appropriate therapy to hasten resolution of the disease. AIM: The focus of this article is to provide an update and review of the most pertinent aspects that may be helpful in the management of dermatophytosis in any single or multiple cat situation. EVIDENCE BASE: Where appropriate, evidence from the literature is used to supplement a summary of the author’s clinical experience and research in feline dermatophytosis.

Lack of association between p53 SNP and FISS in a cat population from Germany.
Mucha, D., S. Laberke, S. Meyer, and J. Hirschberger
One recent study indicates a significant association between certain single nucleotide polymorphisms (SNPs) in the genomic sequence of feline p53 and feline injection-site sarcoma (FISS). The aim of this study was to investigate the correlation between a specific nucleotide insertion in p53 gene and FISS in a German cat population. Blood samples from 150 German cats were allocated to a control group consisting of 100 healthy cats and a FISS-group consisting of 50 cats with FISS. All blood samples were examined for the presence of the SNP in the p53 gene. Results found the T-insertion at SNP 3 in 20.0% of the cats in the FISS-group and 19.2% of cats in the control-group. No statistically significant difference was observed in allelic distribution between the two groups. Further investigations are necessary to determine the association of SNPs in the feline p53 gene and the occurrence of FISS.

Echocardiographic findings in 11 cats with acromegaly.
Myers, J. A., K. F. Lunn, and J. M. Bright
BACKGROUND: Information regarding cardiac changes in domestic cats with acromegaly is limited. HYPOTHESIS/OBJECTIVES: The objective of this study was to describe the echocardiographic findings in cats with acromegaly. ANIMALS: Eighteen cats diagnosed with acromegaly at Colorado
State University between 2008 and 2012. Of these 18 cats, 11 had echocardiography performed.

METHODS: A retrospective review of medical records was made to identify cats with acromegaly that also had echocardiography performed. RESULTS: Of the 11 cats identified, 7 had left ventricular concentric hypertrophy, 6 had left atrial enlargement, and 7 had evidence of abnormal diastolic function. All 11 cats had evidence of structural or functional cardiac disease. CONCLUSIONS AND CLINICAL IMPORTANCE: Cardiovascular abnormalities frequently are present in cats with acromegaly, and a complete cardiac evaluation should be considered in these patients.

In cats with newly diagnosed diabetes mellitus, use of a near-euglycemic management paradigm improves remission rate over a traditional paradigm.

Vet Q (2014) 1-5.

Nack, R., and A. E. DeClue

The object of this retrospective study was to compare the effect on remission rates of a near euglycemic paradigm (NEP) to a traditional paradigm (TP) of glycemic control in cats with newly diagnosed diabetes mellitus. Medical records of 54 cats with naive diabetes mellitus managed with low carbohydrate, high protein prescription diets, and twice daily subcutaneous glargine insulin injections were reviewed. Cats were assigned to an NEP or TP group based on frequency of evaluation of blood glucose concentration and the criteria used to assess glycemic control. The two groups were compared with regard to the incidence of clinical and biochemical hypoglycemia and remission rates. Multiple logistic regression was used to evaluate the association between remission and independent variables. Fourteen of 18 cats (78%) in the NEP group achieved remission, whereas five of the 36 (14%) of the TP group achieved remission (p < 0.001). For the NEP group, biochemical hypoglycemia was noted in 8/18 (44%) and clinical hypoglycemia was documented in 2/18 (11%) of the cats. In the TP group, biochemical hypoglycemia was noted in 12/36 (33%) cats and 5/36 (14%) had clinical hypoglycemia. In conclusion, management of newly diagnosed diabetic cats using an NEP of glycemic control results in higher remission rates without an increased incidence of observed clinical or biochemical hypoglycemia. Although an NEP appears to have benefit it should be evaluated further with regard to its overall and long term effects on health and quality of life as well as its overall cost effectiveness.

ANIMAL MODELS OF DISEASE: Classification and etiology of diabetes in dogs and cats.


Nelson, R. W., and C. E. Reusch

Diabetes mellitus is a common disease in dogs and cats. The most common form of diabetes in dogs resembles type 1 diabetes in humans. Studies suggest that genetics, an immune-mediated component, and environmental factors are involved in the development of diabetes in dogs. A variant of gestational diabetes also occurs in dogs. The most common form of diabetes in cats resembles type 2 diabetes in humans. A major risk factor in cats is obesity. Obese cats have altered expression of several insulin signaling genes and glucose transporters and are leptin resistant. Cats also form amyloid deposits within the islets of the pancreas and develop glucotoxicity when exposed to prolonged hyperglycemia. In conclusion, management of newly diagnosed diabetic cats using an NEP of glycemic control results in higher remission rates without an increased incidence of observed clinical or biochemical hypoglycemia. Although an NEP appears to have benefit it should be evaluated further with regard to its overall and long term effects on health and quality of life as well as its overall cost effectiveness.

Feline dermatophytosis: steps for investigation of a suspected shelter outbreak.

PRACTICAL RELEVANCE: Dermatophytosis (ringworm) is the most important infectious and contagious skin disease of cats in shelters. Its importance relates to the fact that it can affect all cats, but tends to affect those which would otherwise have good chances for adoption. Although many diseases in shelters fit this description, dermatophytosis is of particular significance because of associated public health concerns. CLINICAL CHALLENGES: Disease management in animal shelters is challenging because new animals are frequently entering the population, numerous animals are often housed together, and resources are almost always limited. GLOBAL RELEVANCE: Outbreaks of dermatophytosis occur worldwide and no animal shelter is completely shielded from possible introduction of the disease into the population. AUDIENCE: This article offers a flexible stepwise approach to dealing with a known or suspected outbreak of dermatophytosis in an animal shelter. It is based on the authors’ experiences spanning more than a decade of responses and/or consultations. While primarily aimed at veterinarians involved in shelter medicine, the principles largely apply to other group-housing situations, such as catteries and breeding establishments. AIMS: The goals in dealing with a potential dermatophytosis outbreak are to ascertain if the ‘outbreak’ is actually an outbreak, to develop a shelter-specific outbreak management plan and to implement a long-term plan to prevent recurrences.

Feline fecal virome reveals novel and prevalent enteric viruses.
Humans keep more than 80 million cats worldwide, ensuring frequent exposure to their viruses. Despite such interactions the enteric virome of cats remains poorly understood. We analyzed a fecal sample from a single healthy cat from Portugal using viral metagenomics and detected five eukaryotic viral genomes. These viruses included a novel picornavirus (proposed genus “Sakobuvirus”) and bocavirus (feline bocavirus 2), a variant of feline astrovirus 2 and sequence fragments of a highly divergent feline rotavirus and picobirnavirus. Feline sakobuvirus A represents the prototype species of a proposed new genus in the Picornaviridae family, distantly related to human salivirus and kobuvirus. Feline astroviruses (mamastrovirus 2) are the closest known relatives of the classic human astroviruses (mamastrovirus 1), suggestive of past cross-species transmission. Presence of these viruses by PCR among Portuguese cats was detected in 13% (rotavirus), 7% (astrovirus), 6% (bocavirus), 4% (sakobuvirus), and 4% (picobirnavirus) of 55 feline fecal samples. Co-infections were frequent with 40% (4/10) of infected cats shedding more than one of these five viruses. Our study provides an initial description of the feline fecal virome indicating a high level of asymptomatic infections. Availability of the genome sequences of these viruses will facilitate future tropism and feline disease association studies.

Effects of sitagliptin on plasma incretin concentrations after glucose administration through an esophagostomy tube or feeding in healthy cats.
Nishii, N., S. Takashima, A. Iguchi, Y. Murahata, A. Matsuu, Y. Hikasa, and H. Kitagawa
We investigated the effect of sitagliptin, a dipeptidyl peptidase 4 inhibitor, on plasma incretin concentrations after glucose administration through an esophagostomy tube or feeding in healthy cats.
Six cats were used for the glucose administration experiment and 5 cats were used for the feeding experiment. Glucose administration through an esophagostomy tube increased plasma glucagon-like peptide 1 (GLP-1) concentrations by 6-fold, whereas plasma glucose-dependent insulino tropic polypeptide (GIP) concentrations did not change. Feeding increased both plasma GLP-1 concentrations by 1.5-fold and GIP concentrations by 4.6-fold. Sitagliptin was administered through an esophagostomy tube (25 and 50 mg per cat) in the glucose administration experiment and orally (25 mg per cat) in the feeding experiment. Sitagliptin treatment potentiated the GLP-1 response to glucose by 1.5-fold (P < 0.05). In addition, postprandial plasma GLP-1 concentration was higher by 2-fold when sitagliptin was administered (P < 0.05). In contrast, administration of sitagliptin did not affect plasma GIP concentrations after glucose administration or feeding. Sitagliptin enhanced insulin secretion following glucose administration by 1.5-fold (P < 0.05); however, it did not influence the plasma glucose concentration. Furthermore, sitagliptin had no effect on the postprandial plasma glucose and insulin concentrations. In conclusion, this study provides no evidence that sitagliptin is beneficial for management of feline diabetes mellitus.

**Effect of melatonin implants on spermatogenesis in the domestic cat (Felis silvestris catus).**

Theriogenology (2014)

*Nunez Favre, R., M. C. Bonaura, R. Praderio, M. C. Stornelli, R. L. de la Sota, and M. A. Stornelli*

The aim of this study was to assess the efficacy of subcutaneous melatonin implants to temporarily and reversibly suppress spermatogenesis in male cats. Tomcats (n = 8) were housed in a conditioned room with alternating long and short 2-month photoperiod cycles to maintain sperm production and quality. Animals were randomly assigned to one of the two treatments. Four animals received a subcutaneous melatonin implant (MEL, 18 mg; Syntex, Argentina), whereas the other four received a subcutaneous placebo implant (PLA, 0 mg; Syntex). Semen samples were collected by electroejaculation every 14 days for 252 days. Sperm parameters were evaluated in all ejaculates, and data were analyzed by ANOVA. Melatonin-implanted cats significantly decreased their sperm quality in all the parameters studied compared with the control group (MEL vs. PLA; least squares means +/- SEM; motility, 71.3 +/- 3.4 vs. 82.1 +/- 3.6; velocity, 3.4 +/- 0.1 vs. 4.6 +/- 0.1; total sperm count, 2.6 +/- 2.2 vs. 19.4 +/- 3.3; acrosome integrity, 48.7 +/- 5.6 vs. 62.8 +/- 5.6; plasma membrane integrity, 52.2 +/- 4.7 vs. 72.9 +/- 5.5; normal sperm morphology, 45.8 +/- 3.3 vs. 63.7 +/- 3.4; P < 0.05). Conversely, volume and serum testosterone concentrations were similar in both groups (volume, 0.15 +/- 0.02; serum testosterone concentrations, 1.1 +/- 0.1; CV 18.9%; P > 0.05). At 91 +/- 7 days after implant insertion, sperm motility decreased 38.5%, velocity 26.5%, total sperm count 82%, acrosome integrity 22%, plasma membrane integrity 30%, and normal sperm morphology decreased 32% of preimplant values. This effect was present until 120 +/- 15 days after implant insertion. After that, seminal parameters started to increase and reached preimplant values at about 140 +/- 7 days after implant insertion. Nevertheless, treated animals conserved the capacity to produce semen during the treatment period. In conclusion, a single subcutaneous melatonin implant effectively and reversibly reduced sperm production and quality in male domestic cats for approximately 120 +/- 15 days without clinically detectable adverse effects.

**Management of dogs and cats with endotracheal tube tracheal foreign bodies.**


*Nutt, L. K., J. A. Webb, K. J. Prosser, and A. Defarges*
Two cats and 3 dogs were treated for an endotracheal tube tracheal foreign body (ETFB) during recovery from general anesthesia. Bronchoscopy was used to remove the ETFB. Animals were clinically normal at discharge. While rare, ETFB can occur upon recovery from anesthesia. Bronchoscopy is an effective way to remove ETFB.

**Longevity and mortality of cats attending primary care veterinary practices in England.**


O’Neill, D. G., D. B. Church, P. D. McGreevy, P. C. Thomson, and D. C. Brodbelt

Enhanced knowledge on longevity and mortality in cats should support improved breeding, husbandry, clinical care and disease prevention strategies. The VetCompass research database of primary care veterinary practice data offers an extensive resource of clinical health information on companion animals in the UK. This study aimed to characterise longevity and mortality in cats, and to identify important demographic risk factors for compromised longevity. Crossbred cats were hypothesised to live longer than purebred cats. Descriptive statistics were used to characterise the deceased cats. Multivariable linear regression methods investigated risk factor association with longevity in cats that died at or after 5 years of age. From 118,016 cats attending 90 practices in England, 4009 cats with confirmed deaths were randomly selected for detailed study. Demographic characterisation showed that 3660 (91.7%) were crossbred, 2009 (50.7%) were female and 2599 (64.8%) were neutered. The most frequently attributed causes of mortality in cats of all ages were trauma (12.2%), renal disorder (12.1%), non-specific illness (11.2%), neoplasia (10.8%) and mass lesion disorders (10.2%). Overall, the median longevity was 14.0 years (interquartile range [IQR] 9.0-17.0; range 0.0-26.7). Crossbred cats had a higher median longevity than purebred cats (median [IQR] 14.0 years [9.1-17.0] vs 12.5 years [6.1-16.4]; P <0.001), but individual purebred cat breeds varied substantially in longevity. In cats dying at or after 5 years (n = 3360), being crossbred, having a lower bodyweight, and being neutered and non-insured were associated with increased longevity. This study described longevity in cats and identified important causes of mortality and breed-related associations with compromised longevity.

**Acidifying and yeast extract in diets for adults cats.**


This study evaluated the effects of adding an acidifying agent based on phosphoric acid (A), a yeast extract from a specific strain (Saccharomyces cerevisiae) (Y) and the combination of these two additives in food for adult cats. A test was conducted with 24 animals (mean 3.5 years old), mixed breed, weighing 3.72 +/- 0.74 kg, kept in individual metabolic cages and distributed in a completely randomized design with a 2 x 2 factorial design (with or without A 0.6% of dry matter, with or without Y 1.5% of dry matter) totalling four treatments and six replicates of each condition. The experimental period was 15 days. The A or the Y reduced (P< 0.01) the dry matter intake, but the effect was not observed when they were associated. The association improved (P<0.05) the digestibility of dry matter and ashes. The A reduced urine pH (P=0.05) regardless of the presence of the Y. There was no effect (P>0.09) on other parameters evaluated. Results of this study show that the isolated use of 0.6% A or 1.5% Y in diets for cats is not recommended. However, the association of these two additives was beneficial in increasing nutrient digestibility.
Association between characteristics of cats and satisfaction of owners who adopted cats from an animal hospital in Japan.

Onodera, N., K. Uchida, and Y. Kakuma
A follow-up questionnaire survey was conducted with 29 cat owners who adopted cats from an animal hospital in Japan. Physical characteristics were found to be important factors for the owners when choosing a cat. There were significant differences between impression of the cat for the owners at present and images of their ideal cats, and the levels of aggression and activeness of the cats at present were rated higher than their ideal cats. A significant negative correlation was found between the degree of satisfaction with the cat and occurrence of house soiling; thus, some behavioral problems may deteriorate the relationship between the owner and the cat.


Oppliger, S., S. Hartnack, C. E. Reusch, and P. H. Kook
OBJECTIVE: To investigate agreement of a feline pancreas-specific lipase assay and a colorimetric lipase assay with a 1,2-o-dilauryl-rac-glycero-3-glutaric acid-6'-methylresorufin ester (DGGR) substrate with results of pancreatic ultrasonography in cats with suspicion of pancreatitis. DESIGN: Retrospective case series. ANIMALS: 161 client-owned cats with suspicion of pancreatitis. PROCEDURES: Feline pancreas-specific lipase concentration and DGGR lipase activity were measured from the same blood sample in cats undergoing investigation for pancreatitis, with < 24 hours between ultrasonography and lipase determinations. Ultrasonographic variables evaluated were ultrasonographic diagnosis of pancreatitis, enlargement, margins, echogenicity, mesenteric echogenicity, peripancreatic free fluid, cysts, masses, and common bile and pancreatic duct dilation. Agreement was assessed by use of the Cohen kappa coefficient. RESULTS: Agreement between the lipase assays was substantial (kappa = 0.703). An ultrasonographic diagnosis of pancreatitis had fair agreement with feline pancreas-specific lipase concentration > 5.4 mug/L (kappa = 0.264) and DGGR lipase activity > 26 U/L (kappa = 0.221). The greatest agreement between feline pancreas-specific lipase concentration > 5.4 mug/L and DGGR lipase activity > 26 U/L was found for a hypoechoic and mixed-echoic (kappa = 0.270 and 0.266, respectively), hypoechoic (kappa = 0.261 and 0.181, respectively), and enlarged (kappa = 0.218 and 0.223, respectively) pancreas. CONCLUSIONS AND CLINICAL RELEVANCE: Agreement between pancreatic ultrasonography and lipase assay results was only fair. It remains unknown whether lipase results or pancreatic ultrasonography constitutes the more accurate test for diagnosing pancreatitis; therefore, results of both tests need to be interpreted with caution.

Intercat aggression: restoring harmony in the home: a guide for practitioners.

Pachel, C. L.
Intercat aggression is a common problem within multicat households. Diagnosis and treatment requires an understanding of the social structure of free-living cats and of how those interactions are impacted by confinement and household management practices. There are multiple causes of aggression between cats within a home, and treatment plans should be customized to account for the diagnosis and behavior...
pattern identified. Some cases of intercat aggression can be treated successfully without requiring full separation of the involved cats. In cases where separation is required, treatment includes steps for successful reintroduction and reintegration. Several situational and maintenance medication options can be used to improve the response to treatment.

**An update on feline infectious peritonitis: Virology and immunopathogenesis.**


**Pedersen, N. C.**

Feline infectious peritonitis (FIP) continues to be one of the most researched infectious diseases of cats. The relatively high mortality of FIP, especially for younger cats from catteries and shelters, should be reason enough to stimulate such intense interest. However, it is the complexity of the disease and the grudging manner in which it yields its secrets that most fascinate researchers. Feline leukemia virus infection was conquered in less than two decades and the mysteries of feline immunodeficiency virus were largely unraveled in several years. After a half century, FIP remains one of the last important infections of cats for which we have no single diagnostic test, no vaccine and no definitive explanations for how virus and host interact to cause disease. How can a ubiquitous and largely non-pathogenic enteric coronavirus transform into a highly lethal pathogen? What are the interactions between host and virus that determine both disease form (wet or dry) and outcome (death or resistance)? Why is it so difficult, and perhaps impossible, to develop a vaccine for FIP? What role do genetics play in disease susceptibility? This review will explore research conducted over the last 5 years that attempts to answer these and other questions. Although much has been learned about FIP in the last 5 years, the ultimate answers remain for yet more studies.

**The epidemiological scenario of feline sporotrichosis in Rio de Janeiro, State of Rio de Janeiro, Brazil.**


**Pereira, S. A., I. D. Gremiao, A. A. Kitada, J. S. Boechat, P. G. Viana, and T. M. Schubach**

Introduction Sporotrichosis is a mycosis affecting both humans and animals. Within the context of the ongoing sporotrichosis epidemic in the State of Rio de Janeiro, Brazil, sick cats plays an important role in the zoonotic transmission. The aim of this study was to update the number of feline cases diagnosed at the Fundacao Oswaldo Cruz (2005-2011). Methods The medical records of the cats followed were reviewed; the inclusion criterion was the isolation of Sporothrix spp. in culture. Results In total, 2,301 feline cases were identified. Conclusions These results should alert sanitary authorities to the difficulties associated with sporotrichosis control.

**Dietary management of feline endocrine disease.**


**Peterson, M. E., and L. Eirmann**

When treating cats with endocrine disease, most veterinarians concentrate on medical or surgical treatments that can be used to manage or cure the disease. Dietary issues are frequently ignored or not properly addressed. However, nutritional support can play an integral role in the successful management of feline endocrine diseases. Furthermore, because most cats with endocrine disease are senior or geriatric, they may also have concurrent health conditions that warrant dietary intervention.
This article discusses recommendations for nutritional support of the 2 most common endocrine problems of cats seen in clinical practice: hyperthyroidism and diabetes mellitus.

**THYROID SCINTIGRAPHY FINDINGS IN 2096 CATS WITH HYPERTHYROIDISM.**

*Vet Radiol Ultrasound (2014)*

*Peterson, M. E., and M. R. Broome*

Thyroid scintigraphy is currently the reference standard for diagnosing and staging cats with hyperthyroidism, but few studies describing the scintigraphic characteristics in a large number of cats have been reported. The objective of this study was to better characterize thyroid scintigraphy findings by evaluating 2096 consecutive cats with hyperthyroidism that were referred over a 3.5-year period. Of these cats, 2068 (98.7%) had a high thyroid-to-salivary ratio (>1.5), whereas 2014 (96.1%) were found to have a high thyroid-to-background ratio (>6.1). When the patterns of the cats’ thyroid disease were recorded, 665 (31.7%) had unilateral disease, 1060 (50.6%) had bilateral-asymmetric disease (two thyroid lobes unequal in size), 257 (12.3%) had bilateral-symmetric disease (both lobes similar in size), and 81 (3.9%) had multifocal disease (>/=3 areas of increased radionuclide uptake). The number of areas of 99m TcO- 4 uptake in the 2096 cats ranged from 1 to 6 (median, 2), located in the cervical area in 2057 (98.1%), thoracic inlet in 282 (13.5%), and in the thoracic cavity in 115 (5.5%). Ectopic thyroid tissue (e.g. lingual or mediastinal) was diagnosed in 81 (3.9%) cats, whereas thyroid carcinoma was suspected in 35 (1.7%) of the cats. The results of this study support conclusions that most hyperthyroid cats have unilateral or bilateral thyroid nodules, but that multifocal disease will develop in a few cats that have ectopic thyroid disease or thyroid carcinoma. Both ectopic thyroid disease and thyroid carcinoma are relatively uncommon in hyperthyroid cats, with a respective prevalence of approximately 4% and approximately 2% in this study.

**Cytologic and immunocytochemical characterization of feline progressive histiocytosis.**

*Vet Clin Pathol (2014)*


BACKGROUND: Feline Progressive Histiocytosis (FPH) is a cutaneous dendritic cell neoplasm characterized by slow progression and spread to internal organs in the terminal stage. FPH is often misdiagnosed as an inflammatory reaction and has not been fully characterized from a cytologic diagnostic perspective. OBJECTIVES: The purpose of the study was to characterize the cytologic and immunocytochemical aspects useful for FPH diagnosis. METHODS: Fine-needle aspiration cytologic samples of 5 cases of FPH confirmed by skin biopsy and necropsy were evaluated. Immunocytochemistry with antibodies recognizing CD1a, CD1c, CD3, CD11b, CD18, CD21, and MHCII was performed on air-dried, acetone-fixed smears. E-cadherin expression was assessed on paraffin-embedded skin biopsies. Transmission electron microscopy (TEM) was performed in one case. RESULTS: Main cytologic findings on variably cellular samples were characterized by single to cohesive large, round to polygonal cells with intermediate to low N/C ratio, abundant clear homogeneous cytoplasm, and round to oval nuclei with rare bi- to multinucleated atypical cells, associated with low numbers of small lymphocytes and/or neutrophils. Neoplastic cells expressed CD1a, CD1c, CD11b, CD18, and MHCII. Anti-CD3 antibodies identified reactive T cells admixed with the neoplastic cells. E-cadherin expression was observed in all but one case. TEM failed to identify Birbeck granules in one case. CONCLUSIONS: FPH is a distinctive neoplastic lesion.
composed of nonphagocytizing histiocytes variably admixed with neutrophils and small mature lymphocytes. Immunocytochemical analysis with CD1 is mandatory to confirm a dendritic cell origin. Immunocytochemistry and cytomorphology allowed the specific and rapid diagnosis of FPH on cytologic samples.

**Felid herpesvirus 1 (FHV 1) carriers among urban breeding facilities in Wroclaw (Poland).**

*Ploneczka-Janeczko, K., K. Bierowiec, J. Bania, M. Kielbowicz, and Z. Kielbowicz*

The prevalence of Felid herpesvirus 1 (FHV 1) carriers among closed, one-cat breeding facilities in the urban environment of Wroclaw city between 2011-2013 was investigated. A probe-based real-time PCR was used to detect FHV 1 DNA in conjunctival swab extracts. Of the 67 breeding cats investigated 14 animals (20.9%) were confirmed to contain FHV 1 specific DNA. The herpesvirus DNA was detected in eight cats from the group expressing clinical signs of FHV 1 infection (n = 28) and in six clinically healthy animals (n = 39). The percentage of positive carriers ranged from 12 to 44%, depending on the frequency of sampling. The total prevalence in cats at the optimal age for reproduction (2 to 7 years) was 20%. One-cat breeding facilities of purebred cats in Wroclaw (Poland) constitute a significant reservoir of FHV 1 and the number of monitoring repeats may influences the success of FHV 1 detection.

**Infectious diseases in large-scale cat hoarding investigations.**

*Polak, K. C., J. K. Levy, P. C. Crawford, C. M. Leutenegger, and K. A. Moriello*

Animal hoarders accumulate animals in over-crowded conditions without adequate nutrition, sanitation, and veterinary care. As a result, animals rescued from hoarding frequently have a variety of medical conditions including respiratory infections, gastrointestinal disease, parasitism, malnutrition, and other evidence of neglect. The purpose of this study was to characterize the infectious diseases carried by clinically affected cats and to determine the prevalence of retroviral infections among cats in large-scale cat hoarding investigations. Records were reviewed retrospectively from four large-scale seizures of cats from failed sanctuaries from November 2009 through March 2012. The number of cats seized in each case ranged from 387 to 697. Cats were screened for feline leukemia virus (FeLV) and feline immunodeficiency virus (FIV) in all four cases and for dermatophytosis in one case. A subset of cats exhibiting signs of upper respiratory disease or diarrhea had been tested for infections by PCR and fecal flotation for treatment planning. Mycoplasma felis (78%), calicivirus (78%), and Streptococcus equi subspecies zooepidemicus (55%) were the most common respiratory infections. Feline enteric coronavirus (88%), Giardia (56%), Clostridium perfringens (49%), and Tritrichomonas foetus (39%) were most common in cats with diarrhea. The seroprevalence of FeLV and FIV were 8% and 8%, respectively. In the one case in which cats with lesions suspicious for dermatophytosis were cultured for Microsporum canis, 69/76 lesions were positive; of these, half were believed to be truly infected and half were believed to be fomite carriers. Cats from large-scale hoarding cases had high risk for enteric and respiratory infections, retroviruses, and dermatophytosis. Case responders should be prepared for mass treatment of infectious diseases and should implement protocols to prevent transmission of feline or zoonotic infections during the emergency response and when transferring the rescued cats to other shelters or to adopters.
Prepubertal gonadectomy in cats: different surgical techniques and comparison with gonadectomy at traditional age.

Vet Rec (2014)

Porters, N., I. Polis, C. Moons, L. Duchateau, K. Goethals, S. Huyghe, and H. de Rooster

Feasibility, surgical time and complications of different surgical techniques for prepubertal gonadectomy (PPG; 8-12 weeks of age) in cats were studied and compared to gonadectomy at traditional age (TAG; 6-8 months of age). Kittens were randomly assigned to PPG or TAG. Ovarian pedicle haemostasis for PPG was achieved by ligatures (n=47), vascular clips (n=50), bipolar electrocoagulation (n=50), or pedicle tie (n=50); for TAG (n=34) ligatures were used. In male cats, PPG consisted of closed castration by spermatic cord knot (n=92) or ligature (n=91) while TAG (n=34) was an open castration by spermatic cord knot. A linear (surgical time) and a logistic regression (complications) model were designed. Significance was set at 0.05. For female PPG, clips and coagulation were the fastest procedures; placement of ligatures was most time-consuming. In male PPG, knot placement was significantly faster than ligation. In both sexes, very few intraoperative or wound complications were observed, irrespective of the surgical technique used. Surgical times in females (ligatures) as well as in males (knot) were significantly shorter for PPG than for TAG. PPG was as safe as TAG, yet took less time to perform and did not result in a greater rate of postoperative complications.

Survey of Dermatophytes in Stray Cats with and without Skin Lesions in Northern Italy.


Proverbio, D., R. Perego, E. Spada, G. Bagnagatti de Giorgi, A. Della Pepa, and E. Ferro

The aim of this study was to determine the prevalence of dermatophytes in stray cats with and without clinical lesions from different colonies in rural and urban areas of Milan and surroundings in northern Italy. Stray cats (273) were caught during a trap-neuter-release (TNR) program conducted in different colonies of northern Italy in both rural and urban areas. Each cat was examined in dark environment with a Wood’s lamp prior to sample collection. Hair or scales exhibiting typical fluorescence were removed with a pair of sterile hemostats and cultured. The hair of all cats was then sampled by Mackenzie modified brush technique regardless of the presence or absence of skin lesions attributable to dermatophytosis. All the hair samples were subjected to fungal culture. 15 cats were positive (5.5%). Microsporum canis was the most common dermatophyte isolated (13/15). The only other isolated dermatophyte was Trichophyton mentagrophytes (2/15). Our estimated prevalence of dermatophytes in stray cats was much lower than other Italian studies on the same population.

Bioavailability of morphine, methadone, hydromorphone, and oxymorphone following buccal administration in cats.


Pypendop, B. H., J. E. Ilkiw, and Y. Shilo-Benjamini

Buccal administration of buprenorphine is commonly used to treat pain in cats. It has been argued that absorption of buprenorphine through the buccal mucosa is high, in part due to its pKa of 8.24. Morphine, methadone, hydromorphone, and oxymorphone have a pKa between 8 and 9. This study characterized the bioavailability of these drugs following buccal administration to cats. Six healthy adult female spayed cats were used. Buccal pH was measured prior to drug administration. Morphine sulfate, 0.2 mg/kg IV or 0.5 mg/kg buccal; methadone hydrochloride, 0.3 mg/kg IV or 0.75 mg/kg
buccal; hydromorphone hydrochloride, 0.1 mg/kg IV or 0.25 mg/kg buccal; or oxymorphone hydrochloride, 0.1 mg/kg IV or 0.25 mg/kg buccal were administered. All cats received all treatments. Arterial blood was sampled immediately prior to drug administration and at various times up to 8 h thereafter. Bioavailability was calculated as the ratio of the area under the time-concentration curve following buccal administration to that following IV administration, each indexed to the administered dose. Mean +/- SE (range) bioavailability was 36.6 +/- 5.2 (12.7-49.5), 44.2 +/- 7.9 (18.7-70.5), 22.4 +/- 6.9 (6.4-43.4), and 18.8 +/- 2.0 (12.9-23.5)% for buccal administration of morphine, methadone, hydromorphone, and oxymorphone, respectively. Bioavailability of methadone was significantly higher than that of oxymorphone.

Pharmacokinetics of dexmedetomidine after intravenous administration of a bolus to cats.
Pypendop, B. H., and J. E. Ilkiw
OBJECTIVE: To characterize the pharmacokinetics of dexmedetomidine after IV administration of a bolus to conscious healthy cats. ANIMALS: 5 healthy adult spayed female cats. PROCEDURES: Dexmedetomidine was administered IV as a bolus at 3 doses (5, 20, or 50 mug/kg) on separate days in a random order. Blood samples were collected immediately before and at various times for 8 hours after drug administration. Plasma dexmedetomidine concentrations were determined with liquid chromatography-mass spectrometry. Compartment models were fitted to the concentration-time data by means of nonlinear regression. RESULTS: A 2-compartment model best fit the concentration-time data after administration of 5 mug/kg, whereas a 3-compartment model best fit the data after administration of 20 and 50 mug/kg. The median volume of distribution at steady-state and terminal half-life were 371 mL/kg (range, 266 to 435 mL/kg) and 31.8 minutes (range, 30.3 to 39.7 minutes), respectively, after administration of 5 mug/kg; 545 mL/kg (range, 445 to 998 mL/kg) and 56.3 minutes (range, 39.3 to 68.9 minutes), respectively, after administration of 20 mug/kg; and 750 mL/kg (range, 514 to 938 mL/kg) and 75.3 minutes (range, 52.2 to 223.3 minutes), respectively, after administration of 50 mug/kg. CONCLUSIONS AND CLINICAL RELEVANCE: The pharmacokinetics of dexmedetomidine was characterized by a small volume of distribution and moderate clearance and had minimal dose dependence within the range of doses evaluated. These data will help clinicians design dosing regimens once effective plasma concentrations are established.

Relationship between plasma dexmedetomidine concentration and sedation score and thermal threshold in cats.
Pypendop, B. H., and J. E. Ilkiw
OBJECTIVE: To characterize the relationship between plasma dexmedetomidine concentration and the temperature difference between the thermal threshold and skin temperature (DeltaT) and between plasma dexmedetomidine concentration and sedation score in healthy cats. ANIMALS: 5 healthy adult spayed female cats. PROCEDURES: Cats received IV administrations of saline (0.9% NaCl) solution, dexmedetomidine (5, 20, or 50 mug/kg), or acepromazine (0.1 mg/kg). Blood samples were collected and thermal threshold and sedation score were determined before and at various times up to 8 hours after drug administration. In addition, cats received an IV infusion of dexmedetomidine that targeted a concentration achieving 99% of the maximum effect on DeltaT. RESULTS: No change in DeltaT over time was found for the saline solution and acepromazine treatments; DeltaT increased for 45 minutes
when cats received dexmedetomidine at 5 and 20 mug/kg and for 180 minutes when cats received dexmedetomidine at 50 mug/kg. No change in sedation score over time was found for saline solution. Sedation score increased for 120 minutes after cats received acepromazine and for 60, 120, and 180 minutes after cats received dexmedetomidine at 5, 20, and 50 mug/kg, respectively. The plasma dexmedetomidine concentration-effect relationships for the effect on DeltaT and sedation score were almost identical. The plasma dexmedetomidine concentration after infusion was lower than targeted, and DeltaT was not significantly affected. CONCLUSIONS AND CLINICAL RELEVANCE: Dexmedetomidine administration to cats resulted in thermal analgesia and also profound sedation. These data may be useful for predicting the course of thermal analgesia and sedation after dexmedetomidine administration to cats.

Spatially heterogeneous land cover/land use and climatic risk factors of tick-borne feline cytauxzoonosis.


BACKGROUND: Feline cytauxzoonosis is a highly fatal tick-borne disease caused by a hemoparasitic protozoan, Cytauxzoon felis. This disease is a leading cause of mortality for cats in the Midwestern United States, and no vaccine or effective treatment options exist. Prevention based on knowledge of risk factors is therefore vital. Associations of different environmental factors, including recent climate were evaluated as potential risk factors for cytauxzoonosis using Geographic Information Systems (GIS). METHODS: There were 69 cases determined to be positive for cytauxzoonosis based upon positive identification of C. felis within blood film examinations, tissue impression smears, or histopathologic examination of tissues. Negative controls totaling 123 were selected from feline cases that had a history of fever, malaise, icterus, and anorexia but lack of C. felis within blood films, impression smears, or histopathologic examination of tissues. Additional criteria to rule out C. felis among controls were the presence of regenerative anemia, cytologic examination of blood marrow or lymph node aspirate, other causative agent diagnosed, or survival of 25 days or greater after testing. Potential environmental determinants were derived from publicly available sources, viz., US Department of Agriculture (soil attributes), US Geological Survey (land-cover/landscape, landscape metrics), and NASA (climate). Candidate variables were screened using univariate logistic models with a liberal p value (0.2), and associations with cytauxzoonosis were modeled using a global multivariate logistic model (p<0.05). Spatial heterogeneity among significant variables in the study region was modeled using a geographically weighted regression (GWR) approach. RESULTS: Total Edge Contrast Index (TECI), grassland-coverage, humidity conditions recorded during the 9(th) week prior to case arrival, and an interaction variable, “diurnal temperature range x percent mixed forest area” were significant risk factors for cytauxzoonosis in the study region. TECI and grassland areas exhibited significant regional differences in their effects on cytauxzoonosis outcome, whereas others were uniform. CONCLUSIONS: Land-cover areas favorable for tick habitats and climatic conditions that favor the tick life cycle are strong risk factors for feline cytauxzoonosis. Spatial heterogeneity and interaction effects between land-cover and climatic variables may reveal new information when evaluating risk factors for vector-borne diseases.

Open wide: blindness in cats after the use of mouth gags.


Reiter, A. M.
Effect of high-dose ciclosporin on the immune response to primary and booster vaccination in immunocompetent cats.

Roberts, E. S., K. A. Vanlare, L. M. Roycroft, and S. King

Ciclosporin (Atopica oral solution for cats 100 mg/ml; Novartis Animal Health) was recently approved for use in cats with feline hypersensitivity dermatitis. The immunosuppressant effect of ciclosporin on the ability of cats to mount an immune response following vaccination was determined. Thirty-two healthy, immunocompetent adult cats (16 cats/group) were treated with either ciclosporin for 56 days at a dose of 24 mg/kg once daily or sham dosed. Prior to treatment, cats had an adequate antibody response to primary vaccination against feline calicivirus (FCV), feline herpesvirus-1 (FHV-1), feline panleukopenia virus (FPV), feline leukemia virus (FeLV) and rabies. Booster vaccination or novel vaccination with feline immunodeficiency virus (FIV) was administered 28 days after initiation of treatment with ciclosporin. There were no differences between the ciclosporin-treated and control cats for FCV and FPV antibody titers following booster vaccination. There were delays/reductions in antibody response to FHV-1, FeLV and rabies in treated cats; however, adequate protection was achieved in response to all booster vaccinations. Following primary vaccination with FIV, control cats showed a response, but treated cats showed no antibody production. Adverse events commonly associated with ciclosporin treatment, including diarrhea/loose stool, vomiting, salivation and regurgitation, were reported. In adult cats treated with 24 mg/kg/day of ciclosporin (more than three times the therapeutic dose), vaccine titer levels were adequate for protection following booster vaccination. In contrast, treated cats failed to mount a humoral response to a novel (FIV) vaccination, suggesting that memory B-cell immune responses remain intact during repeated high-dose ciclosporin administration in cats, but that primary immune responses are impaired.

Comparison of two coproparasitological techniques for the detection of Platynosomum sp. infection in cats.
Vet Parasitol (2014)


Platynosomum sp. is the etiologic agent of platynosomiasis, a hepatic disease that affects domestic cats. The parasite develops in the bile ducts and gallbladder, causing severe hepato-biliary disease. Considering the importance of the disease and the increase in the number of households with cats, the aim of this study was to compare two different techniques for the detection of the parasite’s eggs and to assess the frequency of Platynosomum sp. infection in cats. Forty fecal samples from cats of different ages, from an animal shelter in the city of Salvador, Bahia State, Brazil, were subjected to two different techniques: a centrifugal fecal flotation procedure in Sheather’s sugar solution and centrifugal sedimentation in formalin-ether solution. Positive results were found for 12.5% of the samples using the centrifugal fecal flotation assay, whereas all samples were negative when employing the centrifugal sedimentation test. The results suggest that this parasite can be found infecting cats in Salvador city and that centrifugal fecal flotation in sugar solution can be a more suitable detection of the parasite’s eggs at fecal samples. Therefore, platynosomiasis must be included in the diseases to be studied routinely in domestic felids.
Rabies prevention and management of cats in the context of trap-neuter-vaccinate-release programmes.

Domestic cats are an important part of many Americans’ lives, but effective control of the 60-100 million feral cats living throughout the country remains problematic. Although trap-neuter-vaccinate-return (TNVR) programmes are growing in popularity as alternatives to euthanizing feral cats, their ability to adequately address disease threats and population growth within managed cat colonies is dubious. Rabies transmission via feral cats is a particular concern as demonstrated by the significant proportion of rabies post-exposure prophylaxis associated with exposures involving cats. Moreover, TNVR has not been shown to reliably reduce feral cat colony populations because of low implementation rates, inconsistent maintenance and immigration of unsterilized cats into colonies. For these reasons, TNVR programmes are not effective methods for reducing public health concerns or for controlling feral cat populations. Instead, responsible pet ownership, universal rabies vaccination of pets and removal of strays remain integral components to control rabies and other diseases.

Histology and Clinical Outcome of Benign and Malignant Vascular Lesions Primary to Feline Cervical Lymph Nodes.
Vet Pathol (2014)

A novel form of primary feline hemangiosarcoma and additional cases of plexiform vascularization in the cervical lymph nodes are reported. Sixteen cases of feline lymphadenopathy attributed to abnormal vascular proliferation were identified and evaluated. Most of these lesions were diagnosed histologically as hemangiosarcoma. However, lesions of plexiform vascularization, with and without areas of putative malignant transformation, were also identified. Mean age of the cats was 11 years (range, 3-16 years) with most being domestic shorthair and medium hair (13). Two domestic long hair and 1 Maine Coon were identified. Excisional nodal biopsy was performed in 15 cases and incisional biopsy in 1 case. Six cats were euthanized due to their disease. Survival times ranged from </=1 month to >/=30 months. We provide a new clinical differential for cervical lymphadenopathy in cats that is not widely recognized. Proper identification of primary nodal vascular lesions in cats will enable further characterization of clinical features and biologic behavior to determine specific therapy.

Extended-spectrum beta-lactamase, carbapenemase and AmpC producing Enterobacteriaceae in companion animals.

Rubin, J. E., and J. D. Pitout
Organisms in the family Enterobactericeae including, Escherichia coli, commonly cause community and hospital-associated infections in both humans and companion animals. The increasing prevalence of infections with organisms producing broad spectrum beta-lactamses such as the ESBLs (particularly the CTX-M type), AmpC and carbapenemase enzymes are threatening the future of the beta-lactam drugs. While a number of organisms within the Enterobacteriaceae producing these enzymes have been isolated from cats, dogs and horses, E. coli, including isolates indistinguishable from strains found in people, has most frequently been described in the literature. Although little is known about the prevalence of colonization, or incidence of infections with these organisms in companion animals, the
growing body of literature suggests that they are increasing. Transmission of these organisms to and from humans into companion animals has not been adequately described, although significant public and animal health concerns exist.

**Feline Upper Respiratory Tract Lymphoma: Site, Cyto-histology, Phenotype, FeLV Expression, and Prognosis.**

*Vet Pathol* (2014)

*Santagostino, S. F., C. M. Mortellaro, P. Boracchi, G. Avallone, M. Caniatti, A. Forlani, and P. Roccabianca*

Lymphoma is the most common feline upper respiratory tract (URT) tumor. Primary nasal and nasopharyngeal lymphomas have been evaluated as distinct pathological entities; however, data on their differing clinical behavior are missing. A total of 164 endoscopic-guided URT pinch biopsies were formalin fixed and routinely processed. Imprint cytological specimens were stained with May Grunwald-Giemsa. Immunohistochemistry for anti-CD20, CD3, FeLVp27, and FeLVgp70 was performed. Prognostic significance of clinicopathological variables was investigated by univariate and multivariate analysis. Lymphoma was diagnosed in 39 cats (24%). Most cats with lymphoma were domestic shorthair (32 [82%]), were male (F/M = 0.56), and had a mean age of 10.3 years (range, 1-16 years). Lymphomas were primary nasal in 26 cats (67%), nasopharyngeal in 6 (15%), and in both locations (combined lymphomas) in 7 cats (18%). Neoplastic growth pattern was diffuse in 35 cases (90%) and nodular in 4 (10%). Epitheliotropism was observed in 10 cases (26%). Tumor cells were large in 15 cases, were small and medium in 11 cases each, and 2 had mixed cell size. Submucosal lymphoplasmacytic inflammation was observed in 23 cases (59%). Cytology was diagnostic for lymphoma in 12 of 25 cases (48%). A B-cell origin prevailed (34 [87%]). Feline leukemia virus (FeLV) p27 or gp70 antigen was detected in 21 lymphomas (54%). URT lymphomas were aggressive, with survival varying from 0 to 301 days (mean, 53 days). Epitheliotropism in 8 B-cell lymphomas (80%) and in 2 T-cell lymphomas (20%) correlated with prolonged survival. Age younger or older than 10 years had a negative prognostic value. Lymphoplasmacytic inflammation and FeLV infection may represent favoring factors for URT lymphoma development.

**Prognostic analyses on anatomical and morphological classification of feline lymphoma.**


The present study was carried out to analyze the prognosis of 163 cats with lymphoma classified anatomically and cytomorphologically. Anatomically, alimentary lymphoma was the most common form and showed significantly shorter survival than mediastinal and nasal lymphomas in cats. Cytomorphologically, there was no predominant subtype in feline lymphomas. Immunoblastic type (18%), centroblastic type (16%), globule leukocyte type (15%), lymphocytic type (12%), lymphoblastic type (12%), pleomorphic medium and large cell type (10%) and anaplastic large cell type (7%) were relatively common subtypes. Most of the cats with globule leukocyte lymphoma had the alimentary form. Comparing median survival time among classifications, cats with globule leukocyte lymphoma showed significantly shorter survival than those with high-grade and other low-grade lymphomas. Furthermore, cats with high-grade lymphomas showed significantly shorter survival
than cats with other low-grade lymphomas. The present study indicated the clinical significance of anatomical and cytomorphological evaluation in feline lymphomas.

**Touchdown polymerase chain reaction detection of polycystic kidney disease and laboratory findings in different cat populations.**


*Scalon, M. C., T. F. da Silva, L. C. Aquino, F. T. Carneiro, M. G. Lima, M. D. Lemos, and G. R. Paludo*

Autosomal-dominant polycystic kidney disease (ADPKD) is the most prevalent inherited genetic disease of cats, predominantly affecting Persian and Persian-related cats. A point mutation (C-->A transversion) in exon 29 of the PKD1 gene causes ADPKD, and is the specific molecular target for genetic diagnosis in cats. The current study describes a newly developed touchdown polymerase chain reaction (PCR) to detect this single point mutation, using 2 primers specific for the mutant allele, adapted from an existing multiplex amplification refractory mutation system (ARMS PCR). Furthermore, correlations between the clinical outcomes of tested animals and the results of the genetic test were investigated. A total of 334 cats were tested, 188 from the Veterinary Hospital of Small Animals at the University of Brasilia, and 146 from an anti-rabies vaccine campaign of the Federal District. A total prevalence of 9% was evident among the samples, with 33% of the Persian cats testing positive, and 7% of the Brazilian long- and shorthaired cats testing positive. Prevalence was not correlated with gender or hemogram. Positive animals exhibited hyperglobulinemia (P = 0.02). This research demonstrated that the mutation does not only occur in Persian and Persian-related cats, and that a touchdown PCR can be used to diagnose ADPKD.

**Suppression of fertility in pre-pubertal dogs and cats.**


*Schäfer-Somi, S., D. Kaya, N. Gultiken, and S. Aslan*

Pre-pubertal gonadectomy in dogs and cats is still controversially discussed because some consequences cause health problems. Nevertheless, postponement of puberty, that is, prevention of an increase in sexual hormones and thereby prevention of their manifold effects, is of major importance, not only in controlling overpopulation but also to preserve the genetic base for future breeding stock and pets. Therefore, alternatives for surgical suppression of fertility in pre-pubertal animals were critically reviewed. As a promising alternative, the slow-release GnRH agonist deslorelin and other GnRH analogues have been investigated. In female dogs and cats, puberty could be significantly postponed without initial flare-up effect and without disturbance of body development. First trials to delay puberty in female and male cats by application of a 4.7-mg deslorelin implant 24 h after birth so far are promising. In female dogs, a previous investigation showed that when the implant was inserted at the age of 4 months, the initial flare-up effect was prevented. Body development was normal in the studies reviewed here, and with the 9.4-mg implant, puberty was significantly delayed until the age of 21 months or older. In one study, bitches either received a 4.7- or a 9.4-mg implant at the age of 4 months and the epiphyses were mostly closed before the time of first oestrus. Using a 4.7-mg deslorelin implant in pre-pubertal male dogs significantly postponed puberty, and age at puberty was >2 years when a 9.4-mg implant was used. However, further investigations are required, especially concerning the effect of different GnRH agonist dosages and resorption rates on the duration of postponement of puberty as well as long-term effects in both dogs and cats.
Cryptosporidium felis in faeces from cats in the UK.
Vet Rec (2014) **174:**609.
**Scorza, V., A. Willmott, D. Gunn-Moore, and M. R. Lappin**

Structural and functional changes relevant to maxillary arterial flow observed during computed tomography and nonselective digital subtraction angiography in cats with the mouth closed and opened.
**Scrivan, P. V., M. Martin-Flores, R. van Hatten, and A. J. Bezuidenhout**

Some cats develop blindness during procedures with mouth gags, which possibly relates to maxillary arterial occlusion by opening the mouth. Our first aim was to use computed tomography (CT) to describe how vascular compression is possible based on morphologic differences between mouth positions. Our second aim was to use nonselective digital subtraction angiography to assess whether opening the mouth induces collateral circulation. Six healthy cats were examined. During CT, the maxillary artery coursed between the angular process of the mandible and the rostrolateral wall of the tympanic bulla. The median distance between these structures was shorter when the mouth was opened (left, 4.3 mm; right, 3.6 mm) vs. closed (left, 6.9 mm; right, 7.1 mm). Additionally, the distance was shorter on the side ipsilateral to the gag (P = 0.03). During nonselective angiography, with the mouth closed, there was strong sequential opacification of the external carotid arteries, maxillary arteries, maxillary retia mirabilia, cerebral arterial circle, and basilar artery. Additionally, there was uniform opacification of the cerebrum and cerebellum. With the mouth opened, opacification of the maxillary arteries (rostral to the angular processes) was reduced in all cats, the cerebral arterial circle and basilar artery had simultaneous opacification in four of six (67%) cats, and the cerebrum had reduced opacification compared to the cerebellum in four of six (67%). In conclusion, the maxillary arteries are situated such that they can be compressed when opening the mouth. Opening the mouth did not consistently induce collateral circulation sufficient to produce comparable cerebral opacification as when the mouth was closed.

Seroprevalence of Neospora caninum in cats from the Czech Republic.
Acta Parasitol (2014) **59:**359-361.
**Sedlak, K., E. Bartova, and T. Machacova**

Sera of 414 cats coming from different parts of the Czech Republic were tested for N. caninum antibodies. Sera samples were collected during years 2002-2011. N. caninum antibodies were detected by a commercial competitive-inhibition enzyme-linked immunosorbent assay (cELISA) with cut off >/=30% inhibition. Samples positive in cELISA were confirmed by an indirect fluorescence antibody test (IFAT); titre >/=50 was considered positive. In total, 137 (33%) cats reacted positively in cELISA; N. caninum antibodies in IFAT were detected in 16 (3.86%) cats with titres 50 and 100. In 6 cats, positive for N. caninum antibodies, T. gondii antibodies were also detected by IFAT. It is the first report of N. caninum antibodies in domestic cats from the Czech Republic and third report in Europe.
Architecture and inflammatory cell composition of the feline lung with special consideration of eosinophil counts.


An increase in the number of eosinophils in bronchoalveolar lavage fluid (BALF) is a hallmark of feline asthma; however, a wide range in the percentage of eosinophils in BALF has been documented in healthy cats. In this study, BALF and lung tissue were collected from 15 cats without respiratory disease, BALF was taken from 15 cats with asthma and lung tissue was collected from six different asthmatic cats. Total nucleated cell count (TNCC) and inflammatory cell percentages were measured in BALF and lung tissue was evaluated microscopically. Asthmatic cats had a significantly higher eosinophil count in lung tissue, but BALF TNCC did not differ significantly between groups. Cats without respiratory signs had significantly more numerous macrophages and lymphocytes in BALF than asthmatics, but significantly lower percentages of eosinophils (4.2 +/- 7.8% versus 49.4 +/- 20.6%, P <0.001). In healthy feline airways a BALF eosinophil percentage of <5% can be expected. Dominant microscopical findings in feline asthma include high eosinophil counts, airway remodelling and inflammation. There is good correlation between the findings in BALF and tissue in feline asthma.

Antifungal drug susceptibility and phylogenetic diversity among Cryptococcus isolates from dogs and cats in North America.


Singer, L. M., W. Meyer, C. Firacative, G. R. Thompson, E. Samitz, and J. E. Sykes

Molecular types of the Cryptococcus neoformans/Cryptococcus gattii species complex that infect dogs and cats differ regionally and with host species. Antifungal drug susceptibility can vary with molecular type, but the susceptibility of Cryptococcus isolates from dogs and cats is largely unknown. Cryptococcus isolates from 15 dogs and 27 cats were typed using URA5 restriction fragment length polymorphism analysis (RFLP), PCR fingerprinting, and multilocus sequence typing (MLST). Susceptibility was determined using a microdilution assay (Sensititre YeastOne; Trek Diagnostic Systems). MICs were compared among groups. The 42 isolates studied comprised molecular types VGI (7%), VGIIa (7%), VGIIb (5%), VGIIc (5%), VGIII (38%), VGIV (2%), VNI (33%), and VNII (2%), as determined by URA5 RFLP. The VGIV isolate was more closely related to VGIII according to MLST. All VGIII isolates were from cats. All sequence types identified from veterinary isolates clustered with isolates from humans. VGIII isolates showed considerable genetic diversity compared with other Cryptococcus molecular types and could be divided into two major subgroups. Compared with C. neoformans MICs, C. gattii MICs were lower for flucytosine, and VGIII MICs were lower for flucytosine and itraconazole. For all drugs except itraconazole, C. gattii isolates exhibited a wider range of MICs than C. neoformans. MICs varied with Cryptococcus species and molecular type in dogs and cats, and MICs of VGIII isolates were most variable and may reflect phylogenetic diversity in this group. Because sequence types of dogs and cats reflect those infecting humans, these observations may also have implications for treatment of human cryptococcosis.

A Study on Borna Disease Virus Infection in Domestic Cats in Japan.


Borna disease virus (BDV) infection causes neurological disease in cats. Here, we report BDV infection in 199 hospitalized domestic cats in the Tokyo area. BDV infection was evaluated by detection of plasma antibodies against BDV-p24 or -p40. BDV-specific antibodies were detected in 54 cats (27.1%). Interestingly, the percentage of seropositive cats was not significantly different among the three clinical groups, i.e., healthy (29.8%), neurologically asymptomatic disease (22.2%) and neurological disease (33.3%). The specific antibodies were present even in cats aged below one year. The seropositive ratio was constant, irrespective of age and sampling season. The present study suggests that additional factors are required for onset of Borna disease in naturally infected cats and that BDV is transmitted through vertical routes in cats.

Guidelines for vaccination of dogs and cats in Korea.

Song, W. J., H. T. Kim, H. S. Yoo, and H. Y. Youn
This guideline contains the recommended vaccination schedules of dogs and cats from World Small Animal Veterinary Association (WSAVA) and American Animal Hospital Association (AAHA). In 2010, WSAVA published guidelines for the vaccination of dogs and cats. And, in 2011, AAHA also published guidelines for vaccination of dogs. In Korea, there is no published guideline for vaccination of dogs and cats yet. Therefore, the plane of vaccination also reports the present situation of vaccination schedule of dogs and cats in Korean animal hospitals.

Nocardia cyriacigeorgica as the causative agent of mandibular osteomyelitis (lumpy jaw) in a cat.

Soto, E., M. Arauz, C. A. Gallagher, and O. Illanes
An unusual case of osteomyelitis caused by Nocardia cyriacigeorgica infection and resulting in mandibular osteomyelitis and cellulitis (lumpy jaw) is described in a young cat. A 1-cm hard nodular mass was an incidental finding in the right mandible of a 14-month-old cat during routine physical examination. The lesion was fast growing, reaching up to 6 cm in its largest dimension over a 5-week period. A core biopsy of the affected mandible revealed foci of osteolysis, woven bone formation, and a few large clusters of filamentous bacteria surrounded by fine eosinophilic amorphous material bordered by neutrophils, plasma cells, macrophages, and occasional multinucleated giant cells. Pure cultures of acid-fast variable, Gram-positive filamentous bacteria were recovered on blood and chocolate agar plates at 48-hr postinoculation. On amplification and sequencing of the 16S ribosomal RNA and 65-kDa heat shock protein genes, the microorganisms were identified as N. cyriacigeorgica, within the actinomycetes.

Frequency of piroplasms Babesia microti and Cytauxzoon felis in stray cats from northern Italy.

Emerging diseases caused by piroplasms pose a health risk for man and other animals, and domestic cats have been proposed as potential reservoirs for some piroplasm infections. The aim of this study was to identify the frequency of the piroplasms Babesia microti and Cytauxzoon felis in stray cats from northern Italy and to identify possible risk factors associated with these infections. Blood samples from
260 stray cats enrolled in a trap-neuter-release (TNR) program in northern Italy were examined with conventional PCR for the presence of Babesia microti and Cytauxzoon felis DNA. No sample (0.0%) tested positive for C. felis, whilst B. microti DNA was detected in two samples (0.8%). Both infected cats were in good clinical condition and recovered well from the neutering surgery. One of these two cats had a triple co-infection with Babesia microti, Candidatus Mycoplasma haemominutum, and Anaplasma phagocytophilum. Evidence presented in this study indicates that the blood borne protozoans Babesia microti and Cytauxzoon felis are not widely distributed in stray cat populations in Milan, northern Italy, and that the significance of cats as a reservoir host for B. microti in this area is limited.

A review of the studies using buprenorphine in cats.
Steagall, P. V., B. P. Monteiro-Steagall, and P. M. Taylor

Pain management is a crucial component of feline medicine and surgery. This review critically evaluates studies using buprenorphine in cats and highlights the clinical application of the opioid in this species. The pharmacokinetic-pharmacodynamic (PK-PD) modeling of IV buprenorphine has been best described by a combined effect compartmental/receptor association-dissociation model with negative hysteresis. Therefore, plasma concentrations of the drug are not correlated with analgesia, and clinicians should not expect to observe pain relief immediately after drug administration. In addition, a ceiling effect has not been demonstrated after administration of clinical doses of buprenorphine in cats; dosages of up to 0.04 mg/kg have been reported. The route of administration influences the onset, duration, and magnitude of antinociception and analgesia when using this drug in cats. At clinical dosages, the SC route of administration does not appear to provide adequate antinociception and analgesia whereas the buccal route has produced inconsistent results. Intravenous or IM administration at a dosage of 0.02-0.04 mg/kg is the preferred for treatment of pain in the acute setting. A literature search found 14 clinical trials evaluating buprenorphine sedation, analgesia, or both in cats. There were 22 original research studies reporting the antinociceptive effects of buprenorphine by means of thermal threshold, mechanical threshold, or both, minimal alveolar concentration, or PK-PD. Individual variability in response to buprenorphine administration has been reported, indicating that buprenorphine may not provide sufficient analgesia in some cats. Pain assessment is important when evaluating the efficacy of buprenorphine and determining whether additional analgesic treatment is needed.

Feline parvovirus infection and associated diseases.
Stuetzer, B., and K. Hartmann

Feline parvovirus, caused by the single-stranded DNA virus feline parvovirus (FPV), is a highly contagious and often lethal disease of cats and other Felidae. FPV, but also canine parvovirus (CPV) can be isolated from both healthy and diseased cats. In Germany, CPV was detected in only approximately 10% of feline samples, but in Southeast Asia, reports estimated that up to approximately 80% of diseased cats were infected with CPV. Infection spreads rapidly, especially in cells with high mitotic activity, such as bone marrow, lymphoid tissue and intestinal crypt cells. Anorexia, vomiting, diarrhoea, neutropenia and lymphopenia are common in clinically affected cases. In utero or neonatal infection can result in cerebellar hypoplasia. Depending on the severity of clinical signs, mortality
ranges from 25 to 100%. Effective vaccination and thorough disinfection are of the utmost importance in the prevention of disease transmission in multi-cat households and animal shelters. If clinical signs develop, supportive treatment should be commenced. The efficacy of feline recombinant interferon and FPV antibodies has not been clearly demonstrated. Commercially available vaccines should induce protective immunity when administered according to current guidelines. Recent studies suggest that in some kittens, maternally derived antibodies (MDA) can persist for much longer than has been previously recognised. FPV serum antibody tests are available, but protection status needs to be interpreted with caution in kittens with MDA and a negative titre in adult cats does not necessarily denote lack of protection.

**Efficacy of an inactivated FeLV vaccine compared to a recombinant FeLV vaccine in minimum age cats following virulent FeLV challenge.**


*Stuke, K., V. King, K. Southwick, M. I. Stoeva, A. Thomas, and M. T. Winkler*

The aim of the study was to determine the efficacy of an inactivated feline leukemia virus (FeLV) vaccine (Versifel (R)) FeLV, Zoetis.) compared to a recombinant FeLV vaccine (Purevax (R)) FeLV, Merial Animal Health) in young cats, exposed under laboratory conditions to a highly virulent challenge model. The study was designed to be consistent with the general immunogenicity requirements of the European Pharmacopoeia 6.0 Monograph 01/2008:1321-Feline Leukaemia Vaccine (Inactivated) with the exception that commercial-strength vaccines were assessed. Fifty seronegative cats (8-9 weeks old) were vaccinated subcutaneously on two occasions, three weeks apart, with either placebo (treatment group T01), Versifel FeLV Vaccine (treatment group T02), or Purevax FeLV Vaccine (treatment group T03) according to the manufacturer’s directions. Cats were challenged three weeks after the second vaccination with a virulent FeLV isolate (61E strain). Persistent FeLV antigenemia was determined from 3 to 15 weeks postchallenge. Bone marrow samples were tested for the presence of FeLV proviral DNA to determine FeLV latent infection. At week 15 after challenge with the virulent FeLV 61E strain, the Versifel FeLV Vaccine conferred 89.5% protection against FeLV persistent antigenemia and 94.7% protection against FeLV proviral DNA integration in bone marrow cells. In comparison, the Purevax FeLV Vaccine conferred 20% protection against FeLV persistent antigenemia and 35% protection against FeLV proviral DNA integration in bone marrow cells following challenge. The data from this study show that the Versifel FeLV Vaccine was efficacious in preventing both FeLV persistent p27 antigenemia and FeLV proviral DNA integration in bone marrow cells of cats challenged with this particular challenge model under laboratory conditions and provided better protection than Purevax FeLV in this experimental challenge model with highly virulent FeLV.

**Pradofloxacin: A novel veterinary fluoroquinolone for treatment of bacterial infections in cats.**


*Sykes, J. E., and J. M. Blondeau*

Pradofloxacin is a novel third-generation oral veterinary fluoroquinolone with activity against Gram-positive aerobic bacteria and anaerobes (lower minimum inhibitory concentrations in vitro). It also has activity against other bacterial species, including Bartonella henselae, Pasteurella multocida, Bordetella bronchiseptica, extra-intestinal Escherichia coli, and some mycobacterial species. This review focuses
on the current knowledge of the mechanism of action, adverse effects, clinical applications, and pharmacokinetic/pharmacodynamic properties of pradofloxacin in cats.

**New insights on metastrongyloid lungworms infecting cats of Sardinia, Italy.**
In addition to the well-known Aelurostrongylus abstrusus (Strongylida: Angiostrongylidae), Troglostrongylus brevior (Strongylida: Crenosomatidae) has recently been diagnosed as a causative agent of bronco-pulmonary infections of cats in Spain and Italy. However, information concerning the impact of this species of lungworm on feline population is limited to a few case reports. From July 2011 to May 2013 an epidemiological survey was carried out on Sardinia island (Italy), where 107 individual faecal samples were examined by Baermann technique, and first-stage larvae were identified based on their morphology and characterization of molecular markers. The 29.9% (32/107) of cats examined were infested by broncho-pulmonary nematodes and, although A. abstrusus was the most frequently detected (n=27; 25.2%), larvae of T. brevior were also found (n=7; 6.5%). In addition, two cats (1.9%) were co-infested by both species. Overall metastrongyloid infection was higher in female cats (n=22; 38.6%) than in males (n=10; 20%) (chi(2)=4.39; p=0.036). The mean age of positive animals was 21.1 (+/−29.8) months, being infected animals from 2 months to 10 years of age. Of the 32 animals that scored positive for lungworms only 6 (18.8%) displayed a respiratory condition associated with lungworm infestations. Biomolecular characterization confirmed the morphological diagnosis of A. abstrusus. Positive samples that were identified at genus level as Troglostrongylus spp. were molecularly characterized as T. brevior. This study represents the first epidemiological survey on metastrongyloid lungworms of domestic cats in Sardinia and the first report of T. brevior on this island.

**Use of a rotary battery-powered device for the collection of bone marrow in dogs and cats.**
Vet Rec (2014) **175**:173.
Tappin, S. W., A. Lorek, and E. J. Villiers
Bone marrow biopsies form an important part of investigations into a large number of conditions in veterinary patients. In the human field, powered drivers specifically designed for the collection of bone marrow have become available. These systems have been shown to obtain better quality bone marrow, more quickly and with less pain. This study showed that a powered rotary bone marrow collection system could be used in dogs and cats to collect bone marrow, easily and without complications. Good quality bone marrow aspirates were obtained in the majority of patients; where aspirates could not be collected it was not possible to obtain aspirates from alternative sites using a standard manual technique. Bone marrow core samples were of increased size (mean useable area 16.5 mm(2)), compared to samples obtained using a standard manual technique (mean useable area 4.1 mm(2), P<0.001). Samples obtained using the powered system were also judged to be of significantly better diagnostic quality. The use of a powered system for bone marrow collection may aid the collection of better quality bone marrow samples in small animal patients.

**From FUS to Pandora syndrome: where are we, how did we get here, and where to now?**
Tony Buffington, C. A., J. L. Westropp, and D. J. Chew
NEW CONCEPTS: Ideas about the causes of lower urinary tract signs (LUTS) in cats have changed significantly in the past 40 years. Recent research is challenging the conventional view that the bladder is always the perpetrator of LUTS, and suggests that the bladder can also be one victim of a systemic process associated with a sensitized central stress response system. AIM: In this article the authors provide their perspective on the implications of these findings for the diagnosis and treatment of cats with LUTS, provide some historical context, and suggest ways that the veterinary profession might work together to better understand the disorders underlying these signs, and possibly reduce their prevalence.

Abnormal repetitive behaviors in dogs and cats: a guide for practitioners.
Tyne, V. V., and L. Sinn
Abnormal repetitive behaviors (ARBs) represent a diverse group of behaviors whose underlying mechanism is poorly understood. Their neurobiology likely involves several different neurotransmitter systems. These behaviors have been referred to as compulsive disorders, obsessive compulsive disorders and stereotypies. Underlying medical conditions and pain can often cause changes in behavior that are mistaken for ARBs. A complete medical work-up is always indicated prior to reaching a presumptive diagnosis. The frequency of ARBs can be reduced but not always eliminated with the use of selective serotonin reuptake inhibitors (SSRIs) or tricyclic antidepressants (TCAs) in conjunction with behavior modification and environmental enrichment.

Seroprevalence of heartworm (Dirofilaria immitis) in feline and canine hosts from central and northern Portugal.
J Helminthol (2014) 1-5.
Dirofilaria immitis is endemic in Portugal. Several studies have reported the presence of canine heartworm disease, although no previous studies on feline infections have been published. The aim of this study was to determine the prevalence of D. immitis in cats and dogs from central and northern Portugal. Blood samples from 434 cats were tested for circulating anti-D. immitis and anti-Wolbachia antibodies. Furthermore, 386 dogs were tested for circulating D. immitis antigens. Overall feline seroprevalence was 15%, while canine prevalence was 2.1%. The highest feline seroprevalences of 18.7% and 17.6% were found in Aveiro and Viseu, respectively, while the highest canine prevalences of 8.8% and 6.8% were found in Coimbra and Aveiro, respectively. Cats and dogs showing respiratory signs presented higher prevalences of 24.4% and 17%, respectively, while 50% of cats with gastrointestinal signs were seropositive. The present study confirms the seropositivity of D. immitis in the feline population in central and northern Portugal, and suggests the importance of including heartworm disease in the list of differential diagnoses of cats and dogs showing clinical signs compatible with the disease.

Diagnostic utility of aqueocentesis and aqueous humor analysis in dogs and cats with anterior uveitis.
Wiggans, K. T., W. Vernau, M. R. Lappin, S. M. Thomasy, and D. J. Maggs
OBJECTIVE: To evaluate diagnostic utility of aqueous humor analysis in animals with anterior uveitis. ANIMALS: Client-owned dogs (n = 12) and cats (n = 10). PROCEDURES: Examination findings and diagnostic test results including aqueous humor cytology were compared. RESULTS: Disease duration prior to aqueocentesis was not significantly different between dogs with idiopathic anterior uveitis and those with an etiologic diagnosis, but was shorter in cats with feline infectious peritonitis (FIP) than those with idiopathic uveitis. Microbial nucleic acids, antigens, or antibodies against them were seldom found in blood/serum; however, serum feline coronavirus titers >/=1:6400 were detected only in cats with FIP. Aqueous humor cytology was diagnostic in no cats and two dogs, both with neoplasia. Although aqueous humor contained predominantly neutrophils in cats with FIP and large reactive lymphocytes and plasma cells appeared more frequent in cats with idiopathic uveitis, neither clinical nor cytologic assessment of anterior chamber contents differed significantly between cats with idiopathic or FIP-associated uveitis. Cytologically assessed plasma cell number was correlated with keratic precipitates and disease duration. Clinically detectable hyphema and cytologic erythrocyte number were correlated. However, cytologic cell grades and clinical grade of flare or cell numbers within the anterior chamber were not correlated. CONCLUSIONS: Aqueous humor cytology permitted diagnosis of neoplasia in dogs with anterior uveitis but was generally not helpful in cats. Poor correlation between clinical and cytologic assessment of cell numbers and type within the anterior chamber dictates that clinical grading should not be the sole criterion for electing to perform aqueocentesis.

Association between urinary vascular endothelial growth factor excretion and chronic kidney disease in hyperthyroid cats.
Williams, T. L., J. Elliott, and H. M. Syme
Many hyperthyroid cats develop azotaemic chronic kidney disease (aCKD) following treatment, which has led to the hypothesis that hyperthyroidism might be detrimental to renal function. Renin-angiotensin-aldosterone system (RAAS) activation occurs in hyperthyroidism, which could cause peritubular hypoxia, tubular damage and the development of aCKD. Urinary vascular endothelial growth factor:creatinine ratio (VEGFCR) is postulated to be a marker of tubular hypoxia. VEGFCR was correlated with plasma renin activity (PRA) and compared between hyperthyroid cats that did and did not develop aCKD following treatment (pre-azotaemic and non-azotaemic groups respectively). PRA was positively correlated with VEGFCR (rs = 0.382; P = 0.028); however, pre-azotaemic hyperthyroid cats had significantly lower VEGFCR than non-azotaemic cats at baseline (median 122.3 fg/g versus 167.0 fg/g; P < 0.001). RAAS activation in hyperthyroidism is associated with increased VEGFCR; however, increased VEGFCR was not correlated with the development of aCKD. Therefore, tubular hypoxia may not be a mechanism for renal damage in hyperthyroid cats.

Use of a morphometric method and body fat index system for estimation of body composition in overweight and obese cats.
OBJECTIVE: To develop morphometric equations for prediction of body composition and create a body fat index (BFI) system to estimate body fat percentage in overweight and obese cats. DESIGN: Prospective evaluation study. ANIMALS: 76 overweight or obese cats >/= 1 year of age.
PROCEDURES: Body condition score (BCS) was determined with a 5-point scale, morphometric measurements were made, and dual-energy x-ray absorptiometry (DEXA) was performed. Visual and palpation-based evaluation of various body regions was conducted, and results were used for development of the BFI system. Best-fit multiple regression models were used to develop equations for predicting lean body mass and fat mass from morphometric measurements. Predicted values for body composition components were compared with DEXA results. RESULTS: For the study population, prediction equations accounted for 85% of the variation in lean body mass and 98% of the variation in fat mass. Values derived from morphometric equations for fat mass and lean mass were within 10% of DEXA values for 55 of 76 (72%) and 66 of 76 (87%) cats, respectively. Body fat as a percentage of total body weight (ie, body fat percentage) predicted with the BCS and BFI was within 10% of the DEXA value for 5 of 39 (13%) and 22 of 39 (56%) cats, respectively. CONCLUSIONS AND CLINICAL RELEVANCE: The BFI system and morphometric equations were considered accurate for estimation of body composition components in overweight and obese cats of the study population and appeared to be more useful than BCS for evaluation of these patients. Further research is needed to validate the use of these methods in other feline populations.

**Pamidronate disodium for palliative therapy of feline bone-invasive tumors.**


Wypij, J. M., and D. A. Heller

This study sought to quantify in vitro antiproliferative effects of pamidronate in feline cancer cells and assess feasibility of use of pamidronate in cats by assessing short-term toxicity and dosing schedule in cats with bone-invasive cancer. A retrospective pilot study included eight cats with bone invasive cancer treated with intravenous pamidronate. In vitro, pamidronate reduced proliferation in feline cancer cells (P < 0.05). One cat treated with pamidronate in combination with chemotherapy and two cats treated with pamidronate as a single agent after failing prior therapy had subjective clinically stable disease; median progression free interval in these cats from initial pamidronate treatment was 81 days. Three cats developed azotemia while undergoing various treatment modalities including nonsteroidal anti-inflammatory drugs and pamidronate. Median overall survival was 116.5 days for all cats and 170 days for cats with oral squamous cell carcinoma. Median progression free survival was 55 days for all cats and 71 days for cats with oral squamous cell carcinoma. Pamidronate therapy appears feasible for administration in cancer bearing cats with aggressive bone lesions in the dose range of 1-2 mg/kg every 21-28 days for multiple treatments. No acute or short-term toxicity was directly attributable to pamidronate.

**Prognostic Evaluation of Feline Mammary Carcinomas: A Review of the Literature.**

*Vet Pathol (2014)*

Zappulli, V., R. Rasotto, D. Caliari, M. Mainenti, L. Pena, M. H. Goldschmidt, and M. Kiupel

A large number of studies have investigated feline mammary tumors in an attempt to identify prognostic markers and generate comparative analyses with human breast cancer. Nevertheless, a retrospective base of assessments and the lack of standardization in methodology and study design have caused weakness in study results, making comparison difficult. We examined feline mammary tumor publications and evaluated postulated prognostic parameters according to the recently published “Recommended Guidelines for the Conduct and Evaluation of Prognostic Studies in Veterinary Oncology.” Using these criteria, we determined with statistically significant reliability that prognostic
parameters for feline mammary tumors are tumor grading and lymph node/lymphovascular invasion. Furthermore, tumor subtype, size, and staging are worthy of further standardized investigation. We present statistical significance for each studied parameter as well as its relevance to disease progression and survival. Our evaluation suggests that marker expression (ie, Ki67, HER2, ER) may provide relevant information applicable for therapeutic predictions; however, consensus efforts and protocol standardization are needed. We identify and discuss major points of concern—such as sample preservation and selection, standardization of immunohistochemical protocols, and evaluation of results—to provide support for subsequent reliable analyses.