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The International Society of Feline Medicine

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**Ovarian activity reversibility after the use of deslorelin acetate as a short-term contraceptive in domestic queens.**

The objective was to evaluate ovarian activity reversibility in domestic queens after short-term contraceptive treatment with deslorelin acetate. Ten mature queens were used. In all queens, the estrous cycle was evaluated every 72 h by vaginal cytology (VC) and behavior assessments. When queens had VC characteristic of interestrus or diestrus, one deslorelin acetate implant (4.7 mg) was placed in the subcutaneous tissue of the interscapular region (day of insertion = Day 0). Thereafter, VC was performed every 48 h and on Day 90, implants were removed. At Day 100, estrus and ovulation were induced with 100 IU eCG (im), followed by 100 IU hCG (im), 84 h later (Day 103.5). Queens were ovariohysterectomized on Day 106. Corpora lutea (CL) were counted, oviducts were flushed, and oocytes were identified, isolated and stained to assess viability. In all queens, blood samples for plasma progesterone concentrations were collected once a week, from Days -21 to 106. After deslorelin acetate application, four queens had VC and behavior typical of estrus, and one ovulated. Furthermore, ovulation occurred in three queens that did not have VC or behavior consistent with estrus. After the initial ovulation, all females had anestrous VC during the deslorelin treatment period. Implants were readily removed. Following implant removal, all females responded to treatments to induce estrus and ovulation. There were (mean +/- SEM) 13.1 +/- 5.5 CL and 8.1 +/- 5.5 oocytes per queen; the oocyte recovery rate was 56.8 +/- 25.4% and all recovered oocytes were viable. We concluded that deslorelin acetate can be used as a reversible short-term contraceptive in domestic cats, because estrus and ovulation were successfully induced following implant removal.


**Iridocorneal angle measurements in mammalian species: normative data by optical coherence tomography.**

Objective Gonioscopy provides limited quantitative information to compare the iridocorneal anatomy across different species. In addition, the anatomic relationships by histologic examination are altered during processing. As a result, the comparative anatomy of the iridocorneal angle across several mammalian species was evaluated by Optical Coherence Tomography (OCT). Methods Cats, beagle dogs, minipigs, owl monkeys, cynomolgus monkeys, and rhesus monkeys (n = 6 or 7 per species) were evaluated. Imaging was performed using the OCT. The anterior chamber angle (ACA), angle opening distance (AOD), and the angle recess area (ARA) were evaluated. Results AC angle: cat (63 +/- 6 degrees) > owl monkey (54 +/- 4 degrees) > beagle dog (42 +/- 4 degrees) > minipig (40 +/- 3 degrees) > rhesus monkey (36 +/- 1 degrees) > cynomolgus monkey (34 +/- 2 degrees). AOD: cat (3.3 +/- 0.5 mm) > owl monkey (2.05 +/- 0.2 mm) > beagle dog (1.08 +/- 0.1 mm) > rhesus monkey (0.92 +/- 0.06 mm) > minipig (0.64 +/- 0.04 mm) > cynomolgus monkey (0.43 +/- 0.03 mm). ARA: cat (3.5 +/- 0.1 mm(2)) > owl monkey (1.41 +/- 0.2 mm(2)) > dog (0.88 +/- 0.1 mm(2)) > rhesus monkey (0.62 +/- 0.06 mm(2)) > minipig (0.21 +/- 0.05 mm(2)) > cynomolgus monkey (0.15 +/- 0.01 mm(2)). Conclusions This study benchmarks the normative iridocorneal angle measurements across different mammalian species by OCT. These data can be useful to compare iridocorneal angle measurements in disease states as OCT evolves as a common diagnostic tool in veterinary ophthalmic research and practice.


**Use of intramedullary fully-threaded pins in the fixation of feline and canine humeral, femoral and tibial fractures.**

Intramedullary fully-threaded pins were manufactured from an alloy of titanium, aluminium and vanadium in a fully-threaded style. Pins were produced in various diameters, ranging from 4 mm to 11 mm. Pin lengths varied from 5 cm to 22 cm. The proximal end of the pins was designed to fit into a hexagonal screwdriver, while the distal end was slightly tapered to allow for ease of entry into cancellous bone. Treatment using the fully-threaded intra-medullary pin was carried out in a total of 175 fractures of the humerus, femur, and tibia in 95 cats (bilateral femur in 1 case) and 77 dogs (bilateral femur in 2 cases). Radiographic follow-up for the cases was performed at monthly intervals. Non-union developed in one dog with a femoral fracture in which cerclage wire had also been used. Delayed healing and lameness were observed in two other dogs. Healing with excessive callus formation was observed in 16 dogs. However, there were not any problems noted in these dogs in regards to limb usage. Clinical and radiological results obtained for the remaining cases were found to be very good. Normal, complete fracture healing occurred between four to 14 weeks in dogs, and between four to 12 weeks in cats. Pins were removed upon observation of satisfactory functional and radiographic recovery. Pins could not be removed from 26 cats and 21 dogs as the owners had declined pin removal, or because the owners were lost to follow-up.


**Infectious endogenous retroviruses in cats and emergence of recombinant viruses.**

Endogenous retroviruses (ERVs) comprise a significant percentage of the mammalian genome, and it is poorly understood whether they will remain as inactive genomes or emerge as infectious retroviruses. Although several types of ERVs are present in domestic cats, infectious ERVs have not been demonstrated. Here, we report a previously uncharacterized class of endogenous gammaretroviruses, termed ERV-DCs, that is present and hereditary in the domestic cat genome. We have characterized a subset of ERV-DC proviral clones, which are numbered according to their genomic insertions. One of these,
ERV-DC10, located in the q12-q21 region on chromosome C1, is an infectious gammaretrovirus capable of infecting a broad range of cells, including human. Our studies indicate that ERV-DC10 entered the genome of domestic cats in the recent past and appeared to translocate to or reintegrate at a distinct locus as infectious ERV-DC18. Insertional polymorphism analysis revealed that 92 of 244 domestic cats had ERV-DC10 on a homozygous or heterozygous locus. ERV-DC-like sequences were found in primate and rodent genomes, suggesting that these ERVs, and recombinant viruses such as RD-114 and BaEV, originated from an ancestor of ERV-DC. We also found that a novel recombinant virus, feline leukemia virus subgroup D (FeLV-D), was generated by ERV-DC env transduction into feline leukemia virus in domestic cats. Our results indicate that ERV-DCs behave as donors and/or acceptors in the generation of infectious, recombinant viruses. The presence of such infectious endogenous retroviruses, which could be harmful or beneficial to the host, may affect veterinary medicine and public health.


Fish oil supplementation maintains adequate plasma arachidonate in cats, but similar amounts of vegetable oils lead to dietary arachidonate deficiency from nutrient dilution.

Because fatty acid (FA) metabolism of cats is unique, effects of dietary fish and vegetable oil supplementation on plasma lipids, lipoproteins, lecithin/cholesterol acyl transferase activities, and plasma phospholipid and esterified cholesterol (EC) FAs were investigated. Cats were fed a commercial diet supplemented with 8 g oil/100 g diet for 4 weeks using either high-oleic-acid sunflower oil (diet H), Menhaden fish oil (diet M), or safflower oil (diet S). When supplemented, diet M contained sufficient arachidonate (AA), but diets H and S were deficient. We hypothesized that diet M would modify plasma lipid metabolism, increase FA long-chain n-3 (LCn-3) FA content but not deplete AA levels. Also, diet S would show linoleic acid (LA) accumulation without conversion to AA, and both vegetable oil supplements would dilute dietary AA content when fed to meet cats’ energy needs. Plasma samples on weeks 0, 2, and 4 showed no alterations in total cholesterol or nonesterified FA concentrations. Unesterified cholesterol decreased and EC increased in all groups, whereas lecithin/cholesterol acyl transferase activities were unchanged. Diet M showed significant triacylglycerol lowering and decreased pre-beta- lipoprotein cholesterol. Plasma phospholipid FA profiles revealed significant enrichment of 18:1n-9 with diet H, LA and 20:2n-6 with diet S, and FA LCn-3FA with diet M. Depletion of AA was observed with diets H and S but not with diet M. Diet M EC FA profiles revealed specificity for LA and 20:5n-3 but not 22:5n-3 or 22:6n-3.

Oversupplementation of some commercial diets with vegetable oils causes AA depletion in young cats due to dietary dilution. Findings are consistent with the current recommendations for at least 0.2 g AA/kg diet and that fish oil supplements provide both preformed LCn-3 polyunsaturated FA and AA.


Clinical leptospirosis in three cats (2001-2009).

Based on previous research, cats were thought to have been resistant to the development of clinical signs following infection with Leptospira spp. This case report presents three confirmed, naturally infected clinical cases of feline leptospirosis. The cases presented were all indoor/outdoor cats that were known to hunt. They were also all presented at different stages of renal insufficiency; however, they did not show any liver involvement. The authors suggest that there may be a longer incubation period in cats than dogs and recommend further research in the form of a large, clinical study.


Twenty-two cases of feline histoplasmosis seen at the Virginia-Maryland Regional College of Veterinary Medicine Teaching Hospital between 1986 and 2009 were reviewed. The median age of affected cats was 9 yr (mean, 8.8 yr). Female domestic shorthairs were more commonly affected. The clinical presentation of most cases was nonspecific. The most common presenting complaints included weakness, lymphadenopathy, weight loss, and anorexia. Less frequent clinical signs included vomiting, diarrhea, blindness, and lameness. Less than half of the cats had clinical evidence of pulmonary disease on admission. Anemia and hypoalbuminemia were common laboratory abnormalities. An interstitial pattern was the most common radiographic pattern observed with pulmonary disease. Diagnosis was based on identification of the organism on cytology or histopathology. Fifteen of the 22 cats were treated, and itraconazole was the most common antifungal agent prescribed. Median duration of the antifungal treatment was 5 mo for cats that survived to discharge. Overall survival at time of discharge for cats in this study was 55%.


Effects of MRI on microchip function.


Molecular characterization of feline infectious peritonitis virus strain DF-2 and studies of the role of ORF3abc in
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**Viral cell tropism.**
The full-length genome of the highly lethal feline infectious peritonitis virus (FIPV) strain DF-2 was sequenced and cloned into a bacterial artificial chromosome (BAC) to study the role of ORF3abc in the FIPV-feline enteric coronavirus (FECV) transition. The reverse genetic system allowed the replacement of the truncated ORF3abc of the original FIPV DF-2 genome with the intact ORF3abc of the canine coronavirus (CCoV) reference strain Elmo/02. The in vitro replication kinetics of these two viruses was studied in CrFK and FCWF-4 cell lines, as well as in feline peripheral blood monocytes. Both viruses showed similar replication kinetics in established cell lines. However, the strain with a full-length ORF3 showed markedly lower replication of more than 2 log(10) titers in feline peripheral blood monocytes. Our results suggest that the truncated ORF3abc plays an important role in the efficient macrophage/monocyte tropism of type II FIPV.


**Chronic kidney disease in dogs and cats.**


**Evaluation of the impedance analyzer PocH-100iV Diff for analysis of canine and feline blood.**

**BACKGROUND:** An automated impedance-based in-house hematology analyzer, the PocH-100iV Diff, which provides a 3-part leukocyte differential count that includes eosinophils, recently has been introduced. **OBJECTIVES:** The aims of this study were to validate results from the PocH-100iV Diff for dogs and cats and evaluate the impact of the anticoagulant used and sample storage conditions. **METHODS:** Blood samples collected in K(3) EDTA from 153 cats and 150 dogs were included in the comparison study. The reference analyzer was the ADVIA 2120 hematology analyzer, and manual differential leukocyte counts and PCV were the manual reference methods. **RESULTS:** Coefficients of variation were < 3% except for platelet counts and feline differential and eosinophil counts. Correlation between analyzers was good to excellent except for hemoglobin (HGB) concentration in dogs and RBC indices for both species. Biases were close to 0 except for MCHC and platelet counts. Correlation with manual counts was good for lymphocytes and OTHR cells (combined neutrophil and monocyte counts) and fair and poor for feline and canine eosinophil counts, respectively. Estimated sensitivity and specificity for detection of eosinophilia were, respectively, 50% and 98% for cats and 34% and 77% for dogs. A significant anticoagulant effect was seen for MCV in cats and for HCT, MCH, MCHC, and platelet, OTHR, and eosinophil counts in dogs. RBC and WBC counts, HGB concentration, and MCH were stable for 72 h. HCT, MCV, MCHC, and platelet counts were affected by sample storage (dogs > cats; 22 degrees C > 4 degrees C). **CONCLUSIONS:** The PocH-100iV Diff is a suitable in-house instrument. A strength is its specific, but moderately sensitive, detection of feline eosinophils.


**Stifle arthodesis in two cats.**

Two Domestic Shorthaired cats were admitted after sustaining multiligamentous injuries of the stifle joint. In one cat, prosthetic ligamentous reconstruction was unsuccessful at maintaining normal stifle stability. Both cats were treated with stifle arthrodesis using internal fixation with a plate and screws without external coaptation. In one case, arthrodesis was achieved using a 2.7 mm 16-hole dynamic compression plate placed medially. In the second case, a 2.7 mm 14-hole dynamic compression plate was placed cranially. No major complications were noted, and both cats were able to return to good levels of activity in the medium term.


**Plasma ACTH precursors in cats with pituitary-dependent hyperadrenocorticism.**

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

Pets can be reservoirs of Shiga toxin-producing Escherichia coli (STEC) strains. The aim of this study was to examine nine strains belonging to several serotypes (O91:H21, O91:H16, O178:H19, O8:H19, O22:H8, O22:HNT, ONT:H8), previously recovered from cats or dogs. To this end, we assessed a set of additional virulence genes (stx(2) subtype, subAB, ehxA, eae and saa), cytotoxic activity, and genetic relationships with strains isolated from cattle, meat and humans using pulsed-field gel electrophoresis (PFGE). Most of the isolates carried the stx(2) and/or stx(2vh-b) sequences, while only the O91:H21 isolate presented the mucus-activatable stx(2d) variant, as confirmed by sequencing the genes of subunits A and B. All the strains showed cytotoxic activity in cultured cells. One of the two O178:H19, selected for its high level of cytotoxicity in Vero cells, showed the ability to cause functional alterations in the human colon mucosa in vitro. None of the strains possessed the subAB, eae or saa genes and only the strains belonging to serotype O8:H19 carried the ehxA gene. The isolates shared 90-100% similarity by PFGE to epidemiologically unrelated strains of the corresponding serotypes recovered from cattle, meat or humans. Our results demonstrate that dogs and cats may have a role in the infection of humans by STEC, probably serving as a vehicle for bovine strains in the cycle of human infection, and thus emphasize the health risks for owners and their families.


Insecticide and acaricide molecules and/or combinations to prevent pet infestation by ectoparasites.

External antiparasitic drugs used in cats and dogs have evolved in terms of active ingredients but also regarding formulations. Old chemical groups have been supplanted by phenylpyrazoles, neonicotinoids, oxadiazines, spinosyns or others which are entering the veterinary market. In addition to insecticides-acaricides, insect and mite growth inhibitors (IGRs) have emerged. These IGRs are used in animals or in the environment, either alone or in combination with insecticides-acaricides. The notion of antiparasitic treatment has evolved to the concept of prevention of ectoparasite infestation but also of transmitted diseases through the introduction of formulations providing long-lasting activity. At the same time, ease-of-use has been improved with the development of spot-on formulations. Progress has also been achieved through the development of antiparasitic drugs providing control of both external and internal parasites.


Comparison of stroke volume and cardiac output as measured by a single observer using four different ultrasound techniques in six clinically healthy cats.

The aim of this study was to assess agreement and repeatability of four ultrasound methods for measuring stroke volume (SV) and cardiac output (CO) in cats. Measurement of SV and CO was performed by the Teichholz method, the Simpson’s method (SM), the area length method (ALM) and a volumetric flow method across the aorta (Trace method). For each method, the coefficient of variation (CV) was calculated and agreement was determined by Bland-Altman analysis. The CV was acceptable (<20%) for all parameters, except for SV and CO obtained by SM (28.8% and 22.4%, respectively) and ALM (21.6% and 22.6%, respectively). Narrow limits of agreement were observed between both planimetric methods (SM and ALM). The Trace method was the most repeatable, followed by the Teichholz method. Despite excellent inter-method agreement, neither of the planimetric methods produced results with adequate repeatability. As the Teichholz and Trace methods were acceptably repeatable, and probably gave the most representative values, they appear to be the most useful methods for the measurement of SV and CO in cats. Further investigations are needed to compare the echocardiographic methods described here with a standard technique such as thermodilution.


Evaluation of thrombelastographic platelet-mapping in healthy cats.

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


RECOVER evidence and knowledge gap analysis on veterinary CPR. Part 1: Evidence analysis and consensus process: collaborative path toward small animal CPR guidelines.

OBJECTIVE: To describe the methodology used by the Reassessment Campaign on Veterinary Resuscitation (RECOVER) to evaluate the scientific evidence relevant to small animal CPR and to compose consensus-based clinical CPR guidelines for dogs and cats. DESIGN: This report is part of a series of 7 articles on the RECOVER evidence and knowledge gap analysis and consensus-based small animal CPR guidelines. It describes the organizational structure of RECOVER, the evaluation process employed, consisting of standardized literature searches, the analysis of relevant articles according to study design, species and predefined quality markers, and the drafting of clinical CPR guidelines based on these data. Therefore, this article serves as the methodology section for the subsequent 6 RECOVER articles. SETTING: Academia, referral practice. RESULTS: RECOVER is a collaborative initiative that systematically evaluated the evidence on 74 topics relevant to small animal CPR and generated 101 clinical CPR guidelines from this analysis. All primary contributors were veterinary specialists, approximately evenly split between academic institutions and private referral practices. The evidence evaluation and guideline drafting processes were conducted according to a predefined sequence of steps designed to reduce bias and increase the repeatability of the findings, including multiple levels of review, culminating in a consensus process. Many knowledge gaps were identified that will allow prioritization of research efforts in veterinary CPR. CONCLUSIONS: Collaborative systematic evidence review is organizationally challenging but feasible and effective in veterinary medicine. More experience is needed to refine the process.


Methadone in combination with acepromazine as premedication prior to neutering in the cat.

Objective To investigate the safety, sedative and analgesic properties of methadone in combination with acepromazine prior to neutering in cats. Study design Controlled clinical, block randomized, prospective, blinded study designed for regulatory purposes. Animals 24 female and 21 male healthy cats. Methods Cats received one of three opioids combined with acepromazine (0.05 mg kg(-1)) intramuscularly (IM) for premedication: Group 1: buprenorphine (0.02 mg kg(-1)), group 2: methadone (0.5 mg kg(-1)), group 3 butorphanol (0.4 mg kg(-1)). Sedation was assessed 30 minutes after premedication using a visual analogue scale (VAS) and simple descriptive scale. Anaesthesia was induced with alfaxalone and maintained with isoflurane in oxygen. Surgical ovariohysterectomy or castration was performed. Pain was assessed using an interactive VAS (IVAS) and mechanical nociceptive threshold (MNT) with a pressure rate onset device. Methadone (0.5 mg kg(-1) IM) and meloxicam (0.2 mg kg(-1) subcutaneously) were provided 6 and 8 hours after premedication respectively, or together as rescue analgesia (IVAS above 50). Results Sedation scores, induction agent dose, pain scores at all time points and rescue analgesia were not statistically different between groups. In methadone treated cats there was no significant variation in MNT over time, suggesting a possible anti-hyperalgesic action, whereas in the other two groups lower thresholds were recorded at various time points after surgery compared to baseline. No cats required rescue analgesia after the second dose of methadone. No perioperative adverse effects occurred. Conclusion and clinical relevance Methadone provided comparable sedation and analgesia to both buprenorphine and butorphanol when combined with acepromazine. Differences in analgesic efficacy between opioids might have been undetectable because of the surgical model and surgeon competency. Nevertheless, methadone is an effective analgesic in cats and its administration prior to feline neutering may be advantageous.


Occurrence of anti-Toxoplasma gondii and anti-Neospora caninum antibodies in cats with outdoor access in Sao Luis, Maranhao, Brazil.

The present study aimed to investigate the frequency of anti-Toxoplasma gondii and anti-Neospora caninum antibodies in cats with outdoor access in Sao Luis, Maranhao, Brazil. The presence of IgG anti-T. gondii and anti-N. caninum antibodies was tested using the Indirect Immunofluorescent Antibody Test (IFAT). IgG anti-T. gondii and anti-N. caninum antibodies were detected in 101 (50.5%) and 54 (27%) sampled cats, respectively. The titers of anti-T. gondii antibodies ranged from 40 (cut-off) to 2560. On the other hand, the titers of anti-N. caninum antibodies ranged from 25 (cut-off) to 400. Twenty-seven cats (13.5%) were shown to be seropositive for both parasites. Seventy-four cats (34%) were seropositive only for T. gondii. Twenty-two cats (11%) were seropositive only for N. caninum. The present study showed that cats with outdoor
access in Sao Luis, Maranhao, are exposed to T. gondii and N. caninum.


Antioxidant status in hyperthyroid cats before and after radioiodine treatment.

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


Survey of Aelurostrongylus in cats.


Malignant peripheral nerve sheath tumor in a cat with nodal and pulmonary metastases.

Peripheral nerve sheath tumors in domestic cats are infrequently reported and are often locally invasive. An 11-year-old Domestic Shorthair cat was originally diagnosed with a right maxillary benign peripheral nerve sheath tumor at incisional biopsy. At necropsy, the neoplasm had features of malignancy including metastases to the regional lymph nodes and lung. Histologically, the neoplasm contained 2 distinct regions: spindle cells arranged in dense interwoven bundles with Antoni A areas and Verocay bodies and Antoni B regions with loosely arranged spindle cells separated by a mucinous matrix. Immunohistochemically, the neoplastic cells in the primary mass and right mandibular lymph node were strongly positive for vimentin, S-100, and glial fibrillar acidic protein. The neoplastic cells within the lung were strongly positive for vimentin and weakly positive for S-100 and glial fibrillar acidic protein.


The few studies attempting to specifically characterize dermatophytes from hair samples of dogs and cats using PCR-based methodology relied on sequence-based analysis of selected genetic markers. The aim of the present investigation was to establish and evaluate a PCR-based approach employing genetic markers of nuclear DNA for the specific detection of dermatophytes on such specimens. Using 183 hair samples, we directly compared the test results of our one step and nested-PCR assays with those based on conventional microscopy and in vitro culture techniques (using the latter as the reference method). The one step-PCR was highly accurate (AUC > 90) for the testing of samples from dogs, but only moderately accurate (AUC = 78.6) for cats. A nested-PCR was accurate (AUC = 93.6) for samples from cats, and achieved higher specificity (94.1 and 94.4%) and sensitivity (100 and 94.9%) for samples from dogs and cats, respectively. In addition, the nested-PCR allowed the differentiation of Microsporum canis from Trichophyton interdigitale (zoophilic) and geophilic dermatophytes (i.e., Microsporum gypseum or Trichophyton terrestre), which was not possible using the one step-assay. The PCRIs evaluated here provide practical tools for diagnostic applications to support clinicians in initiating prompt and targeted chemotherapy of dermatophytoses.


Recombinant human thyrotropin in veterinary medicine: current use and future perspectives.

Recombinant human thyrotropin (rhTSH) was developed after bovine thyrotropin (bTSH) was no longer commercially available. It was approved by the Food and Drug Administration (FDA) and the European Medicines Agency (EMEA) as an aid to diagnostic follow-up of differentiated thyroid carcinoma in humans and for thyroid remnant ablation with radioiodine. In addition, rhTSH is used in human medicine to evaluate thyroid reserve capacity and to enhance radioiodine uptake in patients with metastatic thyroid cancer and multinodular goiter. Likewise, rhTSH has been used in veterinary medicine over the last decade. The most important veterinary use of rhTSH is thyroidal functional reserve testing for the diagnosis of
canine hypothyroidism. Recent pilot studies performed at Ghent University in Belgium have investigated the use of rhTSH to optimize radioiodine treatment of canine thyroid carcinoma and feline hyperthyroidism. Radioiodine treatment optimization may allow a decreased therapeutic dosage of radioiodine and thus may improve radioprotection. This review outlines the current uses of rhTSH in human and veterinary medicine, emphasizing research performed in dogs and cats, as well as potential future applications.

Pathology in practice. Primary hepatic chondroblastic osteosarcoma.

A cross-sectional study to compare changes in the prevalence and risk factors for feline obesity between 1993 and 2007 in New Zealand.
It has been suggested that the prevalence of feline obesity has increased recently in parallel with the prevalence of obesity in the human population. We had previously determined the prevalence of obesity in an urban New Zealand population of cats in 1993. This study was conducted to determine the prevalence and risk factors of obesity in the same population base, one generation (15 years) later. It was also designed to test the hypothesis that the increase in feeding of energy dense “premium” dry foods to cats in the region was associated with any change in obesity prevalence. A door-to-door survey, conducted within the city limits of Palmerston North, obtained data on the environment, diet, health and behaviour of 200 cats. The interviewers used a validated scoring system to assess the body condition score (BCS) of each cat and this was used as the outcome variable of interest. Variables were grouped into four risk-factor groupings for stepwise logistic regression, namely cat characteristics, feeding variables, owner’s perception of their cat, and household characteristics. Using the same definition for overweight and obese as that used in the 1993 study (BCS>6/9), the prevalence of obesity was 27%, compared with 26% in 1993. In this study, 63% of cats had a BCS of 6/9 or greater. Variables that were identified as significant from each model (p</=0.1) were included in a combined model. In this model, only three variables were significant: owner underestimation of the body condition of the cat, the cat’s leg length, and its age. Thus, we found no evidence to support the hypothesis that the prevalence of obesity in this population has increased, or that changes in feeding practices have affected obesity incidence. The lack of any feeding variables in the combined model is noteworthy. From a population health perspective, the association between obesity and owner’s perception of their cat’s body condition suggests that more attention should be directed towards ‘normalising’ the public’s view of what a cat’s normal body condition is, rather than placing the educational emphasis on changing cats’ feeding patterns or food types.

Increased incidence of thoracic wall deformities in related Bengal kittens.
Clinical records made during routine vaccinations were compared between populations of domestic shorthair cats and Bengal kittens. An increased incidence (12/244) of thoracic wall deformity was detected amongst the Bengal kittens. Deformities detected were: pectus excavatum (five), unilateral thoracic wall concavity (six) and scoliosis (one). Five-generation pedigrees were analysed for the affected kittens that showed a high degree of common ancestry indicating the likelihood of a familial cause.

Post-trauma inguinal seroma formation in the cat.
Seven cats presented with large caudoventral abdominal or inguinal swellings following road traffic accidents. No case had evidence of disruption to the body wall or inguinal ring and the inguinal swellings may have been the result of either shear or compressive injury to soft tissues of the inguinum or disruption of the regional lymphatics. Six cases resolved completely following strict rest or simple Penrose drain placement with no recurrence reported. Recurrence of seroma was seen in one case but which then fully resolved following omentisation of the inguinum.

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

Evaluation of an automated assay based on monoclonal anti-human serum amyloid A (SAA) antibodies for
measurement of canine, feline, and equine SAA.
Major acute phase proteins (APPs) have proven diagnostically useful in dogs, cats and horses with routine use facilitated by commercially available automated heterologous assays. An automated assay applicable across all three species would highly facilitate further dissemination of routine use, and the aim of this study was to validate an automated latex agglutination turbidimetric immunoassay based on monoclonal anti-human serum amyloid A (SAA) antibodies for measurement of canine, feline and equine SAA. Serum samples from 60 dogs, 40 cats and 40 horses were included. Intra- and inter-assay imprecision, linearity and detection limit (DL) were determined to assess analytical performance. To assess clinical performance, equine and feline SAA measurements were compared with parallel measurements using a previously validated automated SAA assay in a method comparison setting, and by assessing overlap performance of canine SAA in healthy dogs and diseased dogs with and without systemic inflammation. Intra- and inter-assay CVs ranged between 1.9-4.6% and between 3.0-14.5%, respectively. Acceptable linearity within a clinically relevant range of SAA concentrations was observed for all three species. The DL was 1.06mg/L. Method comparison revealed acceptable agreement of the two assays measuring feline and equine SAA, and the overlap performance of canine SAA was acceptable. The tested assay measured SAA in canine, feline and equine serum with analytical and overlap performance acceptable for clinical purposes so improving practical aspects of clinical APP application. The monoclonal nature of the antibodies suggests strong, long-term inter-batch performance stability.


Number of cats and dogs in UK welfare organisations.
It is not known how many cats and dogs are admitted to welfare organisations annually. This study produced the first estimates of the size of this population. A questionnaire was mailed out to welfare organisations during 2010, followed by a postal/email reminder and requests to non-responders for a telephone interview. The questionnaire covered areas including, the current number of cats and dogs being housed, how much of the year organisations were operating at full capacity as well as the number of cats and dogs admitted, rehomed and euthanased between January and December 2009. Responses were obtained from 54.8 per cent of organisations. Sixty-six per cent of cat welfare organisations and 48 per cent of dog welfare organisations reported that they operated at full capacity for 12 months of the year. The number of cats and dogs entering UK welfare organisations during 2009 was estimated as 131,070 and 129,743, respectively. This highlights the scale of the work performed by welfare organisations in caring for and rehoming unwanted cats and dogs annually and emphasises the urgent need to address concerns over the considerable number of these animals. This study has also produced useful baseline data, which will be essential for monitoring population changes over time.

Pharmacokinetics of pioglitazone in lean and obese cats(1).
Clark, M. H., Hoenig, M., Ferguson, D. C., Dirikolu, L. Pharmacokinetics of pioglitazone in lean and obese cats. J. vet. Pharmacol. Therap. doi: 10.1111/j.1365-2885.2011.01341.x. Pioglitazone is a thiazolidinedione insulin sensitizer that has shown efficacy in Type 2 diabetes and nonalcoholic fatty liver disease in humans. It may be useful for treatment of similar conditions in cats. The purpose of this study was to investigate the pharmacokinetics of pioglitazone in lean and obese cats, to provide a foundation for assessment of its effects on insulin sensitivity and lipid metabolism. Pioglitazone was administered intravenously (median 0.2 mg/kg) or orally (3 mg/kg) to 6 healthy lean (3.96 +/- 0.56 kg) and 6 obese (6.43 +/- 0.48 kg) cats, in a two by two Latin Square design with a 4-week washout period. Blood samples were collected over 24 h, and pioglitazone concentrations were measured via a validated high-performance liquid chromatography assay. Pharmacokinetic parameters were determined using two-compartmental analysis for IV data and noncompartmental analysis for oral data. After oral administration, mean bioavailability was 55%, t(1/2) was 3.5 h, T(max) was 3.6 h, C(max) was 2131 ng/mL, and AUC(0-infinity) was 15 556 ng/mL.h. There were no statistically significant differences in pharmacokinetic parameters between lean and obese cats following either oral or intravenous administration. Systemic exposure to pioglitazone in cats after a 3 mg/kg oral dose approximates that observed in humans with therapeutic doses.

Canine parvovirus in asymptomatic feline carriers.
Canine parvovirus (CPV) and feline panleukopaenia virus (FPLV) are two closely related viruses, which are known to cause severe disease in younger unvaccinated animals. As well as causing disease in their respective hosts, CPV has recently acquired the feline host range, allowing it to infect both cats and dogs. As well as causing disease in dogs, there is evidence that under some circumstances CPV may also cause disease in cats. This study has investigated the prevalence of parvoviruses in the faeces of clinically healthy cats and dogs in two rescue shelters. Canine parvovirus was demonstrated in 32.5% (13/50) of faecal samples in a cross sectional study of 50 cats from a feline only shelter, and 33.9% (61/180) of faecal samples in a longitudinal study of 74 cats at a mixed canine and feline shelter. Virus was isolated in cell cultures of both canine and feline origin from all PCR-positive samples suggesting they contained viable, infectious virus. In contrast to the high CPV prevalence in cats, no FPLV was found, and none of 122 faecal samples from dogs, or 160 samples collected
from the kennel environment, tested positive for parvovirus by PCR. Sequence analysis of major capsid VP2 gene from all positive samples, as well as the non-structural gene from 18 randomly selected positive samples, showed that all positive cats were shedding CPV2a or 2b, rather than FPLV. Longitudinally sampling in one shelter showed that all cats appeared to shed the same virus sequence type at each date they were positive (up to six weeks), despite a lack of clinical signs. Fifty percent of the sequences obtained here were shown to be similar to those recently obtained in a study of sick dogs in the UK (Clegg et al., 2011). These results suggest that in some circumstances, clinically normal cats may be able to shed CPV for prolonged periods of time, and raises the possibility that such cats may be important reservoirs for the maintenance of infection in both the cat and the dog population.


Normograde and Retrograde Pinning of the Distal Fragment in Feline Humeral Fractures.

OBJECTIVE: To determine if normograde and retrograde pinning of the distal humeral fragment, performed to maximize pin purchase in this fragment, would damage vital structures in and around the elbow and shoulder joints in cats. STUDY DESIGN: Anatomic study. SAMPLE POPULATION: Cadaveric cats (n = 12; 24 thoracic limbs). METHODS: Twelve thoracic limb pairs were harvested from domestic short-haired cats and 1 limb from each pair was allocated to 1 of 3 groups. A transverse osteotomy was created at the junction of the middle and distal thirds in the diaphyseal osteotomy group (n = 8) and proximal to the supracondylar foramen in the metaphyseal osteotomy group (n = 8). Humeri in the normograde group (n = 8) were left intact. Retrograde pinning of the distal fragment in both osteotomy groups was performed with the elbow flexed. Pins were driven into the medial epicondyle until they exited the skin caudal to the elbow and dissection of the soft tissues around the exit tract of the pin was performed. The fracture was reduced and the pin was advanced until it exited the proximal humeral fragment. In the specimens in normograde group, pinning was initiated on the distal aspect of the medial epicondyle. A 1.0 mm guide hole was drilled from the medial epicondyle to the center of the medullary cavity of the distal humeral metaphysis. A bevelled 1.5 mm IM pin was driven proximally through the guide hole until it exited the proximal humerus. RESULTS: Pins exiting the distal aspect of the medial epicondyle passed through muscle origins in 5 specimens in the diaphyseal osteotomy group and in all 8 specimens in the metaphyseal group. The ulnar nerve was entrapped in 1 specimen in both the metaphyseal osteotomy and diaphyseal osteotomy groups. The articular cartilage of the trochlea was damaged in 5 specimens in the diaphyseal osteotomy group and in 1 specimen in the metaphyseal osteotomy group. There was no damage to articular or periarticular structures by pins exiting the proximal humerus. CONCLUSION: Retrograde pinning of the distal fragment in humeral fractures in the cat may damage the articular cartilage and cannot be recommended. Normograde pinning is safe and maximizes pin purchase in the distal fragment.


Monitoring methods for dogs and cats with diabetes mellitus.

Effective monitoring is essential for the management of dogs and cats with diabetes mellitus. However, methods for evaluating glycemic control must be tailored to meet both the needs of the patient and the expectations of the owner. This article discusses the philosophies that drive blood glucose monitoring in veterinary diabetics and review common practices. The advantages and limitations of the various options are presented.


Clinical evaluation of urine Histoplasma capsulatum antigen measurement in cats with suspected disseminated histoplasmosis.

Diagnosis of Histoplasma capsulatum infection in cats traditionally relies upon identification of organisms in circulating monocytes or in tissue specimens from affected organs. In this retrospective study, results of a urine antigen assay were compared with standard diagnostic methods in cats with clinical signs suggestive of histoplasmosis. Antigenuria was detected in 17/18 cats with a histopathologic or cytopathologic diagnosis of histoplasmosis. This preliminary evaluation of the Histoplasma urine antigen test suggests it may be a useful aid in diagnosing this disease in cats.


Composition and use of puppy milk replacers in German Shepherd puppies in the Netherlands.

Enostosis or eosinophilic panostitis is a common disease in young growing large-breed dogs, such as the German Shepherd, and the risk of developing the disease by 3-4 months of age is increased by a high calcium intake. The aim of the study was to investigate whether German Shepherd puppies raised on milk replacers receive more calcium and/or vitamin D than their requirements in the pre-weaning period and thus are at increased risk of developing skeletal diseases. To this end, we surveyed German Shepherd breeders in the Netherlands about the use of puppy milk replacers (PMR). The metabolizable energy, calcium, phosphorus and vitamin D content of the eight most used PMR were compared with that of bitch milk, as reported in the literature. The protein and fat content of most PMR were somewhat lower (range 24.4-33.2 g per 100 g on dmb and 18.3-37.5 g per 100 g on dmb respectively) compared with bitch milk (31.9 and 40.2 g on dmb respectively). The vitamin D content of one of the PMR samples was sevenfold the level recommended by the NRC (Nutrient Requirements of
Cats from 7 months to 2 years of age were the most affected (50.79%). In Brazil, violence is a public health problem and cartilage problems later in life.

Couturier, L., D. Rault, L. Gatel, and P. Belli (2012) Vet Radiol Ultrasound 53:342-347. **Ultrasoundographic characterization of the feline cardia and pylorus in 34 healthy cats and three abnormal cats.** A prospective study was performed in 34 fasted healthy cats to describe the normal ultrasonographic anatomy of the cardia and pylorus. Measurements were obtained for the caudal esophageal wall thickness (Ew), cardia wall thickness (Cw), pyloric wall thickness (Pw), thickness of the pyloric muscularis (Mp), length of the thicker part of the proximal duodenal submucosa (Di). Among the 34 cats, 24 were examined using a linear transducer, and 10 with a microconvex transducer. Ew and Cw could be measured in 70% of the cats when a linear transducer was used, in 100% of the cats when a microconvex probe was used, Pw and Mp could be measured in 100% of the cats whatever probe was used. The submucosa of the most proximal part of the duodenum was thicker in half of the cats in longitudinal section. The muscularis layer of the pylorus was triangular in longitudinal section and thicker than the muscularis of the proximal duodenum. The mean for Ew, Cw, Pw, Mp, and Di was 4.9 mm (SD = 1.1), 5 mm (SD = 0.6), 4.4 mm (SD = 0.6), 2.5 mm (SD = 0.5), and 4.7 mm (SD = 2.38), respectively. Three cats with abnormalities of the cardia and pylorus are also described to illustrate clinical implications.

Crumley, W. R., A. J. Rankin, and R. A. Allbaugh (2012) Am J Vet Res 73:704-708. **Evaluation of the aqueous humor flow rate in the eyes of clinically normal cats by use of fluorophotometry.** OBJECTIVE: To evaluate aqueous humor flow rate in the eyes of clinically normal cats by use of a noninvasive technique successfully used in other species. ANIMALS: 20 domestic shorthair cats. PROCEDURES: 1 drop of 10% fluorescein sodium was instilled into both eyes of 5 cats every 5 minutes until 3 drops had been administered. Fluorophotometry was performed at 2, 4, 5, 6, 7, 8, 9, and 10 hours after fluorescein application to monitor fluorescein removal and determine aqueous humor flow rate. The 3-drop protocol was used for the remaining 15 cats, and fluorophotometry was performed at 5, 6, 7, and 8 hours after fluorescein application. Aqueous humor flow rates were calculated manually by use of established equations with minor adjustments to constant values to reflect feline anatomic features. Correlation coefficients and slope ratios were calculated to assess the legitimacy of the flow rate data. Paired t tests were calculated to assess for differences between the right and left eyes. RESULTS: Mean +/- SD calculated aqueous humor flow rate in the right, left, and both eyes of the 20 cats was 5.94 +/- 2.30 muL/min, 5.05 +/- 2.06 muL/min, and 5.51 +/- 2.21 muL/min, respectively. Correlation coefficients and slope ratios revealed that the aqueous humor flow rates were accurate. No significant differences in values for the right and left eyes were detected. CONCLUSIONS AND CLINICAL RELEVANCE: Accurate aqueous humor flow values for cats can be determined by use of the fluorophotometric technique evaluated in this study.

Dall’Aglio, C., L. Pascucci, F. Mercati, A. Polisca, P. Ceccarelli, and C. Boiti (2012) Res Vet Sci 92:362-365. **Immunohistochemical detection of the orexin system in the placenta of cats.** The aim of the present study was to investigate the presence and distribution of cells containing orexin A (OXA), and orexin type 1 and 2 receptors (OX1R and OX2R, respectively) in the feline placenta by means of immunohistochemical technique. OXA was identified in several decidual and syncytiotrophoblastic cells present in the lamellar portion of the placenta. In the same placental structures, few decidual and syncytiotrophoblastic cells showed the presence of OX1R-like immunoreactivity. Characteristically, immunopositivity for OX2R, but not for OX1R, was evidenced in the cells of the glandular layer. The orexinergic system was not expressed in the uterine structures that were not engaged by the chorion. Our results provide the first evidence of the presence of a placental orexinergic system in a mammalian species. Orexin A and both OX1R and OX2R are unequally distributed within the cat placenta. Local OXA production and the presence of specific receptors, differentially expressed in the placental structures of the cat, suggest that the orexinergic system may participate in placental growth and development as well as in the regulation of its steroidogenic capacity via endocrine, paracrine and/or autocrine mechanisms.

de Siqueira, A., F. C. Cassiano, M. F. Landi, E. F. Marlet, and P. C. Maiorka (2012) J Feline Med Surg **Non-accidental injuries found in necropsies of domestic cats: a review of 191 cases.** Animal cruelty is defined as a deliberate action that causes pain and suffering to an animal. In Brazil, legislation known as the Environmental Crimes Law states that cruelty toward all animal species is criminal in nature. From 644 domestic cats necropsied between January 1998 and December 2009, 191 (29.66%) presented lesions highly suggestive of animal cruelty. The main necroscopic finding was exogenous carbamate poisoning (75.39%) followed by blunt-force trauma (21.99%). Cats from 7 months to 2 years of age were the most affected (50.79%). In Brazil, violence is a public health problem and
there is a high prevalence of domestic violence. Therefore, even if laws provide for animal welfare and protection, animals are common targets for violent acts. Within a context of social violence, cruelty toward animals is an important parameter to be considered, and the non-accidental lesions that were found are evidence of malicious actions.

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

**Immunohistochemical and Biochemical Evidence of Ameloblastic Origin of Feline Amyloid-Producing Odontogenic Tumors in Cats.**  
Amyloid-producing odontogenic tumors (APOT) are rare, and in cats, the histogenesis of the amyloid remains undetermined. In the present study, APOTs in 3 cats were characterized by immunohistochemistry, and the amyloid components analyzed using tandem mass spectrometry. Antiameloblastin antibodies labeled both neoplastic epithelial cells and amyloid in all cases. Neoplastic epithelial cells had strong, diffuse immunoreactivity to antibodies against cytokeratin AE1/AE3, cytokeratin 14, and cytokeratin 19 in all cases and focal immunoreactivity to nerve growth factor receptor antibodies in 2 of 3 cases. Amyloid and some tumor stromal cells were weakly positive for laminin. Calretinin, amelogenin, S100, and glial fibrillary acidic protein antibodies did not label neoplastic epithelial cells or amyloid. Extracted amyloid peptide sequences were compared to the porcine database because the cat genome is not yet complete. Based on this comparison, 1 identical ameloblastin peptide was detected in each tumor. These results suggest that feline APOTs and the amyloid they produce are of ameloblastic lineage.

**Effects of a standardized anesthetic protocol on hematologic variables in healthy cats.**  
This study evaluated the effects of an anesthetic protocol using intravenous ketamine and midazolam, and intramuscular buprenorphine on hematologic variables in cats. Twelve healthy adult cats had blood collected for a complete blood count before and after the induction of anesthesia. There were significant decreases in red blood cell counts, hemoglobin concentrations and hematocrits after the induction of anesthesia. On average, red blood cell counts and hematocrits decreased by 25%, and hemoglobin concentrations decreased by 24%. Based on hematocrit, 3/12 samples (25%) taken while the cats were anesthetized would have been interpreted as belonging to anemic patients while none of the cats would have been considered anemic before anesthesia. This study suggests that a complete blood count performed on blood taken under anesthesia with this anesthetic protocol should be interpreted cautiously in order to not make a false diagnosis of anemia.

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

**Occurrence and characteristics of extended-spectrum-beta-lactamase- and AmpC-producing clinical isolates derived from companion animals and horses.**
OBJECTIVES: To investigate the occurrence and characteristics of extended-spectrum beta-lactamase (ESBL)- and AmpC-producing Enterobacteriaceae isolates in clinical samples of companion animals and horses and compare the results with ESBL/AmpC-producing isolates described in humans. METHODS: Between October 2007 and August 2009, 2700 Enterobacteriaceae derived from clinical infections in companion animals and horses were collected. Isolates displaying inhibition zones of $<=$ 25 mm for cefotaxime and/or ceftazidime by disc diffusion were included. ESBL/AmpC production was confirmed by combination disc tests. The presence of resistance genes was identified by microarray, PCR and sequencing. Escherichia coli genotypes by multilocus sequence typing and antimicrobial susceptibility by broth microdilution. RESULTS: Sixty-five isolates from dogs (n = 38), cats (n = 14), horses (n = 12) and a turtle were included. Six Enterobacteriaceae species were observed, mostly derived from urinary tract infections (n = 32). All except 10 isolates tested resistant to cefotaxime and ceftazidime by broth microdilution using clinical breakpoints. ESBL/AmpC genes observed were bla(CTX-M-1), -2, -9, -14, -15 bla(TEM-52), bla(CMY-2) and bla(CMY-39). bla(CTX-M-1) was predominant (n = 17). bla(CTX-M-9) occurred in combination with qnrA1 in 3 of the 11 Enterobacter cloacae isolates. Twenty-eight different E. coli sequence types (STs) were found. E. coli carrying bla(CTX-M-1) belonged to 13 STs of which 3 were previously described in Dutch poultry and patients. CONCLUSIONS: This is the first study among a large collection of Dutch companion animals and horses characterizing ESBL/AmpC-producing isolates. A similarity in resistance genes and E. coli STs among these isolates and isolates from Dutch poultry and humans may suggest exchange of resistance between different reservoirs.


Dietary and animal-related factors associated with the rate of urinary oxalate and calcium excretion in dogs and cats.

This paper reports the results of a cohort study and randomised clinical trial (RCT) in cross-over design. In the cohort study, the range of urinary oxalate (Uox) and calcium (Uca) excretion was determined within a sample of the Dutch population of dogs and cats, and dietary and animal-related factors associated with these urine parameters were identified. Spot urine samples were collected from privately owned dogs (n=141) and cats (n=50). The RCT determined the effect of a commercial raw meat versus a dry diet on Uox and Uca excretion rate in 23 dogs. In the cohort study, Uox excretion ranged from 21.1 to 170.6 mmol oxalate/mol creatinine in dogs and 27.5 to 161.6 in cats. Urinary calcium excretion ranged from 3.4 to 462.8 mmol calcium/mol creatinine in dogs and 10.1 to 128.0 in cats. In dogs, increased Uox and Uca excretion was associated with (1) the intake of a dry diet as the primary source of energy, (2) receiving no snacks and (3) breed. Increased Uox excretion was associated with males as well. In cats, urine collection in anaesthetised subjects was identified as a confounder. In the RCT, feeding the dry diet resulted in higher Uox (P<0.001) and Uca (P=0.021) excretion rates in dogs.


Changes in dietary macronutrient profile do not appear to affect endogenous urinary oxalate excretion in healthy adult cats.

The progressive increase in calcium oxalate uroliths reported in cats diagnosed with urolithiasis may partly be due to changes in nutrition. Since cats have a predominant mitochondrial alanine:glyoxylate aminotransferase 1 (AGT1) location, high carbohydrate intake may induce endogenous oxalate synthesis. This hypothesis was tested by feeding 12 adult, female cats three diets differing in macronutrients, namely, high protein (HP), high carbohydrate (HC) and high fat (HF), using a randomised Latin square design in a 36-day study. In addition to plasma, urine was collected quantitatively using modified litter boxes. A pilot study with four cats, conducted to determine the adaptation time of urinary oxalate (Uox) excretion to a dietary change, indicated a mean (+/-SEM) adaptation time of 5.9 +/- 0.7 days, with the urinary oxalate:creatinine (Ox:Cr) ratio increasing from 36.1 +/- 3.7 to 81.6 +/- 2.3 mmol/mol. In the main study, plasma oxalate concentration was significantly lower when feeding the HP compared to the HF (P=0.003) diet, whereas Uox excretion (mmol/kgBW(0.75)/day) and the urinary Ox:Cr ratio were unaffected by diet. The Uox concentration (mmol/L) was significantly lower when feeding the HP compared to the HC (P=0.004) and HF (P=0.001) diets. The results indicate that changes in macronutrient profile may not influence endogenous Uox excretion in cats but high dietary protein did reduce Uox concentration and may therefore help to lower the risk of calcium oxalate formation.


Domestic Cats Are Susceptible to Infection With Low Pathogenic Avian Influenza Viruses From Shorebirds.

Domestic cats are susceptible to infection with highly pathogenic avian influenza virus H5N1, resulting in pneumonia and in some cases, systemic spread with lesions in multiple organ systems. Recent transmission of the 2009 pandemic H1N1 influenza virus from humans to cats also resulted in severe pneumonia in cats. Data regarding the susceptibility of cats to other influenza viruses is minimal, especially regarding susceptibility to low pathogenic avian influenza viruses from wild birds, the reservoir host. In this study, the authors infected 5-month-old cats using 2 different North American shorebird avian influenza viruses (H1N9 and H6N4 subtypes), 3 cats per virus, with the goal of expanding the understanding of avian influenza virus infections in this species. These viruses replicated in inoculated cats based on virus isolation from the
Prevalence and characterization of methicillin-resistant Staphylococcus pseudintermedius in pets from South China.

Evaluation of lomustine as a rescue agent for cats with resistant lymphoma.

This retrospective study evaluated the use of lomustine as a rescue agent for 39 cases of resistant feline lymphoma. Parameters assessed included lymphocyte cell size, number of previous chemotherapy drugs and number of previous chemotherapy protocols received, time from lymphoma diagnosis to initiation of lomustine therapy, body weight and anatomic location of lymphoma. Cell size, number of previous chemotherapy drugs, number of previous chemotherapy protocols and anatomic location were all significant prognostic factors for the progression free interval. Twenty-one cats (54%) received more than one dose of lomustine. The overall median progression free interval (MPFI) was 39 days (range 7-708 days). The MPFI for large versus small and intermediate cell lymphomas was 21 versus 169 days, respectively. The MPFI for gastrointestinal versus non-gastrointestinal lymphomas was 180 versus 25.5 days, respectively. Lomustine has an acceptable efficacy and safety for use as a rescue agent in feline lymphoma.

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

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

Postprandial glycemia in cats fed a moderate carbohydrate meal persists for a median of 12 hours -- female cats have higher peak glucose concentrations.

The postprandial increase in glucose concentration is typically not considered in selecting diets to manage diabetic and pre-diabetic cats. This study describes increases in glucose and insulin concentrations in 24 clinically healthy, neutered adult cats following one meal (59 kcal/kg) of a moderate carbohydrate diet (25% of energy). Median time to return to baseline after feeding for glucose was 12.2 h (1.8-/>=24 h) and for insulin was 12.3 h (1.5-/>=24 h). Time to return to baseline for glucose was not different between male (10.2 h) and female (17.2 h) cats. There was evidence female cats had a longer return to baseline for insulin (18.9 h versus 9.8 h) and females had higher (0.9 mmol/l difference) peak glucose than males. This demonstrates that the duration of postprandial glycaemia in cats is markedly longer than in dogs and humans, and should be considered when managing diabetic and pre-diabetic cats.

USE OF ULTRASOUND TO LOCATE RETAINED TESTES IN DOGS AND CATS.

Ultrasonography was used to locate undescended testes in 30 dogs and 4 cats where the final testicular location was determined surgically. Time between ultrasound and surgery ranged between 0 and 17 days. Forty-three testes (63.2%) were retained and 42/43 (97.7%) were detected ultrasonographically. Retained testes were located in the abdomen (n = 28) and inguinal region (n = 14). One retained testis could not be identified with use of ultrasound. Locations of retained testes ranged from the caudal pole of the kidney to the inguinal region. Descriptions of testicular echogenicity and size were not available for all testes. A 100% positive predictive value was found for all testes with use of ultrasound in both abdominal and inguinal regions. The sensitivity of ultrasound was 96.6% for abdominal and 100% for inguinal testes. Ultrasound is a sensitive test for location of retained testes, and supports the opinion that preoperative ultrasound can help facilitate location of retained testes prior to surgical exploration or laparoscopy. (c) 2012 Veterinary Radiology & Ultrasound.

Prevalence and characterization of methicillin-resistant Staphylococcus pseudintermedius in pets from South China.
The aim of this study was to determine the presence of and characterize methicillin-resistant Staphylococcus pseudintermedius (MRSP) isolated from pets in South China. From 2007 to 2009, 898 samples were collected from 785 pets in Guangdong Province. The identity of staphylococcal species and the presence of methicillin resistance were confirmed by phenotypic and genotypic assays. The genetic relationships of MRSP isolates were determined by multilocus sequence typing (MLST), PFGE and spa typing. SCCmec elements and antimicrobial resistance genes profiling were characterized by PCR amplification. A total of 144 S. pseudintermedius isolates were recovered from the dogs and cats tested, and 69 (47.9%) of these isolates were identified as MRSP. Most of the MRSP isolates exhibited simultaneous resistance to four or more different antimicrobial agents. However, valnemulin showed robust activity against MRSP (MIC(90)=1μg/ml). Integron 1, 2 and 3 were not detected in MRSP isolates. Twenty-four different multilocus sequence types were found among the MRSP isolates, with ST4 (n=9), ST5 (n=8), and ST95 (n=7) being dominant sequence types. In addition, 8 new sequence types (ST134, 135, 136, 137, 139, 140 and 148) were identified. Of the 69 MRSP isolates, SCCmecV was the most prevalent type (n=33), followed by SCCmecVII (n=13), SCCmecII-III (n=7), and SCCmecIII (n=4). This study demonstrates for the first time that the occurrence of MRSP in healthy pets in China and shows that MRSP in South China has high genetic diversity.


CT AND MRI EVALUATION OF SKULL BONES AND SOFT TISSUES IN SIX CATS WITH PRESUMED ACROMEGALY VERSUS 12 UNAFFECTED CATS.

Feline acromegaly is predominantly caused by an adenoma of the pituitary gland, resulting in excessive growth hormone and insulin-like growth factor (IGF-1) secretion. In advanced cases, cats will display prominent facial features and upper airway congestion secondary to bony and soft tissue proliferation. The purpose of this study was to describe CT and MRI characteristics of soft tissues and skull bones in six cats with presumed acromegaly and to compare findings with those observed in 12 unaffected cats. In the five acromegalic cats with CT or MRI evidence of a pituitary tumor, frontal bone thickness was greater than age-matched controls with and without a history of upper airway disease. These five cats also had evidence of soft tissue accumulation in the nasal cavity, sinuses, and pharynx. One cat with insulin-resistant diabetes mellitus, elevated IGF-1, and a normal pituitary size did not have evidence of frontal bone thickening or upper airway congestion.


RECOVER evidence and knowledge gap analysis on veterinary CPR. Part 7: Clinical guidelines.

OBJECTIVE: To present a series of evidence-based, consensus guidelines for veterinary CPR in dogs and cats. DESIGN: Standardized, systematic evaluation of the literature, categorization of relevant articles according to level of evidence and quality, and development of consensus on conclusions for application of the concepts to clinical practice. Questions in five domains were examined: Preparedness and Prevention, Basic Life Support, Advanced Life Support, Monitoring, and Post-Cardiac Arrest Care. Standardized worksheet templates were used for each question, and the results reviewed by the domain members, by the RECOVER committee, and opened for comments by veterinary professionals for 4 weeks. Clinical guidelines were devised from these findings and again reviewed and commented on by the different entities within RECOVER as well as by veterinary professionals. SETTING: Academia, referral practice and general practice. RESULTS: A total of 74 worksheets were prepared to evaluate questions across the five domains. A series of 101 individual clinical guidelines were generated. In addition, a CPR algorithm, resuscitation drug-dosing scheme, and postcardiac arrest care algorithm were developed. CONCLUSIONS: Although many knowledge gaps were identified, specific clinical guidelines for small animal veterinary CPR were generated from this evidence-based process. Future work is needed to objectively evaluate the effects of these new clinical guidelines on CPR outcome, and to address the knowledge gaps identified through this process.


Common lesions in the male reproductive tract of cats and dogs.

This article provides an overview of the lesions of the male genital tract of the dog and cat and covers those common diseases that affect the scrotal contents including testis and epididymis, the accessory genital glands especially the prostate, and the penis and prepuce. The majority of lesions of the male reproductive tract of cats and dogs are reported in dogs, and this is reflected in the number and types of diseases listed here. The author will attempt to balance simple with dramatic lesions and will start with the penis and prepuce, where lesions are seen more commonly.


Development and evaluation of a questionnaire for assessment of health-related quality of life in cats with cardiac disease.
OBJECTIVE: To develop, validate, and evaluate a questionnaire (Cats’ Assessment Tool for Cardiac Health [CATCH] questionnaire) for assessing health-related quality of life in cats with cardiac disease. DESIGN: Prospective study.

ANIMALS: 275 cats with cardiac disease. PROCEDURES: The questionnaire was developed on the basis of clinical signs of cardiac disease in cats. A CATCH score was calculated by summing responses to questionnaire items; possible scores ranged from 0 to 80. For questionnaire validation, owners of 75 cats were asked to complete the questionnaire (10 owners completed the questionnaire twice). Disease severity was assessed with the International Small Animal Cardiac Health Council (ISACHC) classification for cardiac disease. Following validation, the final questionnaire was administered to owners of the remaining 200 cats. RESULTS: Internal consistency of the questionnaire was good, and the CATCH score was significantly correlated with ISACHC classification. For owners that completed the questionnaire twice, scores were significantly correlated. During the second phase of the study, the CATCH score ranged from 0 to 74 (median, 7) and was significantly correlated with ISACHC classification. CONCLUSIONS AND CLINICAL RELEVANCE: Results suggested that the CATCH questionnaire is a valid and reliable method for assessing health-related quality of life in cats with cardiac disease. Further research is warranted to test the tool’s sensitivity to changes in medical treatment and its potential role as a clinical and research tool.


Tritrichomonas—systematics of an enigmatic genus.

Tritrichomonas spp. are parasitic protozoans that proliferate on mucus membranes of the urogenital, gastro-intestinal or nasal tract. For instance, Tritrichomonas foetus is an important cause of reproductive failure in cattle. Some years ago, T. foetus was also identified as a causative agent of diarrhoea in cats. Previous studies on the morphological, physiological and molecular levels have raised doubts as to the phylogenetic relationship among some Tritrichomonas species, particularly in relation to T. foetus, Tritrichomonas suis, and Tritrichomonas mobilensis. With the advent of molecular genetic tools, it has become clear that these three tritrichomonad species are closely related or may even represent the same species. Indeed, since recently, T. suis and T. foetus are generally considered as one species, with T. mobilensis being a closely related sister taxon. To date, molecular studies have not yet been able to resolve the taxonomic (specific) status of T. foetus from cattle and cats. In the future, novel genomic approaches, particularly those involving next generation sequencing are poised to resolve the taxonomy of Tritrichomonas spp. Here, we review the literature on the current state of knowledge of the taxonomy of T. foetus, T. suis, and T. mobilensis with special reference to the relationship between T. foetus from cattle and cats.


OBJECTIVES: To evaluate whether the presenting rectal temperature and level of azotemia predicts the length of hospitalization (LOH) in a population of obstructed male cats. To describe the relationships between physical examination parameters, blood electrolytes, and azotemia in a clinical population of obstructed male cats. DESIGN: Retrospective clinical study. SETTING: Emergency and referral specialty hospitals. ANIMALS: Two hundred and forty-three male cats that presented with urethral obstruction between 2006 and 2009. INTERVENTIONS: None. MEASUREMENTS AND MAIN RESULTS: No significant association between the hours of hospitalization and rectal temperature was detected (P = 0.39). Blood urea nitrogen (BUN) and creatinine (CREA) concentrations were positively correlated with LOH (P < 0.01). BUN and CREA were significantly higher (P < 0.01) for the hypothermic group compared to the normothermic group. Potassium was negatively correlated to heart rate and rectal temperature but positively correlated to BUN and CREA. CONCLUSION: No association with regard to rectal temperature and LOH could be demonstrated in this population of cats. However, the presence of azotemia in obstructed male cats appears to provide the clinician with additional information regarding the necessary LOH and eventual cost to the client.


Integrative taxonomy at work: DNA barcoding of taeniids harbour by wild and domestic cats.

In modern taxonomy, DNA barcoding is particularly useful where biometric parameters are difficult to determine or useless owing to the poor quality of samples. These situations are frequent in parasitology. Here, we present an integrated study, based on both DNA barcoding and morphological analysis, on cestodes belonging to the genus Taenia, for which biodiversity is still largely underestimated. In particular, we characterized cestodes from Italian wildcats (Felis silvestris silvestris), free-ranging domestic cats (Felis silvestris catus) and hybrids populations. Adult taeniids were collected by post-mortem examinations of the hosts and morphologically identified as Taenia taeniaeformis. We produced cox1 barcode sequences for all the analysed specimens, and we compared them with reference sequences of individuals belonging to the genus Taenia retrieved from GenBank. In order to evaluate the performance of a DNA barcoding approach to discriminate these parasites, the strength of correlation between species identification based on classical morphology and the molecular
divergence of cox1 sequences was measured. Our study provides clear evidence that DNA barcoding is highly efficient to reveal the presence of cryptic lineages within already-described taeniid species. Indeed, we detected three well-defined molecular lineages within the whole panel of specimens morphologically identified as T. taeniaeformis. Two of these molecular groups were already identified by other authors and should be ranked at species level. The third molecular group encompasses only samples collected in Italy during this study, and it represents a third candidate species, still morphologically undescribed.

In this retrospective study of 41 cats with chronic nasal disease diagnoses included nasal neoplasia (n = 19), idiopathic chronic rhinosinusitis (ICRS) (n = 12), nasopharyngeal polyps (n = 3), foreign bodies (n = 2), nasopharyngeal stenosis (n = 1) and nasal aspergillosis (n = 1). In 3 cats diagnosis could not be established despite thorough work-up. Gender, indoor or outdoor housing, quality or quantity of nasal discharge, bacteriological findings of nasal flushes, radiology and CT findings did not differ significantly between cats with neoplasia and cats with ICRS. Cats with neoplasia were older (3 - 15, median 11 years) and showed clinical signs for a shorter period of time (1 - 8, median 2 months) than cats with ICRS (age 1 - 13, median 7.5 years; signs: 1 - 36, median 5 months). In all cats with neoplasia a mass was detected rhinoscopically, while this was only seen in 30 % of cats with ICRS. The exact diagnosis has to be established by examination of biopsy samples. A combination of physical examination, imaging studies and rhinoscopy with cytological and histopathological examination of samples enhances the likelihood for a correct diagnosis.

Background - Oral triamcinolone (T) and methylprednisolone (M) have been recommended at various dosages for the control of pruritus associated with feline allergic dermatitis. Objectives - The first objective was to determine effective dosages of methylprednisolone (Pfizer, New York, NY, USA) and triamcinolone (Boehringer Ingelheim Vetmedica, Inc., St Joseph, MO, USA) required to induce remission from pruritus associated with feline allergic dermatitis. The second objective was to compare efficacy of several different alternate day maintenance dosages. The third objective was to determine whether laboratory abnormalities occurred at effective dosages. Animals - Thirty-two client-owned allergic cats were randomly assigned to the M or T groups. Methods - Owners reported weekly on pruritus score and behavioural changes. Remission was defined as a pruritus score of &lt;=2/10, with 0 as the least and 10 as the most pruritic. Serum chemistry, complete blood count, fructosamine and urinalysis were assessed on day 0, at the end of the 7-14 day induction phase and at study completion. Results - Mean once daily doses required for induction were 1.41 mg/kg for M and 0.18 mg/kg for T. Mean alternate day maintenance doses were 0.54 mg/kg for M and 0.08 mg/kg for T. There was a statistically significant decrease in eosinophils and increase in fructosamine for both groups from baseline to study completion. Fructosamine levels did not exceed the reference range in any case. Conclusions - These results suggest that triamcinolone is approximately seven times as potent as methylprednisolone, and that these dosages are efficacious and well tolerated for the control of pruritus in allergic cats.

Heartworm Associated Respiratory Disease (HARD) is a pulmonary syndrome that results from the vascular and parenchymal inflammatory response associated with the arrival and death of Dirofilaria immitis in the distal pulmonary arteries. Barometric whole-body plethysmography (BWBP) is a non-invasive pulmonary function test (PFT) that allows a dynamic study of breathing patterns and is useful to study airway disease and the response to different treatments. The aim of this prospective non-blinded study was to compare respiratory function variables between healthy cats and HARD cats (seropositive to D. immitis) by use of BWBP. Twenty-five healthy cats and six HARD cats were put into the plethysmograph chamber and different respiratory variables were measured. The results were analyzed and compared between the two groups of animals. There were significant differences for bronchoconstriction index variables Pause (P-value&lt;0.001) and enhanced pause (P-value&lt;0.001), minute volume (P-value&lt;0.05) and tidal volume (P-value&lt;0.05) between healthy and HARD cats. There were no significant differences in respiratory rate and inspiratory and expiratory times between both groups of animals. The results obtained in our study support that HARD cats show significant differences in pulmonary function variables obtained by BWBP due to an acute inflammatory response at bronchial, vascular and parenchymal level. This PFT could be a useful method to facilitate the diagnosis of pathological states of bronchoconstriction in HARD cats.

**Feline calicivirus: a neglected cause of feline ocular surface infections?**

OBJECTIVE: To investigate the prevalence of feline calicivirus (FCV) infection in relation to ocular surface lesions in cats with upper respiratory tract diseases (URTD). ANIMALS STUDIED: Ninety-nine cats with ocular surface infection and symptoms or recent history of URTD were examined at various rescue shelters and hospitals. PROCEDURE: A complete general and ophthalmic examination was performed including Schirmer tear test, slit-lamp biomicroscopy, fluorescein and lissamine green staining. Clinical and ocular symptoms were scored and recorded. Conjunctival samples were collected using a cytobrush, and nucleic acid extraction using RT-PCR was carried out to analyze for the presence of various infectious agents. RESULTS: RT-PCR detected either FCV, feline herpes virus type 1 (FHV-1), Chlamydia felis or Mycoplasma spp. in 63/99 samples. 30/63 samples were positive for FCV, 23/63 for C. felis, 21/63 for Mycoplasma spp., and 16/63 for FHV-1. Out of the 30 FCV-positive samples, 11 were positive only for FCV and in 19 samples FCV was seen in combination with other agents. FCV infection was highest in animals examined at the rescue and in the age group of 0-2 months. Erosive conjunctivitis was an important ocular finding. Oral ulcers were detected in all FCV-infected cats. CONCLUSION: Results indicate that FCV is highly prevalent in cats with URTD either as a sole infectious agent or in combination with other pathogens and therefore is a potential cause for ocular surface lesions during the URTD.


**Evaluation of Different Antiretroviral Drug Protocols on Naturally Infected Feline Immunodeficiency Virus (FIV) Cats in the late Phase of the Asymptomatic Stage of Infection.**

THE AIM OF THIS STUDY WAS TO EVALUATE THE EFFICACY OF THE ANTIRETROVIRALS: Zidovudine (ZDV) alone; ZDV + Recombinant Human Interferon-alpha (rHuIFN-alpha); ZDV + Lamivudine (3TC) and ZDV + valproic acid (Valp) on naturally feline immunodeficiency virus (FIV)-infected cats, in the late phase of the asymptomatic stage of infection. The follow-up was performed over one year, through clinical evaluation and the determination of viral loads and CD4+/CD8+ ratios. Neurological signs were studied by visual and auditory evoked potentials (VEP, AEP) and the responses were abnormal in 80% of the FIV-infected cats. After one year, an improvement in VEP and AEP was observed in the ZDV + Valp group and a worsening in the group receiving ZDV + rHuIFN-alpha. The CD4+/CD8+ ratio showed a significant increase (both intra and inter-groups) only in ZDV and ZDV + 3TC, between their pre-treatment and one year values, as well as among the other groups. Viral load only showed a significant decrease in ZDV and ZDV + 3TC groups, when comparing the values at one year of treatment vs. pre-treatment values and when the different groups were compared. In addition, the viral load decrease was significantly more pronounced in the ZDV + 3TC vs. ZDV group. We conclude that ZDV and ZDV + 3TC produce significant reductions in viral load and stimulate a recovery of the CD4+/CD8+ ratio, compared with the other protocols. It is clear that the addition of 3TC resulted in a greater reduction in viral load than use of ZDV as a single drug. Therefore, the combination ZDV + 3TC could be more effective than the sole use of ZDV.


**Bacterial reproductive pathogens of cats and dogs.**

With the notable exception of Brucella canis, exogenous bacterial pathogens are uncommon causes of reproductive disease in cats and dogs. Most bacterial reproductive infections are endogenous, and predisposing factors for infection are important. This article reviews the etiology, pathogenesis, clinical presentation, diagnosis, treatment, and public health significance of bacterial reproductive pathogens in cats and dogs.


**Incidence of Mycobacterial Infections in Cats in Great Britain: Estimate from Feline Tissue Samples Submitted to Diagnostic Laboratories.**

The aim of this study was to estimate the incidence of mycobacterial infections in cats in Great Britain (GB). This was performed using the proxy measure of feline tissue samples submitted to diagnostic laboratories in GB that were found to have histopathological changes typical of mycobacterial infection (‘MYC’). Sixteen primary diagnostic laboratories were asked for information on the number of feline samples submitted in 2009, the number with MYC, the number undergoing Ziehl-Neelsen (ZN) staining and, for comparison, the number diagnosed with lymphoma. Eight laboratories provided full data for the whole year: 11 782 samples; lymphoma 3.2% (mean, 95% CI: 2.89, 3.5), MYC 1.16% (0.98; 1.37) and ZN-positive 0.31% (0.22; 0.43). Data on 1569 samples from seven laboratories that provided partial data on samples for the whole year revealed similar results, although all changes were more frequent: lymphoma 5.42% (4.35; 6.66), MYC 2.36% (1.66; 3.23) and ZN-positive 0.77% (0.40; 1.33). One laboratory only provided data for part of the year (4.5 months), reporting all three types of histopathology less frequently: 18 232 samples; lymphoma 0.2% (0.18; 0.32), MYC 0.07% (0.04; 0.12) and ZN-positive 0.05% (0.02; 0.09). The reasons for low reporting rates in this high-throughput laboratory are unclear. In total, 187 samples were reported as having MYC. Five Reference laboratories were also contacted, reporting 174 feline tissue submissions in 2009, with mycobacteria being cultured from 90. The study shows that MYC are frequently
reported in tissue samples from cats in GB, being reported in approximately 1% of samples, with confirmation as ZN-positive in approximately 0.3%. Lymphoma is recognized as a common disease in cats, being seen in approximately 3% of samples in this study. When compared against MYC, lymphoma was reported only twice as frequently. This confirms that far from being rare, clinically significant mycobacterial infections occur commonly in cats in GB.

**Thoracoscopic en bloc thoracic duct sealing and partial pericardectomy for the treatment of chylothorax in two cats.**

Two cats with intractable idiopathic chylothorax and a history of unsuccessful medical management were treated thoracoscopically with en bloc thoracic duct sealing and subtotal pericardectomy using a bipolar feedback-controlled vessel sealing device. No surgical complications were observed. Twenty-four and 26 months after surgery, both cats were free of thoracic effusion and clinical signs.

**Kaolin-activated thromboelastography in echocardiographically normal cats.**

OBJECTIVE: To determine reference values for kaolin-activated thromboelastography in echocardiographically normal cats. ANIMALS: 30 healthy cats without evidence of cardiomyopathy on echocardiographic examination. PROCEDURES: All cats underwent echocardiographic examination, the findings of which were reviewed by a board-certified cardiologist. Cats that struggled (n = 10) received mild sedation with butorphanol and midazolam IM to permit phlebotomy without interruption in jugular venous blood flow. Blood samples were collected for analysis of thromboelastography variables, PCV, total solids concentration, platelet count, activated partial thromboplastin time, prothrombin time, fibrinogen concentration, and antithrombin concentration. RESULTS: All 4 thromboelastography variables had < 5% mean intra-assay variability. Mean values were as follows: reaction time, 4.3 minutes; clotting time, 1.6 minutes; alpha angle, 66.5 degrees; and maximum amplitude, 56.4 mm. Compared with nonsedated cats, cats that required sedation had a significantly shorter clotting time and greater alpha angle, whereas reaction time and maximum amplitude were not significantly different. CONCLUSIONS AND CLINICAL RELEVANCE: Kaolin-activated thromboelastography was a reliable test with unremarkable intra-assay variability in echocardiographically normal cats. Sedation may affect certain thromboelastography variables, but the effect is unlikely to be clinically important. It remains unknown whether subclinical cardiomyopathy has a significant effect on thromboelastography variables in cats.

**Patient-based feedback control for erythroid variables obtained using in-house automated hematology analyzers in veterinary medicine.**

BACKGROUND: Automated in-house diagnostic analyzers, most commonly used for hematologic and biochemical analysis, are typically calibrated, and then control materials are used to confirm the quality of results. Although this approach provides indirect knowledge that the system is performing correctly, it does not provide direct knowledge of system performance between control runs. OBJECTIVES: The objectives of this study were to apply analysis of weighted moving averages to assess performance of hematology analyzers using animal patient samples from dogs, cats, and horses as they were analyzed and apply correction factors to mitigate instrument-driven biases when they developed. METHODS: A set of algorithms was developed and applied to sequential batches of 20 samples. Repeated samples within a batch and large populations of samples with similar abnormalities were excluded. Data for 6 hematologic variables were grouped into batches of weighted moving averages; data were analyzed with control chart rules, a gradient descent algorithm, and fuzzy logic to define and apply adjustments. RESULTS: A total of 102 hematology analyzers that had developed biases in RBC count, HCT, hemoglobin (HGB) concentration, MCV, MCH, and MCHC were evaluated. Following analysis, all variables except HGB concentration required adjustment, with RBC counts requiring only slight change and MCV requiring the greatest change. Adjustments were validated by comparing PCVs with the original and adjusted HCT values. CONCLUSIONS: The proposed system provides feedback control to minimize system bias for RBC count, HCT, HGB concentration, MCV, MCH, and MCHC. Fundamental assumptions must be met for the approach to assure proper functionality.

**Efficacy and adverse effects of the antiviral compound plerixafor in feline immunodeficiency virus-infected cats.**

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


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

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


Comparison of four ventilatory protocols for computed tomography of the thorax in healthy cats.

OBJECTIVE: To identify ventilatory protocols that yielded good image quality for thoracic CT and hemodynamic stability in cats. Animals-7 healthy cats. PROCEDURES: Cats were anesthetized and ventilated via 4 randomized protocols (hyperventilation, 20 seconds [protocol 1]; single deep inspiration, positive inspiratory pressure of 15 cm H(2)O [protocol 2]; recruitment maneuver [protocol 3]; and hyperventilation, 20 seconds with a positive end-expiratory pressure of 5 cm H(2)O [protocol 4]). Thoracic CT was performed for each protocol; images were acquired during apnea for protocols 1 and 3 and during positive airway pressure for protocols 2 and 4. Heart rate; systolic, mean, and diastolic arterial blood pressures; blood gas values; end-tidal isoflurane concentration; rectal temperature; and measures of atelectasis, total lung volume (TLV), and lung density were determined before and after each protocol. RESULTS: None of the protocols eliminated atelectasis; the number of lung lobes with atelectasis was significantly greater during protocol 1 than during the other protocols. Lung density and TLV differed significantly among protocols, except between protocols 1 and 3. Protocol 2 TLV exceeded reference values. Arterial blood pressure after each protocol was lower than before the protocols. Mean and diastolic arterial blood pressure were higher after protocol 3 and diastolic arterial blood pressure was higher after protocol 4 than after protocol 2. CONCLUSIONS AND CLINICAL RELEVANCE: Standardization of ventilatory protocols may minimize effects on thoracic CT images and hemodynamic variables. Although atelectasis was still present, ventilatory protocols 3 and 4 provided the best compromise between image quality and hemodynamic stability.


Evaluation of cytologic findings in feline conjunctivitis.

BACKGROUND: Cytologic examination of smears prepared from ocular swabs of conjunctiva from cats with conjunctivitis permits identification of the type of inflammation and possibly specific microorganisms. Results of studies of the diagnostic utility of cytology for detection of infectious causes of feline conjunctivitis have been inconsistent. OBJECTIVES: The objectives of this study were to describe cytologic findings in cats with conjunctivitis and to compare those findings with results of PCR analysis for feline herpesvirus (FHV-1), Chlamyphila felis (C felis), and Mycoplasma felis (M felis). METHODS: Conjunctival smears from 88 cats with conjunctivitis and 10 healthy control cats were stained with a Romanowsky stain and evaluated for the type of inflammation and evidence of an infectious agent. PCR analysis for FHV-1, C felis, and M felis was performed. RESULTS: Infectious agents identified by PCR analysis were FHV-1 in 9 cats (10%), C felis in 8 cats (9%), and M felis in 6 cats (7%). Inclusions interpreted as chlamydial inclusions were found in all cytologic smears from cats positive for C felis by PCR analysis and in 3 PCR-negative cats. Inclusions interpreted as
Mycoplasma organisms were found in 3 of 6 cats that were PCR-positive for M felis and in 1 PCR-negative cat. FHV-1 inclusion bodies were not detected on cytologic examination. CONCLUSIONS: Cytologic examination can be diagnostic for C felis infection when many typical inclusions are present. Cytologic examination was unreliable in diagnosing M felis infection, and viral inclusions of FHV-1 were not found in specimens stained with Romanowsky stains.


Chondroma of the vertical ramus of the feline mandible.

A 5-year-old, castrated male, domestic shorthair cat presented with firm swelling in the right temporal region of the skull. The cat’s jaws were almost locked in the closed position. Radiographs showed a mass with an irregular mineralized matrix superimposed on the caudal right mandible and temporomandibular joint. Surgical exploration revealed that the mass arose from the proximal part of the vertical ramus, which was removed, with the exclusion of the temporomandibular joint. It was possible to open the cat’s mouth to nearly normal extension immediately after surgery. Recovery was uneventful - the cat has had no problem eating and no mass recurrence has been detected 3 years after surgery. Histological examination of the mass was consistent with chondroma. To the best of our knowledge, this is the first clinical and pathological description of a chondroma in cats, and one of the rare cases describing clinical presentation and management of primary bone tumours involving the vertical ramus of the feline mandible.


The cat as a model for human obesity and diabetes.

Obesity is the most common nutritional disorder of cats and is a risk factor for diabetes. Similar to developments in obese people, obese cats show peripheral tissue insulin resistance and may demonstrate glucose intolerance when challenged with pharmacological amounts of glucose. However, they compensate well for the insulin resistance and do not show elevated glucose concentrations when monitored during their regular daily routine, including postprandial periods. This is possible because obese cats in the fasted and postprandial state are able to maintain hepatic insulin sensitivity and decrease endogenous glucose production, which allows them to maintain normoglycemia. Also dissimilar to what is seen in many obese humans, cats do not develop atherosclerosis and clinical hypertension. The time course for progression to overt diabetes of obese cats is unknown. One might speculate that diabetes develops when the liver finally becomes insulin resistant and/or insulin secretion becomes too low to overcome increased glucose production. In addition, amyloid, demonstrated to be deposited in islet of chronically obese cats, may contribute to a reduction in insulin secretion by reducing functional beta-cell mass.


Detection of subgenomic mRNA of feline coronavirus by real-time polymerase chain reaction based on primer-probe energy transfer (P-sg-QPCR).

Feline infectious peritonitis is one of the most severe devastating diseases of the Felidae. Upon the appearance of clinical signs, a cure for the infected animal is impossible. Therefore rapid and proper diagnosis for both the presence of the causative agent, feline coronavirus (FCoV) and the manifestation of feline infectious peritonitis is of paramount importance. In the present work, a novel real-time RT-PCR method is described which is able to detect FCoV and to determine simultaneously the quantity of the viral RNA. The new assay combines the M gene subgenomic messenger RNA (sg-mRNA) detection and the quantitation of the genome copies of FCoV. In order to detect the broadest spectrum of potential FCoV variants and to achieve the most accurate results in the detection ability the new assay is applying the primer-probe energy transfer (PriProET) principle. This technology was chosen since PriProET is very robust to tolerate the nucleotide substitutions in the target area. Therefore, this technology provides a very broad-range system, which is able to detect simultaneously many variants of the virus(es) even if the target genomic regions show large scale of variations. The detection specificity of the new assay was proven by positive amplification from a set of nine different FCoV strains and negative from the tested non-coronaviral targets. Examination of faecal samples of healthy young cats, organ samples of perished animals, which suffered from feline infectious peritonitis, and cat leukocytes from uncertain clinical cases were also subjected to the assay. The sensitivity of the P-sg-QPCR method was high, since as few as 10 genome copies of FCoV were detected. The quantitative sg-mRNA detection method revealed more than 10-50,000 times increase of the M gene sg-mRNA in organ materials of feline infectious peritonitis cases, compared to those of the enteric FCoV variants present in the faeces of normal, healthy cats. These results indicate the applicability of the new P-sg-QPCR test as a powerful novel tool for the better detection and quantitation of FCoV and for the improved diagnosis of feline infectious peritonitis, this important disease of the Felidae, causing serious losses in the cat populations at a global scale.


Cross-sectional survey of antimicrobial prescribing patterns in UK small animal veterinary practice.
The increase in the prevalence of antimicrobial resistance has resulted in both human and veterinary antimicrobial use coming under increased scrutiny. The aim of this study was to characterise antimicrobial prescribing patterns in small-animal veterinary practices in the UK. A cross-sectional survey of UK small animal veterinarians was undertaken. A postal questionnaire to evaluate antimicrobial prescribing habits was sent to 900 clinicians. Data were collected on the clinicians, their practices and their sources of information regarding antimicrobials and their use. Respondents were asked if they would prescribe antimicrobials to animals described in four clinical scenarios, and, if so, to provide details of the prescription(s). Questionnaires were completed by 51% of the veterinarians. Only 3.5% of clinicians reported that their practice had an antimicrobial use policy. Penicillins were most commonly prescribed in three clinical scenarios, and 1st generation cephalosporins were most commonly prescribed in a scenario about canine pyoderma. In one scenario, fluoroquinolones and 3rd generation cephalosporins accounted for 10% and 13% of prescriptions respectively. Five percent of all prescriptions were under the recommended dose and 20% were over the recommended dose. Overall, 2.3% of prescriptions were not licensed for use in dogs or cats in the UK. Associations between the use of various antimicrobial drugs and independent variables were analysed using multivariable logistic regression models. Off-license prescriptions and inaccurate dosing of antimicrobials by small-animal clinicians in the UK appears to occur. Antimicrobial use guidelines are rare in small animal practice. The introduction of such guidelines has been shown to lead to more appropriate use of antimicrobials and is therefore recommended.

Irwin, K. E., K. M. Beale, and V. A. Fadok (2012) Vet Dermatol

Use of modified ciclosporin in the management of feline pemphigus foliaceus: a retrospective analysis.
Background - Glucocorticoids as sole therapy for pemphigus foliaceus (PF) in cats are not always successful, and it is common to need additional immunomodulating agents to manage the disease. Hypothesis/Objectives - This retrospective study evaluated the use of modified ciclosporin as an adjuvant or sole immunomodulating drug in cats with PF and compared their response to PF cats managed with chlorambucil. Animals - Fifteen client-owned cats diagnosed with PF that received ciclosporin and/or chlorambucil as part of their treatment and had adequate follow-up to assess treatment response were evaluated. Methods - Records were reviewed from feline PF patients presented between the years of 1999 and 2009. Cats were divided into two treatment groups: those treated with ciclosporin and those treated with chlorambucil. Most cats in both groups also received concurrent systemic glucocorticoids. Each group contained six patients. Three cats were treated with both medications and are discussed separately. Time to disease remission, remission-inducing glucocorticoid dose, maintenance or final glucocorticoid dose, disease response and adverse effects were assessed. Results - There was no significant difference in remission times or disease response between groups. All six patients maintained with ciclosporin for PF management were weaned off systemic glucocorticoids, while glucocorticoid therapy was stopped in only one of the six cats receiving chlorambucil. Conclusions and clinical importance - Modified ciclosporin is effective in the management of feline pemphigus foliaceus and is glucocorticoid sparing.


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


Allometric Study on the Relationship between the Growth of Ovarian Follicles and Oocytes in Domestic Cats.
The relationship between the growth of preantral and antral follicles and that of their oocytes in ovaries of domestic cats (Felis catus) was analyzed. Eight hundred and five pairs of follicles and oocytes from the ovaries of 51 female cats were collected, and only healthy and fresh follicles and oocytes with or without zona pellucida were used in this study. Immediately after collection, the diameters of follicles and their oocytes were measured. The relationship of the follicle diameter to the oocyte diameter was applied to four regression models and statistically analyzed. The best fitting model was found to be a hyperbolic regression (the coefficient of determination was 0.976 between the follicles and their oocytes with a zona pellucida, y=184x/(x+0.0738); the coefficient of determination was 0.983 between the follicles and their oocytes without a zona pellucida, y=122x/(x+0.0301)). The differentiated equations for the hyperbolic curves in the oocytes with or without a zona pellucida and the follicles were found to be y’=13.6/(x+0.0738)² and y’=3.67/(x+0.0301)² where y and x
were the diameters of the oocytes (microm) and follicles (mm), respectively. When follicles grew to a size larger than 0.4 mm in diameter, the growth rates of their oocytes calculated by the differentiation equations showed an asymptotic depression around zero. Thus, it was suggested that when the follicles grew to a size larger than 0.4 mm in diameter, their oocytes reached full size and ceased to grow and that the zona pellucida stopped growing when the diameter of the follicles reached 0.3 mm in domestic cats.

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

Vaccination against Feline Panleukopenia: implications from a field study in kittens.
ABSTRACT: BACKGROUND: Feline Panleukopenia (FPL) is a serious disease of cats that can be prevented by vaccination. Kittens are routinely vaccinated repeatedly during their first months of life. By this time maternally derived antibodies (MDA) can interfere with successful vaccination and inhibit the development of active immunity. The efficacy of primary vaccination under field conditions was questioned by frequent reports to the Paul-Ehrlich-Institut on outbreaks of FPL in vaccinated breeding catteries. We therefore initiated a field study to investigate the development of immunity in kittens during primary vaccination against FPL. 64 kittens from 16 litters were vaccinated against FPL at the age of 8, 12 and 16 weeks using three commercial polyvalent vaccines. Blood samples were taken before each vaccination and at the age of 20 weeks. Sera were tested for antibodies against feline panleukopenia virus (FPV) by hemagglutination inhibition test and serum neutralisation assay in two independent diagnostic laboratories. RESULTS: There was a good correlation between the results obtained in different laboratories and with different methods. Despite triple vaccination 36.7% of the kittens did not seroconvert. Even very low titres of maternally derived antibodies (MDA) apparently inhibited the development of active immunity. The majority of kittens displayed significant titres of MDA at 8 and 12 weeks of age; in some animals MDA titres that interfered with vaccination were still detected at 20 weeks of age. Interestingly, the vaccines tested differed significantly in their ability to overcome low levels of maternal immunity. CONCLUSIONS: In the given situation it is recommended to quantify antibodies against FPV in the serum of the queen or of the kittens before primary vaccination of kittens. The beginning of primary vaccination should be delayed until MDA titres have declined. Unprotected kittens that have been identified serologically should be revaccinated.

The cat fur mite, Lynxacarus radovskyi Tenorio, 1974 (Acarina: Astigmata: Listrophoridae) from cat, Felis catus in peninsular Malaysia.
The cat fur mite, Lynxacarus radovskyi Tenorio, 1974 (Acarina: Astigmata: Listrophoridae) is reported from cats, Felis catus from three sites in peninsular Malaysia. The first site is a Malay village, Kampong Menteri in Taiping, Perak, where the mites were found on local pet cats. The other two sites are urban cities of Kuala Lumpur, in the Federal Territory and Georgetown, in the island of Penang. Mites from the urban areas were collected from stray cats. Although several ectoparasites (fleas, mites, ticks and lice) have been previously reported, L. radovskyi is recorded herein for the first time on cats from peninsular Malaysia.

Comparison of CD34, CD31, and factor VIII-related antigen immunohistochemical expression in feline vascular neoplasms and CD34 expression in feline nonvascular neoplasms.
The diagnosis of vascular neoplasms is often facilitated by the use of immunohistochemical markers such as factor VIII-related antigen, CD31, and CD34. However, the relative sensitivity and specificity of these markers have not been compared in cat vascular neoplasms. In this study, these 3 immunohistochemical markers were evaluated in 61 endothelial neoplasms
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(50 hemangiosarcomas and 11 hemangiomas) in 59 cats. All neoplasms were labeled by all 3 markers. CD34 had the highest average immunolabeling intensity in neoplastic endothelial cells. CD31 had the lowest average background labeling, followed by CD34 and factor VIII-related antigen, respectively. CD34 expression was also examined in 130 nonvascular neoplasms of cats; 14 of 62 epithelial neoplasms, 39 of 43 mesenchymal neoplasms, 8 of 23 leukocytic neoplasms, and 2 of 2 melanomas were positive. Given the broad expression of CD34 in mesenchymal neoplasms, this marker has limited diagnostic relevance for vascular neoplasms of cats.

Severe hypoglycemia in a cat with primary hypoadrenocorticism.
This article describes a 3-year-old, castrated male, mixed-breed cat with historical, clinical and laboratory findings compatible with primary hypoadrenocorticism, confirmed by adrenocorticotropic hormone stimulation test. Severe but asymptomatic hypoglycaemia was an unexpected biochemical finding and resolved after fludrocortisone acetate and prednisolone treatment. This case report shows that hypoadrenocorticism should be included in the differentials list of severe hypoglycaemia in cats.

Effect of anesthetic breathing circuit type on thermal loss in cats during inhalation anesthesia for ovariohysterectomy.
OBJECTIVE: To compare the effects of a nonrebreathing circuit versus a reduced volume circle anesthetic breathing circuit on body temperature change in cats during inhalation anesthesia for ovariohysterectomy. DESIGN: Randomized, controlled clinical trial. ANIMALS: 141 female domestic cats hospitalized for routine ovariohysterectomy. PROCEDURES: Cats were randomly assigned to receive inhalation anesthetics from either a nonrebreathing circuit or a reduced volume circle system with oxygen flow rates of 200 and 30 mL/kg/min (90.9 and 13.6 mL/lb/min), respectively. Body temperatures were monitored throughout the anesthetic period via an intrathoracic esophageal probe placed orally into the esophagus to the level of the heart base. RESULTS: No difference in body temperature was found between the 2 treatment groups at any measurement time. The duration of procedure had a significant effect on body temperature regardless of the type of anesthetic circuit used. CONCLUSIONS AND CLINICAL RELEVANCE: Duration of the procedure rather than the type of anesthetic circuit used for inhalation anesthesia was more influential on thermal loss in cats undergoing ovariohysterectomy.

Inter- and intraspecies transmission of canine influenza virus (H3N2) in dogs, cats, and ferrets.
Please cite this paper as: Kim et al. (2012) Inter- and intraspecies transmission of canine influenza virus (H3N2) in dogs, cats, and ferrets. Influenza and Other Respiratory Viruses DOI: 10.1111/j.1750-2659.2012.00379.x. Background The emergence of zoonotic viruses in domestic animals is a significant public health concern. Canine influenza virus (CIV) H3N2 is a virus that can infect companion animals and is, therefore, a potential public health concern. Objective This study investigated the inter- and intraspecies transmission of CIV among dogs, cats, and ferrets, under laboratory conditions, to determine whether transmission of the virus was possible between as well as within these domestic animal species. Method The transmission routes for inter- and intraspecies transmission were airborne and direct contact, respectively. Transmission was conducted through intranasal infection of dogs followed by exposure to either cats or ferrets and by coningling infected and naive animals of the same species. Results The interspecies transmission of CIV H3N2 via airborne was only observed from dogs to cats and not from dogs to ferrets. However, direct intranasal infection of either cats or ferrets with CIV could induce influenza-like clinical signs, viral shedding, and serological responses. Additionally, naive cats and ferrets could be infected by CIV via direct contact with infected animals of the same species. Conclusion Cats appear to be another susceptible host of CIV H3N2, whereas ferrets are not likely natural hosts. The molecular-based mechanism of interspecies and intraspecies transmission of CIV H3N2 should be further studied.

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


**Current British veterinary attitudes to the use of perioperative antimicrobials in small animal surgery.**

A questionnaire was sent to 2951 mixed and small animal veterinary practices to examine the use of perioperative antimicrobials in cats and dogs in the UK. The percentage of respondents who always used antimicrobials in two surgical procedures classified according to NRC criteria as ‘clean’ was 25.3 per cent for removal of a 1 cm cutaneous mass and 32.1 per cent for routine prescrotal castration. Factors considered important in decision-making about when to use antimicrobial agents included immunosuppression, presence of a drain, degree of wound contamination, potential for spillage of visceral contents and implantation of prosthesis. The most common antimicrobial agents mentioned were potentiated amoxicillin (98.0 per cent), amoxicillin (60.5 per cent), clindamycin (21.8 per cent), enrofloxacin (21.7 per cent), cephalaxin (18.6 per cent) and metronidazole (12.7 per cent). Forty-three per cent of all responding veterinarians listed a long-acting preparation for perioperative use. The routes used were subcutaneous (76.1 per cent), intravenous (25.8 per cent), intramuscular (19.8 per cent), oral (13.5 per cent) and topical (7.7 per cent). Antimicrobials were given before surgery (66.6 per cent), during surgery (30.2 per cent), immediately after surgery (12.0 per cent) and after surgery (6.3 per cent).

This survey has identified the suboptimal use of perioperative antimicrobials in small animal surgery with improvements needed with respect to timing, duration, choice of antimicrobial and a more prudent selection of surgical cases requiring prophylaxis.


**The use of ciclosporin A in veterinary dermatology.**

Ciclosporin A (CsA) has potent immunosuppressive and immunomodulatory activity that has been exploited in human medicine to prevent the rejection of transplanted organs and to manage atopic dermatitis and psoriasis. Over the past decade, CsA has been employed more frequently in veterinary dermatology and its value in the management of several canine and feline dermatoses is now well established. CsA inhibits calcineurin phosphatase, suppressing T cell activation and the synthesis of T cell cytokines consequently impairing the activity of B cells, antigen-presenting cells, mast cells, basophils and eosinophils. The pharmacokinetics of CsA are similar in humans, dogs and cats and the drug has a wide safety margin in dogs, cats and rabbits. Adverse effects, principally transient vomiting and soft faeces/diarrhoea, may be seen shortly after instituting treatment but often resolve despite continuing treatment. Gingival hyperplasia and cutaneous effects such as hirsutism may occur after prolonged treatment.


**Prevalence of spondylosis deformans in the feline spine and correlation with owner-perceived behavioural changes.**

OBJECTIVES: The primary objective was to determine the prevalence, spinal distribution, and association with the signalment of cats suffering from different grades of feline spondylosis deformans (spondylosis). The secondary objective was to document behavioural changes associated with spondylosis by owner observation. METHODS: A cross-sectional study was performed to determine the prevalence of feline spondylosis (group 1). A prospective study was performed to determine the association between radiographic abnormalities of the lumbarosacral region (L3-S1) and owner perceived behavioural changes based on a completed questionnaire (group 2). The radiographs were reviewed using a grading system (0-3) for spondylosis. RESULTS: The prevalence of spondylosis in group 1 was 39.4% (158/402). Cats with spondylosis were significantly older than cats without spondylosis (p <0.001). The thoracic (T) vertebrae T4-T10 were most often affected by spondylosis, but spondylosis was most severe in the T10-S1 vertebrae. In group 2, spondylosis of the lumbarosacral region was significantly correlated with owner-reported behavioural changes, such as a decreased willingness to greet people and to being petted, increased aggressiveness, and a poor perceived quality of life (p = 0.037). CLINICAL SIGNIFICANCE: This study found that feline spondylosis is common and that spondylosis of the lumbarosacral region may be accompanied by behavioural changes.


**Nutritional care for aging cats and dogs.**


**Companion Animals Symposium: Obesity in dogs and cats: What is wrong with being fat?**
Few diseases in modern pets are diet induced. One possible exception to this is obesity, which is ultimately caused by consuming more calories than needed by the dog or cat. Although fat is the most concentrated and efficiently stored source of calories, and protein least so, an excess of calories from any source will contribute to adiposity. Obesity is an excess of body fat sufficient to result in impairment of health or body function. In people, this is generally recognized as 20 to 25% above ideal BW. This degree of excess is important in dogs as well. A lifelong study in dogs showed that even moderately overweight dogs were at greater risk for earlier morbidity; these dogs required medication for chronic health problems sooner than their lean-fed siblings. The average difference in BW between groups was approximately 25%. Obese cats also face increased health risks, including an increased risk of arthritis, diabetes mellitus, hepatic lipodisosis, and early mortality. The risk for development of diabetes increases about 2-fold in overweight cats and about 8-fold in obese cats. Altered adipokine secretion appears to be an important mechanism for the link between excess BW and many diseases. Once considered to be physiologically inert, adipose tissue is an active producer of hormones, such as leptin and resistin, and cytokines, including many inflammatory cytokines such as tumor necrosis factor-alpha, IL-1beta and IL-6, and C-reactive protein. The persistent, low-grade inflammation secondary to obesity is thought to play a causal role in chronic diseases such as osteoarthritis, cardiovascular disease, diabetes mellitus, and others. For example, tumor necrosis factor-alpha alters insulin sensitivity by blocking activation of insulin receptors. In addition, obesity is associated with increased oxidative stress, which also may contribute to obesity-related diseases. Management of obesity involves nutritional modification as well as behavioral modification. Increased protein intake combined with reduced calorie intake facilitates loss of body fat while minimizing loss of lean body mass. Limiting treats to 10% of calorie intake and increasing exercise both aid in successful BW management.

Laflamme, D. P., H. Xu, C. J. Cupp, W. W. Kerr, Z. Ramadan, and G. M. Long (2012) J Feline Med Surg Evaluation of canned therapeutic diets for the management of cats with naturally occurring chronic diarrhea. Dietary therapy plays an important role in the management of most gastrointestinal disorders. This study was designed to test the efficacy of a new therapeutic diet for cats with diarrhea, compared to the top selling brand. Sixteen adult cats with chronic diarrhea were grouped and assigned to diet X (Hill’s Prescription Diet i/d Feline) or diet Y (Purina Veterinary Diets EN Gastroenteric Feline Formula). Following baseline evaluations, cats were fed their assigned test diet for 4 weeks. Fecal scores (FS; 7 = very watery; 1 = extremely dry and firm) were recorded daily during the last week on each diet. Each cat was then switched to the alternate test diet and the procedure was repeated. Fifteen cats completed the study. Both therapeutic diets resulted in a significant improvement in average FS and diet Y also resulted in significantly better results compared with diet X. Average FS improved at least one unit in 40% of the cats while fed diet X and in 67% of the cats while fed diet Y, resulting in normal stools (average FS = 3) in 13.3% of cats fed diet X and 46.7% of cats fed diet Y. This study confirms the value of dietary change in the management of chronic diarrhea in cats.

Lalor, S. M., R. J. Mellanby, E. J. Friend, K. L. Bowlt, J. Berry, and D. Gunn-Moore (2012) Transbound Emerg Dis 59:279-281. Domesticated cats with active mycobacteria infections have low serum vitamin D (25(OH)D) concentrations. Vitamin D insufficiency is regularly observed in human patients with tuberculosis but it is unknown if spontaneous mycobacteria infections in other species are associated with suboptimal vitamin D status. Serum 25 hydroxyvitamin D (25(OH)D) concentrations were significantly lower in cats with mycobacteriosis than in healthy cats (P < 0.001).


recorded diagnosis of dyspnea examined at the National Veterinary Schools of Alfort and Toulouse (France) between January 2001 and October 2009. PROCEDURES: Dogs and cats were divided into 2 groups according to the presence or absence of PB. Stratified analysis by species was performed. Signalement of affected animals and occurrence of PB were recorded. The relationship between PB and pleural diseases among dyspneic dogs and cats was analyzed. RESULTS: A strong relationship between PB and pleural diseases was highlighted in multivariate analysis (dogs, OR = 12.6 and 95% confidence interval = 4.6 to 31.2; cats, OR = 14.1 and 95% confidence interval = 6.0 to 33.5). Paradoxical breathing prevalence among dyspneic dogs and cats was 27% and 64%, respectively. Occurrence of pleural diseases in dyspneic animals with and without PB was 49% and 9% in dogs and 66% and 13% in cats, respectively. The sensitivity and specificity of PB as a predictor of pleural diseases were 0.67 and 0.83 in dyspneic dogs and 0.90 and 0.58 in dyspneic cats, respectively. The positive and negative predictive values of PB were 0.49 and 0.91 in dyspneic dogs and 0.66 and 0.87 in dyspneic cats, respectively. Age, sex, feline breeds, and canine morphotypes in patients with PB were not significantly different from those of other dyspneic animals. CONCLUSIONS AND CLINICAL RELEVANCE: PB was strongly associated with pleural diseases in dyspneic dogs and cats. The presence of this clinical sign should prompt small animal practitioners to implement appropriate emergency procedures and guide their diagnostic strategy.


Prognostic factors and a prognostic index for cats with acute kidney injury.

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


Efficacy of Ronidazole for Treatment of Cats Experimentally Infected with a Korean Isolate of Tritrichomonas foetus.

To evaluate the efficacy of ronidazole for treatment of Tritrichomonas foetus infection, 6 Tritrichomonas-free kittens were experimentally infected with a Korean isolate of T. foetus. The experimental infection was confirmed by direct microscopy, culture, and single-tube nested PCR, and all cats demonstrated trophozoites of T. foetus by day 20 post-infection in the feces. From day 30 after the experimentally induced infection, 3 cats were treated with ronidazole (50 mg/kg twice a day for 14 days) and 3 other cats received placebo. Feces from each cat were tested for the presence of T. foetus by direct smear and culture of rectal swab samples using modified Diamond’s medium once a week for 4 weeks. To confirm the culture results, the presence of T. foetus rRNA gene was determined by single-tube nested PCR assay. All 3 cats in the treatment group receiving ronidazole showed negative results for T. foetus infection during 2 weeks of treatment and 4 weeks follow-up by all detection methods used in this study. In contrast, rectal swab samples from cats in the control group were positive for T. foetus continuously throughout the study. The present study indicates that ronidazole is also effective to treat cats infected experimentally with a Korean isolate of T. foetus at a dose of 50 mg/kg twice a day for 14 days.


Feline exocrine pancreatic carcinoma: a retrospective study of 34 cases.

Thirty-four cases were reviewed in this retrospective study for information on clinical presentation, prognostic indicators, survival time and response to various therapies. The most common presenting clinical signs were weight loss, decreased appetite, vomiting, palpable abdominal mass and diarrhea. Metastatic disease was confirmed in 11 cases. The overall median survival was 97 days. The median survival times for patients who received chemotherapy or had their masses surgically removed was 165 days. Those patients who had an abdominal effusion present at the time of diagnosis survived a median of 30 days. Cats that received non-steroidal anti-inflammatory drug therapy had a median survival of 26 days. This study confirms that exocrine pancreatic carcinoma in cats is an aggressive tumour with a high metastatic rate and poor prognosis, although three patients survived over 1 year. Fifteen percent of the patients were diabetic, which raises the question as to what the link between diabetes and pancreatic cancer in people and cats may be.

Prevalence of Toxoplasma gondii, Bartonella species, and haemoplasma infection in cats in South Africa.

Vector-borne agents and Toxoplasma gondii are common in cats with many being zoonotic. The current study investigated the prevalence of selected infectious agents in cats from Johannesburg, South Africa, for which no published data exists. Whole blood and sera were obtained from 102 cats with a variety of disease conditions. Total DNA was extracted from the blood and assayed using PCR techniques for Mycoplasma haemofelis, Candidatus M haemominutum, Candidatus M turicensis, Bartonella species, Ehrlichia species and Anaplasma species. Enzyme-linked immunosorbent assays were used to detect IgG and IgM serum antibodies to T gondii and IgG serum antibodies to Bartonella species. Associations between test results, patient characteristics and haematological values were also evaluated. Overall, 56 cats (55%) were positive in one or more of the assays. Haemoplasma DNA was amplified from 26 cats [M haemofelis: four cats (3.9%); Candidatus M haemominutum from 22 cats (21.6%)] and Bartonella species DNA was amplified from eight cats [Bartonella henselae: five cats (4.9%); Bartonella clarridgeiae: three cats (2.9%)]; DNA of Ehrlichia species or Anaplasma species were not amplified. Of the cats, 24 (23.5%) were seropositive for Bartonella IgG and 18 (17.6%) were positive for T gondii IgM (12 cats), IgG (eight cats), or both (two cats). The study concluded that Bartonella species haemoplasmas and T gondii are common in client-owned cats in the region and the diagnosis of feline vector-borne agents and T gondii is difficult without the use of specific diagnostic tests, as there are minimal patient characteristics or haematological changes that indicate infection.


Complex adnexal tumours of the skin: a report of three cases and review of literature.

AIMS: Complex or composite adnexal tumours of the skin (CATS) are unusual neoplasms composed of two or more histopathologically distinct subtypes of appendageal neoplasms coexisting in a single cutaneous lesion. The authors report three examples of CATS, review literature and discuss their probable histogenesis. METHODS AND RESULTS: Of the three tumours described, one tumour showed a mixture of a proliferating pilar tumour and syringocystadenoma papilliferum, the second lesion was composed of a proliferating pilar tumour and tubulopapillary hidradenoma and the third tumour exhibited a syringocystadenoma papilliferum and tubulopapillary hidradenoma in combination. CONCLUSIONS: CATS are rare tumours. The authors reported three unique cases in addition to the 10 other reported cases. These three cases further strengthen the hypothesis of a ‘folliculoapocrine’ unit as the most likely point of origin of CATS.


Detection of different Leishmania spp. and Trypanosoma cruzi antibodies in cats from the Yucatan Peninsula (Mexico) using an iron superoxide dismutase excreted as antigen.

Although human leishmaniasis has been reported in 20 states in Mexico, no case of leishmaniasis has been reported in cats to date. In the Yucatan Peninsula, it has been found that dogs may act as reservoirs for at least three Leishmania species (Leishmania mexicana, Leishmania braziliensis, and Leishmania panamensis). In this study we identified specific antibodies against these three Leishmania spp. and Trypanosoma cruzi in the sera from 95 cats from two States on the Yucatan Peninsula, namely Quintana Roo and Yucatan, by ELISA and Western blot techniques using whole extract and an iron superoxide dismutase excreted by the parasites as antigens. As well as demonstrating the presence of trypanosomatid antibodies in the feline population on the Yucatan Peninsula, we were also able to confirm the high sensitivity and specificity of the iron superoxide dismutase antigen secreted by them, which may prove to be very useful in epidemiological studies.


Inhibitory effect of sodium hypochlorite and chlorhexidine digluconate in clinical isolates of Sporothrix schenckii.

The susceptibility of Sporothrix schenckii isolates from clinical cases of canine, feline and human sporotrichosis, and from the environment, was evaluated with 4% sodium hypochlorite and 6.6% chlorhexidine digluconate using the broth microdilution, agar diffusion and direct exposure techniques. The minimal inhibitory concentration was smaller than 0.8% for chlorhexidine digluconate and between 8% and 4% for sodium hypochlorite. Inhibition zones were not found in agar diffusion for sodium hypochlorite, and zones averaging 1.9 mm were found for chlorhexidine digluconate. In the direct exposure test, sodium hypochlorite demonstrated best performance at 20 min of contact, as chlorhexidine digluconate presented little antimicrobial activity.


Complex partial orofacial seizures in English cats.

The prevalence of leptospiral antibodies in free roaming cats in Worcester County, Massachusetts.

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


Clinical features and risk factors for development of urinary tract infections in cats.
The clinical and diagnostic features of 155 cats with urinary tract infection (UTI) and 186 controls with negative urine culture/s were characterized retrospectively (signalment, clinical signs, urinalysis, urine culture, concurrent diseases, lower urinary tract diagnostic/therapeutic procedures). Multivariable logistic regression was used to identify risk factors associated with UTI. Cats of all ages were affected by UTI with no sex/breed predisposition. Lower urinary tract signs were absent in 35.5% of cats with UTI. Pyuria and bacteriuria had sensitivities of 52.9% and 72.9%, and specificities of 85.5% and 67.7% for detection of UTI, respectively. Risk factors significantly associated with increased odds of UTI were urinary incontinence (odds ratio (OR) = 10.78, P = 0.0331), transurethral procedures (OR = 8.37, P <0.0001), urogenital surgery (OR = 6.03, P = 0.0385), gastrointestinal disease(OR = 2.62, P = 0.0331), decreased body weight (OR = 0.81, P = 0.0259) and decreased urine specific gravity(OR = 0.78, P = 0.0055). Whilst not independently significant, renal disease and lower urinary tract anatomic abnormalities improved statistical model performance and contributed to UTI.


Serum cobalamin concentrations in cats with gastrointestinal signs: correlation with histopathological findings and duration of clinical signs.
The aims of this study were to investigate the prevalence of hypocobalaminaemia in UK cats presented for referral investigation of gastrointestinal signs and to ascertain whether the duration of clinical signs or severity of disease (based on WSAVA Gastrointestinal Standardization histopathological grading) related to cobalamin concentration. The study population comprised 39 cats, of which 11 (28.2%) had hypocobalaminaemia. Eight of these cats were diagnosed with a single cause of gastrointestinal signs: intestinal inflammation (five); alimentary lymphoma (two); and cholangitis (one). Two or more concurrent diseases were diagnosed in the three remaining cases. Alimentary lymphoma and the most severe grade of histological intestinal inflammation were associated most commonly with concurrent hypocobalaminaemia, but there was no statistically significant correlation between serum cobalamin concentrations and histopathological score or duration of clinical signs.


Response rate and duration associated with a 4Gy 5 fraction palliative radiation protocol.
The purpose of this retrospective study was to determine if 4Gy fractions over 5 consecutive days is an effective and safe palliative radiation protocol for dogs and cats. Eighty patients (22 cats, 58 dogs) with complete follow-up information were evaluated. Overall response rate (ORR) for all patients was 67%. Median progression free survival (MPFS) was 3.3 months and median survival (MST) was 4.2 months. Primary bone tumors were the most common tumors treated. The ORR for primary bone tumors was 66.6%, the MPFS was 3.5 months, and MST was 3 months. The most common tumor treated in cats was oral squamous cell carcinoma and ORR was 54.5 %, the MPFS was 1.8 months, and MST was 3 months. Soft tissue sarcomas were the second most common tumor treated in dogs (10). ORR was 80% and the two other patients had stable disease. MPFS was 5.7 months and MST was 7.9 months. Overall rate of toxicity was 18.4% in 65 sites that were evaluated for toxicity. Acute toxicities were all grade I or II and occurred in 16.9 % of patients evaluated. All late toxicity was grade I alopecia and leukotrichia. There appears to be a comparable response rate for this palliative protocol as compared to others historically. This response was seen over a wide range of tumors. We also documented a low toxicity profile in a shorter overall treatment time, making this protocol more attractive for some clients.


Validation of the TonoVet(R) rebound tonometer in normal and glaucomatous cats.
Objective To validate intraocular pressure (IOP) readings obtained in cats with the TonoVet(R) tonometer. Animals studied IOP readings obtained with the TonoVet((R)) were compared to IOP readings determined by manometry and by the
Tono-Pen XL in 1 normal cat and two glaucomatous cats. TonoVet(R) and Tono-Pen XL readings were also compared in a further six normal and nine glaucomatous cats. Procedures The anterior chambers of both eyes of three anesthetized cats were cannulated and IOP was varied manometrically, first increasing from 5 to 70 mmHg in 5 mmHg increments, then decreasing from 70 to 10 mmHg in 10 mmHg decrements. At each point, two observers obtained three readings each from both eyes, with both the TonoVet(R) and Tono-Pen XL. IOP was measured weekly for 8 weeks with both tonometers in six normal and nine glaucomatous unmedicated cats. Data were analyzed by linear regression. Comparisons between tonometers and observers were made by paired student t-test. Results The TonoVet(R) was significantly more accurate than the Tono-Pen XL (P = 0.001), correlating much more strongly with manometric IOP. In the clinical setting, the Tono-Pen XL underestimated IOP when compared with the TonoVet(R)). Conclusions Both the TonoVet(R)) and Tono-Pen XL provide reproducible IOP measurements in cats; however, the TonoVet(R)) provides readings much closer to the true IOP than the Tono-Pen XL. The TonoVet(R)) is superior in accuracy to the Tono-Pen XL for the detection of ocular hypertension and/or glaucoma in cats in a clinical setting.


**Natural transmission of feline immunodeficiency virus from infected queen to kitten.**

**ABSTRACT:** BACKGROUND: Feline immunodeficiency virus (FIV) is a naturally occurring lentivirus that infects cats. The primary mode of transmission occurs through bite wounds, and other routes are difficult to observe in nature.

**FINDINGS:** The purpose of this study was to evaluate FIV transmission from queen to kitten in a colony of naturally infected stray cats. With this aim, a queen was monitored over a period of three years. A blood sample was taken to amplify and sequence gag, pol and env regions of the virus from the queen, two kittens and other cats from the colony.

**CONCLUSION:** Phylogenetic analysis showed evidence of queen to kitten transmission.


**From problem to success: feline weight loss programs that work.**

**PRACTICAL RELEVANCE:** Obesity is the most common unhealthy nutritional condition that is recognized in cats. Documented associated health risks include diabetes mellitus, lameness, non-allergic skin disease, feline lower urinary tract disease and idiopathic hepatic lipidosis. CLINICAL CHALLENGES: Simply recommending a diet designed for weight loss fails, in most cases, to result in successful weight loss in the obese or overweight cat. A more in-depth approach that centers on communication and commitment, alongside a program of feeding a predetermined amount of a specific diet plus exercise and enrichment of the cat’s life, offers a chance for a healthy result. PATIENT GROUP: It has been reported in some developed countries that as much as 40-50% of the feline population may be overweight or obese, with middle-aged cats, male cats, mixed-breed cats and neutered cats being at greatest risk. AUDIENCE: This review of what is currently known about the health risks, predisposing factors and treatment of excessive weight gain in cats is aimed at all veterinary health professionals. EVIDENCE BASE: The information reported in the review is drawn from the current scientific literature as well as from the clinical experience of the authors.


**Large-scale serosurvey of Besnoitia besnoiti in free-living carnivores in Spain.**

The disease bovine besnoitiosis is responsible for severe economic losses caused by the protozoan Besnoitia besnoiti. The identity of the definitive host (DH) of this parasite has yet to be determined, although it is presumed to be a carnivore. With the aim of advancing in the identification of B. besnoiti DH, a necessary step in implementing control strategies, the contact rate of 205 free-roaming carnivores with this parasite in Spain was studied. The study included 16 wolves (Canis lupus), 41 red foxes (Vulpes vulpes), 21 pine martens (Martes martes), eight stone martens (M. foina), 12 Eurasian badgers (Meles meles), 18 common genets (Genetta genetta), five Egyptian mongooses (Herpestes ichneumon), 28 European wildcats (Felis silvestris silvestris), 43 feral cats (Felis silvestris catus), and 13 other animals belonging to five other species. Serum samples were analysed by an indirect fluorescent antibody test (IFAT) and by two western immunoblots (WB, one with tachyzoite and the other with bradyzoite antigen). Twelve individuals (eight of which were cats) seroconverted by one or other of these techniques but no individual showed seroconversion by IFAT and one of the WBs. The results provided no evidence to support the idea that within the geographical regions covered by the analysis wild carnivores are implicated in the transmission of B. besnoiti in Spain.


**Administration of Fozivudine Tidoxil as a Single-Agent Therapeutic during Acute Feline Immunodeficiency Virus Infection Does Not Alter Chronic Infection.**

Initiating combination antiretroviral therapy (ART) during acute HIV infection has been correlated with decreased viral set point and improved lymphocyte function. However, the long term effects of single-agent therapy administered only during the acute stage of infection (interrupted treatment) remain largely uncharacterized. In this study we provide longitudinal data using the feline immunodeficiency virus (FIV) model for HIV infection. Infected cats were treated with a prophylactic
single-agent therapy, Fozivudine tidoxil (FZD), for six weeks, starting one day before infection. The initial acute infection study, reported elsewhere, demonstrated a decrease in plasma- and cell-associated viremia at two weeks post-infection (PI) in FZD-treated cats as compared to placebo-treated cats. We hypothesized that this early alteration in plasma- and cell-associated viremia would alter the virus set point and ultimately affect the outcome of chronic infection. Here we provide data at one, two and three years PI for plasma- and/or cell-associated viremia, total lymphocyte counts and CD4:CD8 ratios. There was no difference in viremia or cell counts between treated and nontreated groups at all time points tested. Contrary to our hypothesis, these results suggest that treatment with a single agent anti-retroviral drug during acute lentivirus infection does not significantly alter viral load and immune function during the chronic, asymptomatic stage of infection.


Feline gastrointestinal microbiota.
The close relationship between gastrointestinal (GI) microbiota and its host has an impact on the health status of an animal that reaches beyond the GI tract. A balanced microbiome stimulates the immune system, aids in the competitive exclusion of transient pathogens and provides nutritional benefits to the host. With recent rapid advances in high-throughput sequencing technology, molecular approaches have become the routinely used tools for ecological studies of the feline microbiome, and have revealed a highly diverse and complex intestinal ecosystem in the feline GI tract. The major bacterial groups are similar to those found in other mammals, with Firmicutes, Bacteroidetes, Actinobacteria and Proteobacteria constituting more than 99% of intestinal microbiota. Several nutritional studies have demonstrated that the feline microbiota can be modulated by the amount of soluble fibers (i.e., prebiotics) and macronutrients (i.e., protein content) in the diet. Initial clinical studies have suggested the presence of a dysbiosis in feline inflammatory bowel disease (IBD). Recently, metagenomic approaches have attempted to characterize the microbial gene pool. However, more studies are needed to describe the phylogenetic and functional changes in the intestinal microbiome in disease states and in response to environmental and dietary modulations. This paper reviews recent studies cataloging the microbial phylotypes in the GI tract of cats.


Pharmacokinetics of the low molecular weight heparin dalteparin in cats.
Low molecular weight heparin (LMWH) is used as an anticoagulant in cats although only limited pharmacokinetic data are available in this species. The aim of the present study was to establish the pharmacokinetics of dalteparin in cats based on anti-FXa heparin activities. Groups of clinically healthy cats (six animals per treatment) received individual LMWH injections at three different doses intravenously (IV) (25, 50, 100 anti-factor Xa international units [IU anti-FXa]/kg) or subcutaneously (SC) (50, 100, 200 IU anti-FXa/kg). Blood samples were collected before and at various times after injection. Anti-FXa activity was measured with a chromogenic substrate test. Following IV injection, maximum plasma heparin activities (C(max)) were 0.67 +/- 0.14, 1.44 +/- 0.22 and 2.87 +/- 0.38 IU anti-FXa/mL, respectively. The calculated mean half-life (t(1/2)) was between 39 and 57 min and was not significantly dose-dependent (P=0.139). The volume of distribution (35-39 mL/kg) was almost equivalent to the plasma volume. After SC injection, C(max) values of 0.41 +/- 0.10, 0.86 +/- 0.17 or 1.91 +/- 0.16 IU anti-FXa/mL, respectively, were calculated at 91-110 min post-injection. The t((1/2)) values were between 106 and 122 min and were not significantly influenced by dose (P=0.784). The bioavailability after SC injection was approximately 100%. The high bioavailability of the SC administered LMWH dalteparin in cats was consistent with other species and indicated predictable blood levels. However, the comparatively short t((1/2)) may indicate the necessity of multiple daily injections, which should be verified in clinical trials.


Pharmacological Inhibition of Feline Immunodeficiency Virus (FIV).
Feline immunodeficiency virus (FIV) is a member of the retroviridae family of viruses and causes an acquired immunodeficiency syndrome (AIDS) in domestic and non-domestic cats worldwide. Genome organization of FIV and clinical characteristics of the disease caused by the virus are similar to those of human immunodeficiency virus (HIV). Both viruses infect T lymphocytes, monocytes and macrophages, and their replication cycle in infected cells is analogous. Due to marked similarity in genomic organization, virus structure, virus replication and disease pathogenesis of FIV and HIV, infection of cats with FIV is a useful tool to study and develop novel drugs and vaccines for HIV. Anti-retroviral drugs studied extensively in HIV infection have targeted different steps of the virus replication cycle: (1) inhibition of virus entry into susceptible cells at the level of attachment to host cell surface receptors and co-receptors; (2) inhibition of fusion of the virus membrane with the cell membrane; (3) blockade of reverse transcription of viral genomic RNA; (4) interruption of nuclear translocation and viral DNA integration into host genomes; (5) prevention of viral transcript processing and nuclear export; and (6) inhibition of virion assembly and maturation. Despite much success of anti-retroviral therapy slowing disease progression in people, similar therapy has not been thoroughly investigated in cats. In this article we review current pharmacological approaches and novel targets for anti-lentiviral therapy, and critically assess potentially suitable applications against FIV infection in cats.

**Spontaneous pneumothorax in 35 cats (2001-2010).**
Thirty-five cases of spontaneous pneumothorax were reviewed. In contrast to dogs, cats with an established etiology all had spontaneous pneumothorax associated with lung disease. Underlying diseases identified in affected cats included inflammatory airway disease, neoplasia, heartworm infection, pulmonary abscess and lungworm infection. Many cats were managed successfully with observation alone or needle thoracocentesis and specific therapy for their primary lung disease. Cats who present with spontaneous pneumothorax may be treated successfully with non-surgical therapies and appear to have a better prognosis than previously extrapolated from canine studies.


**Potential for pet animals to harbour methicillin-resistant Staphylococcus aureus when residing with human MRSA patients.**
Colonization by methicillin-resistant Staphylococcus aureus (MRSA) may be persistent in people and is horizontally transmissible. The scientific literature suggests that domestic pets may also participate in cross-transmission of MRSA within households. The objectives of this study were to evaluate the prevalence of and risk factors for MRSA carriage by pets residing in households with an MRSA-infected person. From 66 households in which an MRSA-infected patient resided, we screened 47 dogs and 52 cats using a swab protocol. Isolates from pets and humans were genotyped using two techniques and compared for concordance. Human participants completed a 22-question survey of demographic and epidemiologic data relevant to staphylococcal transmission. Eleven of 99 pets (11.5%) representing 9 (13.6%) of households were MRSA-positive, but in only six of these households were the human and animal-source strains genetically concordant. Human infection by strain USA 100 was significantly associated with pet carriage [OR = 11.4 (95% CI 1.7, 76.9); \( P = 0.013 \)]. Yet, for each day of delay in sampling the pet after the person’s MRSA diagnosis, the odds of isolating any type of MRSA from the pet decreased by 13.9% [(95% CI 2.6, 23.8); \( P = 0.017 \)]. It may be concluded that pets can harbour pandemic strains of MRSA while residing in a household with an infected person. However, the source of MRSA to the pet cannot always be attributed to the human patient. Moreover, the rapid attrition of the odds of obtaining a positive culture from pets over time suggests that MRSA carriage may be fleeting.


**Therapeutic efficacy of milbemycin oxime/praziquantel oral formulation (Milbemax(R)) against Thelazia callipaeda in naturally infested dogs and cats.**
BACKGROUND: Over the last few decades, canine and feline thelaziosis caused by Thelazia callipaeda eye worms has gained the attention of the veterinary community due to the spread of this ocular infestation in geographical areas previously regarded as non endemic. The therapeutic efficacy of milbemycin oxime/praziquantel tablets (Milbemax(R)) against T. callipaeda was tested in naturally infested dogs and cats. METHODS: From January 2009 to July 2011 a placebo controlled and randomized field study was conducted in T. callipaeda endemic areas of Switzerland (CH) and Italy (ITA) involving client-owned animals. Dogs (n = 56) and cats (n = 31) were physically examined at enrolment Day 0 (D0) and twice afterwards (D7 and D14). Infested animals were orally treated with Milbemax(R) or with placebo tablets on D0 and, if an animal was found still infested with T. callipaeda, also on D7. On D14 nematodes were flushed from the conjunctiva, identified and counted. RESULTS: Out of 56 dogs, 43 were included in the statistical analysis, whereas 13 were excluded because the products under investigation were not administered with food, as required by the label. On D7 and D14, 72.7% and 90.9% of treated dogs were eye worm free, whereas in the placebo group 95.2% and 76.2% still harbored nematodes, resulting in a mean percentage worm count reduction for the Milbemax(R) group of 86.1% and 96.8%, respectively. Both results were significantly higher (p = 0.0001) than the placebo group. Out of the 31 cats included in the study at D7 and D14, 53.3% and 73.3% treated with Milbemax(R) were free of T. callipaeda, while 81.3% and 73.3 in the placebo group were still harbouring eye worms, resulting in a mean percentage worm count reduction for the treated group of 62.2% and 80.0%, respectively. Both results were significantly higher (p = 0.0106 and p = 0.0043) than the placebo group. CONCLUSIONS: The commercial formulation of milbemycin oxime at the minimal dose of 0.5 mg/kg and 2 mg/k in dogs and cats, respectively, showed a high therapeutic efficacy in curing T. callipaeda infestations. The advantages of an oral application are additionally increased by the large spectrum of activity of praziquantel and milbemycin oxime against Cestodes and Nematodes infesting dogs and cats.


**Canine and feline intracranial meningiomas: an updated review.**
Meningiomas are the most common primary brain tumours in dogs and cats. There are several morphological phenotypes of this extra-axial neoplasm and they show predilections for certain anatomical locations. There have been a number of
The Presence of p16CDKN2A Protein Immunostaining Within Feline Nasal Planum Squamous Cell Carcinomas Is Associated With an Increased Survival Time and the Presence of Papillomaviral DNA.
In humans, oral SCCs are either caused by papillomavirus (PV) infection or by other carcinogens such as tobacco. As these 2 groups of SCCs have different causes they also have different clinical behaviors. Immunostaining using anti-p16(CDKN2A) protein (p16) antibodies is used to indicate a PV etiology in human oral SCCs and p16-positive SCCs have a more favorable prognosis. The present study investigated whether p16 immunostaining within feline nasal planum SCCs was similarly associated with the presence of PV DNA and with a longer survival time. Intense p16 immunostaining was visible in 32 of 51 (63%) SCCs. In 30 cats with nonexcised SCCs, cats with p16-positive neoplasms had a longer estimated mean survival time (643 days) than cats with p16-negative SCCs (217 days, P = .013). Papillomavirus DNA was amplified more frequently from p16-positive nasal planum SCCs (28 of 32) than p16-negative SCCs (5 of 19, P < .001). The different survival times in cats with p16-positive and p16-negative SCCs suggests that p16 could be a useful prognostic indicator in these common feline cancers. As the clinical behavior of the SCCs can be subdivided using p16 immunostaining, the 2 groups of SCCs may be caused by different factors, supporting a PV etiology in a proportion of feline nasal planum SCCs.

Proportion of pet cats registered with a veterinary practice and factors influencing registration in the UK.
Registration of a cat with a veterinary practice is likely to be a critical factor for access to key preventative medicine. A cross-sectional study was conducted to collect data in the United Kingdom on the registration status of cats and potential explanatory variables. These data were also used to identify potential sources of bias associated with selecting controls from veterinary registered populations of cats due to differences between registered and unregistered cats. Cat owners reported that 13.6% (84/616) of their cats had not been registered with a veterinary practice since living at their current address. Multivariable logistic regression indicated that unregistered cats were significantly more likely than registered cats to be entire, to have not been vaccinated within the previous year, to be living in households in Northern Ireland and in households with an annual income < £10,000.(1) Whilst the neuter status and the vaccination status of the cat are likely to result from non-registration, the household location and annual income are factors that can be used to inform future interventions designed to increase the proportion of veterinary registered cats.

Sedative effects of dexmedetomidine, dexmedetomidine-pethidine and dexmedetomidine-butorphanol in cats.
Nagore, L., Soler, C., Gil, L., Serra, I., Soler, G., Redondo, J. I. Sedative effects of dexmedetomidine, dexmedetomidine-pethidine and dexmedetomidine-butorphanol in cats. J. vet. Pharmacol. Therap. doi: 10.1111/j.1365-2885.2012.01405.x. The purpose of this study was to assess the clinical effects of dexmedetomidine, both alone and combined with pethidine or butorphanol, in cats. A prospective randomized blind study was performed. Thirty cats were randomly assigned to three groups of 10 animals: D: dexmedetomidine (20 μg/kg IM); DP: dexmedetomidine (10 μg/kg IM) and pethidine (2.5 mg/kg IM); DB: dexmedetomidine (10 μg/kg IM) and butorphanol (0.4 mg/kg IM). Quality of sedation, analgesia, muscle relaxation and the possibility of performing some clinical procedures were compared using a multifactorial scale. Sedation, analgesia and muscle relaxation increased progressively over time and did not differ in the three protocols. The three protocols facilitated the completion of several clinical procedures. The clinical variables studied showed a similar behaviour in the three protocols and remained close to the baseline, except for a drop in heart rate in protocol D. In conclusion, dexmedetomidine, either alone or combined with pethidine or butorphanol, offers suitable sedation, analgesia and relaxation to perform various clinical procedures in cats.

Feline intestinal parasites in Finland: prevalence, risk factors and anthelmintic treatment practices.
The aim of this study was to estimate the prevalence of feline intestinal parasites in Finland and to determine the possible risk factors for infection. Altogether 411 feline fecal samples were analyzed with a flotation method to reveal helmhinch eggs and protozoan oocysts. Of the samples, 402 were also screened for Giardia species antigens with a commercial enzyme-
linked immunosorbent assay kit. The cat owners completed a questionnaire. Toxocara cati prevalence was 5.4% and Toxascaris leonina 0.2%. Taenia species eggs were found in 1.5% of the samples and Isospora felis in 0.7%, whilst 3.2% of the samples tested positive for Giardia species antigen. Risk factors for Toxocara/Toxascaris species infection included being a non-pedigree cat, having access to the outdoors, living outside of the cities and receiving home-made food. Pedigree cats were at greater risk of contracting Giardia duodenalis. The majority of the cat owners (62.4%) treated their cat with anthelmintics 2-4 times per year.

Double-J ureteral stenting in nine cats with ureteral obstruction.
Ureteral stenting is a common practice in human medicine and has recently been reported in dogs and cats to provide urinary diversion for ureteral obstructions caused by ureteroliths, strictures, neoplasia, and in an attempt to prevent postoperative complications following ureteral anastomosis. The aim of this report is to describe a surgical technique of ureteral stenting and the follow-up and complications in nine cats. Number 3 French double-J catheters were used during open surgery for ureterotomy/ureterolith removal in eight cats and for segmental ureterectomy/end-to-end anastomosis in one cat for a localized benign stricture. Neoureterocystostomy was necessary in eight of the cats. Uroperitoneum did not occur. Stents were still in place in 7/9 animals after 357-1565 days (median 1277 days). A minor complication (sten migration) occurred in one cat, but stent removal was not required. Major complications were encrustation and persistent stranguria (in one cat each), requiring stent removal at 90 and 123 days, respectively. The first cat had a new stent inserted but was euthanased 3 months later for progressive renal failure. Despite the small number of cats, both the outcome and long-term stent tolerance observed in most cases suggest that ureteral stenting is a safe, adjunctive measure to ureteral surgery, mainly for concomitant ureteral and renal pelvic stones to prevent further obstruction and avoid pyelotomy/nephrotomy. However, smaller stents should be used to decrease the need for ureteral surgery.

Macro cyclic lactones in the treatment and control of parasitism in small companion animals.
Macro cyclic lactones (MLs) have many anti-parasitic applications in small companion animal medicine. They were first developed as chemoprophylactics against heartworm (Dirofilaria immitis) infection to be applied monthly for retroactive killing of third- and fourth-stage larvae. ML-containing products formulated for oral (ivermectin, milbemycin oxime), topical (selamectin, moxidectin) or injectable sustained release (moxidectin, ivermectin) are approved for heartworm prevention in dogs or cats. Clearance of microfilariae and gradual or “soft” killing of adult heartworms constitute increasingly prevalent extra-label uses of MLs against D. immitis. Some commercial ML formulations contain sufficient levels of active ingredient (milbemycin oxime, selamectin, moxidectin) to support additional label claims against gastrointestinal nematode parasites such as hookworms (Ancylostoma spp.) and ascarid round worms (Toxocara spp. and Toxascaris leonina). Beyond these approved applications, safe, extra-label uses of MLs against nematodes parasitizing the urinary tract, such as Capillaria spp., and parasites of the tissues, such as Dipetalonema reconditum, Dirofilaria repens, Thelazia spp. and Spiricercus lupi, in dogs and cats as well as exotic pets have been reported. MLs as a group have intrinsic insecticidal and acaricidal activity, and topical or oral formulations of certain compounds (selamectin, moxidectin, milbemycin oxime or ivermectin) are approved for treatment and control of fleas, certain ixodid ticks, sarcoptiform and demodecictic mange mites and psoroptiform ear mites. Extra-label applications of MLs against ectoparasites include notoedric mange mites, demanysiid s such as Omythousus bacoti, numerous species of fur mite (e.g. Cheyletiella spp. and Lynxacarus) and trombiculids (“chiggers”) in cats, dogs and nontraditional or exotic pets.

Humoral immune response to a recombinant hemoplasma antigen in experimental ‘Candidatus Mycoplasma turicensis’ infection.
‘Candidatus Mycoplasma turicensis’ is a feline hemoplasma species that was isolated in a cat with hemolytic anemia. PCR has been widely used to investigate and diagnose ‘Candidatus Mycoplasma turicensis’ infection, but so far, little is known about the humoral immune response in infected cats. Recently, enzyme-linked immunosorbent assays (ELISA) were developed to monitor anti-feline hemoplasma antibodies. The aim of the present study was to investigate the humoral immune response in cats experimentally infected with ‘Candidatus Mycoplasma turicensis’ and to monitor the influence of the pre-administration of methylprednisolone and subsequent antibiotic treatment. Serum and plasma samples from 15 specified pathogen-free cats infected with ‘Candidatus Mycoplasma turicensis’ were analyzed by ELISA. Seroconversion was demonstrated in all cats, and the antibodies remained detectable until the end of the study (up to 100 weeks post-exposure). In some cats, the ELISA seemed more sensitive and better able to demonstrate exposure to ‘Candidatus Mycoplasma turicensis’ than PCR. The peak antibody level occurred after the peak of the bacterial blood loads. The methylprednisolone administrations were associated with increased antibody levels, while antibiotic treatment, particularly with doxycycline, resulted in a decrease in antibody levels. Additionally, preliminary data indicated that three of four seropositive cats were protected from bacteremia after a subsequent challenge. In conclusion, the ELISA was found to be a
**Reversible suppression of sexual activity in tomcats with deslorelin implant.**

The aim of the study was to assess the efficacy of using a Gn-RH agonist implant (deslorelin, 4.7 mg, Suprelorin) to control sexual activity of male cats and reestablishment of sexual function after the implant removal 4 mo after placement. Using a control group (Group 1, \( n = 5 \)), 22 domestic tomcats were given the implant subcutaneously in the region of the right shoulder blade and were then divided into two treatment groups. Animals in Group 2 (\( n = 14 \)) were observed from the date of implant surgery and the observation lasted for 4 mo. In Group 3 (\( n = 8 \)) all animals were monitored from the date of implant surgery. Then, after 4 mo, all implants were removed and the toms were observed for a further 4 mo. In all animals during their first visit and then in 1-mo intervals, changes in testosterone concentrations were assessed before (T0) and 4 h after (T4) human chorionic gonadotropin (HCG) administration and testis size was measured. In all toms, semen collection was performed, using an electroejaculator, in the course of the first visit and then in 2-mo intervals or at the end of observation. Total sperm count was determined in each semen sample. Two to four animals were castrated at weeks 4, 8, 12, 16, 20, 24, 28 and 32 and histologic assessment of the testes was performed. By evaluation of 200 cross sections of seminiferous tubules, the degree of spermatogenic suppression was assessed and animals in Groups 2 and 3 were assigned into groups according to most tubules with the most developed germ cell observed: G1, spermatocytes; G2, round spermatids; G3, elongating spermatids and G4, elongated spermatids. The mean area of Leydig-cell nuclei was calculated. In animals in Group 2, suppression after implant insertion was monitored. T4 concentrations, testis size, and total sperm count gradually decreased (\( P < 0.01; P < 0.01; \) and \( P < 0.05 \), respectively) within 4 mo after implantation. Histologic evaluation showed a high individual variation in the degree of suppression of spermatogenesis. In animals in Group 3, the implant was removed 4 mo after insertion and the return of sexual activity was monitored. Within 4 mo, T4 concentration and total sperm count increased to the physiological values of intact toms. Testes gradually increased in size and within 4 mo of implant removal almost reached pretreatment size. According to histologic evaluation of the seminiferous tubules, as early as 1 mo after implant removal, all animals were assigned to G4, with most tubules containing elongated spermatids as the most developed germ cells. Treatment with the long-term subcutaneous Gn-RH agonist implant was well tolerated and no adverse treatment-related effects were noted. These results demonstrated efficacy of 4.7 mg deslorelin implant (Suprelorin) with high variability of the effect onset in toms. Furthermore, the study revealed a strong need for complex examination, including testis size measurement, monitoring of hormonal changes, spermatological analysis and histologic evaluation, to declare the animal infertile. After the implant removal, all observed parameters confirmed the reversibility of the method and gradual return of sexual activity in toms.


**Computed tomographic features of feline nasopharyngeal polyps.**

The computed tomographic (CT) findings of histopathologically confirmed nasopharyngeal polyps are described in 13 cats. Most polyps were mildly hypodense to adjacent muscles and isodense to soft-tissue (\( n = 13 \)), homogeneous (\( n = 12 \)) and with ill-defined borders (\( n = 10 \)) on precontrast images. After contrast medium administration, the polyps were homogeneous (\( n = 11 \)), with well-defined borders (\( n = 13 \)), oval (\( n = 13 \)), and had rim enhancement (\( n = 13 \)). Nasopharyngeal polyps were pedunculated in 11 cats with a stalk-like structure connecting the polyp through the auditory tube to an affected tympanic bulla. All cats had at least one tympanic bulla severely affected, with CT images identifying: (1) complete (\( n = 12 \)) or partial (\( n = 1 \)) obliteration of either the dorsal or ventral compartments with soft-tissue attenuating material; (2) pathologic expansion (\( n = 13 \)) with wall thickening (\( n = 10 \)) that was asymmetric in nine cats; and (3) identification of a polyp-associated stalk-like structure (\( n = 11 \)). Nine cats had unilateral tympanic bulla disease ipsilateral to the polyp, and four cats had bilateral tympanic bulla disease, most severe ipsilateral to the polyp with milder contralateral pathologic changes. Two cats had minimal osteolysis of the tympanic bulla. Enlargement of the medial retropharyngeal lymph node was seen commonly (\( n = 8 \)), and in all cats it was ipsilateral to the most affected tympanic bulla. One cat had bilateral lymphadenopathy. CT is an excellent imaging tool for the supportive diagnosis of nasopharyngeal polyps in cats. CT findings of a well-defined mass with strong rim enhancement, mass-associated stalk-like structure, and asymmetric tympanic bulla wall thickening with pathologic expansion of the tympanic bullae are highly indicative of an inflammatory polyp.


**Seroprevalence and risk factors for Toxoplasma gondii infection in domestic cats in The Netherlands.**

Cats, as definitive hosts, play an important role in the transmission of Toxoplasma gondii. To determine the seroprevalence and risk factors for T. gondii infection in Dutch domestic cats, serum samples of 450 cats were tested for T. gondii antibodies by indirect ELISA. Binary mixture analysis was used to estimate the seroprevalence, the optimal cut-off value...
and the probability of being positive for each cat. The seroprevalence was estimated at 18.2% (95% CI: 16.6-20.0%) and showed a decrease with age in very young cats, an increase up to about 4 years old and ranged between 20 and 30% thereafter. Hunting (OR 4.1), presence of a dog in the household (OR 2.1), former stray cat (OR 3.3) and feeding of raw meat (OR 2.7) were identified as risk factors by multivariable logistic regression analysis. Prevalence differences were estimated by linear regression on the probabilities of being positive and used to calculate the population attributable fractions for each risk factor. Hunting contributed most to the T. gondii seroprevalence in the sampled population (35%).


Common lesions in the female reproductive tract of dogs and cats.
Reproductive lesions are commonly seen in small animal practice. Lesions in the ovaries, uterus, and vagina may seriously influence normal reproductive capacity of dogs and cats and may put at risk the general health of the patients. The objective of this article is to give the veterinary practitioner a current and concise guide to the clinical signs, intraoperative changes, diagnosis, and treatment/management of lesions in the reproductive tract of the bitch and queen commonly seen in practice.


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

An internet survey of breeders’ and cat rescue organisation’s opinions about early castration of cats.
There has been concern that early castration of pedigree kittens may lead to a depletion of gene pools. Web-based questionnaires on early castration were distributed to breeders and cat rescue organisations. One of the reasons that breeders used early castration was to counteract what they considered irresponsible breeding, such as overuse of strains within the breed or production of cross-breeds. Of all pedigree kittens, 45.1% were kept intact while 54.9% were neutered before re-homing. Nineteen (65.5%) of the cat rescue organisations believed that early castration could be beneficial in reducing the number of homeless cats, but only six had applied early castration (20.6%). Three organisations replied that their veterinarian declined to do early castration and two believed that it was not safe for the kittens. There does not, necessarily, seem to be conflicting interests between keeping genetic variation in pedigree breeds and the possibility of limiting the population of homeless cats.

A preliminary study of changes in tear film proteins in the feline eye following nictitating membrane removal.
OBJECTIVE: To investigate the influence of nictitating membrane (third eyelid) removal on selected proteins in feline tears. ANIMAL STUDIED: Domestic short-haired cats (7-17 months; 2.6-5.2 kg) were used. PROCEDURES: Eye-flush tears were collected periodically for up to 18 weeks from both eyes of animals with nictitating membranes removed, but nictitating gland left intact, (n = 4) or with nictitating membranes intact (n = 4). Tear comparisons were based on total protein content (TPC) using micro bicinchoninic acid assay, immunoglobulin A (IgA), and matrix-metalloproteinase (MMP)-9 measurements using sandwich enzyme-linked immunosorbent assay (ELISA) and tear gelatinase activity using gelatin zymography. Expression of MMP-2 and -9 in nictitating membranes removed at baseline (week 0) and eyes collected at 18 weeks were also investigated in histological sections using immunoperoxidase for visualization. RESULTS: Nictitating membrane removal did not significantly change TPC and MMP-9 in tears within the first 4 weeks. MMP-9 was not detected by ELISA in tears from eyes without nictitating membranes from week 5 onwards. IgA (%IgA of TPC) data varied between animals. Gelatin zymography showed increased MMP-2 and -9 activity in tears from eyes without nictitating membranes at week 1 and a decrease following week 2 post-surgery. MMP-2 and -9 were immunolocalised to conjunctival goblet cells of removed nictitating membranes and to the conjunctival epithelium, respectively. After 18 weeks,
the distribution of MMPs in tissue was comparable between eyes with and without nictitating membranes.

CONCLUSIONS: Based on this preliminary study, nictitating membrane removal appeared to cause long-term changes in expression of tear proteins, including reduced MMP-9 expression.


**Feline parathyroid hormone: validation of hormonal assays and dynamics of secretion.**

Validated assays for quantification of intact parathyroid hormone (I-PTH) are no longer available. Moreover, the third-generation PTH assay that only detects the whole PTH molecule (W-PTH) has never been tested in cats. The work presented here is aimed to validate a commercially available assay for measurement of I-PTH and W-PTH in cats and to study the dynamics of PTH secretion in healthy cats. Our results show that both assays are reliable for the measurement of feline PTH. In healthy adult cats W-PTH concentration (15.1 +/- 1.6 pg/mL) was greater (P < 0.001) than I-PTH concentration (9.1 +/- 0.7 pg/mL). The dynamics of PTH secretion in response to changes in extracellular calcium (Ca(2+)) were investigated in 13 cats by studying PTH-Ca(2+) curves. PTH-Ca(2+) curves were obtained by intravenous infusion of disodium ethylenediaminetetraacetic acid and CaCl(2). PTH was measured using both I-PTH and W-PTH assays. During hypocalcemia a sigmoidal curve that was similar when measured with I-PTH or W-PTH was obtained. The maximal PTH concentration in response to hypocalcemia was greater with W-PTH (179.6 +/- 41.9 pg/mL) than with I-PTH (67.6 +/- 10.5 pg/mL; P = 0.01). However, hypercalcemia resulted in an equivalent PTH inhibition, with both assays yielding PTH concentrations as follows: W-PTH = 4.0 +/- 0.4 pg/mL and I-PTH = 4.9 +/- 0.3 pg/mL (NS). Parameters of the feline PTH-Ca(2+) curve are similar to what has been previously reported in dogs.


**Neonatal gene therapy with a gamma retroviral vector in mucopolysaccharidosis VI cats.**

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


**Toggle rod stabilisation of coxofemoral luxation in 14 cats.**

OBJECTIVES: To describe the surgical technique and to report outcomes in cats with coxofemoral luxation treated with open reduction and toggle rod stabilisation. METHODS: Retrospective study of cats with coxofemoral luxation stabilised via the toggle rod method. Short-term follow-up included clinical examination and radiographs. Long-term follow-up was via owner questionnaire. RESULTS: Fourteen cats were included. All of the cats had reported unilateral craniodorsal hip luxation. Nine cats (64.3%) had additional orthopaedic injuries. Luxations were stabilised with a 3.2-mm toggle rod (2.7-mm toggle rod in one cat) and two loops of four-metric polydioxanone (five-metric polydioxanone in one cat and three loops of four-metric polydioxanone in two cats). Success rate, in terms of maintenance of reduction, was 86%. Reluxation occurred in two cats (14%), both of which had multiple limb injuries. Eleven owner questionnaires (mean follow-up time 15.5 months) reported a functional outcome of “very good” to “excellent”. Although the diameter of the pelvic canal was reduced by the presence of the toggle rod (mean narrowing 16.2%), none of the cats had defaecatory issues. CLINICAL SIGNIFICANCE: Toggle rod stabilisation is an effective method for the treatment of coxofemoral luxation in cats. Injuries to multiple limbs may be a risk factor for reluxation.


**Mycoplasma species in cats with lower airway disease: improved detection and species identification using a polymerase chain reaction assay.**

There is some evidence that Mycoplasma species may be associated with lower airway disease in cats. Retrospective and prospective studies were carried out on a total population of 76 cats but failed to identify any cases of Mycoplasma species.
infection by bacterial culture alone. The overall prevalence of bacterial infection (15.8%) was also lower than that identified in previous studies. When a molecular detection technique, the PCR-DGGE, was employed the prevalence of Mycoplasma species detected was 15.4%, with M felis, M gateae and M feliminutum species identified, although the significance of these Mycoplasma species in feline lower airway disease remains in question. However, the PCR-DGGE technique allowed species identification and indicated the presence of M feliminutum, a species not previously isolated from the lower airways of cats.

**Nasopharyngeal disease in cats: 2. Specific conditions and their management.**  
**PRACTICAL RELEVANCE:** Nasopharyngeal disease is a common presenting problem in feline medicine. **CLINICAL CHALLENGES:** The management of feline nasopharyngeal disease can be challenging at a number of levels. In many cases, a specific diagnosis may remain elusive. Some conditions may not be curable so owners need to understand the requirement for long-term management. In addition, treatment may be compromised by poor patient compliance. **AUDIENCE:** This review, which is directed at any clinicians involved in the management of cats with nasopharyngeal disease, discusses acute rhinitis (cat ‘flu) and a variety of conditions causing chronic rhinosinusitis/chronic nasopharyngeal disease. The intention is to assist treatment decision making by reviewing the most appropriate therapies from the options available for these patients. **EVIDENCE BASE:** The information presented in this article is based on peer-reviewed publications and the clinical experience of the authors.

**Nasopharyngeal disease in cats: 1. Diagnostic investigation.**  
**PRACTICAL RELEVANCE:** Nasal discharge, sneezing and upper respiratory noise are frequent presenting signs in feline practice. **CLINICAL CHALLENGES:** The small nasal cavity of the cat can make visualisation of lesions challenging. In addition, investigations may identify only secondary complications of a disease process, rather than the initial aetiological agent. **GLOBAL IMPORTANCE:** Nasopharyngeal disease is a worldwide problem. However, fungal disease shows regional variations in prevalence. **AUDIENCE:** This review, aimed at general practitioners as well as those undertaking more specialist investigations in feline respiratory disease, aims to provide practical guidance on the approach necessary to obtain a diagnosis in cats with nasopharyngeal disease. It should also help to explain why a specific diagnosis may not always be possible. **EQUIPMENT:** While access to endoscopy and computed tomography is advantageous, extensive information can be gained from equipment readily available in all practices. **EVIDENCE BASE:** The information presented in this article is based on peer-reviewed publications and the clinical experience of the authors.

**Beneficial cross-protection of allergen-specific immunotherapy on airway eosinophilia using unrelated or a partial repertoire of allergen(s) implicated in experimental feline asthma.**  
The study hypothesis was that in experimentally asthmatic cats rush immunotherapy (RIT) using allergens not completely matched with sensitizing allergen(s) would at least partially attenuate the asthmatic phenotype and modulate the aberrant immune response. In phase I, cats sensitized to Bermuda grass allergen (BGA), house dust mite allergen (HDMA) or placebo received BGA RIT. In phase II, cats dually sensitized to BGA and HDMA received RIT using BGA, HDMA or placebo. Efficacy of RIT was assessed using percentage bronchoalveolar lavage fluid (BALF) eosinophils. Additionally, a variety of immunologic assays were performed. Eosinophilic airway inflammation significantly decreased over time in asthmatic cats given RIT using sensitizing allergen or unrelated allergen (P<0.001). In dually sensitized cats, single allergen RIT but not placebo reduced airway eosinophilia (P=0.038). Differences in allergen-specific lymphocyte proliferation, in the number of IL-10 producing cells and in the percentage T regulatory cells were detected between asthmatic cats getting RIT and controls. Cross-protection manifested by reduced airway eosinophilia was noted in cats treated with RIT allergens which did not completely match allergen used in asthma induction. However, the mechanism of immunologic tolerance may differ when improperly matched allergens to the sensitizing allergens are used in RIT.

**Flow cytometric determination of allergen-specific T lymphocyte proliferation from whole blood in experimentally asthmatic cats.**  
The ability to quantify feline lymphocyte proliferation, especially to specific antigen or allergen, would be valuable in experimental models and naturally developing disease where activated lymphocytes drive immune responses. Traditional proliferation assays may pose radioactivity hazards, lack the ability to distinguish viable from non-viable cells, and cannot discriminate individual populations of proliferating lymphocytes (e.g., the CD4+ T cell class). We hypothesized that in an experimental model of feline allergic asthma a four-color flow cytometric assay capable of simultaneously detecting division, viability and cell surface markers (pan T cell marker CD5 or CD4) would allow characterization of lymphocytes stimulated ex vivo using the sensitizing allergen, Bermuda grass (BGA). Peripheral blood mononuclear cells were harvested
from eight experimentally asthmatic cats to validate and optimize use of a cell proliferation dye or bromodeoxyuridine (BrdU) with BGA-specific stimulation in a lymphocyte proliferation flow cytometric assay. Only the latter reagent was suitable in the cat. After a 3 day incubation, antibodies with different fluorochromes were used to identify BrdU, viable cells, CD5 and CD4 for subsequent flow cytometric analysis. In asthmatic cats, the group mean+/−SEM of proliferating CD5+ lymphocytes was 2.3+/−0.5%. The group mean+/−SEM of proliferating CD4+ lymphocytes was 1.2+/−0.3%. Flow cytometry is a sensitive method for detecting simultaneous proliferation and viability of very minor populations of allergen-specific lymphocytes in experimentally asthmatic cats.


Feline histoplasmosis: Fluconazole therapy and identification of potential sources of Histoplasma species exposure.

Feline histoplasmosis is a systemic fungal infection often treated with itraconazole, which can be cost-prohibitive for some clients. Additionally, although the clinical disease in cats has been documented, sources of Histoplasma species spore exposure in cats have yet to be thoroughly investigated. The objectives of this study were to compare the outcomes of cats with histoplasmosis treated with fluconazole to those treated with itraconazole, and to evaluate possible sources of exposure for affected cats. Medical records from feline patients with confirmed histoplasmosis (n = 32) at Kansas State University were systematically reviewed and follow-up was performed by owner telephone interview. Cats treated with fluconazole (n = 17) had similar mortality and recrudescence rates when compared with cats treated with itraconazole (n = 15). Thus, fluconazole may be a viable alternative therapy for the treatment of feline histoplasmosis. Eleven cats were housed strictly indoors and possible sources of exposure reported for these cats included potted plants (5/11) and unfinished basements (6/11).


Potassium iodide capsule treatment of feline sporotrichosis.

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


Effects of treatment with ivabradine and atenolol on reproducibility of echocardiographic indices of left heart size and function in healthy cats.

OBJECTIVES: Data on reproducibility of echocardiographic indices in cats are commonly derived from studies in healthy, non-treated animals. However, medical treatment may alter reproducibility of such data possibly influencing interpretation of results of clinical trials assessing the effects of drugs on cardiovascular function. The objectives were therefore to investigate the effects of ivabradine and atenolol on reproducibility of echocardiographic indices of left heart function.

ANIMALS: Eight healthy cats. METHODS: Repeated echocardiographic examinations were performed by two observers in mildly sedated cats at baseline and after four weeks of treatment (Group 1, ivabradine 0.3 mg/kg q12 h PO, n = 4; Group 2, atenolol 6.25 mg/cat q12 h PO, n = 4) in a prospective, double-blind, randomized study. Test reliability was determined by estimating measurement variability, within-day interobserver variability, and between-day intraobserver variability of all echocardiographic indices. Variability was expressed as coefficient of variation (CV) and the absolute value below which the difference between two measurements lay with 95% probability. Effects of treatments on variability were compared using linear mixed effects models ANOVA and Fisher’s exact test. RESULTS: Overall, CVs ranged from 0.5 to 50.6% at baseline, 0.5-45.5% after ivabradine, and 0.5-23.3% after atenolol. Reproducibility of all variables determined did neither improve nor worsen consistently after either treatment although atenolol exhibited a tendency toward higher reliability with none of the CVs exceeding 24% as compared to ivabradine. CONCLUSIONS: Treatment of healthy cats with either atenolol or ivabradine had only minor effects on reproducibility of echocardiographic data. Whether these findings can be extrapolated to cats with hypertrophic cardiomypathy deserves further study.


Evaluation of detemir in diabetic cats managed with a protocol for intensive blood glucose control.

The aim of this study was to report outcomes using detemir and a protocol aimed at intensive blood glucose control with home monitoring in diabetic cats, and to compare the results with a previous study using the same protocol with glargine.
Eighteen cats diagnosed with diabetes and previously treated with other insulins were included in the study. Data was provided by owners who joined the online German Diabetes-Katzen Forum. The overall remission rate was 67%. For cats that began the protocol before or after 6 months of diagnosis, remission rates were 81% and 42%, respectively ($P = 0.14$). No significant differences were identified between the outcomes for the glargine and detemir studies, with the exception of three possibly interrelated factors: a slightly older median age of the detemir cohort at diabetes diagnosis, a higher rate of chronic renal disease in the detemir cohort and lower maximal dose for insulin detemir.

Use of a combined slit-lamp SD-OCT to obtain anterior and posterior segment images in selected animal species.
Objective To obtain images of anterior and posterior segments of the eye using a slit-lamp (SL)/spectral domain (SD) optical coherence tomography (OCT) integrated system designed for the human eye, in the cat, dog, minipig and monkey. Animals studied One healthy adult monkey, one healthy adult minipig, one healthy adult dog, one healthy adult cat, and three cats and four dogs affected by corneal or retinal diseases. Procedure A SL SCAN-1 SD-OCT, which is a slit-lamp SL-D7 that contains an integrated OCT module and a fundus viewer, was used to generate OCT images (512-2048), while simultaneously taking ‘en-face’ slit-lamp images (eSL). OCT images were obtained under sedation or anesthesia. These images were compared to histological retinal sections obtained from a monkey, a minipig, a dog, and a cat. Results ‘en-face’ slit-lamp images and OCT images of the ocular tissues were obtained allowing for the identification of different corneal and retinal layers in all animal species. Measurements of the total retinal thickness (TRT) from the inner limiting membrane to the retinal pigment epithelium were performed in various regions throughout the retina. Reduction in TRT was consistent with clinical features of retinal degeneration identified in dogs and cats. Conclusion This noninvasive procedure is useful for both experimental and clinical assessments of ocular tissue damage. Images of anterior and posterior segments are readily obtained under routine clinical conditions. Future studies are warranted to establish normal OCT data in our patients with this new instrument.

A new Rickettsia species found in fleas collected from human dwellings and from domestic cats and dogs in Senegal.
The insects of the order Siphonaptera, commonly named fleas, are vectors of pathogens around the world. Our previous studies showed that 4.4% of acute febrile diseases in the Sine-Saloum region of Senegal were due to Rickettsia felis. The aim of this study was to explain the high prevalence of R. felis infections in two rural Senegalese populations by an entomological, systematic monitoring protocol. A total of 232 fleas from three species (Ctenocephalides felis, Echidnophaga gallinacea, and Synosternus pallidus) were collected by candle trapping and manually from pets in the villages of Dielmo and Ndiop during the year 2010. The fleas were then tested for the presence of Bartonella and Rickettsia species. No fleas were found to be positive for any Bartonella species or R. felis. Surprisingly, we found that 91.4% of S. pallidus were infected by a new Rickettsia species, which, based on sequence analysis of gltA, ompB, and two fragments of rpoB, was found to be closely related to R. felis. The results from this study did not explain the high incidence of R. felis infections in these Senegalese populations.

Adapter-modified Ussing chamber enables evaluation of endoscopically-obtained colonic biopsy samples from cats and dogs.
Adapter-modified Ussing chambers have been used for assessment of endoscopically obtained intestinal biopsies in humans. The aim of this study was to evaluate the feasibility of an adapter-modified Ussing chamber for assessment of intestinal transport physiology in endoscopically-obtained colonic biopsies from cats and dogs. Fifteen colonic biopsies from four cats and 13 colonic biopsies from four dogs were transferred into a modified Ussing chamber and sequentially exposed to several compounds. Baseline mean+/−SD conductance was measured. Changes of short circuit current (ΔI(sc)) were observed after exposure to glucose (number of feline biopsies that responded=0/number of canine biopsies that responded=4), phloridzin (n=0/n=7), histamine (n=5/n=12), serotonin (n=7/n=12), prostaglandin (n=5/n=7), forskolin (n=7/n=7), and ouabain (n=9/n=7). The adapter-modified Ussing chamber studied here enables investigation of transport physiology of endoscopically-obtained colonic biopsies from companion animals. However, we observed a large variability of results, suggesting that clinical use of this method is limited.

Evaluation of a veterinary triage list modified from a human five-point triage system in 485 dogs and cats.
OBJECTIVES: To devise a veterinary triage list (VTL) and to determine whether the application of this VTL results in more accurate categorization of emergency patients compared with intuitive triage. DESIGN: Prospective and retrospective observational study. SETTING: Private veterinary emergency clinic. ANIMALS: Four hundred and eighty-five client-owned dogs and cats. INTERVENTIONS: None. MEASUREMENTS AND MAIN RESULTS: A VTL was composed using a human triage system and data from medical records of the study group. Target waiting times were prospectively
The objective of this study was to determine and compare the assemblages and triose phosphate isomerase genes of mammalian Giardia duodenalis. Comparisons of mammalian Giardia duodenalis assemblages based on the beta-giardin, glutamate dehydrogenase and triose phosphate isomerase genes.

The objective of this study was to determine and compare the assemblages of Giardia duodenalis isolated from mammalian species.
fetal samples using the beta-giardin (bg), glutamate dehydrogenase (gdh) and triosephosphate isomerase (tpi) genes. A total of 202 samples, either submitted to the Veterinary Diagnostic Laboratory (Parasitology) at Colorado State University or part of ongoing research studies, were typed. A subset of 50 dog samples were also assessed by the tpi-D-specific primers. Of these, 183 were from dogs, 13 were from cats, two were from llamas, and one each was from a calf, an alpaca, a sheep, and a horse. The majority of the dogs (171 of 183 isolates) in this study were infected with only dog-adapted Assemblage C or D. The tpi-D-specific primers confirmed that 28 of the samples that typed as Assemblage D by the bg and gdh genes were also Assemblage D by the tpi-D-specific primers. Only 12 isolates were Assemblage A alone or Assemblage A and Assemblage C or D. Of the 13 cat isolates, seven were Assemblage F, two were Assemblage D, three were Assemblage A and 1 contained both Assemblages C and D. The calf isolate was Assemblage E (gdh, tpi) and the alpaca (bg, gdh), llamas (gdh), sheep (bg, gdh, tpi) and horse (tpi) isolates were all Assemblage A. When the assemblage could be determined for more than one gene, 91 of 117 dog isolates gave consistent results and 8 of 9 cat isolates gave consistent results.


**Bactericidal properties of pradofloxacin against veterinary pathogens.**

Pradofloxacin is a new veterinary 8-cyano-fluoroquinolone developed for use against bacterial infections in dogs and cats involving both aerobic and anaerobic bacteria. The minimal bactericidal concentrations have been determined against clinical isolates of Staphylococcus pseudintermedius, Staphylococcus aureus, Escherichia coli, Pasteurella multocida, Streptococcus canis, Proteus spp., Fusobacterium spp., Porphyromonas gingivalis and Prevotella species. A subset of these species was selected, and the in vitro rate of kill by pradofloxacin was determined. For 27 of the 30 tested aerobic strains the pradofloxacin MBC was within two doubling dilutions of the MIC. For the remaining strains, the MIC and MBC were within three to four doubling dilutions. Pradofloxacin also demonstrated bactericidal activity against all anaerobic strains, and the MBC was equal to the MIC for four of the strains, within 1 doubling dilution for three strains, within 2 dilutions for a further 3 strains and within 3 dilutions for the remaining five strains. As pradofloxacin concentration was increased, a faster rate of killing was observed; bactericidal effects were seen in all cases at concentrations <= 0.25 mg/mL. The bactericidal activity against the anaerobic strains was marked, of particular relevance was the complete absence of regrowth even at 48 h at concentrations as low as 0.125 mg/mL. In conclusion, pradofloxacin exhibits clear bactericidal activity in terms of MBC and kill kinetics against aerobic and anaerobic clinical isolates from dogs and cats at concentrations that are greatly exceeded within the systemic circulation after administration of the recommended therapeutical doses to the target animals. It is expected that such a rapid rate of kill will play a significant role in clinical efficacy. These data demonstrate the complete and rapid killing of anaerobic bacteria by a veterinary 8-cyano-fluoroquinolone.


**In vivo assessment of natural killer cell responses during chronic feline immunodeficiency virus infection.**

Accumulating evidence suggests that natural killer (NK) cells may have an important role in HIV-1 disease pathogenesis; however, in vivo studies are lacking. Feline immunodeficiency virus (FIV) infection of cats provides a valuable model to study NK cell function in vivo. The immune response against Listeria monocytogenes (Lm) is well characterized, allowing its use as an innate immune probe. We have previously shown that locally delivered IL-15 can improve Lm clearance in FIV-infected animals, and this correlated with an increase in NK cell number. In the present study, chronically FIV-infected and SPF-control cats were challenged with Lm by unilateral subcutaneous injection next to the footpad and then treated with 5-bromo-2’-deoxyuridine (BrdU). The Lm draining and contralateral control lymph nodes were evaluated for NK, NKT, CD4+ and CD8+ T cell number, proliferation, apoptosis, and NK cell function. Listeria monocytogenes burden was also assessed in both control and Lm draining lymph nodes. NK, NKT, CD4+ T and CD8+ T cells in the Lm-challenged lymph node of FIV-infected cats did not increase in number. In addition, after Lm challenge, NK cells from FIV-infected cats did not increase their proliferation rate, apoptosis was elevated, and perforin expression was not upregulated when compared to SPF-control cats. The failure of the NK cell response against Lm challenge in the draining lymph node of FIV-infected cats correlates with the delayed control and clearance of this opportunistic bacterial pathogen.


**Effect of NT-pro-BNP assay on accuracy and confidence of general practitioners in diagnosing heart failure or respiratory disease in cats with respiratory signs.**

**BACKGROUND:** N-terminal pro-B-type natriuretic peptide (NT-proBNP) can distinguish congestive heart failure (CHF) from primary respiratory disease in cats with respiratory signs with approximately 90% diagnostic accuracy, but the additive benefit of NT-proBNP to improve the diagnosis obtained from conventional testing in individual cases remains unknown.

**HYPOTHESIS:** NT-proBNP will improve the diagnostic accuracy and confidence of general practice veterinarians in assessing cats with respiratory signs. ANIMALS: Ten cats with respiratory signs. METHODS: History, physical examination, thoracic radiographs, electrocardiogram (ECG), and biochemical analysis of 10 cats presented to the University of Pennsylvania or Tufts University with a history of respiratory signs were evaluated by 50 general practice veterinarians using an online survey tool. Participants were asked to provide (1) diagnosis of CHF or primary respiratory
disease, and (2) level of confidence in their diagnosis (1, lowest to 10, highest) before and after disclosure of NT-proBNP results. Diagnoses (CHF, n = 5; primary respiratory, n = 5) were compared to the gold standard defined as consensus opinion of 3 board-certified cardiologists blinded to the NT-proBNP results. RESULTS: Overall correctness of the practitioners was 69.2%, and significantly increased after practitioners were provided NT-proBNP results (87.0%, P = .0039). Median practitioner confidence before NT-proBNP disclosure was 6 (IQR, 5-8) and significantly increased after disclosure (8; IQR, 6-10; P = .0039). CONCLUSIONS: These data indicate a relatively low accuracy and level of confidence in the diagnosis of feline respiratory signs. Use of NT-proBNP assay in conjunction with conventional evaluation by general practitioners significantly improved their diagnostic accuracy and confidence.


**Buprenorphine in combination with naloxone at a ratio of 15:1 does not enhance antinociception from buprenorphine in healthy cats.**

Naloxone can enhance the antinociceptive/analgesic effects of buprenorphine in humans and rats. The antinociceptive effects of a patented 15:1 buprenorphine:naloxone combination was investigated in cats using a thermal and mechanical nociceptive model. Twelve cats received buprenorphine 10 μg/kg, naloxone 0.67 μg/kg or a buprenorphine-naloxone combination intramuscularly in a randomised cross over study. Using thermal and mechanical analgesiometry validated in the cat, pre-treatment baselines were measured. Following test drug administration, thresholds were studied for the next 24h. Naloxone did not enhance the thermal antinociceptive effect of buprenorphine. The results from this study are in agreement with previously published work showing that naloxone antagonises the effects of clinically analgesic doses of buprenorphine. Mechanical nociceptive thresholds were not affected by buprenorphine.


**RECOVER evidence and knowledge gap analysis on veterinary CPR. Part 6: Post-cardiac arrest care.**

OBJECTIVE: To systematically examine the evidence for interventions after the return of spontaneous circulation (ROSC) on outcomes from veterinary cardiopulmonary resuscitation and to determine important knowledge gaps. DESIGN: Standardized, systematic evaluation of the literature, categorization of relevant articles according to level of evidence and quality, and development of consensus on conclusions for application of the concepts to clinical post-cardiac arrest care. SETTING: Academia, referral practice, and general practice. RESULTS: Fifteen standardized clinical questions important for post-cardiac arrest care were asked and research articles relevant to answering these questions were identified through structured, explicit literature database searches. The majority of these articles report research in species other than dogs or cats or consisted of experimental work in canine cardiac arrest models. Outcome metrics reported in these studies widely varied and ranged from quantification of mechanistic endpoints, such as elaboration of reactive oxygen species, to survival, and functional neurologic outcome. CONCLUSIONS: Despite the near complete absence of clinical veterinary studies, the process allowed the formulation of statements for several postcardiac arrest treatments that were either supportive, such as mild therapeutic hypothermia or controlled reoxygenation, or neutral, such as for mannitol administration or seizure prophylaxis. Evidence grading allowed transparency in regards to the strength of these recommendations. Moreover, numerous knowledge gaps emerged that will allow generation of a road map for progress in veterinary post-cardiac arrest care.


**Guide to emergency interception during parturition in the dog and cat.**

Clinicians in private practice, specialty practice, and emergency clinic settings are likely to be presented with bitches and queens with parturition emergencies. Parameters for the identification of dystocia include prolonged parturition, collapse of the dam, abnormal vaginal discharge, prolonged labor, prolonged interval between delivery of neonates, uterine inertia, malpresentation of the fetus, and large litter sizes. Methods for the diagnosis of dystocia are discussed. Resolution of parturition emergencies may be achieved through manipulative, medical, or surgical methods, although the great percentage of dystocia will require surgical intervention. Techniques for medical and surgical interception are discussed.


**A survey of southeastern United States veterinarians’ preferences for managing cats with diabetes mellitus.**

This study evaluated primary practitioners’ perceptions of managing feline diabetics. Surveys distributed during local continuing education events achieved a response rate of 46% (90/195). A mean of 74% feline diabetics required chronic insulin; 26% were transient diabetics. Choice of insulin was most influenced by duration of action: human recombinant protamine zinc insulin was ranked first (42%) and glargine second (27%). Dietary management was always/usually recommended by 97% respondents, with prescription or proprietary low-carbohydrate, high-protein diets recommended in 93% responses. More recent graduates (P = 0.0419), those who worked in larger practices (P = 0.0315), and those who saw more transient diabetics (P = 0.0288) were more likely to recommend dietary change. In-house blood glucose curves
(BGCs) were the most popular method of assessing glycemic control, while at-home BGCs were least popular, although their use correlated positively with annual diabetic caseload \((r = 0.43, P = 0.0239)\). Owners mishandling insulin was cited as the most common cause of poor glycemic control, while clinical signs of acromegaly were rarely recognized.


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

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


**Urethral flow-responsive afferents in the cat sacral dorsal root ganglia.**

Although sensory feedback from the urethra plays an integral role in the regulation of lower urinary tract function, little is known about the properties of flow-responsive primary afferent neurons. The purpose of this study was to characterize the activity of sacral afferents that responded to fluid flow through the urethra. Single neuron action potentials were recorded extracellularly from the S1 and S2 dorsal root ganglia in eight cats anesthetized with alpha-chloralose. 21 of 116 cells responded to urethral flow but not to mechanical palpation of the perineum, 22 responded to both urethral flow and palpation, and 27 responded to palpation only. 34 of the 43 flow-responsive cells exhibited a firing response to 10 ml flow boluses that could be fit using a power function: \(FR(t) = ax(t)^{b}+c\), where FR is firing rate, t is time, and a, b and c are constants. In all 34 cells the ‘b’ term was negative, indicating that the firing rate slowed over the time course of the urethral flow. In 16 of the 24 cells that were recorded during different flow rates, a power function provided a good fit of the relationship between firing rate and flow rate: \(FR(flow) = kx(flow)^{p}+q\), where k, p and q are constants. In each of these 16 cells the ‘p’ term was positive, indicating that the firing rate tended to increase with increases in flow rate. These are the first data to characterize the properties of flow-responsive afferents in the cat, and reveal properties that parallel those of other afferents.


**Coinfection of Leishmania chagasi with Toxoplasma gondii, Feline Immunodeficiency Virus (FIV) and Feline Leukemia Virus (FeLV) in cats from an endemic area of zoonotic visceral leishmaniasis.**

The aim of the present study was to determine the coinfection of Leishmania sp. with Toxoplasma gondii, Feline Immunodeficiency Virus (FIV) and Feline Leukemia Virus (FeLV) in a population of cats from an endemic area for zoonotic visceral leishmaniasis. An overall 66/302 (21.85%) cats were found positive for Leishmania sp., with infection determined by direct parasitological examination in 30/302 (9.93%), by serology in 46/302 (15.23%) and by both in 10/302 (3.31%) cats. Real time PCR followed by amplicon sequencing successfully confirmed Leishmania infantum (syn Leishmania chagasi) infection. Out of the Leishmania infected cats, coinfection with FIV was observed in 12/66 (18.18%), with T. gondii in 17/66 (25.75%) and with both agents in 5/66 (7.58%) cats. FeLV was found only in a single adult cat with no Leishmania infection. A positive association was observed in coinfection of Leishmania and FIV \((p<0.0001)\), but not with T. gondii \((p>0.05)\). In conclusion, cats living in endemic areas of visceral leishmaniasis are significantly more likely to be coinfected with FIV, which may present confusing clinical signs and therefore cats in such areas should be always carefully screened for coinfections.


**Seroprevalence of feline immunodeficiency virus, feline leukaemia virus and Toxoplasma gondii in stray cat colonies in northern Italy and correlation with clinical and laboratory data.**

Stray cat colonies in urban and rural areas of Lombardy, northern Italy, were surveyed for seroprevalence of feline immunodeficiency virus (FIV) antibodies, feline leukaemia virus (FeLV) antigen and Toxoplasma gondii IgG. Of 316 cats tested, 6.6% were positive for FIV and 3.8% were positive for FeLV infection; 203 cats were tested for T gondii IgG
antibodies and a prevalence of 30.5% was detected. Statistical analysis tested the influence of provenience, age, gender, health status and laboratory results on seroprevalence and found male gender and adult age were risk factors for FIV infection. FIV-infected cats were more likely to have a decreased red blood cell count than FIV seronegative cats. No predictors were significantly associated with FeLV and T gondii seropositivity. Colony cats in this study posed a limited risk for retrovirus infection to pet cats allowed outdoors, whereas toxoplasmosis exposure was comparable with the worldwide data.


ABSTRACT: BACKGROUND: The development of anaemia in feline leukaemia virus (FeLV)-infected cats is associated with the emergence of a novel viral subgroup, FeLV-C. FeLV-C arises from the subgroup that is transmitted, FeLV-A, through alterations in the amino acid sequence of the receptor binding domain (RBD) of the envelope glycoprotein that result in a shift in the receptor usage and the cell tropism of the virus. The factors that influence the transition from subgroup A to subgroup C remain unclear, one possibility is that a selective pressure in the host drives the acquisition of mutations in the RBD, creating A/C intermediates with enhanced abilities to interact with the FeLV-C receptor, FLVCR. In order to understand further the emergence of FeLV-C in the infected cat, we examined primary isolates of FeLV-C for evidence of FeLV-A variants that bore mutations consistent with a gradual evolution from FeLV-A to FeLV-C. RESULTS: Within each isolate of FeLV-C, we identified variants that were ostensibly subgroup A by nucleic acid sequence comparisons, but which bore mutations in the RBD. One such mutation, N91D, was present in multiple isolates and when engineered into a molecular clone of the prototypic FeLV-A (Glasgow-1), enhanced replication was noted in feline cells. Expression of the N91D Env on murine leukaemia virus (MLV) pseudotypes enhanced viral entry mediated by the FeLV-A receptor THTR1 while soluble FeLV-A Env bearing the N91D mutation bound more efficiently to mouse or guinea pig cells bearing the FeLV-A and -C receptors. Long-term in vitro culture of variants bearing the N91D substitution in the presence of anti-FeLV gp70 antibodies did not result in the emergence of FeLV-C variants, suggesting that additional selective pressures in the infected cat may drive the subsequent evolution from subgroup A to subgroup C.

CONCLUSIONS: Our data support a model in which variants of FeLV-A, bearing subtle differences in the RBD of Env, may be predisposed towards enhanced replication in vivo and subsequent conversion to FeLV-C. The selection pressures in vivo that drive the emergence of FeLV-C in a proportion of infected cats remain to be established.


In order to investigate the genetic variation between Tritrichomonas foetus from bovine and feline origins, cysteine protease 8 (CP8) coding sequence was selected as the polymorphic DNA marker. Direct sequencing of CP8 coding sequence of T. foetus from four feline isolates and two bovine isolates with polymerase chain reaction successfully revealed conserved nucleotide polymorphisms between feline and bovine isolates. These results provide useful information for CP8-based molecular differentiation of T. foetus genotypes.


Immunolabeling for the critical lymphocyte survival factor, Bcl-2, of intestinal biopsies from cats with histologic evidence of inflammatory bowel disease (IBD) or gastrointestinal (GI) lymphoma was evaluated to determine if expression differed significantly between these two disease processes. Immunolabeling for Bcl-2 was performed on small intestinal endoscopic or full thickness biopsy sections from 55 cats. Diagnosis of IBD, T-cell lymphoma or B-cell lymphoma was established previously. The percentage of infiltrating lymphocytes that were positively labeled for Bcl-2 was subjectively determined for each case. Eight cats were diagnosed with IBD and 47 cats with lymphoma. A significantly higher percentage of cells were positively immunolabeled for Bcl-2 in cats with GI lymphoma [median (range); 90 (5-95)%] compared with cats with IBD [60 (15-95)%] (P = 0.029). However, the overall degree of positive immunolabeling in both groups tended to be high. This over-expression of Bcl-2 may prove useful as a therapeutic target for IBD and GI lymphoma in cats.


Feline calicivirus (FCV) is a pathogenic microorganism that causes upper respiratory diseases in cats. Recently, an FCV infection with a high mortality rate has been confirmed, and there is need to develop a treatment for cases of acute infection. We evaluated whether the replication of FCV could be prevented by RNA interference. For this study, we designed an
Prevalence of Feline Coronavirus Antibodies in Japanese Domestic Cats during the Past Decade.
From 2001 to 2010, 17,392 Japanese cats were examined for feline coronavirus (FCoV) antibodies. Seroprevalence of purebreds (66.7%) was higher than random breeds (31.2%). Seroprevalence increased greatly in purebreds by aged three months, while random breeds did not fluctuate greatly with aging, indicating cattery environments can contribute to FCoV epidemic. Purebreds from northern regions of Japan were likely to be sero-positive (76.6% in Hokkaido, 80.0% in Tohoku), indicating cattery cats in cold climates might be more closely confined. Among purebreds, American Shorthair, Himalayan, Oriental, Persian, and Siamese were at low seroprevalence, while American Curl, Maine Coon, Norwegian Forest Cat, Ragdoll, and Scottish Fold were at high seroprevalence. There would be also breed-related differences in Japan, similar to the previous studies in Australia.

Efficacy of a spot on combination containing imidacloprid 10% and moxidectin 1% (Advocate(R)/Advantage(R)) Multi, Bayer Animal Health against Ancylostoma ceylanicum in cats.
Ancylostoma ceylanicum is a common zoonotic hookworm of dogs and cats, especially in the Asia-Pacific region. The objective of this study was to determine the efficacy of a spot on combination product containing imidacloprid 10% and moxidectin 1% (Advocate(R)/Advantage(R)) Multi, Bayer Animal Health against A. ceylanicum in experimentally infected cats. Sixteen kittens were each subcutaneously injected with 100 infective third-stage larvae of A. ceylanicum. Kittens were stratified by egg count and randomly allocated into control and treatment groups. The kittens in the treatment group were each treated with a spot on combination of 10% (w/v) imidacloprid and 1% (w/v) moxidectin, administered topically at recommended label dose rates. The kittens in the control group were not treated. Egg counts were performed daily until the end of the study period and compared for the treated and control groups. No eggs were detected in the treated group of kittens within 4 days of treatment and faecal samples from this group remained negative throughout the rest of the study, resulting in a treatment efficacy (egg reduction) of 100% (P<0.0001). The egg counts remained high (993+/−666 epg) in the untreated control group for the rest of the study period. This study demonstrated that based on faecal egg count reduction, the spot on combination containing imidacloprid 10% (w/v) and moxidectin 1% (w/v) (Advocate(R)/Advantage(R)) Multi, Bayer Animal Health) given at the recommended dose is highly effective against infection with A. ceylanicum in cats.

Differential role of opioid receptors in tibial nerve inhibition of nociceptive and nonnociceptive bladder reflexes in cats.
Naloxone (an opioid receptor antagonist) was used to examine the role of opioid mechanisms in bladder reflexes and in somatic afferent inhibition of these reflexes by tibial nerve stimulation (TNS). Experiments were conducted in alphachloralose-anesthetized cats when the bladder was infused with saline or 0.25% acetic acid (AA). The bladder volume was measured at the first large-amplitude (>30 cmH2O) contraction during a cystometrogram and termed “estimated bladder capacity” (EBC). AA irritated the bladder, induced bladder overactivity, and significantly (P < 0.0001) reduced EBC to 14.3 +/- 1.9% of the saline control. TNS (5 Hz, 0.2 ms) at 4 and 8 times the threshold (T) intensity for inducing an observable toe movement suppressed AA-induced bladder overactivity and significantly increased EBC to 41.5 +/- 9.9% (4T, P < 0.05) and 46.1 +/- 7.9% (8T, P < 0.01) of the saline control. Naloxone (1 mg/kg iv) completely eliminated TNS inhibition of bladder overactivity. Naloxone (0.001-1 mg/kg iv) did not change EBC during AA irritation. However, during saline infusion naloxone (1 mg/kg iv) significantly (P < 0.01) reduced EBC to 66.5 +/- 8.1% of the control EBC. During saline infusion, TNS induced an acute increase in EBC and an increase that persisted following the stimulation. Naloxone (1 mg/kg) did not alter either type of inhibition. However, naloxone administered during the poststimulation inhibition decreased EBC. These results indicate that opioid receptors have different roles in modulation of nociceptive and nonnociceptive bladder reflexes and in somatic afferent inhibition of these reflexes, raising the possibility that opioid receptors may be a target for pharmacological treatment of lower urinary tract disorders.

Cytologic diagnosis of disseminated histoplasmosis in the wall of the urinary bladder of a cat.
A 10 yr old domestic longhair presented with a 2.5 mo history of recurrent hematuria. Abdominal ultrasound examination demonstrated a thickened urinary bladder, abdominal lymphadenopathy, and a thickened and rounded spleen. Cytologic examination of fine-needle aspirate samples revealed Histoplasma capsulatum organisms in the urinary bladder wall and
spleen. The cat was treated with itraconazole (10 mg/kg per os q 24 hr for 2.5 wk). The cat was euthanized after 19 days of treatment because of lack of improvement. To the authors’ knowledge, this is the first documented case of feline disseminated histoplasmosis diagnosed in the urinary bladder wall.


**A reverse genetics approach to study feline infectious peritonitis.**

Feline infectious peritonitis (FIP) is a lethal immunopathological disease caused by feline coronaviruses (FCoVs). Here, we describe a reverse genetics approach to study FIP by assessing the pathogenicity of recombinant type I and type II and chimeric type I/type II FCoVs. All recombinant FCoVs established productive infection in cats, and recombinant type II FCoV (strain 79-1146) induced FIP. Virus sequence analyses from FIP-diseased cats revealed that the 3c gene stop codon of strain 79-1146 has changed to restore a full-length open reading frame (ORF).


**Feline infectious peritonitis virus with a large deletion in the 5’ terminal region of spike gene retains its virulence for cats.**

In this study, Japanese strain of type I feline infectious peritonitis virus (FIPV), C3663, was found to have a large deletion of 735 bp within the gene encoding the spike (S) protein, with a deduced loss of 245 amino acids of the N-terminal region of the S protein. This deletion is similar to that observed in porcine respiratory coronavirus (PRCoV) when compared to transmissible gastroenteritis virus, which correlates with reduced virulence. By analogy to PRCoV, we expected that the pathogenicity of C3663 may be attenuated in cats. However, two of four cats inoculated with C3663 died of FIP, and a third C3663-inoculated cat showed FIP lesions at 91 days after challenge. These results indicate that the 5’ terminal region of the S gene is not essential for the development of FIP.


**Pet roundworms and hookworms: A continuing need for global worming.**

**ABSTRACT:** Ascarids and ancylostomatids are the most important parasites affecting companion dogs and cats worldwide, in terms of diffusion and risk for animal and human health. Different misconceptions have led the general public and pet owners to minimize the importance of these intestinal worms. A low grade of interest is also registered among veterinary professions, although there is a significant merit in keeping our guard up against these parasites. This article reviews current knowledge of ascarids and ancylostomatids, with a special focus on pathogenicity, epidemiology and control methods in veterinary and human medicine.


**Comparative echocardiographic and clinical features of hypertrophic cardiomyopathy in 5 breeds of cats: a retrospective analysis of 344 cases (2001-2011).**

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


**Rickettsia felis in Ctenocephalides felis from Guatemala and Costa Rica.**

Rickettsia felis is an emerging human pathogen associated primarily with the cat flea Ctenocephalides felis. In this study, we investigated the presence of Rickettsia felis in C. felis from Guatemala and Costa Rica. Ctenocephalides felis were collected directly from dogs and cats, and analyzed by polymerase chain reaction for Rickettsia-specific fragments of 17-
study therefore failed to demonstrate clinically meaningful effects of these sedation protocols on echocardiographic indices in healthy cats, with special emphasis on the assessment of left atrial size and function, as well as left ventricular diastolic performance. Seven cats underwent echocardiography (transthoracic two-dimensional, spectral Doppler, color flow Doppler and tissue Doppler imaging) before and after sedation with both acepromazine (0.1 mg/kg IM) and butorphanol (0.25 mg/kg IM), or acepromazine (0.1 mg/kg IM), butorphanol (0.25 mg/kg IM) and ketamine (1.5 mg/kg IV). Heart rate increased significantly following acepromazine/butorphanol/ketamine (mean ±/− SD of increase, 40 ±/− 26 beats/min) and non-invasive systolic blood pressure decreased significantly following acepromazine/butorphanol (mean ±/− SD of decrease, 12 ±/− 19 mmHg). The majority of echocardiographic variables were not significantly different after sedation compared with baseline values. Both sedation protocols resulted in mildly decreased left ventricular end-diastolic dimension and mildly increased left ventricular end-diastolic wall thickness. This study therefore failed to demonstrate clinically meaningful effects of these sedation protocols on echocardiographic variables.

Detection of wolbachia DNA in blood for diagnosing filaria-associated syndromes in cats.
A fundamental role for the endosymbiotic bacteria Wolbachia pipiens in the pathogenesis of Dirofilaria immitis infections has emerged in recent years. Diagnostic opportunities arising from this breakthrough have not yet been fully exploited. This study was aimed at developing conventional and real-time PCR assays to carry out a molecular survey in a convenience sample of cats living in an area where D. immitis is endemic and to evaluate the detection of bacterial DNA in blood as a surrogate assay for diagnosing filaria-associated syndromes in cats. COI and FtsZ loci were used as targets for D. immitis and Wolbachia PCR assays, respectively, and real-time TaqMan PCR assays were used only for Wolbachia. A convenience sample of 307 disease-affected or healthy cats examined at a University facility were PCR tested, and their medical records were investigated. Conventional nested PCR for Wolbachia amplified the endosymbionts of both D. immitis and D. repens, while real-time PCR was highly specific only for the former. Observed prevalences of 0.3 and 10.4% were found using conventional nested PCR assays for D. immitis and real-time PCR for Wolbachia, respectively. Similar prevalences were established using the Wolbachia nested PCR (98% concordance with real-time PCR). The group of Wolbachia-positive samples had a significantly higher proportion of subjects with respiratory signs (29.0% versus 9.7%; P = 0.002). The findings of this study indicate that a highly sensitive PCR assay can be used to detect the Wolbachia organism in the peripheral blood of cats with respiratory signs.

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

Understanding adiponectin in dogs and cats: A work in progress.
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measurements, suggesting that sedation with acepromazine, butorphanol and/or ketamine can be used to facilitate echocardiography in healthy cats.


Markers of Borna disease virus infection in cats with staggering disease.
Borna disease virus (BDV) is a RNA-virus causing neurological disorders in a wide range of mammals. In cats, BDV infection may cause staggering disease. Presently, staggering disease is a tentative clinical diagnosis, only confirmed at necropsy. In this study, cats with staggering disease were investigated to study markers of BDV infection aiming for improvement of current diagnostics. Nineteen cats fulfilled the inclusion criteria based on neurological signs and pathological findings. In 17/19 cats, BDV infection markers (BDV-specific antibodies and/or BDV-RNA) were found, and antibodies in serum (13/16, 81%) were the most common marker. BDV-RNA was found in 11/19 cats (58%). In a reference population without neurological signs, 4/25 cats were seropositive (16%). The clinical history and neurological signs in combination with presence of BDV infection markers, where serology and rRT-PCR on blood can be helpful tools, improve the diagnostic accuracy in the living cat.

Prevention of fetal suffering during ovariohysterectomy of pregnant animals.

Hepatic copper and iron accumulation and histologic findings in 104 feline liver biopsies.
In contrast to dogs, the role of copper and iron accumulation in feline hepatic disease remains poorly characterized. Therefore, the objective of the current study was to compare the amount and distribution of copper and iron accumulation for different disease processes in feline liver biopsies. Liver biopsies (from 104 privately owned cats) were categorized by primary histopathologic lesion. Copper (by rubeanic acid) and iron (by Prussian blue) accumulation were graded by amounts (0-3) and location (centrilobular, midzonal, periporal, random). The Kruskal-Wallis test and Pearson chi-square test were used to assess differences in metal grade and location, respectively, between diagnostic categories. Histologic diagnoses were normal (n = 12), congenital (n = 6), neoplastic (n = 16), infectious and/or inflammatory (n = 39), and other (n = 31). Hepatocellular iron staining was negative in 18 samples; remaining samples had grade 1 (n = 38), 2 (n = 40), and 3 (n = 8) accumulation. Ninety-two samples were negative for copper; remaining samples had grade 1 (n = 5), 2 (n = 6), and 3 (n = 1) accumulation. No significant differences were found in the amount of iron or copper accumulation between the different diagnostic categories. Diagnostic category and the location of copper or iron accumulation were not associated. Hepatic iron accumulation was common and not associated with histologic diagnosis. Hepatocellular copper accumulation was more common in cats than previously reported, had a similar pattern of distribution to fibrotic changes, and was not present in histologically normal liver biopsies.

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

Energy requirement and food intake behaviour in young adult intact male cats with and without predisposition to
overweight.

Obesity is a common problem in cats. In the experimental cat family of the institute of animal nutrition besides a “normal” lean phenotype, cats with predisposition to an overweight phenotype are present. To investigate energy requirements and food intake behaviour of intact male cats of different phenotypes, six “normal” lean cats (GL) and six cats disposed to overweight (GO) were used. At the beginning of the experiment, all cats had an ideal body condition score of 5. To reach this the GO cats had to pass a weight-loss program. Energy requirements of the cats were determined using respiration chambers, whereas the amount and frequency of food intake was measured with a feeding station recording the data automatically. Energy requirement at weight constancy of the GO cats was even on fat-free mass (FFM) significantly (P = 0.02) lower (162.6 kJ/kg FFM/d) than that of the “normal” lean cats (246 kJ/kg FFM/d). The GO cats also showed a higher food intake 34.5 +/- 1.5 g dry matter/kg body weight(0.67) compared to the GL cats (24.0 +/- 2.1 g dry matter/kg body weight(0.67)) (P = 0.001). In conclusion quantifiable differences in food intake and behaviour in cats predisposed to overweight compared to “normal” lean cats were found.


OBJECTIVE: To determine cardiopulmonary effects of incremental doses of dopamine and phenylephrine during isoflurane-induced hypotension in cats with hypertrophic cardiomyopathy (HCM). ANIMALS: 6 adult cats with severe naturally occurring HCM. PROCEDURES: Each cat was anesthetized twice (once for dopamine treatment and once for phenylephrine treatment; treatment order was randomized). Hypotension was induced by increasing isoflurane concentration. Cardiopulmonary data, including measurement of plasma concentration of cardiac troponin I (cTnI), were obtained before anesthesia, 20 minutes after onset of hypotension, and 20 minutes after each incremental infusion of dopamine (2.5, 5, and 10 µg/kg/min) or phenylephrine (0.25, 0.5, and 1 µg/kg/min). RESULTS: Mean +/- SD end-tidal isoflurane concentration for dopamine and phenylephrine was 2.44 +/- 0.05% and 2.48 +/- 0.04%, respectively. Cardiac index and tissue oxygen delivery were significantly increased after administration of dopamine, compared with results after administration of phenylephrine. Systemic vascular resistance index was significantly increased after administration of phenylephrine, compared with results after administration of dopamine. Oxygen consumption remained unchanged for both treatments. Systemic and pulmonary arterial blood pressures were increased after administration of both dopamine and phenylephrine. Acid-base status and blood lactate concentration did not change and were not different between treatments. The cTnI concentration increased during anesthesia and infusion of dopamine and phenylephrine but did not differ significantly between treatments. CONCLUSIONS AND CLINICAL RELEVANCE: Dopamine and phenylephrine induced dose-dependent increases in systemic and pulmonary blood pressure, but only dopamine resulted in increased cardiac output. Hypotension and infusions of dopamine and phenylephrine caused significant increases in cTnI concentrations.


Alimentary neoplasia in geriatric dogs and cats.


Quantification of the humoral immune response and hemoplasma blood and tissue loads in cats coinfected with ‘Candidatus Mycoplasma haemominutum’ and feline leukemia virus.

‘Candidatus Mycoplasma haemominutum’ (CMhm) is a hemotropic mycoplasma (aka hemoplasma) of domestic cats and wild felids. In a transmission study, we exposed eight specified pathogen-free cats to blood from Iberian lynxes (Lynx pardinus) infected with CMhm. The cats were coinfected with feline leukemia virus (FeLV) from an Iberian lynx or with a prototype FeLV. The goal of the present study was to quantify the humoral immune response to CMhm and to identify potential target tissues and sequestration sites. Antibodies were measured by a recombinant antigen-based enzyme-linked immunosorbent assay, and blood and tissue loads were quantified using real-time PCR. Seven out of eight cats became CMhm-infected; all of these cats seroconverted between 3 and 13 weeks after inoculation. Antibody levels correlated with the CMhm blood loads. The peak CMhm blood loads were inversely correlated with the incubation period. PCR-positive results were found in all 24 tissues tested but not for all samples. Although all tissues were PCR-positive in one cat euthanized ten weeks after infection, many tissues tested negative in six cats euthanized at week 20 after infection. In several cats, the spleen, lung, liver, heart and aorta contained more copies than expected given the tissue’s blood supply, but most tissues contained fewer copies than expected. In conclusion, this is the first study to quantify the humoral immune response and tissue loads in CMhm-FeLV-coinfected cats. The tissue loads appeared to correlate with the duration of infection and with the blood loads, but no evidence of significant CMhm tissue sequestration was found.

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


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


Intravesical application of lidocaine and sodium bicarbonate in the treatment of obstructive idiopathic lower urinary tract disease in cats.
BACKGROUND: In human patients with interstitial cystitis, intravesical instillation of alkalinized lidocaine sometimes is associated with sustained amelioration of symptoms beyond the acute treatment phase. Interstitial cystitis shares many features in common with feline idiopathic cystitis. OBJECTIVE: To evaluate whether intravesical instillation of alkalinized lidocaine decreases recurrence of urethral obstruction and severity of clinical signs in cats with obstructive idiopathic LUTD. ANIMALS: Twenty-six cats with obstructive idiopathic LUTD. Twelve cats in case group (treatment with alkalinized lidocaine) and 14 control cats (treatment with placebo or standard treatment). METHODS: Cats were randomly assigned to treatment (2 or 4 mg/kg lidocaine and sodium bicarbonate) or placebo groups (0.2 mL/kg saline solution and sodium bicarbonate). The intravesical instillation was done once a day for 3 days. Some cats underwent standard treatment only (indwelling urinary catheter for 3 days without intravesical instillations). A 2-week, 1-month, and 2-month follow-up after treatment was made using a questionnaire. The recurrence rate and amelioration scores of clinical signs were assessed and compared. RESULTS: Recurrence of urethral obstruction was 58% (7/12) in the case group and 57% (8/14) in the control group. Amelioration scores were similar between the 2 groups. CONCLUSION AND CLINICAL IMPORTANCE: Intravesical administration of lidocaine for up to 3 consecutive days had no apparent beneficial effect on decreasing recurrence rate and severity of clinical signs in cats with obstructive idiopathic LUTD.


Inhibition of bladder overactivity by a combination of tibial neuromodulation and tramadol treatment in cats.
Our recent study in cats revealed that inhibition of bladder overactivity by tibial nerve stimulation (TNS) depends on the activation of opioid receptors. TNS is a minimally invasive treatment for overactive bladder (OAB), but its efficacy is low. Tramadol (an opioid receptor agonist) is effective in treating OAB but elicits significant adverse effects. This study was to determine if a low dose of tramadol (expected to produce fewer adverse effects) can enhance the TNS inhibition of bladder overactivity. Bladder overactivity was induced in alpha-chloralose-anesthetized cats by an intravesical infusion of 0.25% acetic acid (AA) during repeated cystometrograms (CMGs). TNS (5 Hz) at two to four times the threshold intensity for inducing toe movement was applied during CMGs before and after tramadol (0.3-7 mg/kg iv) to examine the interaction between the two treatments. AA irritation significantly reduced bladder capacity to 24.8 +/-3.3% of the capacity measured during saline infusion. TNS alone reversibly inhibited bladder overactivity and significantly increased bladder capacity to 50-60% of the saline control capacity. Tramadol administered alone in low doses (0.3-1 mg/kg) did not significantly change
bladder capacity, whereas larger doses (3-7 mg/kg) increased bladder capacity (50-60%). TNS in combination with tramadol (3-7 mg/kg) completely reversed the effect of AA. Tramadol also unmasked a prolonged (>2 h) TNS inhibition of bladder overactivity that persisted after termination of the stimulation. The results suggest a novel treatment strategy for OAB by combining tibial neuromodulation with a low dose of tramadol, which is minimally invasive with a potentially high efficacy and fewer adverse effects.


Oocyst shedding in cats vaccinated by the nasal and rectal routes with crude rhoptry proteins of Toxoplasma gondii.

During this study, cats were immunized by the intranasal and rectal routes with crude rhoptry proteins of Toxoplasma gondii admixed with Quil-A. Twenty-five domestic short hair cats divided into five groups (n=5) were used during this evaluation: G1 and G3 cats received 200 mug of the rhoptry proteins with Quil-A (20 mug) by the intranasal and rectal routes, respectively; G2 and G4 cats received bovine serum albumin (BSA, 200 mug/dose) with Quil-A (20 mug); and G5 animals served as unvaccinated controls. All treatments were performed at days 0, 21, 42, and 63. The challenge was done with 800 cysts of the ME49 of T. gondii strain at day 70 (challenge day). The serum IgG, IgM, IgA, and fecal IgA antibody levels were evaluated by using the indirect enzyme-linked immunosorbent assay (ELISA). Some animals produced antibody levels beyond cut-off; however, two animals from G1 (OD(mean)=0.308, OD(cut-off)=0.200) and three from G3 (OD(mean)=0.254) demonstrated IgG levels on being challenged, with similar results occurring in two cats from G1 to IgM (OD(mean)=0.279, OD(cut-off)=0.200). Fecal IgA levels were detected in all G1 cats (OD(mean)=0.330, OD(cut-off)=0.065), and in one cat from G3 (OD(mean)=0.167). The serum and fecal humoral immune responses did not correlate with oocyst shedding. Oocyst shedding varied from 98.4% (G1), 87.5% (G2), 53.0% (G3), to 58% (G4), and was lower than that of G5 cats. The prepatent period of cats vaccinated intranasally (G1) was reduced from 6-9.6 to 2.8 days, suggesting protection of environmental contamination, considering cats as the primary source of contamination. The intranasally and rectally administered rhoptry vaccines were able to partially protect cats against T. gondii cysts on being challenged; however, the intranasal method of vaccination yielded better results relative to the rectal route.