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April 2014 Abstracts

Journal of the American Veterinary Medical Association – April 15

Identification and effects of common errors and artifacts on the perceived quality of radiographs.
Nuth EK, Armbrust LJ, Roush JK, Biller DS.
Objective-To identify common errors in film and digital radiographs provided by referring veterinarians and determine the effect of such errors on the perceived diagnostic quality of image sets. Design-Prospective study. Sample-135 sets of radiographic images acquired by referring veterinarians for client-owned small animals evaluated at a university hospital. Procedures-Sets of radiographs were prospectively collected and evaluated for proper performance of various radiographic technical variables including exposure, collimation, positioning, inclusion of all appropriate views, presence of artifacts, radiation safety, and labeling. Sets of radiographs were subjectively determined to be of diagnostic or nondiagnostic quality by 2 evaluators. Results-The variables exposure, correct positioning, absence of artifacts, and acquisition of all appropriate views were significantly associated with a determination of diagnostic quality for radiograph sets. Correct patient labeling, radiation safety, and x-ray beam centering and collimation were not associated with a determination of diagnostic quality for radiograph sets. The number of categories with errors was significantly associated with identification of radiograph sets as having diagnostic or nondiagnostic quality. Digital radiographs had a significantly lower number of image artifacts and significantly higher frequency of proper labeling versus film radiographs. Conclusions and Clinical Relevance-Results of this study suggested the technical variables proper exposure, proper positioning, absence of artifacts, and acquisition of all appropriate views were important for acquisition of sets of radiographs of high diagnostic quality. Identification of these errors and adjustment of radiographic technique to eliminate such errors would aid veterinarians in obtaining radiographs of high diagnostic quality and may reduce misinterpretation.

Burdick S1, Berent AC, Weisse C, Langston C.
Objective-To describe the technique and evaluate short- and long-term outcomes in female dogs after endoscopic-guided laser ablation (ELA) of various vestibulovaginal septal remnants (VVSRs). Design-Retrospective case series. Animals-36 dogs. Procedures-Medical records of dogs with VVSRS that underwent ELA were retrospectively reviewed. All patients underwent complete cystourethrovaginoscopy for diagnosis and treatment. Endoscopic-guided laser ablation (with a holmium:yttrium-aluminum-garnet or diode laser) was used to transect the vaginal membrane. Patients with intramural ectopic ureters were concurrently treated with ELA of their ectopic ureters. Endoscopy was repeated 6 to 8 weeks after ELA of vaginal remnants in some patients, and the procedure sites were reassessed. Results-36 female dogs with persistent paramesonephric septal remnants (n = 19), vaginal septa (11), or dual vaginas (6) were included. Twenty-six dogs had urinary incontinence, 2 had recurrent UTIs, and 8 had both. Thirty of 36 (83%) dogs had concurrent ectopic ureters. Endoscopic-guided laser ablation was performed with holmium:yttrium-aluminum-garnet and diode lasers in 8 and 28 dogs, respectively. Five dogs had mild postoperative dysuria for < 24 hours. One patient developed a complication involving inadvertent laser perforation of the vaginal wall. There were no negative effects from this event, and the perforation was fully healed within 8 weeks. At the time of follow-up, all defects were fully healed with no sign of recurrence in the 18 (50%) patients reevaluated. There was a significant improvement in continence scores and a significantly decreased incidence of UTIs after ELA. The median follow-up time was 34 months (range, 8 to 57 months). Conclusions and Clinical Relevance-The results of the present study indicated that ELA provided an effective, safe, and minimally invasive treatment option for various VVSRS in dogs, avoiding the need for more invasive surgery.

Cardiovascular effects of orotracheal intubation following anesthetic induction with propofol, ketamine-propofol, or ketamine-diazepam in premedicated dogs.
Riccó CH1, Henao-Guerrero N.
Objective-To compare the hemodynamic responses to orotracheal intubation following induction of anesthesia with propofol, ketamine-propofol, and ketamine-diazepam in premedicated dogs. Design-Prospective, randomized, masked study. Animals-10 healthy adult Beagles. Procedures-Dogs were randomly allocated to be anesthetized twice, with a 1-week wash-out interval, by means of 2 of 3 possible protocols (propofol [4 mg/kg {1.8 mg/lb}, n = 6 dogs], ketamine [2 mg/kg {0.9 mg/lb}] and propofol [2 mg/kg; 7], or ketamine [5 mg/kg {2.3 mg/lb}] and diazepam [0.2 mg/kg {0.09 mg/lb}; 6]). After instrumentation, continuous heart rate, systolic arterial blood pressure, mean arterial blood pressure, diastolic arterial blood pressure, cardiac index, stroke volume index, and systemic vascular resistance were recorded. Fifteen minutes after premedication, dogs were anesthetized; all anesthetics
were administered IV. After 5 minutes, orotracheal intubation was performed without the use of a laryngoscope. Data were collected prior to intubation (baseline), at intubation, and 30, 60, 90, 120, 150, and 180 seconds thereafter. Results were compared among the 3 groups and over time. Results-No differences among groups were observed for any variables studied. In all groups, arterial blood pressures were significantly decreased at various time points after intubation. A significant increase in systolic arterial blood pressure was observed between baseline and the 30-second time point in the ketamine-diazepam group. No significant differences were detected over time for the other variables in any group. Conclusions and Clinical Relevance-Intubation after anesthetic induction with ketamine-diazepam caused transitory hypertension, whereas intubation after induction with propofol or ketamine-propofol did not cause cardiovascular stimulation. In dogs in which hypertension is a concern, propofol or ketamine-propofol may be a better choice for induction prior to orotracheal intubation.

**Journal of the American Veterinary Medical Association – April 1**

**Performance of a veterinary urine dipstick paddle system for diagnosis and identification of urinary tract infections in dogs and cats.**

Ybarra WL, Sykes JE, Wang Y, Byrne BA, Westropp JL.

Objective-To evaluate the performance of a veterinary urine dipstick paddle (UDP) for diagnosis and identification of urinary tract infection (UTI) in dogs and cats.

Design-Prospective, randomized, blinded study. Sample-207 urine specimens. Procedures-UDPs were inoculated by 2 investigators and incubated according to manufacturer's instructions. Results, including presence or absence of bacterial growth, organism counts, and identification of uropathogens, were compared between investigators and with microbiology laboratory results. A subset of UDPs with bacterial growth was submitted to the laboratory for confirmation. Results-The laboratory reported 64 (30.9%) specimens had growth of bacteria. Bacterial growth was reported for 63 (30.4%) and 58 (28.0%) of the UDPs by investigators 1 and 2, respectively. Sensitivity and specificity of the UDP for detection of bacterial growth were 97.3% and 98.6%, respectively, for investigator 1 and 89.1% and 99.3%, respectively, for investigator 2. For UDPs with $\geq 10^5$ colony-forming units/mL, organism counts correlated well between the laboratory and investigators 1 ($r = 0.95$) and 2 ($r = 0.89$). Pathogen identification was not always accurate. Only 25 of 33 (75.8%) UDPs submitted for confirmation yielded bacteria consistent with those isolated from the original bacterial culture of urine. Conclusions and Clinical Relevance-The veterinary UDP system was a sensitive test for screening patients for bacterial UTI, but uropathogen identification was not always accurate. When UDPs have bacterial growth, a fresh urine specimen should be submitted to the laboratory to confirm the identity of the organisms and to permit antimicrobial susceptibility testing.

**Effects of maropitant, acepromazine, and electroacupuncture on vomiting associated with administration of morphine in dogs.**

Koh RB1, Isaza N, Xie H, Cooke K, Robertson SA.

Objective-To evaluate effects of maropitant, acepromazine, and electroacupuncture on morphine-related signs of nausea and vomiting in dogs and assess sedative effects of the treatments. Design-Randomized controlled clinical trial. Animals-222 dogs. Procedures-Dogs received 1 of 6 treatments: injection of saline (0.9% NaCl) solution, maropitant citrate, or acepromazine maleate or electroacupuncture treatment at 1 acupoint, 5 acupoints, or a sham acupoint. Morphine was administered after 20 minutes of electroacupuncture treatment or 20 minutes after injectable treatment. Vomiting and retching events and signs of nausea and sedation were recorded. Results-Incidence of vomiting and retching was significantly lower in the maropitant (14/37 [37.8%]) group than in the saline solution (28/37 [75.7%]) and sham-acupoint electroacupuncture (32/37 [86.5%]) groups. The number of vomiting and retching events in the maropitant (21), acepromazine (38), 1-acupoint (35), and 5-acupoint (34) groups was significantly lower than in the saline solution (88) and sham-acupoint electroacupuncture (109) groups. Incidence of signs of nausea was significantly lower in the acepromazine group (3/37 [8.1%]) than in the sham-acupoint group (15/37 [40.5%]). Mean nausea scores for the saline solution, maropitant, and sham-acupoint electroacupuncture groups increased significantly after morphine administration, whereas those for the acepromazine, 1-acupoint electroacupuncture, and 5-acupoint electroacupuncture groups did not. Mean sedation scores after morphine administration were significantly higher in dogs that received acepromazine than in dogs that received saline solution, maropitant, and sham-acupoint electroacupuncture treatment. Conclusions and Clinical Relevance-Maropitant treatment was associated with a lower incidence of vomiting and retching, compared with control treatments, and acepromazine and electroacupuncture appeared to prevent an increase in severity of nausea following morphine administration in dogs.

**Australian Veterinary Journal**
Remaining vigilant for the exotic: cases of imported canine leishmaniosis in Australia 2000-2011.
Cleare E1, Mason K, Mills J, Gabor M, Irwin P.

BACKGROUND: Canine leishmaniosis (CL) caused by Leishmania infantum is a disease of worldwide importance, not only because it causes severe and potentially fatal disease in dogs, but also because of its zoonotic relevance. The parasite is the causative agent of human visceral leishmaniosis, a severe, debilitating disease that causes an estimated 59,000 deaths annually. Australia is considered to be free of zoonotic leishmaniosis.

METHODS: A retrospective case series of five imported dogs diagnosed with CL between 2000 and 2011. Cases were identified by word-of-mouth and by referral.

RESULTS: The dogs were diagnosed with CL between 2000 and 2011; clinical, clinicopathological, and serological data are presented, together with a review of the disease and its biosecurity implications for Australia.

CONCLUSIONS: Because of the unique immunopathology and diagnostic challenges associated with CL, the importance of obtaining a travel history is reinforced because some dogs imported prior to 2006 may develop clinical signs of this disease and present for veterinary examination. Furthermore, it is possible for leishmaniosis to become established within Australia under certain circumstances.

Metaphyseal osteopathy in three Australian Kelpie siblings.
Greenwell C1, Brain P, Dunn A.

CASE REPORT: Metaphyseal osteopathy (MO) was diagnosed in three Australian Kelpie puppies that were presented for veterinary assessment of lameness. The three puppies were siblings. Each was from a different litter by the same breeding pair. The puppy in case one was seen by the authors, and the puppies in cases two and three were patients at other veterinary hospitals. However, the medical records and radiographs were examined and reviewed for this report. Radiographic investigation of the lameness revealed pathognomonic appearance of MO affecting the metaphyseal region of the long bones in all three puppies. The diagnosis was confirmed on histopathology in one patient.

CONCLUSION: MO is considered a disease of large and giant-breed dogs, being rarely reported in non-large-breed dogs, and has not been reported in the Australian Kelpie, which is considered a medium-breed dog. This case series suggests a previously unreported breed predisposition to MO in the Australian Kelpie.

The Veterinary Journal

What causes canine sino-nasal aspergillosis? A molecular approach to species identification
Jessica J. Talbot, Lynelle R. Johnson, Patricia Martin, Julia A. Beatty, Deanna A. Sutton, Frédéric Billen, Catriona L. Halliday, Justine S. Gibson, Sarah Kidd, Jörg M. Steiner, Beata Ujvari, Vanessa R. Barrs

On the basis of phenotypic identification methods, Aspergillus fumigatus is reported as the most commonly identified aetiological agent of canine sino-nasal aspergillosis (SNA). However, definitive identification of Aspergillus spp. using phenotypic features alone is unreliable. The aim of this study was to determine the molecular identities of fungal species causing SNA in dogs. Genomic DNA was extracted from 91 fungal isolates from 90 dogs diagnosed with SNA in Australia, the USA and Belgium, and the ITS1-5.8S-ITS2 ribosomal DNA and partial β-tubulin regions were sequenced.

Eighty-eight of 91 (96.7%) isolates were identified as A. fumigatus and 3/91 (3.3%) belonged to Aspergillus section Nigri spp. (Aspergillus tubingensis: 2/91; Aspergillus uvarum: 1/91). These findings confirm that A. fumigatus is the most common aetiological agent of canine SNA. This is the first report to document a pathogenic role for A. tubingensis and A. uvarum in dogs.

Pegylated feline granulocyte colony-stimulating factor increases neutrophil levels in cats.

Neutropenia can often be corrected by treatment with granulocyte-colony stimulating factor (G-CSF) and off-label use of commercial human G-CSF (HuG-CSF) is a commonly used treatment for neutropenic animals. However, long-term HuG-CSF treatment can be associated with adverse effects, including neutropenia. Here, feline (Fe) G-CSF was produced in Pichia pastoris, pegylated (Peg) FeG-CSF and tested in cats. A randomized controlled clinical trial was conducted to evaluate the efficacy of PegFeG-CSF compared to FeG-CSF or HuG-CSF in FIV-infected (n = 14), FIV-uninfected healthy cats.
(n = 19), and in HuG-CSF-induced neutropenic cats (n = 4). Daily FeG-CSF doses induced higher neutrophil production than HuG-CSF after the second week of treatment (P ≤ 0.002). Weekly doses of PegFeG-CSF induced higher neutrophil counts and showed greater sustained activity than weekly doses of FeG-CSF. PegFeG-CSF provided the most therapeutic and sustainable neutrophil production (P < 0.001) in both FIV-uninfected and FIV-infected cats, without the development of neutralizing antibodies. Conversely, all HuG-CSF-treated cats developed neutralizing antibodies, suggesting cross-reactive antibodies to endogenous G-CSF in a majority of the cases with severe neutropenia. Strikingly, when PegFeG-CSF was used to rescue cats with HuG-CSF-induced neutropenia, clinically normal neutrophil numbers returned. Thus, PegFeG-CSF appears to be a superior treatment for neutropenia in feline patients.

Pharmacokinetic profiles of the novel COX-2 selective inhibitor cimicoxib in dogs.
T.W. Kim, B. Lebkowska-Wieruszewska, H. Owen, H.I. Yun, C.J. Kowalski, M. Giorgi

Cimicoxib (CX) is a novel imidazole derivative that is a cyclo-oxygenase (COX)-2 selective non-steroidal anti-inflammatory drug and the latest COX-2 selective inhibitor to be released for veterinary use. Currently there is limited information available on the pharmacokinetic (PK) properties of CX. The aim of the current study was to evaluate the PK features of CX after administration of the recommended dose and after administration of a more variable dose rate in the form of the commercially available tablet. In addition, the effects of food intake on the PK properties were also evaluated. In the first study, five healthy Beagle dogs received 2 mg/kg CX via the oral route following a period of fasting. The second study was conducted using six healthy Labrador retriever dogs which each received an 80 mg tablet (approximate dose 1.95–2.5 mg/kg) using a crossover design, both in the fasted and fed condition. The plasma concentrations of CX were detected by a validated HPLC method. No adverse effects were observed in any dogs during the experiment. The results from the PK analysis were similar between the studies, regardless of precision of dose and fasted and fed conditions. The mean peak concentration of CX was 0.49 and 0.43 µg/mL under fasted and fed conditions, respectively. The mean half-life was about 3 h after all treatments. In addition, simulated multiple dosing data revealed that time over minimal effective concentration was similar after 1.95, 2.0 and 2.5 mg/kg dose administrations. These findings suggest that slight variation from the recommended dose should not alter the therapeutic outcome. In addition, CX can be administered to fed dogs without significantly affecting blood levels.

The immunostimulatory effect of CpG oligodeoxynucleotides on peripheral blood mononuclear cells of healthy dogs and dogs with atopic dermatitis.

Synthetic oligodeoxynucleotides containing cytosine phosphatidyl guanine-rich DNA sequences (CpG ODN) can promote T-helper type 1 (Th1) responses, reduce T-helper type 2 (Th2) responses and/or favour regulatory T cell (Treg) responses in vitro and in vivo in humans and animals, by acting via Toll-like receptor 9 (TLR9). Since CpG ODN can be used as immune-modulators for canine atopic dermatitis (AD), the aim of the current study was to investigate their immunostimulatory potential on peripheral blood mononuclear cells (PBMC) and their subsets, from AD and healthy dogs. Expression of TLR9 and cytokine mRNA in CpG ODN-stimulated and unstimulated cells was assessed by real-time quantitative PCR. Stimulation of PBMC with CpG class C ODN upregulated mRNA expression of interleukin (IL)-6, interferon (IFN)-γ and IL-12p40 in AD dogs (P < 0.05). It also stimulated IFN-γ protein secretion by PBMC of atopic and healthy dogs as measured by ELISA. In healthy dogs only, CpG class C ODN stimulated IFN-α mRNA production by CD21+ cells, and IL-10, IL-13 and IFN-γ mRNA production by CD3+ cells. Increased expression of TLR9 mRNA was only observed in CD3+ cells from AD dogs. No significantly increased gene expression was found in the CD11c+ subset upon stimulation, for those genes evaluated. The results indicate that PBMC of healthy and atopic dogs are sensitive to stimulation with CpG ODN class C, with a resulting Th1 cytokine response in AD dogs and a mixed Th1/Th2/Treg cytokine response in healthy dogs. From this study, little evidence was found to support the use of CpG ODN class C for therapeutic purposes in dogs affected with AD.
Azithromycin pharmacokinetics in the serum and its distribution to the skin in healthy dogs and dogs with pyoderma.

Gila Zur, Stefan Soback, Yfat Weiss, Elad Perry, Eran Lavy, Malka Britzi.

Serum and skin tissue azithromycin (AZM) concentrations were analysed in healthy and pyoderma affected dogs to determine AZM pharmacokinetics and to establish the effect of disease on AZM skin disposition. AZM was administered orally to two groups of healthy dogs: (1) at 7.02 mg/kg (n = 7) and (2) at 11.2 mg/kg (n = 9). A crossover design was used on five of them. Seven dogs with pyoderma were treated with AZM at 10.7 mg/kg. The two groups of healthy dogs received AZM once daily over three consecutive days and dogs with pyoderma received the same treatment repeated twice with an interval of 1 week. AZM concentrations were determined by liquid chromatography–tandem mass spectrometry. AZM was rapidly absorbed and slowly excreted. In healthy dogs, maximum serum concentrations appeared 2 h after administration and were (mean ± standard deviation) 0.60 ± 0.25 µg/mL and 1.03 ± 0.43 µg/mL, and the half-lives were 49.9 ± 5.10 and 51.9 ± 6.69 h for doses of 7.02 and 11.2 mg/kg, respectively. Clearance (CL0–24/F) was similar in both dosing groups (1.24 ± 0.24 and 1.29 ± 0.24 L/h/kg) and the respective mean residence time (MRT0–24) was 11.1 ± 0.8 and 8.4 ± 2.2 h. The skin concentration in healthy dogs was 3.5–6.5 and 5.0–12.0 times higher than the corresponding serum concentration after the two doses and increased after the cessation of AZM administration. The ratio increased significantly in inflamed tissue (9.5–26.2).

The effects of an intravenous bolus of dexmedetomidine following extubation in a mixed population of dogs undergoing general anaesthesia and surgery

James R. Hunt, Louisa S. Slingsby, Joanna C. Murrell.

An observer blinded, placebo controlled study evaluated the effects of 62.5 µg/m2 dexmedetomidine administered IV on recovery from isoflurane anaesthesia in dogs. Forty-four healthy dogs, weighing 1.8–19.95 kg, presented for surgery that was expected to cause mild to moderate pain were studied. All were premedicated with 125 µg/m2 dexmedetomidine and 20 µg/kg buprenorphine IM. Anaesthesia was induced with propofol and maintained with isoflurane. Non-steroidal anti-inflammatory drugs and local anaesthetics were administered as appropriate. Immediately prior to extubation dogs were treated with dexmedetomidine 62.5 µg/m2 (group D) or an equivalent volume of heparinised saline (S). Assessments of heart rate, respiratory rate, pain (short form Glasgow composite pain scale [SF-GCPS], dynamic interactive visual analogue scale [DIVAS]), sedation (simple descriptive scale [SDS], DIVAS) and mechanical nociceptive threshold (MNT) were performed immediately before premedication, 20 min later, at the time of test drug administration (T0) and at 15–30 min intervals for four hours (T240 min). Recovery quality was scored 0 – 3 (SDS). Data were analysed with Student’s t and Mann–Whitney U tests, two-way ANOVA and Fisher’s exact test. Significantly fewer poor quality recoveries were observed in group D (D 2 [1–3]; S 2 [0–3]; P = 0.02), however, sedation was increased in group D compared to group S from T15 to T150 min (P = 0.0001). Pain scores were lower in group D compared to group S from T15 to T120 min (P = 0.001), but the requirement for additional analgesia in the first 4 h following extubation was not different between groups. Dexmedetomidine may decrease the incidence of poor quality anaesthetic recoveries in dogs.

Versican expression in myoepithelial cells from carcinomas in canine mixed mammary tumors.


The matrix of canine mixed mammary tumors (CMMTs) consists of proliferating spindle cells of possible myoepithelial origin, as well as myxomatous tissue, cartilage matrix and/or bone. Among the multiple components of this tumor extracellular matrix, versican probably plays a prominent role due to its importance in tumor progression, cell proliferation and differentiation. However, there are few data related to a possible association between versican expression and the state of myoepithelial cell differentiation in CMMTs. Using immunohistochemistry and histochemistry, the objective of this study was to evaluate the expression of versican, sulfated proteoglycans and mucopolysaccharides in myoepithelial cells at different stages of differentiation and to explore a potential relationship with p63 and α-smooth muscle actin (SMA) expression. A significant difference in versican expression was observed among the different stages of myoepithelial cell differentiation with an inverse correlation between versican and p63/SMA expression. These results suggest that at an early stage of proliferation,
myoepithelial cells acquire a phenotype consistent with a role in chondrogenesis. Moreover, myoepithelial cells showed an affinity for safranin and periodic acid-Schiff staining at different stages of proliferation supporting the myoepithelial origin of spindle cells from CMMTs.

The central role of chloride in the metabolic acid–base changes in canine parvoviral enteritis
Richard K. Burchell, Johan P. Schoeman, Andrew L. Leisewitz.

The acid–base disturbances in canine parvoviral (CPV) enteritis are not well described. In addition, the mechanisms causing these perturbations have not been fully elucidated. The purpose of the present study was to assess acid–base changes in puppies suffering from CPV enteritis, using a modified strong ion model (SIM). The hypothesis of the study was that severe acid–base disturbances would be present and that the SIM would provide insights into pathological mechanisms, which have not been fully appreciated by the Henderson–Hasselbalch model. The study analysed retrospective data, obtained from 42 puppies with confirmed CPV enteritis and 10 healthy control dogs. The CPV-entertoitis group had been allocated a clinical score, to allow classification of the data according to clinical severity. The effects of changes in free water, chloride, l-lactate, albumin and phosphate were calculated, using a modification of the base excess algorithm. When the data were summed for each patient, and correlated to each individual component, the most important contributor to the metabolic acid–base changes, according to the SIM, was chloride (P < 0.001). Severely-affected animals tended to demonstrate hypochloraemic alkalosis, whereas mildly-affected puppies had a hyperchloraemic acidosis (P = 0.007). In conclusion, the acid–base disturbances in CPV enteritis are multifactorial and complex, with the SIM providing information in terms of the origin of these changes.

Randomized clinical trial of the effects of a combination of acepromazine with morphine and midazolam on sedation, cardiovascular variables and the propofol dose requirements for induction of anesthesia in dogs.

The present study evaluated the effects of acepromazine combined with midazolam and morphine on sedation and cardiovascular variables as well as the propofol dose required for induction of anesthesia in dogs compared with acepromazine–morphine or midazolam–morphine. Dogs were randomly assigned to receive an intramuscular administration of (1) acepromazine (0.05 mg/kg) with 0.5 mg/kg of morphine (group AM, n = 10), (2) midazolam (0.5 mg/kg) with 0.5 mg/kg of morphine (group MM, n = 9), or (3) acepromazine with midazolam and morphine at the same doses (group AMM, n = 10). After 30 min, sedation was assessed by a numeric descriptive scale (NDS, range 0–3) and a simple numerical scale (SNS, range 0–10). Dogs were then administered IV propofol to allow endotracheal intubation. NDS and SNS scores were significantly higher in the AMM than in the MM group (P < 0.05). There was a trend towards more dogs presenting with intense sedation (NDS = 3) in AMM (6/10 dogs) compared with AM (1/10 dogs) and MM (1/9 dogs) (P = 0.057). The propofol dose required for induction of anesthesia was significantly lower in AMM (4.0 mg/kg) compared with MM (6.0 mg/kg, P < 0.01) but not AM (4.6 mg/kg). Heart rate decreased in AM after treatment and after intubation. Blood pressure decreased in groups AM and AMM following treatment and in all groups after intubation. The combination AMM resulted in intense sedation more frequently than AM and MM, and provided the greatest sparing effect in the propofol dose. Administration of AM and AMM but not MM decreased blood pressure although hypotension was not recorded in healthy dogs.


The aim of this study was to investigate the efficacy of intra-articular (IA) botulinum toxin A (IA BoNT A) for the treatment of osteoarthritic joint pain in dogs. The study was a placebo-controlled, randomized, double-blinded clinical trial with parallel group design and 12-week follow-up. Thirty-six dogs with chronic lameness due to stifle, hip or elbow osteoarthritis were randomized to receive an IA injection of 30 IU of BoNT A or placebo. The main outcome variables were vertical impulse (VI) and
peak vertical force (PVF) measured with a force platform, and Helsinki chronic pain index (HCPI). Subjective pain score and the need for rescue analgesics were secondary variables. The response to treatment was assessed as the change from baseline to each examination week. The variables were analyzed by ANOVA with repeated measurements and results were considered statistically significant if P ≤ 0.05. The improvement from baseline to 12 weeks after baseline was statistically significant in VI, PVF and HCPI in the treatment group (P = 0.001, P = 0.054 and P = 0.053, respectively). Additionally, there were statistically significant improvements in VI in the treatment group at 2, 4 and 8 weeks after baseline (P = 0.037, P = 0.016 and P = 0.016, respectively). The difference between groups in improvement in VI was statistically significant at 12 weeks after baseline (P = 0.005). There was no significant change in the subjective pain score or in the requirement for rescue analgesics in either group. No major adverse events thought to be related to trial protocol were detected. These results suggest that IA BoNT A has some efficacy in reducing osteoarthritic pain in dogs.

**Spinosad is a potent inhibitor of canine P-glycoprotein.**

Johannes A. Schrickx. Inhibition of the drug transporter P-glycoprotein (P-gp) by the oral flea preventative spinosad has been suggested as the underlying cause of the drug–drug interaction with ivermectin. In this study, an in vitro model consisting of canine cells was validated to describe the inhibitory effect of drugs on canine P-gp. In this model, ivermectin, cyclosporin, verapamil, loperamide and ketoconazole inhibited P-gp function with IC50 values ranging from 0.1 to 3.7 µmol/L. Spinosad was a potent inhibitor of canine P-gp with an IC50 value of 0.27 µmol/L or 0.2 µg/mL. The risk of spinosad causing P-gp related drug–drug interactions in the dog could be predicted by the IC50 value, the oral dosage and plasma concentrations.

**Plasma cytokine concentrations in dogs with a congenital portosystemic shunt.**

Scott Kilpatrick, Adam G. Gow, Rob D. Foale, Simon W. Tappin, Harvey Carruthers, Nicola Reed, Donald A. Yool, Samantha Woods, Ana I. Marques, Rajiv Jalan, Richard J. Mellanby. Congenital portosystemic shunts (cPSS) are a well-recognised vascular anomaly in dogs. Recent studies have shown an association between inflammation and hepatic encephalopathy (HE), which is a common clinical syndrome in dogs with a cPSS. Pro-inflammatory cytokines such as interleukin (IL)-6 and tumour necrosis factor (TNF)-α are frequently increased in the plasma of human patients with liver disease and have been implicated in the development of HE. In the current study, plasma concentrations of IL-2, IL-6, IL-8 and TNF-α were measured using a multiplex electrochemiluminescence immunoassay in 36 dogs with a cPSS and compared to 25 healthy dogs. There were no significant differences in plasma IL-2, IL-8 and TNF-α concentrations between the two groups; however, plasma concentrations of IL-6 were significantly higher in dogs with a cPSS compared to healthy dogs (P = 0.02).

**Journal of Feline Medicine and Surgery**

**Aberrant expression of sLex and sLea as candidate prognostic factors for feline mammary gland tumour**

Saori Yoshida, Kota Yoshida, Tassanee Jaroenpong et al. Expression of the carbohydrate antigens sialyl Lewis x (sLex) and a (sLea) was evaluated in feline mammary gland tumours (FMGT). Immunohistochemical analysis of tissues from 21 FMGT patients and 11 healthy cats revealed significantly higher sLex and sLea antigen expression in adenocarcinoma tissues compared with that of normal mammary tissues (P <0.01). Serum concentration of sLex was evaluated using an enzyme-linked immunosorbent assay and was significantly higher in the 11 FMGT patients (4.71 ± 10.1 U/ml) than the 22 patients with other disease (2.69 ± 1.59 U/ml) (P = 0.03) and the 22 healthy cats (3.71 ± 1.10 U/ml), although the latter difference was not significant. Although the number of cases examined in this study was small, our findings suggest that aberrant expression of sLe
antigens may be induced by tumourigenesis in FMGT and that sLe antigens are potential prognostic tumour markers for FMGT.

**Flow cytometric immunophenotyping of feline bone marrow cells and haematopoietic progenitor cells using anti-human antibodies**

Atefeh Araghi, Seyed Mahdi Nassiri, Nahid Atyabi, et al.

There is a paucity of species-specific antibodies available for feline haematopoietic conditions. The purpose of this study was to broaden the panel of antibodies available for use in the immunophenotypic characterisation of feline haematopoietic cells by testing clones of anti-human monoclonal antibodies (mAbs) on normal, neoplastic and cultured feline haematopoietic progenitors to determine cross-reactivity to feline counterparts. In this study, 24 clones of anti-human mAbs were tested on normal or neoplastic feline bone marrow and peripheral blood cells. Six of these mAbs, including anti-cluster of differentiation (CD)61, anti-CD18, anti-CD14, anti-CD235a, anti-CD41 and anti-CD29, cross-reacted with normal feline bone marrow cells, whereas anti-CD33 and anti-CD117 cross-reacted with the blast cells in the bone marrow of two cats with myelodysplastic syndrome, and anti-CD71, anti-235a, anti-41 and anti-42 cross-reacted with immature erythroid cells in a cat with erythroleukaemia. In a feline immunodeficiency virus-positive cat, bone marrow cells were labelled with anti-CD33, anti-14 and anti-45. Anti-CD18, anti-CD14, anti-CD41 and anti-CD61 also reacted with the peripheral blood cells of the healthy cats. The feline haematopoietic progenitors formed colonies in the methylcellulose-based semisolid medium with significant enrichment of colony-forming unit-granulocyte, monocyte and burst-forming unit-erythroid. A panel of six anti-feline mAbs (anti-CD21-like, anti-T lymphocytes, anti-CD172a, anti-granulocyte, anti-CD45-like and anti-CD18) and eight anti-human antibodies (anti-CD71, anti-CD33, anti-CD235a, anti-CD41, anti-CD61, anti-CD117, anti-CD38 and anti-CD34) were used for the immunophenotypic characterisation of the feline bone marrow progenitors. CD45, CD33, CD235a and CD18 were expressed by the feline haematopoietic progenitor cells, with the highest expression level for CD45.

**Tail vaccination in cats: a pilot study**


Feline injection site sarcomas affect 1–10 cats per every 10,000 vaccinated and are associated with high mortality. Radical resection may be curative, but is often associated with prolonged recovery, disfigurement and loss of function when tumors occur at currently recommended injection sites. The objective of this study was to assess alternatives to currently recommended vaccination sites in terms of preference by oncology practitioners, ease of injection and serological responses. Surgical, radiation and medical oncology practitioners were surveyed regarding their preference for vaccination sites based on the ease of tumor resection. A six-point Likert scale was used to measure each cat’s behavioral reaction to vaccination when injected subcutaneously in the distal hind limb or the distal tail. Serum collected before and 1–2 months after vaccination was tested for antibody titers against feline panleukopenia virus (FPV) and rabies virus (RV). The preferred sites for vaccination by 94 oncology practitioners were below the stifle (41%) and the tail (30%). There were no significant differences in the cats’ behavioral reaction to vaccination below the stifle (n = 31) and in the distal tail (n = 29). Of the cats seronegative for FPV at the time of vaccination, 100% developed protective antibody titers (≥40) against FPV 1–2 months following vaccination. For cats seronegative for RV, all but one cat (tail vaccine) developed acceptable antibody titers (≥0.5 IU/ml) against RV. Tail vaccination was well tolerated and elicited similar serological responses to vaccination in the distal limbs.

**Sleeping and resting respiratory rates in healthy adult cats and cats with subclinical heart disease**

Ingrid Ljungvall, Mark Rishniw, Francesco Porciello, et al.

Sleeping and resting respiratory rates are commonly measured variables in patients with cardiac disease. However, little information is available on these variables in healthy client-owned cats or cats with subclinical heart disease (SHD). Therefore, we examined and characterized the sleeping respiratory rate (SRR) and resting respiratory rate (RRR) in 59 echocardiographically normal (EN) and
28 apparently healthy (AH) cats, and 54 SHD cats acquired by the cat owners in the home environment on eight to 10 separate occasions. The within-cat mean sleeping respiratory rate (SRRmean) in EN cats, AH cats and SHD cats with mild or moderate left atrial (LA) enlargement (as defined by quantiles of the ratio of the LA to the aorta [LA:AO]) was consistently <30 breaths/min; median SRRmean approximated 21 breaths/min. The SRRmean of SHD cats with severe LA enlargement sometimes exceeded 30 breaths/min, and was higher than SRRmean of other SHD cats (P <0.05). The within-cat mean resting respiratory rate was consistently higher than SRRmean (P<0.05). Age and geographic location, but not bodyweight, affected SRRmean in EN and AH cats. Within-cat SRR and within-cat RRR did not vary markedly from day-to-day, as evidenced by a low within-cat coefficient of variation. Data acquisition was considered easy or non-problematic by most participants. Our data provide useful guidelines for SRR and RRR, obtained in the home environment, in healthy cats and cats with SHD, and might prove useful in managing cats with clinical heart disease. Cats with SRRmean >30 breaths/min and cats with multiple SRR measurements >30 breaths/min likely warrant additional evaluation.

Electrochemotherapy with intravenous bleomycin injection: an observational study in superficial squamous cell carcinoma in cats

Natasa Tozon, Darja Pavlin, Gregor Sersa et. Al

The aim of this study was to evaluate the efficacy and safety of electrochemotherapy (ECT) with bleomycin for treatment of squamous cell carcinoma (SCC) in cats. Between March 2008 and October 2011, 11 cats with 17 superficial SCC nodules in different clinical stages (ranging from Tis to T4), located on nasal planum (6/11), pinnae (3/11) and both locations (2/11), were included in a prospective non-randomised study. Sixteen of 17 SCC nodules were treated with ECT (15/16 with single session and in one case with two sessions); one nodule was surgically removed. Altogether, complete response (CR) was achieved for 81.8% (9/11) cats and 87.5% (14/16) nodules, lasting from 2 months up to longer than 3 years. Only 2/9 cats in which CR was initially observed, had recurrence 2 and 8 months after the ECT procedure. In the remaining two cats with highly infiltrative spread into adjacent tissues, progression of the disease was observed, despite ECT, and both were euthanased 4 and 5 months after the procedure. ECT in cats was well tolerated and no evident local or systemic side effects were observed. The results of this study suggest that ECT is a highly effective and safe method of local tumour control of feline cutaneous SCCs. It should be considered as an alternative treatment option, especially when other treatment approaches are not acceptable by the owners, owing to their invasiveness, mutilation or high cost.

A retrospective analysis of urethral rupture in 63 cats

Elena S Addison, Zoe Halfacree, Alasdair Hotston Moore et. Al

The aim of this study was to investigate the short- and long-term morbidity and mortality associated with urethral rupture in cats. Medical records were reviewed from four veterinary hospitals. Diagnosis was made from retrograde urethrography or direct visualisation during surgery. Location of rupture was categorised as pre-, intra- or post-pelvic. Follow-up data were collected from referring veterinarians. Sixty-three cats were included in the study of which, males predominated (88.9%). Trauma was the most common cause (n = 35; 55.6%) with the remainder due to iatrogenic injury. Forty-eight cats (88.9%) were treated surgically and six (11.1%) managed conservatively. Significant differences between cats suffering traumatic versus iatrogenic injury included the presence of musculoskeletal injuries (P <0.001); the location of rupture (P <0.001); the degree of rupture (P <0.001); definitive management (P <0.001) and short-term complications (P = 0.026). Short-term complications were significantly associated with the following: musculoskeletal injuries (P = 0.012); uroabdomen/uroretroperitoneum (P = 0.004); azotaemia (P = 0.021); postoperative urinary diversion (P = 0.036) and >1 surgery performed (P = 0.006). Forty-seven cats (74.6%) survived to discharge. Prognostic factors associated with survival to discharge included the presence of musculoskeletal injuries (P = 0.017); cause of rupture (P = 0.017); location of rupture (P = 0.039) and definitive management (P = 0.020). Twenty-four cats (57.1%) suffered short-term complications and 10 (27.0%) suffered long-term complications. Of those cats surviving to discharge 30 (71.4%) had a good outcome. Median follow-up was 16 months. Outcome was significantly associated with cause of rupture (P = 0.04); short-term complications (P = 0.03) and long-term complications (P <0.001). In conclusion, a significantly greater
proportion of cats with iatrogenic injuries survived to discharge and had a good outcome compared with those that suffered trauma.

Detection of serum antibodies against Bartonella species in cats with sporotrichosis from Rio de Janeiro, Brazil

Amanda AB Kitada, Alexsandra RM Favacho, Raquel VC Oliveir et. Al

Cat scratch disease is a zoonosis caused by Bartonella species, transmitted to humans through scratches or bites from infected cats and via direct contact with infected feces. Sporotrichosis, caused by the fungal complex Sporothrix, is transmitted by traumatic inoculation of the fungus. Cats are important in zoonotic transmission. Serum samples from 112 domestic cats with sporotrichosis and 77 samples from healthy cats were analyzed by indirect immunofluorescence assay (IFA), using the commercial kit Bartonella henselae IFA IgG (Bion). The presence of antibodies against feline leukemia virus (FeLV) and of feline immunodeficiency virus (FIV) core antigens was detected using the commercial kit Snap Combo FIV–FeLV (Idexx). The group of animals with sporotrichosis contained 93 males with a median age of 22 months, eight (7.1%) of which were positive for FIV and 15 (13.4%) for FeLV. The group of animals without sporotrichosis contained 36 males with a median age 48 months, 10 (13.0%) of which were positive for FIV and eight (10.4%) for FeLV. Of the 112 cats with sporotrichosis and 77 cats without mycosis, 72 (64.3%) and 35 (45.5%), respectively, were IFA reactive. No association was found between age, sex, FIV/FeLV and the presence of antibodies to Bartonella species. The results suggest that the study population can be considered a potential source of zoonotic infection for both diseases.

Ejaculation training, seminal alkaline phosphatase and semen preservation through cooling in a milk-based extender in domestic cats

Carla Valiente, Pablo E de la Sota, Sandra Arauz, and Cristina Gobello

The purpose of this report is to describe (1) the training of domestic cats in ejaculation into an artificial vagina (AV), (2) alkaline phosphatase (AP) concentrations in whole ejaculates, and (3) the in vitro effect of a skimmed-milk plus egg yolk (SM-Y) extender on feline spermatozoa incubated at 4°C. Five post-pubertal cats were trained to ejaculate into an AV three times a week for 20 mins in the presence of a teaser queen. Fifty AV-obtained ejaculates were macro- and microscopically assessed, and the AP therein measured by optimized colorimetry. Eighty AV-obtained ejaculates were pooled, diluted in SM-Y extender [80% (v/v) skimmed milk, 20% (v/v) egg yolk, and antibiotics], stored at 4°C and evaluated daily for 6 days. All the animals could be trained to ejaculate, although the interval up to the first AV ejaculation varied from 1.5 to 5.5 months (mean 3.9 months). The final performance at collection ranged from excellent to poor and was inversely related to the training period required in all cases. The mean AP concentration in whole ejaculates was 20,645.6 ± 4405U/l, which was not correlated with the concentration of spermatozoa. Most seminal parameters [(%); total (77 ± 2.3) and progressive (62.7 ± 3.4) motility, live sperm (91.8 ± 1.2), intact plasmalemma (83.5 ± 2.6), normal acrosomes (83.5 ± 2.6), pH (6.6 ± 0.0) and osmolarity (mOsm/l; 321 ± 5.2)], though decreasing during storage in the cold, remained within values compatible with in vivo fertilization for 2 days.

Biological variation and reference change values of feline plasma biochemistry analytes

Randolph M Baral, Navneet K Dhand, Kathleen P Freeman et. Al

This is the first report concerning biological variation and reference change values of feline plasma biochemistry components in the peer-reviewed literature. Biological variation refers to inherent physiological variation of analytes. The ratio of individual biological variation to group biological variation is referred to as an analyte’s index of individuality. This index determines the suitability of an analyte to be assessed in relation to population- or subject-based reference intervals. A subject-based reference interval is referred to as a reference change value or critical difference, and is calculated from individual biological variation. Fourteen cats were sampled for plasma biochemistry analysis once weekly for 6 weeks. Samples were stored and then tested at the same time. Results were assessed in duplicate and coefficients of variation for each analyte were isolated to distinguish variation within
each subject, between all subjects and by the analyser. From these results, an index of individuality and reference change values were determined for each analyte. Five plasma biochemistry analytes (alkaline phosphatase, alanine aminotransferase, cholesterol, creatinine and globulin) had high individuality and, therefore, subject-based reference intervals are more appropriate; only one analyte (sodium) had low individuality, indicating that population-based reference intervals are appropriate. Most analytes had intermediate individuality so population-based reference intervals should be assessed in relation to subject-based reference intervals. The results of this study demonstrate high individuality for most analytes and, therefore, that population-based reference intervals are of limited utility for most biochemical analytes in cats.

Formulation of a standardized protocol and determination of the size and appearance of the spleen in healthy cats

Rebecca S Sayre and Kathy A Spaulding

Standard protocol for splenic measurement is warranted to aid in interpretation when sonographically imaging the spleen of cats. The purpose of this study was to describe the appearance and size of healthy cat spleens, and to develop a standard method of evaluation. Data were obtained from 31 clinically healthy non-sedated cats with no sonographic abnormalities. The sonographic appearance of the spleen’s relative echogenicity compared to the left renal cortex and the hepatic parenchyma was recorded. Splenic height was measured at three sites. Three measurements were determined at each site, and the mean value of these three measurements was determined and used for data analysis. A significance level of P <0.05 was used for analysis, which was performed using S-PLUS software (version 8.1). The mean proximal height of the spleen was 7.1 mm. The mean body sagittal height was 9.3 mm. The mean height of the tail of the spleen was 8.7 mm (95% confidence interval). The splenic parenchymal echogenicity was less than the left renal cortex echogenicity and greater than the liver in 17/31 cats; less than the left kidney cortex and equal to the liver in 5/31 cats; equal to the cortex of the left kidney and greater than the liver in 5/31 cats; equal to the liver and renal cortex in 2/31 cats; and less than the liver and kidney with the renal cortex less than the liver in 2/31 cats. The protocol recommended for consistent evaluation of the spleen in the cat includes three specific measurements.

Ultrasonographic measurement of the relative thickness of intestinal wall layers in clinically healthy cats

Pamela Di Donato, Dominique Penninck, Marco Pietra et al.

The normal sonographic thickness of the individual layers (ie, mucosa, submucosa, muscularis and subserosa-serosa) of the intestinal wall was evaluated in 20 clinically healthy cats. The mean thickness of the wall was 2.20, 2.22, 3.00 and 2.04 mm for duodenum, jejunum, ileum (fold) and ileum (between folds), respectively. The mean thickness of the mucosal layer was 1.27, 1.20, 0.46 and 0.49 mm for duodenum, jejunum, ileum (fold) and ileum (between folds), respectively, and its contribution to wall thickness was significantly greater than that of the other layers in the duodenum (57.7%) and jejunum (55.2%). The mean thickness of the submucosal layer was 0.36, 0.36, 1.49 and 0.53 mm for duodenum, jejunum, ileum (fold) and ileum (between folds), respectively, and its contribution to wall thickness was greater than that of the muscularis in the duodenum (16.3%), jejunum (16%) and ileum (fold) (49.8%). The mean thickness of muscularis was 0.28, 0.35, 0.66 and 0.65 mm for duodenum, jejunum, ileum (fold) and ileum (between folds), respectively, with a corresponding contribution to wall thickness of 12.7%, 14.4%, 22% and 31.6%. Finally, the mean thickness of serosa was 0.29, 0.31, 0.38 and 0.38 mm for duodenum, jejunum, ileum (fold) and ileum (between folds), respectively, with a corresponding contribution to wall thickness of 13.3%, 14.4%, 12.7% and 18.7%. These values can provide baseline information that might be useful in evaluating intestinal disorders affecting preferentially some of the intestinal layers.

Ultrasound-guided pudendal nerve block in cats undergoing perineal urethrostomy: a prospective, randomised, investigator-blind, placebo-controlled clinical trial

Chiara Adami, Thomas Dayer, Claudia Spadavecchia, and Giovanni Angeli
The objective of this study was to evaluate the clinical usefulness, in terms of analgesic efficacy and safety, of ultrasound-guided pudendal nerve block performed with bupivacaine in cats undergoing perineal urethrostomy. Eighteen client-owned male cats scheduled for perineal urethrostomy were enrolled in the study and assigned to one of two treatment groups. The pudendal nerve block was performed under general anaesthesia, as described elsewhere, with 0.3 ml/kg of either saline (group C) or 0.5% bupivacaine (group B) – the total injection volume being split equally between the two sites of injection (left and right). Intra-operatively, assessment of nociception was based on the rescue analgesics requirement, as well as on the evaluation of changes in physiological parameters in comparison with the baseline values. Postoperative pain assessment was performed using three different pain scales at recovery and then 1, 2 and 3 h after recovery. Cats in group B showed lower heart rates and required fewer analgesics during surgery than group C. Postoperatively, group B had lower pain scores and needed less rescue buprenorphine than group C. Iatrogenic block-related complications were not observed. In conclusion, the ultrasound-guided pudendal nerve block can be considered clinically useful in feline medicine as it provides reliable analgesia in cats undergoing perineal urethrostomy.

Case series of feline panleukopenia virus in an animal shelter
Annette Lister and Chutamas Benjanirut

The aim of this study was to describe a series of confirmed and suspected cases of feline panleukopenia virus (FPV) and in-contact cats in an adoption-guarantee shelter in an FPV-endemic area by reviewing shelter records over a 10-month period (January–October 2010). Cats were divided into three groups: in-contact group – asymptomatic cats that were housed with a FPV fecal antigen (Ag)-positive cat/kitten as part of a litter group (n = 66); FPV-survivors group (FPV-infected survivors) – tested FPV fecal Ag-positive and showed clinical signs of FPV, but survived (n = 27); FPV-non-survivors group (FPV-infected non-survivors) – showed clinical signs of FPV and either tested FPV fecal Ag-positive or were housed with an Ag-positive family member, but did not survive (n = 52). Ages ranged from 3 weeks to 3 years, but most were <6 months old (in-contact group: 79%; FPV-survivors group: 70%; FPV-non-survivors group: 85%). A seasonal peak occurred over summer, but cases occurred year-round. Anorexia, dehydration, fever and diarrhea predominated in the FPV-survivors group, and death was preceded by clinical signs of circulatory shock in the FPV-non-survivors group. Housing litters of kittens with their mother was not associated with improved outcome, perhaps because in this population clinical FPV infection was relatively common in queens arriving at the shelter with susceptible litters.

Trans-iliac pin/bolt/screw internal fixation for sacroiliac luxation or separation in cats: six cases
Fui W Yap, Andrew L Dunn, Michael Farrell, and Ignacio Calvo

Trans-iliac pin, bolt or screw stabilisation was performed on six cats with sacroiliac (SI) luxation and separation. For the purpose of this study, SI luxation is defined as the separation of the iliac wing from the sacrum without fracture of the sacral or iliac wing; SI separation is defined as the separation of the iliac wing from the sacrum secondary to fracture of the sacrum and/or the iliac wing. Complications, surgical time and medium-to-long-term outcome were assessed by a retrospective review of the clinical records and owner questionnaires. Postoperative reduction of the SI joint was good-to-excellent in all cases and the outcome was considered good-excellent in all cats apart from one, where the trans-iliac bolt migrated dorsally from the iliac wing. This cat had bilateral SI luxations. Based on our results, trans-iliac fixation of SI luxation/separation is associated with good clinical outcome and should be considered as a treatment option in unilateral SI luxation in cats. Caution should be exercised in the use of trans-iliac pin/bolt as the sole method of stabilisation in bilateral SI luxations.

Cystitis glandularis in a cat
Amalia Agut, Juana D Carrillo, Marta Soler et. Al

An 8-year-old intact male Persian cat was presented for investigation of chronic haematuria. The cat had episodes of haematuria on several occasions that were non-responsive to antimicrobial therapy.
Abdominal ultrasound examination revealed dilation of the renal pelvis and ureters of both kidneys. The urinary bladder wall was thickened, a mass of heterogeneous echogenicity filled the lumen of the bladder, and two parallel thin hyperechoic lines were identified within the lumen, which suggested a urethral catheter. Differential diagnoses for the urinary bladder mass included cystitis and neoplasia. The mass was surgically removed from the urinary bladder, and a urethral catheter was found embedded in the mass. Histopathological findings were consistent with cystitis glandularis of a typical type. Periodic bladder ultrasonographic studies were performed; at the time of writing, over 2 years later, recurrence had not been detected.

**Effectiveness of deslorelin acetate subcutaneous implantation in a domestic queen with after-spaying urinary incontinence**

Maria Carmela Pisu and Maria Cristina Veronesi

A 2-year-old female ovariecctomised Norwegian Forest cat with a history of post-spaying urinary incontinence was diagnosed with acquired urinary sphincter mechanism incompetence (USMI) after complete clinical and laboratory examination. Although there is no literature regarding the treatment of post-spaying USMI in cats, deslorelin acetate is successful in the treatment of post-spaying USMI in dogs. Deslorelin acetate implants have been shown previously to be effective for contraception and oestrus suppression in queens, and suppression of reproductive function in tomcats. Therefore, deslorelin acetate implant treatment was chosen for treatment of post-spaying USMI in this queen. Follow-up examinations were performed on days 8, 15 and 30 after deslorelin implant insertion. Urinary continence was restored about 25 days after implantation and maintained for at least 15 months, without treatment-related negative effects. In the present case report, the post-spaying urinary incontinence related to the acquired USMI was successfully treated with a deslorelin acetate implant. In addition, safe implantation was easy in cats and the single injection resulted in long-lasting efficacy. Further studies are needed to confirm the usefulness of deslorelin acetate treatment for post-spaying USMI in queens and to better delineate the duration of efficacy.

**Successful treatment of an intra-pelvic fungal pseudomycetoma causing constipation and hypercalcaemia in a Persian cat**

Asher Zafrany, Jennifer Ben-Oz, Gilad Segev et. Al

This case report describes the successful treatment of a Persian cat diagnosed with intra-abdominal fungal pseudomycetoma causing hypercalcaemia and constipation due to an extra-luminal mechanical obstruction of the colon. Treatment included surgical excision, supportive care and itraconazole for 6 months.

**Manual ventilation therapy and aggressive potassium supplementation in the management of respiratory failure secondary to severe hypokalaemia in a cat with exocrine pancreatic insufficiency**

Thomas Daste, Olivier Dossin, Brice S Reynolds, and Marcel Aumann

A domestic shorthair cat was referred for progressive muscle weakness and dyspnoea. The cat had a 2-month history of severe weight loss, small intestinal diarrhoea, polyphagia and polyuria/polydipsia. Biochemical analysis and venous blood gas evaluation revealed severe hypokalaemia [1.7 mmol/l; reference interval (RI): 3.5–5.1 mmol/l] and hypoventilation (partial pressure of carbon dioxide = 68 mmHg; RI: 34–38 mmHg). Aggressive potassium supplementation was initiated. The cat was manually ventilated until serum potassium increased to 3 mmol/l. A diagnosis of exocrine pancreatic insufficiency (EPI) was made based on clinical signs and serum feline trypsin-like immunoreactivity (0.1 µg/l; RI: 12–82 µg/l). Medical management of the EPI resulted in clinical recovery.

**Idiopathic generalised tremor syndrome in two cats**
Two male neutered domestic shorthair cats were evaluated for generalised tremors. On neurological examination both cats showed whole-body tremors, worsening with stress. A mainly cerebellar disorder was suspected. Blood examination, cerebrospinal fluid analysis and electrophysiological examination of both cats and magnetic resonance imaging of the brain in one cat were normal. Idiopathic generalised tremor syndrome (IGTS) was suspected owing to the exclusion of underlying causes and the clinical similarities with the syndrome in dogs. Treatment as recommended for dogs was initiated and resulted in improvement. This report describes the first cases of IGTS in cats.

Journal of Small Animal Medicine

Feline blood genotyping versus phenotyping, and detection of non-AB blood type incompatibilities in UK cats.
S. Tasker, E. N. Barker, M. J. Day and C. R. Helps.
Objectives; The aim of this study was to determine the agreement between AB blood phenotyping and genotyping and determine whether non-AB blood type incompatibilities exist in UK cats. Methods; Blood samples underwent phenotyping (A, B or AB) using microplate agglutination, and genotyping (AA, Ab or bb) using pyrosequencing of a fragment of the cytidine monophospho-N-acetylneuraminic acid hydroxylase gene. Non-AB blood type incompatibilities were investigated by cross-matching against reference blood of the same phenotype. RESULTS; Of 112 cats tested, 86 (77%) were blood phenotype A, 19 (17%) type B and 7 (6%) type AB. Genotype and initial phenotype agreed in 96% (107 of 112) of cats, but 5 were discordant; these were all B phenotype with either AA (n=2) or Ab (n=3) genotype. Two of the five cats had repeat blood samples tested: one was reclassified as phenotype A; the other remained phenotype B. Two cats had incompatibilities on minor cross-match, but these were attributed to phenotyping errors. CLINICAL SIGNIFICANCE; Unknown mutation(s) associated with phenotype B, resulting in false AA or Ab genotyping, were evident in a small number of cases in this study. No conclusive evidence for non-AB blood type incompatibilities was found.

Comparison of computed tomography pulmonary angiography and point-of-care tests for pulmonary thromboembolism diagnosis in dogs.
R. Goggs, D. L. Chan, L. Benigni, C. Hirst, L. Kellett-Gregory and V. L. Fuentes
Objectives; To evaluate the feasibility of CT pulmonary angiography for identification of naturally occurring pulmonary thromboembolism in dogs using predefined diagnostic criteria and to assess the ability of echocardiography, cardiac troponins, D-dimers and kaolin-activated thromboelastography to predict the presence of pulmonary thromboembolism in dogs. Methods; Twelve dogs with immune-mediated haemolytic anaemia and evidence of respiratory distress were prospectively evaluated. Dogs were sedated immediately before CT pulmonary angiography using intravenous butorphanol. Spiral CT pulmonary angiography was performed with a 16 detector-row CT scanner using a pressure injector to infuse contrast media through peripheral intravenous catheters. Pulmonary thromboembolism was diagnosed using predefined criteria. Contemporaneous tests included echocardiography, arterial blood gas analysis, kaolin-activated thromboelastography, D-dimers and cardiac troponins. Results; Based on predefined criteria, four dogs were classified as pulmonary thromboembolism positive, three dogs were suspected to have pulmonary thromboembolism and the remaining five dogs had negative scans. The four dogs identified with pulmonary thromboembolism all had discrete filling defects in main or lobar pulmonary arteries. None of the contemporaneous tests was discriminant for pulmonary thromboembolism diagnosis, although the small sample size was limiting. Clinical Significance; CT pulmonary angiography can be successfully performed in dogs under sedation, even in at-risk patients with respiratory distress and can both confirm and rule out pulmonary thromboembolism in dogs.

Left atrial size, atrial function and left ventricular diastolic function in cats with hypertrophic cardiomyopathy.
C. J. Linney, J. Dukes-McEwan, H. M. Stephenson, J. López-Alvarez and S. Fonfara
OBJECTIVES; To describe left atrial size, left atrial volume, left atrial function and left ventricular diastolic function in healthy cats and those with hypertrophic cardiomyopathy without and with congestive heart failure. METHODS; A retrospective study of 61 client-owned, 21 healthy, 21 asymptomatic hypertrophic cardiomyopathy and 19 with hypertrophic cardiomyopathy and congestive heart failure cats. Data were retrieved from clinical records and echocardiography archives. Left atrial diameter and volumes were measured. Left atrial function was investigated using changes in diameter (fractional shortening) and volume (Simpson's method; left atrial ejection fraction). Conventional echocardiographic indices of left ventricular diastolic function were recorded. RESULTS; Left atrial diameter and left atrial volume measurements were significantly higher in hypertrophic
cardiomyopathy with congestive heart failure cats compared with asymptomatic hypertrophic cardiomyopathy and healthy cats (P < 0·001). Left atrial passive, active and complete ejection fraction distinguished between hypertrophic cardiomyopathy with congestive heart failure and asymptomatic hypertrophic cardiomyopathy (P < 0·001). Hypertrophic cardiomyopathy with congestive heart failure cats had significantly lower mitral A wave velocity (P = 0·016) and atrial complete emptying based on diameter and volume measurements (P = 0·008 and P < 0·001, respectively) compared with asymptomatic hypertrophic cardiomyopathy cats. CLINICAL SIGNIFICANCE; Left atrial volume is obtainable by echocardiography in cats. Left atrial volume and atrial function may indicate chronicity and severity of diastolic dysfunction associated with hypertrophic cardiomyopathy and congestive heart failure. Left atrial function was reduced in cats with hypertrophic cardiomyopathy and congestive heart failure compared with healthy and asymptomatic hypertrophic cardiomyopathy groups.

R. V. Ramos, B. P. Monteiro-Steaall and P. V. M. Steagall

OBJECTIVES; The aim of this study was to report the management and complications of anesthesia in dogs undergoing balloon valvuloplasty. METHODS; A retrospective review of medical records of dogs that were diagnosed with pulmonic stenosis and undergoing balloon valvuloplasty between 2000 and 2012. RESULTS; Thirty-nine cases were identified (28 males and 11 females). Median (range) age and bodyweight was 6 (4 to 48) months and 11·5 (2·0 to 30·3) kg, respectively. The most commonly represented breeds included mixed breed (n = 7, 17·9%) and English bulldog (n = 6, 15·3%). Anaesthesia was induced most commonly with intravenous administration of ketamine-diazepam (n = 8, 20·5%), propofol-diazepam (n = 8, 20·5%), or propofol-midazolam-lidocaine (n = 6, 15·4%), and maintained with isoflurane in combination with fentanyl or lidocaine. Anaesthetic and surgery times (mean ± sd) were 268 · 5 ±54 minutes and 193 ± 2 ±50 minutes, respectively. The most common intraoperative complications were hypotension (n = 19, 48·7%), bradycardia (n = 8, 20·5%) and desaturation (n = 7, 17·9%). Cardiac arrhythmias were observed in 21 (53·8%) dogs. Death occurred in one (2·6%) dog due to severe hypotension after balloononing followed by cardiac arrest. CLINICAL SIGNIFICANCE; Successful anaesthesia can be performed in young dogs with pulmonic stenosis undergoing balloon valvuloplasty. Management of anaesthesia requires intense monitoring and immediate treatment of complications. Anaesthetic risk increases during ballooning and may result in cardiac arrest.

Diagnostic accuracy of three biopsy techniques in 117 dogs with intra-nasal neoplasia.
B. J. Harris, B. N. Lourenço, J. M. Dobson and M. E. Herrtage

OBJECTIVES; To determine if nasal biopsies taken at rhinoscopy are more accurate for diagnosing neoplasia than biopsies taken blindly or using advanced imaging for guidance. METHODS; A retrospective study of 117 dogs with nasal mass lesions that were divided into three groups according to the method of nasal biopsy collection; advanced imaging-guided, rhinoscopy-guided and blind biopsy. Signalment, imaging and rhinoscopic findings, and histopathological diagnosis were compared between groups. The proportion of first attempt biopsies confirming neoplasia were determined for each group. RESULTS; There were no statistically significant differences in the proportion of biopsies that confirmed neoplasia obtained via advanced imaging-guided, rhinoscopy-guided or blind biopsy techniques. CLINICAL SIGNIFICANCE; In dogs with a high index of suspicion of nasal neoplasia, blind biopsy may be as diagnostic as rhinoscopy-guided biopsy. Repeated biopsies are frequently required for definitive diagnosis.

Bronchial stent placement in a dog with bronchomalacia and left atrial enlargement

A 13-year-old neutered male Maltese was referred for paroxysms of coughing and cyanosis, with radiographic evidence of bronchial disease and cardiomegaly. Investigation with echocardiography, bronchoscopy, fluoroscopy and bronchoalveolar lavage led to a diagnosis of myxomatous mitral valve degeneration with insufficiency, ISACHC class II heart failure and bronchomalacia with severe left mainstem bronchial collapse. Persistence of intractable cough despite medical therapy prompted placement of a stent in the left mainstem bronchus. Immediately after stent placement, severe pulmonary oedema developed, thought to be due to compression of the left atrium by the stent or acute lung injury related to stent placement. The dog recovered over a 3-day period with diuretic therapy and positive end expiratory pressure ventilation. Subsequently, the dog died from congestive heart failure 102 days after stent placement, during which time occasional, self-limiting coughing episodes occurred.

Cervical spinal intradural arachnoid cysts in related, young pugs
C. Rohdin, H. T. Nyman, P. Wohlsein and K. Hultin Jäderlund
Seven related young pugs were diagnosed with cervical spinal intradural arachnoid cysts by magnetic resonance imaging (n = 6) and myelography (n = 1). All dogs were presented with skin abrasions on their thoracic limbs and non-painful neurological deficits, indicating a C1-T2 myelopathy. In all six dogs examined by magnetic resonance imaging not only the spinal arachnoid cyst but also a concomitant, most likely secondary, syringohydromyelia was confirmed. Pedigree analysis suggested a genetic predisposition for spinal arachnoid cysts in this family of pugs. Generalised proprioceptive deficits more pronounced in the thoracic limbs suggesting a focal cervical spinal cord lesion, with concomitant skin abrasions on the dorsal aspect of the thoracic limbs in a young pug, should alert veterinarians to the possibility of cervical spinal arachnoid cysts.

Complete uterine prolapse without uterine mucosal eversion in a queen
E. Bigliardi, F. Di Ianni, E. Parmigiani, A. M. Cantoni and C. Bresciani
A five-year-old female cat weighing 3 kg was presented by the owner after noticing a large pink, bilobed mass protruding through the vulva during labour. The cat was in good condition, with appropriate lactation, and the newborn kittens were nursing normally. The uterus was not retracted or invaginated at examination, and there was rupture of the mesovarium, mesometrium and uterine-vaginal connection around the cervix. Manual reduction of the prolapsed uterus was not possible because of torn ligaments. A coeliotomy was performed to remove the ovaries, and the apex of the uterine horns was passed by the vaginal route. The remaining part of the mesometrium was disconnected, and the prolapsed uterus was removed. The queen and kittens were discharged from the hospital on the second day after surgery. An unusual feature of this case is that the prolapse was complete, without eversion of any part of the uterus through a vaginal tear.

American Journal of Veterinary Research

Chondroprotective effects of zoledronic acid on articular cartilage in dogs with experimentally induced osteoarthritis.
Michael G. Dearmin, Troy N. Trumble, AnaPatricia Garcia, Jon N. Chambers, Steven C. Budsberg.
Objective—To assess effects of zoledronic acid on biomarkers, radiographic scores, and gross articular cartilage changes in dogs with induced osteoarthritis. Animals—21 purpose-bred hound-type dogs. Procedures—The left stifle joint of each dog was examined arthroscopically to determine initial articular cartilage status, which was followed by cranial cruciate ligament (CrCL) transection to induce osteoarthritis. Dogs were assigned to 3 groups (control group, low dose [10 µg of zoledronic acid/kg], or high dose [25 µg of zoledronic acid/kg]). Treatments were administered SC every 3 months for 1 year beginning the day after CrCL transection. Serum and synovial fluid samples and radiographs were obtained 0, 1, 3, 6, 9, and 12 months after transection. At 12 months, each joint was scored for cartilage defects. Serum and synovial fluid biomarkers of bone and cartilage turnover (bone-specific alkaline phosphatase, type I and II collagen, carboxy-propeptide of type II collagen, and chondroitin sulfate 846) were analyzed with ELISAs. Results—The high-dose group had fewer total articular defects and lower severity scores in CrCL-transected stifle joints than did the control group. In addition, the high-dose group had significantly less change in collagenase cleavage of type I or II collagen in the synovial fluid at 1 and 3 months after CrCL transection than did the control group and also had greater changes in bone-specific alkaline phosphatase in synovial fluid at 3 months after CrCL transection than did the control group. Conclusions and Clinical Relevance—Zoledronic acid had a chondroprotective effect in dogs with a transected CrCL.

The effects of protamine sulfate on clot formation time and clot strength thromboelastography variables for canine blood samples.
Christopher J. Bailey, Amy M. Koenigshof.
Objective—To determine the effects of protamine sulfate on clot formation time and clot strength thromboelastography variables for canine whole blood samples. Animals—Blood samples obtained from 11 healthy dogs. Procedures—Blood samples were collected from jugular veins of dogs into syringes with 3.2% sodium citrate (blood to citrate ratio, 9:1). Blood samples were divided into aliquots, and protamine sulfate was added to various concentrations (0 [control], 22, 44, and 66 µg/mL). Prepared samples were activated with kaolin (n = 8) or not activated (8), CaCl2 was added, and thromboelastography was performed. Reaction time (R), clot formation time (K), rate of clot formation (α angle), and maximum amplitude (MA) were measured. Results—For kaolin-activated and nonactivated blood samples, protamine (66 µg/mL) significantly increased R and K and decreased α angle and MA, compared with values for control samples. Also, protamine (44 µg/mL) decreased MA in nonactivated blood samples and increased K and decreased α angle in kaolin-activated samples, compared with values for control samples. Conclusions and Clinical Relevance—Results indicated protamine prolonged clot formation time and decreased overall clot strength in a dose-dependent manner; such effects may contribute to a hypocoagulable state in dogs. Kaolin-activated and
Clinical Relevance—Results suggested that orally administered cisapride may be of benefit in canine
pressures differed significantly only between the placebo and cisapride treatments. Conclusions and
LES pressures at 7 hours after administration were 44.3, 28.5, and 33.3 mm Hg, respectively. The LES
pressures at 4 hours after administration were 50.7, 30.6, and 31.1 mm Hg, respectively; and median
pressures at 1 hour after administration were 44.4, 37.8, and 36.6 mm Hg, respectively; median LES
metoclopramide, and placebo experiments, median baseline LES pressures were 29.1, 30.5, and 29.0
was used to test whether the 3 treatments affected LES pressure differently. Results—In the cisapride,
Objective—To evaluate the effects of cisapride and metoclopramide hydrochloride administered orally on lower esophageal sphincter pressure in awake dogs.
Jennifer Kempf, Fraser Lewis, Claudia E. Reusch, Peter H. Kook.
Objective—To evaluate the effects of cisapride and metoclopramide hydrochloride administered orally on the lower esophageal sphincter (LES) resting pressure in awake healthy dogs. Animals—6 adult Beagles. Procedures—Each dog was evaluated after administration of a single dose of cisapride (0.5 mg/kg), metoclopramide (0.5 mg/kg), or placebo (empty gelatin-free capsule) in 3 experiments performed at 3-week intervals. To measure LES pressure, a high-resolution manometry catheter equipped with 40 pressure sensors spaced 10 mm apart was used. For each experiment, LES pressure was recorded during a 20-minute period with a virtual electronic sleeve emulation before treatment (baseline) and at 1, 4, and 7 hours after drug or placebo administration. A linear mixed-effects model was used to test whether the 3 treatments affected LES pressure differently. Results—In the cisapride, metoclopramide, and placebo experiments, median baseline LES pressures were 29.1, 30.5, and 29.0 mm Hg, respectively. For the cisapride, metoclopramide, and placebo treatments, median LES pressures at 1 hour after administration were 44.4, 37.8, and 36.6 mm Hg, respectively; median LES pressures at 4 hours after administration were 50.7, 30.6, and 31.1 mm Hg, respectively; and median LES pressures at 7 hours after administration were 44.3, 28.5, and 33.3 mm Hg, respectively. The LES pressures differed significantly only between the placebo and cisapride treatments. Conclusions and Clinical Relevance—Results suggested that orally administered cisapride may be of benefit in canine.
patients for which an increase in LES pressure is desirable, whereas orally administered metoclopramide did not affect LES resting pressures in dogs.

**Canadian Veterinary Journal (no abstracts available online until October 2014)**

Antimicrobial susceptibility of Escherichia coli F4, Pasteurella multocida, and Streptococcus suis isolates from a diagnostic veterinary laboratory and recommendations for a surveillance system
Shiona K. Glass-Kaastra, David L. Pearl, Richard J. Reid-Smith, Beverly McEwen, Durda Slavic, Scott A. McEwen, Jim Fairles (page 341)

Lindsay L. Occhipinti, Joe G. Hauptman (page 357)

Epidermoid cyst of the ileum in a miniature dachshund dog
Shunsuke Shimamura, Risa Kainuma, Ken Kimura, Yasuhiko Okamura, Saori Kobayashi, Masaaki Katayama, Reeko Sato, Jun Yasuda (page 366)

Uncommon acute neurologic presentation of canine distemper in 4 adult dogs
Alba Galán, Araceli Gamito, Beatrice E. Carletti, Alicia Guisado, Juana Martin de las Mulas, José Pérez, Eva M. Martin (page 373)

Functional metastatic parathyroid adenocarcinoma in a dog
Erin N. Kishi, Shannon P. Holmes, Jeffrey R. Abbott, Nicholas J. Bacon (page 383)

**Australian Veterinary Practitioner**

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