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Due to the generosity of Dave Collins, Anna Dengate, Karina Graham, Chris Greenwell, Amy Lam and the ISFM, the CVE is able to offer this resource.

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Sterile nodular panniculitis, vertebral osteomyelitis and spinal cord compression in a Chihuahua-cross
K Lott, A-C Duchaussoy, AW Stent et al.
CASE REPORT A 9-year-old spayed female Chihuahua cross was presented with a chronic history of multiple subcutaneous lesions, an abnormal gait, decreased appetite and weight loss. Left forelimb lameness and hindlimb ataxia with marked left shoulder and thoracolumbar spinal pain were present on examination. Magnetic resonance imaging (MRI) identified vertebral osteomyelitis with spinal cord compression and a subcutaneous lesion caudal to the left scapula. Histopathology of the lesion identified panniculitis. Bacterial, fungal and mycobacterial cultures of the tissue were negative and mycobacterial DNA was not detected by polymerase chain reaction. A diagnosis of sterile nodular panniculitis (SNP), with suspected pyogranulomatous inflammation of epidural fat and vertebral osteomyelitis was made. CONCLUSION Although there are multiple reports of dogs with combined inflammation of the abdominal, epidural, bone marrow or subcutaneous fat, the dog presented here is the first reported case of concurrent SNP, osteomyelitis and epidural inflammation.

Survey of companion animal weight loss programs in metropolitan Adelaide, Australia
JW Siow, SJ Hazel and ML McArthur
BACKGROUND Companion animal obesity is an increasing problem. The aims of this study were to determine the number of companion animal weight loss programs being run by veterinary practices in metropolitan Adelaide, their content and perceived efficacy or limiting factors. METHODS The study was a cross-sectional online survey of 99 metropolitan Adelaide veterinary clinics listed in the Yellow Pages business directory; 65 clinics participated. RESULTS Over half (40/65) of the practices ran a weight loss program. Generally, animals were selected on body condition score. Many programs included exercise and required a specific diet to be used, with revisits usually scheduled fortnightly. Efficacious aspects included the support and information provided for clients and frequent weigh-ins. The most common limiting factor was poor adherence, either by the owner or other members of the household. CONCLUSION The information gained may assist in developing evaluation plans to improve veterinary weight loss programs, which may in turn strengthen the veterinarian–client–pet relationship.

Toothpick as a perforating splenic foreign body in a dog: ultrasonography diagnosis and surgical treatment
DM Silva, M Pavelski, VM Govoni et al.
CASE REPORT A 5-year-old intact male dachshund presented with a history of chronic diarrhoea, intermittent vomiting and abdominal discomfort. Physical examination confirmed abdominal pain. Additional findings were concurrent abdominal distension and pyrexia. Abdominal ultrasonography revealed severe ascites consistent with peritonitis, and septic peritonitis was confirmed cytologically. Treatment for peritonitis was initiated and the abdominal ultrasonography was repeated 1 day later; on examination, the volume of peritoneal fluid was decreased and a hyperechoic foreign body was identified within the splenic parenchyma. An exploratory coeliotomy was performed and a toothpick was successfully removed from the spleen. When abdominal discomfort is identified, foreign body should be considered as a differential diagnosis.

Congenital pituitary dwarfism in a Rottweiler dog
ME Mylonakis, G Kandylis, D Ferlemis
CASE REPORT A 7-month-old male Rottweiler puppy was admitted because of stunted growth. Clinical and clinicopathological examination revealed proportionate growth retardation, lack of primary hairs, bilateral cryptorchidism and mild azotaemia. Plasma growth hormone concentration was low prior to and following stimulation with xylazine, indicating hyposomatotropism. The serum concentrations of insulin-like growth factor-I, prolactin, thyroid-stimulating hormone and total and free thyroxin were low. Plasma luteinising hormone concentration was low prior to and following stimulation with gonadotropin-releasing hormone. Adrenocorticotropic hormone (ACTH) stimulation test and endogenous ACTH concentration were normal. Magnetic resonance imaging of the brain revealed the presence of an intrasellar cyst and a multilobed cystic lesion in the left posterior hemisphere. CONCLUSION To the authors’ knowledge, this is the first report of congenital pituitary dwarfism in the Rottweiler breed that occurred with a pituitary hormone deficiency pattern similar to that seen in German Shepherd Dogs.

Left-sided congestive heart failure in a dog with intraventricular rhabdomyosarcoma
F Spina, D Caivano, E Lepri et al.
CASE REPORT A 9-year-old female Labrador Retriever was referred for evaluation of a 7-day history of exercise intolerance and dyspnoea. Thoracic radiographs showed moderate left atrial enlargement and severe pulmonary oedema. Transthoracic echocardiography revealed a heterogeneous hyperechoic mass extending from the left inflow tract to the outflow tract and protruding through the aortic ostium during systole. Spectral Doppler echocardiography was consistent with left ventricular inflow and outflow tract obstruction secondary to the mass. Because of the lack of response to treatment and the poor prognosis, the dog was euthanased and necropsy was performed. A large intracavitary mass, originating from the left ventricular free wall, filled the ventricular cavity. Mitral leaflets were distorted and thickened with shortened chordae. Microscopic findings were consistent with a rhabdomyosarcoma.

CONCLUSION This report describes an intracavitary left ventricular rhabdomyosarcoma in a dog, causing left ventricle outflow tract obstruction and functional mitral stenosis that was clinically associated with pulmonary oedema.

Journal of Feline Medicine & Surgery

Associations between ‘valentine’ heart shape, atrial enlargement and cardiomyopathy in cats
Matthew D Winter, Robson F Giglio, Clifford R Berry et al.
‘Valentine’ heart shape is a common qualifier used in veterinary radiology to describe a cardiac silhouette with focal enlargement at the level of the base of the heart in feline patients. Anecdotally, this sign has been thought to be related to biatrial enlargement and also to hypertrophic cardiomyopathy (HCM). However, to our knowledge, there has been no study performed to assess the association between cardiac chamber enlargement and cardiac disease with the ‘valentine’-shaped heart. The aim of this study was to verify the association between the ‘valentine’ heart shape observed in ventrodorsal thoracic radiographs and the presence of singular or combined cardiac chamber enlargement, and also the presence and type of cardiomyopathy (CM) in cats. A search of the database of the Small Animal Veterinary Hospital of the University of Florida for cats with a radiology report of thoracic radiographs that contained the words ‘valentine’ and ‘biatrial’, and echocardiography performed within 1 week, was undertaken; 41 cases met the inclusion criteria. Eighty-two percent of the cats of the study sample had some form of CM. The ‘valentine’ heart shape was associated with biatrial enlargement in 41% of the patients in our study sample that had some form of CM and just 8% of cases diagnosed with HCM, suggesting that the ‘valentine’ heart shape has a low association with HCM or biatrial enlargement; however, it should be considered a sign of feline CM.

Correlation of gross urine color with diagnostic findings in male cats with naturally occurring urethral obstruction
Tamera L Brabson, Christopher P Bloch, and Justine A Johnson
Seventy-five male cats with urethral obstruction were prospectively enrolled to evaluate gross urine color at urinary catheter placement for correlation with diagnostic findings. Cats with darker red urine were more likely to be azotemic (serum creatinine concentration >2.0 mg/dl [177 µmol/l]), and urine color correlated well with serum creatinine and serum potassium concentrations. Darker urine color was negatively correlated with urine specific gravity. Urine color was not associated with the presence or absence of lower urinary tract stones on radiographs or ultrasound. Cats with darker red urine at the time of urinary catheter placement are likely to have more significant metabolic derangements and may require more aggressive supportive care.

Prepubertal gonadectomy in cats: different injectable anaesthetic combinations and comparison with gonadectomy at traditional age
Nathalie Porters, Hilde de Rooster, Christel PH Moons et al.
Anaesthetic and analgesic effects of three different injectable anaesthetic combinations for prepubertal gonadectomy (PPG) in cats were studied. One anaesthetic protocol was compared with a similar one for gonadectomy at traditional age (TAG). Kittens were randomly assigned to PPG or TAG. For PPG, three different protocols were compared: (1) intramuscular (IM) administration of 60 µg/kg dexmedetomidine plus 20 µg/kg buprenorphine followed by an IM injection of the anaesthetic agent (20 mg/kg ketamine) (DB-IM protocol); (2) oral transmucosal (OTM) administration of 80 µg/kg dexmedetomidine plus 20 µg/kg buprenorphine followed by an IM injection of 20 mg/kg ketamine combined with 20 µg/kg dexmedetomidine (DB-OTM protocol); (3) IM injection of a 40 µg/kg medetomidine–20 µg/kg buprenorphine–20 mg/kg ketamine combination (MBK-IM protocol). For TAG, a DB-IM protocol was used, but with different doses for dexmedetomidine (40 µg/kg) and ketamine (5 mg/kg). All cats (PPG and TAG) received a non-steroidal anti-inflammatory before surgery. Anaesthetic and analgesic effects were assessed pre- and postoperatively (until 6 h). Cumulative logit, linear and logistic regression models were used for statistical analysis. Compared with the DB-OTM protocol, the DB-IM and MBK-IM protocols provided better anaesthesia with fewer adverse effects in PPG cats. Postoperative pain was not significantly different between anaesthetic protocols. PPG and
TAG cats anaesthetised with the two DB-IM protocols differed significantly only for sedation and pain scores, but sedation and pain scores were generally low. Although there were no anaesthesia-related mortalities in the present study and all anaesthetic protocols for PPG in cats provided a surgical plane of anaesthesia and analgesia up to 6 h postoperatively, our findings were in favour of the intramuscular (DB-IM and MBK-IM) protocols.

**Routine plasma biochemistry analytes in clinically healthy cats: within-day variations and effects of a standard meal**
Brice S Reynolds, Claire Brosse, Elisabeth Jeunesse et al.

Limited information is available on pre-analytical variations in plasma analytes in cats. The objectives of this study were to assess the effects of the time of sampling and a standard meal on plasma analytes in healthy cats. Eight healthy, adult, fasted cats underwent blood sampling every 2 h from 8 am to 8 pm twice at a 12-day interval. On the days of sampling, four cats were kept fasted and the others were fed just after the first sample, in a crossover design. Plasma glucose, urea, creatinine, sodium, potassium, chloride, CO2, calcium, phosphate, proteins, albumin, cholesterol and triglycerides, alanine aminotransferase and alkaline phosphatase were assayed on each sample. Effects of time of sampling and meal on plasma biochemistry results were tested using a general linear model. Diurnal variations in tested plasma analytes in fasted cats were negligible except for urea and creatinine, which gave noticeably higher plasma concentrations in the afternoon than in the morning. Observed postprandial variations were of some importance for phosphate and creatinine and of indisputable clinical relevance for CO2 and urea.

**Comparison of two techniques for ultrasound-guided axillary brachial plexus blockade in cats**
Agustina Ansón, Francisco G Laredo, Francisco Gil et al.

Axillary blockade of the brachial plexus (BP) is advocated in humans and dogs for surgical procedures carried out on the foot, carpus and elbow as it provides complete analgesia distally from above the elbow joint. The aim of this study was to develop an ultrasound (US)-guided approach to block the BP in cats. Two groups of 12 feline cadavers each were used to compare two different techniques to block the BP at the axillary level. The reliability of the techniques was assessed by anatomical and computed tomography (CT) studies. Cadavers of the first group were positioned in dorsal recumbency with the forelimb to be blocked adducted (thoracic limbs flexed and orientated caudally) (FAD technique). The second group was positioned in dorsal recumbency with the forelimb abducted 90° (FAB technique). The accuracy of the techniques was determined by US after injecting 1 ml blue ink along the BP nerves, and by CT after injecting 1 ml of an iodinated contrast medium. The anatomical and CT studies confirmed the accuracy of the US location of the BP nerves. Staining of the axillaris, musculocutaneous, radialis, medianus and ulnaris nerves was observed in 100% of cats using the FAB technique and in 66% of the cats using the FAD technique. Rate of complications was higher in the FAD technique. In conclusion, a US-guided axillary approach to the BP by the use of a FAB technique is a safe and feasible procedure to block the BP in the cat. Further studies are needed to ascertain whether the technique can be applied in a clinical setting.

**Feline cutaneous mast cell tumours: a UK-based study comparing signalment and histological features with long-term outcomes**
Kirsty Melville, Ken C Smith, and Melanie J Dobromylskyj

Feline cutaneous mast cell tumours (MCTs) are the second most common skin tumour in cats; but, unlike in dogs, there is currently no histological grading system for this type of tumour. This study recorded the signalment and anatomical location from a total of 287 records from MCTs submitted to a UK commercial diagnostic laboratory. Questionnaires to submitting practices were used to obtain follow-up data, and the histological features of 86 tumours were evaluated from 69 cats with a known outcome. Twelve of the 69 cats (17.4%) died of MCTs, with significantly lower survival times. The median age of cats presenting with MCTs was 11 years (range 5 months–19 years), with no sex or neutered status predilection. Some pedigree breeds were more susceptible to MCTs, particularly the Siamese, Burmese, Russian Blue and Ragdoll. The head was the most common site in younger cats, compared with the trunk in older cats. The number of tumours had no effect on survival. A new subcategory of well-differentiated MCTs with prominent multinucleated cells is described, and three of the five cats with this novel form died from MCT-related disease. There was an association between mitotic index and survival time. However, there was no significant association between histological type and survival.

**Pulmonary function in obese vs non-obese cats**
Lain García-Guasch, Alicia Caro-Vadillo, Jordi Manubens-Grau et al.

Obesity is a risk factor in the development of several respiratory diseases. Lung volumes tend to be decreased, especially expiratory reserve volume, increasing expiratory flow limitation during tidal breathing. Barometric whole-body plethysmography is a non-invasive pulmonary function test that allows a dynamic study of
breathing patterns. The objective of this study was to compare pulmonary function variables between obese and non-obese cats through the use of barometric whole-body plethysmography. Nine normal-weight and six obese cats were placed in the plethysmograph chamber, and different respiratory variables were measured. There was a significant decrease in tidal volume per kilogram (P = 0.003), minute volume per kilogram (P = 0.001) and peak inspiratory and expiratory flows per kilogram (P = 0.001) in obese cats compared with non-obese cats. Obesity failed to demonstrate a significant increase in bronchoconstriction index variable enhanced pause (Penh), as previously reported in humans and dogs. The results show that feline obesity impairs pulmonary function in cats, although a significant increase in bronchoconstriction indexes was not observed. Non-invasive barometric whole-body plethysmography can help characterise mechanical dysfunction of the airways in obese cats.

Sedative, hematologic and hemostatic effects of dexmedetomidine–butorphanol alone or in combination with ketamine in cats
Julia Volpato, Cláudio Roberto Scabelo Mattoso, Suzane Lilian Beier et al.
Acute stress induced by physical restraint can interfere with the validity of laboratory findings. Sedation could minimize such stress. However, it is not known whether sedation can affect hematologic and hemostatic parameters in cats. The purpose of this study was to evaluate hematologic and hemostatic parameters in domestic cats subjected to physical restraint in addition to one of two sedation protocols. In total, 50 cats were subjected to physical restraint and were then randomly divided into two groups of 25 animals, receiving dexmedetomidine (5 µg/kg) and butorphanol (0.3 mg/kg; DB group) or dexmedetomidine (5 µg/kg), butorphanol (0.3 mg/kg) and ketamine (3 mg/kg; DBK group). The cats were assessed for acute stress, sedation level, onset of sedation and duration of sedation. Blood samples were collected after handling and after sedation. The complete blood count (CBC), platelet count, buccal mucosal bleeding time (BMBT), whole-blood clotting time, prothrombin time (PT), activated partial thromboplastin time (aPTT) and thrombin time (TT) were determined for each sample, before and after chemical restraint. No statistically significant differences were found in the hematologic parameters. Certain hemostatic parameters (PT, aPTT and TT) were higher in the DB group (P <0.05). The onset of sedation was similar in the two groups, and the duration of sedation was longer in the DBK group. Both sedation protocols were effective for short-duration chemical restraint for blood collection from the studied cats, and no clinically relevant effects on hematologic or hemostatic parameters were detected.

Antimicrobial susceptibility in bacterial isolates from Norwegian cats with lower urinary tract disease
Heidi Sjetne, Gaute Skogtun, Henning Sørum, and Anna Vigidis Eggertsdóttir
Studies of feline lower urinary tract disease (FLUTD) among Norwegian cats have shown higher prevalences of bacterial cystitis than most previously published reports. The aims of the present study were to identify bacterial isolates obtained from the urine of Norwegian cats with FLUTD and their susceptibility to antimicrobial agents. Eighty-two bacterial isolates from 72 urine cultures obtained from 71 different cats were included. Escherichia coli, Staphylococcus species, Enterococcus species and Streptococcus species were the most frequently referred species. The percentages of isolates susceptible to the included antimicrobial agents were as follows: enrofloxacin – 92%; trimethoprim/sulfonamide – 91%; nitrofurantoin – 89%; tetracycline – 78%; ampicillin – 73%; amoxicillin/clavulanic acid – 72%; trimethoprim – 68%; amoxicillin – 58%; cephalaxin – 51%; spiramycin – 39%; penicillin – 34%; fusidic acid – 34%; lincomycin – 27%. Although several tendencies towards increasing antimicrobial resistance were detected among the isolates included, the species of bacteria isolated and their patterns of antimicrobial resistance were, in general, in concurrence with the existing literature. Thus, the results do not fully explain the higher prevalence of bacterial cystitis found in Norwegian cats. Moreover, additional explanatory factors beside the inclusion of primary accession cases rather than referred cases were not found.

Molecular detection of haemotropic Mycoplasma species in urban and rural cats from Portugal
Ana Duarte, Vânia Marques, José Henrique Duarte Correia et al.
Objectives The aim of the present study was to evaluate the prevalence of haemoplasma infection in cats in Portugal and to assess risk factors for infection. Methods Real-time polymerase chain reaction techniques were used to assess 236 urban and rural cats from central and southern Portugal. Results The overall prevalence of haemoplasma in the target population was 27.1% (64/236), with individual species’ prevalences as follows: 17.8% (42/236) ‘Candidatus Mycoplasma haemominutum’ (CMhm), 14.4% (34/236) Mycoplasma haemofelis (Mhf) and only 5.9% (14/236) ‘Candidatus Mycoplasma turicensis’ (Cmt). Multiple infections were detected in 8.1% (19/236) of the samples, with triple and double infections with Mhf and CMhm being most commonly detected (5.9% [14/236] of cats). Haemoplasma infection was significantly higher in shelter cats (P = 0.015) than in cats with other lifestyles (eg, free-roaming/house pet/blood donors). Haemoplasma prevalence was also higher in cats with feline immunodeficiency virus infection (FIV, P = 0.011). Although sex was not significantly associated with haemoplasma infection (P = 0.050), CMt was predominantly found in males (P =
Gait and jump analysis in healthy cats using a pressure mat system
Sarah M Stadig and Anna K Bergh
Physical orthopaedic examination in cats does not always reveal signs of lameness and no objective gait analysis method has yet been standardised for use in cats. The aims of the present study were to define appropriate parameters for pressure mat analyses during walk and jump, and to define reference values for gait parameters of healthy cats. Further, the distribution of the vertical force within the paws and the influence of a non-centred head position were investigated. The hypothesis was that cats have a symmetrical gait, a front/hind limb asymmetry similar to dogs, and that peak vertical force (PVF) and vertical impulse (VI) have high intraclass correlation coefficients, confirming the reliability of these parameters. Data for walking (n = 46) showed gait symmetry indices of close to 1.0, besides PVF front/hind (1.3 ± 0.2). The PVF front/hind for jumping cats (n = 16) was 1.7 ± 0.6. Results from the distribution of the vertical force within the paw (n = 39) showed that the main weight during a strike is transferred from the caudal towards the cranio-medial part of the paw. The findings support the hypothesis that healthy cats have similar gait symmetry to healthy dogs and that PVF and VI are reliable gait parameters. In conclusion, the present study provides a reference interval for healthy cats. Further studies are needed to investigate gait parameters in cats with orthopaedic disease.

Effects of intramuscular sedation with alfaxalone and butorphanol on echocardiographic measurements in healthy cats
Thibault Ribas, Isabelle Bublot, Stéphane Junot et al.
Objectives The aim of the study was to evaluate the effects of intramuscular (IM) injections of alfaxalone combined with butorphanol on echocardiographic (ECG) measurements in cats.
Methods Client-owned adult domestic shorthair cats younger than 5 years of age were recruited. All cats that were considered healthy on the basis of physical examination, blood work, urinalysis, blood pressure measurement and baseline ECG underwent a second ECG under sedation. Cats were sedated with two separate IM injections of butorphanol at 0.2 mg/kg and alfaxalone at 2 mg/kg. ECG variables were analysed using a linear mixed model, and sedation scores were analysed using an ordinal mixed logistic model. The significance level was set at α = 0.05 and adjusted at α = 0.0017 for multiple comparisons of the ECG measurements.
Results Ten healthy cats were included. Sedation was uneventful, and recovery was smooth and quick for all cats. The mean duration of lateral recumbency was 36.3 ± 4.37 mins. Reduction in heart rate following sedation approached statistical significance (P = 0.002). The thickness of the interventricular septum, the thickness of the left ventricular free wall, and the left ventricular internal dimensions in diastole and systole were not affected by the sedation. The changes in left atrium/aortic ratio and shortening fraction were statistically significant. Although the peak velocity of early diastolic transmitral flow (E) and late diastolic transmitral flow (A), the peak early diastolic (Ea) mitral valve annulus velocity, and the peak late diastolic (Aa) mitral valve annulus velocity changed after sedation, the ratios E/A, E/Ea and Ee/Aa were not significantly different after sedation. Conclusions and relevance IM injections of alfaxalone and butorphanol induced rapid, deep and short-lasting sedation. The mean differences after sedation were not clinically significant for most echocardiographic measurements.

Concurrent diseases in hyperthyroid cats undergoing assessment prior to radioiodine treatment
Jordi Puig, Isabelle Cattin, and Mayank Seth
Hyperthyroidism is a common endocrinopathy of geriatric cats, which are also prone to various other diseases. This retrospective study examined the prevalence and type of non-renal concurrent diseases present in cats referred for radioiodine assessment that were believed to have no other comorbidities at the time of referral. Ninety-four cats were included and analysed. Seventeen cases (18%) were identified as having concurrent disorders, with alimentary lymphoma (n = 5) and chronic enteropathy (n = 4) as the two most common comorbid diseases. The eosinophil count, total bilirubin and total calcium were significantly higher in the concurrent disease group, although the differences are unlikely to be clinically useful. The results support the utility of careful and individual assessment for all hyperthyroid cats prior to receiving radioiodine.

Extra-nodal subcutaneous Hodgkin's-like lymphoma and subsequent regression in a cat
Jamie A Newton, Felipe de Vicente, Sean P Haugland
Hodgkin’s-like lymphoma is a slow growing neoplasm, usually affecting the lymph nodes of the head and neck, which has been sporadically described in veterinary patients. This report describes the clinical and histopathological features in a 9-year-old male neutered Siamese cat that presented with a 6 week history of mid-dorsocranial swelling. Immunohistochemistry demonstrated positive staining for CD79a, paired box protein and B lymphocyte antigen-36, with variable, weak-to-moderate cytoplasmic staining for human leukocyte antigen-DR and CD18, and negative staining for antimacrophage antibody. The diagnosis based on incisional biopsy was Hodgkin’s-like lymphoma; however, no evidence of neoplasia was found following wide surgical excision. This case report demonstrates two unreported items of note: the novel extranodal site of Hodgkin’s-like lymphoma in a cat and tumour regression following initial biopsy. It is hypothesised that the surgical trauma of biopsying the lesion or the introduction of foreign material may have caused the regression of the neoplastic cells through induction of an anti-tumour immune or inflammatory response.

Lymphocytic mural folliculitis and pancreatic carcinoma in a cat
Remo Lobetti
A 9-year-old castrated domestic shorthair cat was presented with a 6 week history of progressive non-pruritic alopecia, polyphagia and weight loss. A diagnosis of lymphocytic mural folliculitis was made and the cat was treated with a combination of prednisolone and ciclosporin; this produced an improvement in the alopecia but no resolution. Sixteen months after the initial assessment and diagnosis, the cat was re-evaluated for intermittent vomiting and weight loss with normal appetite. On examination the dermatopathy was still evident and a mass involving the duodenum and pancreas was present, which was diagnosed as a pancreatic carcinoma. From this case it would appear that lymphocytic mural folliculitis might be an early dermatological manifestation of pancreatic neoplasia.

Management of acute kidney injury with continuous venovenous haemodiafiltration in a cat
Giacomo Stanzani, Rosanne E Jepson, and Daniel L Chan
Continuous renal replacement therapy is an emerging technique for the treatment of acute kidney injury (AKI). Data regarding its use in cats are limited. This report describes the use of a novel continuous renal replacement therapy (CRRT) system for the treatment of AKI in a cat. A 1.3-year-old cat developed uraemic signs following the administration of a non-steroidal anti-inflammatory agent for the treatment of a suspect traumatic episode. CRRT was provided with a Prismaflex Gambro machine used in continuous venovenous haemodiafiltration mode, with an AN-69 surface-treated membrane, synthetic colloid priming and heparin anticoagulation. Two treatment cycles were performed, totalling 51 h of CRRT. The treatment was effective in controlling uraemic signs, and no major complications were noted. Owing to financial constraints the owners declined further CRRT treatments, and on day 8 of hospitalisation, owing to the lack of significant clinical improvement, humane euthanasia was performed. The set-up detailed in this report provides a viable option for the initial treatment of cats with AKI.

Recovery of normal esophageal function in a kitten with diffuse megaesophagus and an occult lower esophageal stricture
Jaycie Schneider, Marisa Ames, Michael DiCicco et al.
An 8-week-old male domestic shorthair was presented to the Internal Medicine Service at North Carolina State University for regurgitation. Radiographic diagnosis of generalized esophageal dilation and failure of esophageal peristalsis were compatible with diagnosis of congenital megaesophagus. Endoscopic examination of the esophagus revealed a fibrous stricture just orad to the lower esophageal sphincter. Conservative management to increase the body condition and size of the kitten consisted of feeding through a gastrostomy tube, during which time the esophagus regained normal peristaltic function, the stricture orifice widened in size and successful balloon dilatation of the stricture was performed. Esophageal endoscopy should be considered to rule out a stricture near the lower esophageal sphincter in kittens with radiographic findings suggestive of congenital megaeosophagus. Management of such kittens by means of gastrostomy tube feeding may be associated with a return of normal esophageal motility and widening of the esophageal stricture, and facilitate subsequent success of interventional dilation of the esophageal stricture.

Gastric perforation following endoscopic removal of a Bravo pH capsule in a cat
M Katherine Tolbert, Adesola Odunayo, and Linden E Craig
A 7-year-old domestic shorthair cat was evaluated for hyporexia and weight loss following endoscopic placement of an intragastric pH monitoring device. Physical examination of the cat was unremarkable, and its blood work was notable for a mild hypoalbuminemia. The cat’s acute hyporexia and weight loss was attributed to discomfort associated with the intragastric pH monitoring device, as has been reported in humans. Endoscopic removal of the intragastric pH monitoring device resulted in gastric perforation. The cat underwent exploratory laparotomy for surgical resection and repair of the perforated area. To our knowledge, this is the
first report of gastric perforation secondary to removal of a Bravo pH capsule. Caution may be advised when considering intragastric pH capsule removal in cats.

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**Optimal cutoff points of entropy indices for use in predicting responses elicited during determination of minimum alveolar concentration of sevoflurane in dogs.**
Chulabhom Mahidol, Naris Thengchaisri.

Objective To investigate values of spectral indices for use in predicting responses in dogs during determination of minimum alveolar concentration (MAC) of sevoflurane. Animals 15 healthy German Shepherd Dogs. PROCEDURES Sevoflurane MAC was determined by use of tail clamping. Entropy indices of response entropy and state entropy were recorded during MAC determination. Optimal cutoff points of response entropy and state entropy for use in predicting responses to tail clamping were analyzed with a multiple logistic regression. RESULTS Sevoflurane MAC ranged from 1.8% to 2.6% (mean ± SD, 2.2 ± 0.3%). Response entropy and state entropy were significantly higher during positive responses to tail clamping (88 ± 2 and 76 ± 2, respectively) than during negative responses to tail clamping (63 ± 3 and 52 ± 3, respectively). The difference between the 2 entropy indices did not differ between positive (11 ± 1) and negative (13 ± 1) responses to tail clamping. Response entropy and state entropy served as independent predictors of a positive response, with areas under the curve for receiver operating characteristic curves 0.810 (95% confidence interval, 0.716 to 0.903) and 0.828 (95% confidence interval, 0.741 to 0.916), respectively. Optimal cutoff points to predict a positive response were 75 for response entropy and 65 for state entropy, which corresponded to mean ± SD ORs of 25.2 ± 15.6 and 14.9 ± 7.9, respectively. CONCLUSIONS AND CLINICAL RELEVANCE Response entropy and state entropy were good predictors of responses to tail clamping elicited during determination of sevoflurane MAC in healthy dogs.

**Plasma and serum serotonin concentrations and surface-bound platelet serotonin expression in Cavalier King Charles Spaniels with myxomatous mitral valve disease.**

Objective To investigate serum and plasma serotonin concentrations, percentage of serotonin-positive platelets, level of surface-bound platelet serotonin expression (mean fluorescence intensity [MFI]), and platelet activation (CD62 expression) in platelet-rich plasma from Cavalier King Charles Spaniels with myxomatous mitral valve disease (MMVD). Animals Healthy dogs (n = 15) and dogs with mild MMVD (18), moderate-severe MMVD (19), or severe MMVD with congestive heart failure (CHF; 10). PROCEDURES Blood samples were collected from each dog. Serum and plasma serotonin concentrations were measured with an ELISA, and surface-bound platelet serotonin expression and platelet activation were determined by flow cytometry. RESULTS Dogs with mild MMVD had higher median serum (746 ng/mL) and plasma (33.3 ng/mL) serotonin concentrations, compared with MMVD-affected dogs with CHF (388 ng/mL and 9.9 ng/mL, respectively), but no other group differences were found. Among disease groups, no differences in surface-bound serotonin expression or platelet activation were found. Thrombocytopenic dogs had lower serum serotonin concentration (482 ng/mL) than nonthrombocytopenic dogs (731 ng/mL). In 26 dogs, a flow cytometry scatterplot subpopulation (FSSP) of platelets was identified; dogs with an FSSP had a higher percentage of serotonin-positive platelets (11.0%), higher level of surface-bound serotonin expression (MFI, 32.068), and higher platelet activation (MFI, 2.363) than did dogs without an FSSP (5.7%, 1.230, and 1.165, respectively). An FSSP was present in 93.8% of thrombocytopenic dogs and in 29.5% of nonthrombocytopenic dogs. CONCLUSIONS AND CLINICAL RELEVANCE A substantive influence of circulating serotonin on MMVD stages prior to CHF development in Cavalier King Charles Spaniels was not supported by the study findings. An FSSP of highly activated platelets with pronounced serotonin binding was strongly associated with thrombocytopenia but not MMVD.

**Indirect prediction of total body water content in healthy adult Beagles by single-frequency bioelectrical impedance analysis.**
Laurence Yaguîyan-Colliard, Caroline Daumas, Sana Bousbiat, Michel Jaffrin, Philippe Cardot, Dominique Grandjean, Nathalie Priymenko, Patrick Nguyen, Françoise Roux.

Objective To develop equations for prediction of total body water (TBW) content in unsedated dogs by combining impedance (resistance and reactance) and morphological variables and to compare the results of those equations with TBW content determined by deuterium dilution (TBWD). Animals 26 healthy adult Beagles. PROCEDURES TBW content was determined directly by deuterium dilution and indirectly with equations developed from measurements obtained by use of a portable bioelectric impedance device and morphological variables including body length, height, weight, and thoracic and abdominal circumferences.
RESULTS Impedance and morphological data from 16 of the 26 dogs were used to determine coefficients for the following 2 equations: TBW1 = −0.019 (BL2/R) + 0.199 (RC + AC) + 0.996W + 0.081H + 12.31; and TBW2 = 0.048 (BL2/R) + 0.144 (RC + AC) + 0.777W + 0.066H + 0.031X + 7.47, where AC is abdominal circumference, H is height, BL is body length, R is resistance, RC is rib cage circumference, W is body weight, and X is reactance. Results for TBW1 (R21 = 0.843) and TBW2 (R22 = 0.816) were highly correlated with the TBWd. When the equations were validated with data from the remaining 10 dogs, the respective mean differences between TBWd and TBW1 and TBW2 were 0.17 and 0.11 L, which equated to a nonsignificant underestimation of TBW content by 2.4% and 1.6%, respectively. CONCLUSIONS AND CLINICAL RELEVANCE Results indicated that impedance and morphological data can be used to accurately estimate TBW content in adult Beagles. This method of estimating TBW content is less expensive and easier to perform than is measurement of TBWd, making it appealing for daily use in veterinary practice.

Induction of thioredoxin-1 in response to oxidative stress in dogs.
Shuntaro Munakata, Yoshikazu Tanaka, Yoshinori Nezu, Yasuji Harada, Takuya Yogo, Yasushi Hara, Hai Tian, Yoshiyuki Matsuo, Masahiro Tagawa, Junji Yodoi.
OBJECTIVE To determine whether thioredoxin (TRX)-1 can be used as a valid biomarker for oxidative stress in dogs. ANIMALS AND SAMPLES 10 Beagles and Madin-Darby canine kidney cells. PROCEDURES Madin-Darby canine kidney cells were used to verify antigen cross-reactivity between human and canine anti-TRX-antibodies. Dogs were assigned to receive 21% or 100% O2 (5 dogs/group) via an artificial respirator during a 3-hour period of isoflurane anesthesia (starting at 0 hours). Blood and urine samples were collected before (baseline) and at 6, 12, 24, and 48 hours after commencement of inhalation anesthesia. Concentrations of TRX-1 and 8-hydroxy-2’-deoxyguanosine (8-OHdG) in plasma and urine samples were analyzed; urine concentrations were reported as ratios against urine creatinine concentration. RESULTS Canine TRX-1 was recognized by monoclonal human anti-TRX-1 antibodies (clones of adult T-cell leukemia-derived factor [ADF]-11 and ADF21) by western blot analysis. Results of an ELISA indicated that plasma TRX-1 concentration and urine TRX-1-to-creatinine concentration ratio increased rapidly after the 3-hour period of hyperoxia with maximal peaks at 12 and 6 hours, respectively. Urine 8-OHdG-to-creatinine concentration ratio also increased significantly after hyperoxia induction. However, unlike the rapid increase in urine TRX-1-to-creatinine concentration ratio, maximal urine 8-OHdG-to-creatinine concentration ratio was attained at 48 hours after hyperoxia induction. These variables remained unchanged from baseline in the control group. CONCLUSIONS AND CLINICAL RELEVANCE Results indicated that human anti-TRX monoclonal antibodies cross-reacted with canine TRX, and plasma TRX-1 concentrations were rapidly increased in dogs following an oxidative stress challenge. Thus, TRX may be a valuable clinical biomarker for detecting oxidative stress more rapidly than 8-OHdG in dogs.

Journal of Small Animal Practice

Circulating concentrations of a marker of type I collagen metabolism are associated with hypertrophic cardiomyopathy mutation status in ragdoll cats.
K. Borgeat, J. Dudhia, V. Luis Fuentes and D. J. Connolly
OBJECTIVES Human carriers of hypertrophic cardiomyopathy associated sarcomeric mutations have abnormal collagen metabolism before overt left ventricular hypertrophy is detectable. This study investigated whether differences in collagen biomarkers were present in blood samples of ragdoll cats positive for the MYBPC3:R820W mutation compared with negative controls. MATERIALS AND METHODS Cats were recruited for hypertrophic cardiomyopathy screening using echocardiography and genotyping. Circulating markers of collagen turnover (C-terminal telopeptide of type I collagen [CITP; type I collagen degradation] and N-terminal propeptide of type III procollagen [type III collagen synthesis]) and cardiac biomarkers (N-terminal B-type natriuretic peptide and cardiac troponin I) were measured. Correlation between concentrations of collagen biomarkers and echocardiographic variables was analysed, and collagen biomarker concentrations were compared between MYBPC3 mutation positive and negative cats, without left ventricular hypertrophy. RESULTS Linear regression analyses showed that genotype was independently associated with CITP concentration. CITP was higher in mutation carriers (25·4 μg/L, interquartile range 16·0-29·2 μg/L) than non-carriers (14·6 μg/L, interquartile range 9·3-38·19·2 μg/L; P = 0·024). CLINICAL SIGNIFICANCE Circulating CITP was higher in MYBPC3-positive ragdoll cats than negative controls and may indicate altered collagen metabolism. Further studies are necessary to determine whether alterations in circulating collagen biomarker concentration relate to an early stage of hypertrophic cardiomyopathy.

Feeding obese dogs during weight loss is on average cost-neutral
A. J. German, J. Luxmore, S. L. Holden, P. J. Morris and V. Biourge
OBJECTIVES The cost of feeding a purpose-formulated weight loss diet may deter owners of obese dogs from proceeding with a weight loss programme. The current study aimed to compare average food costs during weight loss with those before weight loss. MATERIALS AND METHODS Average daily food costs, for before and during weight loss, were calculated in 22 obese dogs that had successfully completed weight management. RESULTS The median food cost before weight loss was £0.52/day (£0.24–3.31/day), for main meal only, and £0.64/day (£0.26–3.31/day) for main meal and additional food (table scraps and treats). The median food cost during weight loss was £0.90/day (£0.26–1.36/day), and no additional food was given. The average daily feeding costs during weight loss did not differ from pre-weight-loss costs, either with (P = 0.425) or without (P = 0.222) the additional food included. CLINICAL SIGNIFICANCE Knowledge that average diet costs do not significantly differ from food costs prior to weight loss may help veterinarians to persuade owners to enrol obese dogs in a weight management programme.

Systolic cardiac function assessment by feature tracking echocardiography in dogs with myxomatous mitral valve disease.


OBJECTIVES To evaluate endomyocardial and epimyocardial left ventricular circumferential and longitudinal peak systolic strain and strain rate in dogs with myxomatous mitral valve disease using two-dimensional feature tracking imaging echocardiography. MATERIALS AND METHODS Epimyocardial and endomyocardial global and regional myocardial peak systolic strain and strain rate using two-dimensional feature tracking imaging were evaluated in healthy dogs and those in stages B1, B2 and C of myxomatous mitral valve disease. Strain and strain rate in circumferential and longitudinal aspect were evaluated in 48 small- and medium-sized dogs. RESULTS Global endomyocardial circumferential strain and global epimyocardial circumferential strain systolic peak were lower in stage C than in stage B2 (P = 0.04 and P = 0.02) and similar to healthy dogs. Endomyocardial circumferential strain rate in septal and inferior segments were lower in stage C compared to B2 (P = 0.0007 and P = 0.0056), but not different from healthy dogs. There were no statistical differences in the epimyocardial circumferential strain rate, longitudinal strain and strain rate between healthy and affected dogs. CLINICAL SIGNIFICANCE Two-dimensional feature tracking imaging determination of myocardial deformation in epimyocardial and endomyocardial layers allows detection of increased compensatory circumferential left ventricular myocardial systolic performance due to volume overload and absence of this response as disease advances to congestive heart failure.

Acoustic radiation force impulse elastography of the spleen in healthy dogs of different ages.


OBJECTIVES - To determine the elastographic characteristics of splenic parenchyma in clinically healthy dogs of various ages in order to establish preliminary qualitative and quantitative standards/reference intervals for this technique. MATERIALS AND METHODS Thirty three healthy dogs categorized as young, adult and elderly were used. Splenic echotexture, echogenicity, size and ages were assessed with B-mode ultrasonography. Using qualitative elastography, the spleen (head, body and tail) was examined for homogeneity and presence of deformities. shear velocities in different splenic segments were then quantitatively evaluated. RESULTS - All splenic segments visualised with the B-mode ultrasonography appeared normal. Different splenic segments examined with qualitative elastography were free of any detectable malformations and the images appeared as homogeneous dark areas. The mean shear velocity values were 2·32 m/s for head, 2·16 m/s for body and 2·25 m/s for tail of the spleen (P = 0.40), and they did not vary between the different age groups (P > 0.05). CLINICAL SIGNIFICANCE Quantitative and qualitative ARFI elastography of the spleen in clinically healthy dogs differing in age could be easily performed, and it may aid in the diagnosis and evaluation of splenic abnormalities routinely assessed in veterinary practice with B-mode ultrasonography.

Fentanyl-induced asystole in two dogs.

M. Jang, W.-G. Son and I. Lee

Fentanyl is used in small animals for perioperative analgesia during anaesthesia. Severe bradycardia and asystole were observed on bolus administration of a 3 µg/kg loading dose of fentanyl in two dogs under isoflurane anaesthesia. Premedication with 10 µg/kg glycopyrrolate did not prevent asystole in the first case; and although bradycardia was treated with 5 µg/kg glycopyrrolate administered intravenously in the second case, the heart rate continuously decreased and asystole subsequently developed. Asystole in both cases was quickly corrected by intravenous administration of 0·04 mg/kg atropine and closed chest compressions. This case report describes asystole induced by fentanyl administration in isoflurane anaesthetised dogs. Atropine was more effective than glycopyrrolate in the treatment of fentanyl-induced asystole.
Muscular dystrophy due to a sarcoglycan deficiency in a female Dobermann dog.
J. S. Munday, G. D. Shelton, S. Willox and D. D. Kingsbury
A four-month-old female Dobermann presented with myalgia, dysphagia, progressive weakness and loss of body condition. Diagnostic evaluation at nine months of age revealed markedly elevated serum creatine kinase activity, electromyographic abnormalities and histological evidence of chronic-active muscle necrosis. Imaging confirmed dysphagia and aspiration pneumonia. Muscular dystrophy was suspected and immunohistochemical staining of muscle cryosections demonstrated reduced sarcoglycans. Treatment consisted of gastrostomy, and over the next 5 months the dog gained weight, despite continued loss of muscle mass. The dog died at 14 months of age after developing clinical signs of aspiration pneumonia. To the authors’ knowledge, this is the first report of muscular dystrophy in a Dobermann and only the second detailed report of a canine sarcoglycanopathy. Supportive care resulted in an acceptable quality of life for 10 months after clinical signs were first observed.

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Correlation between glucose concentrations in serum, plasma, and whole blood measured by a point-of-care glucometer and serum glucose concentration measured by an automated biochemical analyzer for canine and feline blood samples.
Tauk BS, Drobatz KJ, Wallace KA, Hess RS.
OBJECTIVE: To investigate the correlation between glucose concentrations in serum, plasma, and whole blood measured by a point-of-care glucometer (POCG) and serum glucose concentration measured by a biochemical analyzer. DESIGN: Prospective clinical study. SAMPLES: 96 blood samples from 80 dogs and 90 blood samples from 65 cats. PROCEDURES: Serum, plasma, and whole blood were obtained from each blood sample. The glucose concentrations in serum, plasma, and whole blood measured by a POCG were compared with the serum glucose concentration measured by a biochemical analyzer by use of the Lin concordance correlation coefficient (ρc) and Bland-Altman plots. RESULTS: For both canine and feline samples, glucose concentrations in serum and plasma measured by the POCG were more strongly correlated with the serum glucose concentration measured by the biochemical analyzer (ρc, 0.98 for both canine serum and plasma; ρc, 0.99 for both feline serum and plasma) than was that in whole blood (ρc, 0.62 for canine samples; ρc, 0.90 for feline samples). The mean difference between the glucose concentrations determined by the biochemical analyzer and the POCG in serum, plasma, and whole blood was 0.4, 0.3, and 31 mg/dL, respectively, for canine samples and 7, 6, and 32 mg/dL, respectively, for feline samples. CONCLUSIONS AND CLINICAL RELEVANCE: Results indicated that use of a POCG to measure glucose concentrations in serum or plasma may increase the accuracy and reliability of diagnostic and treatment decisions associated with glucose homeostasis disorders in dogs and cats.

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Retinopathy associated with ivermectin toxicosis in five cats.
Meekins JM1, Guess SC, Rankin AJ.
CASE DESCRIPTION: 5 cats from the same household were examined because of a sudden onset of tremors, obtundation, blindness, and dilated pupils. Approximately 12 hours prior to evaluation, the owner had attempted to treat the cats for suspected ear mite (Otodectes cynotis) infestation by aural administration of a dose of an ivermectin paste intended for oral administration to horses (approx 22 mg/cat; half of the dose was administered into each ear canal). CLINICAL FINDINGS: None of the cats had a menace response; all cats had dilated pupils and decreased pupillary light reflexes. Findings of fundic examination were unremarkable. Electroretinography was performed for 4 cats, and b-wave responses were identified as diminished. Toxicological assay results for serum samples from 2 cats confirmed the presence of ivermectin (450 and 610 µg/L). TREATMENT AND OUTCOME: All 5 cats made a complete recovery. Neurologic abnormalities resolved, electroretinographic responses improved, and vision was restored with no residual pathological changes detected during fundic examination. CLINICAL RELEVANCE: To the authors’ knowledge, the information reported here provided the first description of ophthalmic and electroretinographic findings in cats with ivermectin toxicosis resulting from transdermal administration. Clinical signs, including blindness, resolved with time, without additional medical intervention.

Clinical effects of vinorelbine administration in the management of various malignant tumor types in dogs: 58 cases (1997-2012).
Wouda RM1, Miller ME, Chon E, Stein TJ.
OBJECTIVE: To evaluate the effectiveness of vinorelbine in the management of various malignant tumor types in dogs. DESIGN: Retrospective case series. ANIMALS: 58 dogs with malignant tumors, including pulmonary
carcinoma (n = 31), histiocytic sarcoma (9), mast cell tumor (5), lymphoma (4), melanoma (2), and 7 other tumor types (1 each). PROCEDURES: Medical records of dogs treated with vinorelbine from December 1997 to December 2012 were reviewed for data regarding signalment, clinical signs, physical examination findings, clinicopathologic test results, diagnostic imaging results, vinorelbine doses and dose frequency, surgery and radiotherapy details when applicable, other chemotherapeutics administered, and outcomes. Descriptive, comparative, and survival statistics were computed for all dogs and for dogs by histologic subgroup of tumors. RESULTS: Vinorelbine was administered palliatively to 44 (76%) dogs. One (2%) dog had a complete response for 162 days, 5 (11%) dogs had a partial response for a median duration of 91 days, 19 (43%) dogs had stable disease for a median duration of 68 days, and 19 (43%) dogs developed progressive disease after a median duration of 21 days. Clinical benefit was more difficult to assess in the remaining 14 (24%) dogs that received vinorelbine as an adjuvant treatment. Overall median time to tumor progression was 103 days (range, 5 to 1,533 days). CONCLUSIONS AND CLINICAL RELEVANCE: Vinorelbine appeared to be effective in the treatment of several tumor types in dogs. Follow-up prospective studies of the clinical benefit of the drug in specific clinical scenarios will be necessary to support this conclusion.

Results of magnetic resonance imaging performed within 48 hours after head trauma in dogs and association with outcome: 18 cases (2007-2012).
Yanai H1, Tapia-Nieto R, Cherubini GB, Caine A.
OBJECTIVE: To review results of MRI performed within 48 hours after head trauma in dogs and identify associations between MRI findings and outcome. DESIGN: Retrospective case series. ANIMALS: 18 dogs that underwent MRI within 48 hours after known head trauma. PROCEDURES: Medical records were reviewed for information on signalment, history, clinical findings, MRI findings, treatment, and outcome. RESULTS: 2 dogs were euthanized, 1 died, and 1 had major persistent deficits. The remaining 14 dogs had a good outcome, including 9 that recovered completely and 5 that had minor persistent deficits. The most common MRI abnormalities were intra-axial changes (n = 13) and extra-axial hemorrhage (13). Intra-axial changes were best seen on T2-weighted and fluid attenuation inversion recovery (FLAIR) images. A mass effect was detected in 9 dogs, 6 of which had a midline shift (mean, 2.18 mm). Three dogs had transtentorial herniation, and 2 had transcerebral herniation. Extra-axial hemorrhage was best seen on FLAIR images. The most common location was subdural, with subdural extra-axial hemorrhage most often seen on the same side as the injury. Epidural hemorrhage was seen in 2 dogs. The affected area was larger in these dogs than in dogs with subdural hemorrhage. One dog required surgery and the other was euthanized. CONCLUSIONS AND CLINICAL RELEVANCE: Results suggested that in dogs with acute (< 48 hours' duration) head trauma, T2-weighted and FLAIR images provided the most diagnostic information. Dogs with injuries affecting the caudal fossa or affecting both the rostral and caudal fossae typically had poorer outcomes.