Effect of choroidal perfusion on ocular tissue distribution after intravitreal or suprachoroidal injection in an ex vivo porcine eye model

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Purpose: To compare retinal distribution of dye-drug surrogates after intravitreal (IV) and suprachoroidal (SCS) delivery to determine influence of drug lipophilicity and choroidal circulation. Methods: Thirty-two pig eyes were collected immediately after euthanasia. Sixteen eyes were perfused for thirty minutes through one long posterior ciliary artery with non-dye-containing nutrient media. An IV or SCS injection was performed with either 10µg BSS (Alcon Laboratories, Fort Worth, TX) (n=8), 1% sodium fluorescein (NaF) (Alcon Inc. Lake Forest, IL) (n=12) or 0.12% DII (Ansys Campus Drive, Fremont CA) (n=12). Globes were maintained at 37°C for fifteen minutes then snap frozen and dissected. Aqueous extraction and measurement of NaF or DII concentration was performed using spectrophotometry and fluorospectroscopy, respectively. Results: Retinal NaF and DII dye levels were higher in non-perfused eyes compared to perfused eyes. In perfused eyes, IV injections of DII and NaF reached the highest concentrations in the dorsal retina whereas after SCS delivery the dorsal levels were much lower. With DII SCS injections, however, retinal levels had better distribution throughout the dorsal and ventral retina compared to IV injections. Conclusions: As expected, choroidal circulation reduces access to drug distribution within ocular tissues. SCS injections of lipid drugs allowed direct drug delivery to the choroid with better distribution throughout the retina compared to IV injections. None.

Enucleation in a hoary bat
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Purpose: To describe an enucleation in a Hoary bat (Lasiurus cinereus). Methods: A 25 gram adult male hoary bat presented for exophthalmos and discharge OS. His symptoms did not improve on topical ofloxacin (Falcon, Ft. Worth, TX q 8 hours) and oral enrofloxacin (10 mg/C176 kg, Bayer, Shawnee Mission, KS). He became anorexic so enucleation was performed OS. Appropriate personal protective equipment was worn by all personnel involved in the procedure and all personnel had previously received rabies virus prophylaxis. The bat was premedicated with 0.0007 mg valium (Hospira, Inc., Lake Forest, IL) SQ and maintained with isoflurane (Piramal HealthCare, Andhra Pradesh, India). The surgical site was prepared with dilute iodine (Purdue Products, Andhra Pradesh, India). The surgical site was prepped with a 1% chlorhexidine solution followed by normal saline. The eye was exposed with a periosteal elevator and the capsule was removed with fine forceps. The cornea was then excised with a scalpel and the globe was removed from the eye socket. The eye was quickly washed with sterile saline and the site was then closed with 2-0 Ethicon Vicryl permanent suture. Results: Blanching of the conjunctiva at the site of treatment occurred. Char was evident on the surgical site. No bleeding was present. The animal survived the enucleation and was released back into the wild 5 days later. Conclusions: An enucleation can be safely performed in this species. None.

Inter and intra-user reliability of central corneal thickness (CCT) measurements of healthy canine and feline eyes using a portable spectral-domain optical coherence tomography (SD-OCT) device
AF Alario and CG Pirie
Department of Clinical Sciences, Tufts Cummings School of Veterinary Medicine (TCSVM)

Purpose: To establish corneal thickness measurements using a portable SD-OCT device in healthy canine and feline eyes. Methods: Dogs and cats free of ocular disease were used for this study. Gentle manual restraint was utilized for proper animal positioning. A 6mm corneal pachymetry protocol was performed using the Optovue® iVue SD-OCT (Optovue Inc. Fremont, CA) in both eyes of each animal by one operator. Measurements were obtained manually by 2 independent investigators, in duplicate (248 measurements), using the caliper function. Measurements included epithelial thickness (ET), non-epithelial thickness (NET), and central corneal thickness (CCT). All recorded measurements were analyzed to determine both inter and intra-user reliability. Results: Ten dogs (2M, 4CM, 1F, 3SF) and 10 cats (5CM, 5SF) with a mean age of 4.6 and 4.7 years were examined. Mean canine ET, NET and CCT were 72.25 ± 3.22, 547.96 ± 49.02 mm, 621.00 ± 51.21 mm for investigator A and 64.85 ± 4.76 mm, 546.00 ± 52.02 mm, 622.11 ± 50.04 mm for investigator B. The coefficients of variation for both investigators were <10% for all measurements. Intraclass correlations ranged from 0.38 – 0.99. Conclusion: Manual corneal thickness measurements using the Optovue® iVue SD-OCT device provides ET, NET, and CCT measurements with clinically acceptable intra-and inter-operator reliability in healthy canine and feline eyes. Funding source: None Disclosure: AF Alario (N), CG Pirie (C)

Manual corneal thickness measurements of healthy canine and feline eyes using a portable spectral-domain optical coherence tomography (SD-OCT) device
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Purpose: To establish corneal thickness measurements using a portable SD-OCT device in healthy canine and feline eyes. Methods: Dogs and cats free of ocular disease were used for this study. Gentle manual restraint was utilized for proper animal positioning. A 6mm corneal pachymetry protocol was performed using the Optovue® iVue SD-OCT (Optovue Inc. Fremont, CA) in both eyes of each animal by one operator. Measurements were obtained manually by 2 independent investigators, in duplicate (248 measurements), using the caliper function. Measurements included epithelial thickness (ET), non-epithelial thickness (NET), and central corneal thickness (CCT). All recorded measurements were analyzed to determine both inter and intra-user reliability. Results: Ten dogs (2M, 4CM, 1F, 3SF) and 10 cats (5CM, 5SF) with a mean age of 4.6 and 4.7 years were examined. Mean canine ET, NET and CCT were 72.25 ± 3.22, 547.96 ± 49.02 mm, 621.00 ± 51.21 mm for investigator A and 64.85 ± 4.76 mm, 546.00 ± 52.02 mm, 622.11 ± 50.04 mm for investigator B. The coefficients of variation for both investigators were <10% for all measurements. Intraclass correlations ranged from 0.38 – 0.99. Conclusion: Manual corneal thickness measurements using the Optovue® iVue SD-OCT device provides ET, NET, and CCT measurements with clinically acceptable intra-and inter-operator reliability in healthy canine and feline eyes. Funding source: None Disclosure: AF Alario (N), CG Pirie (C)

Thermal cautery of the canine third eyelid for treatment of cartilage evasion
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Purpose: To present a novel, minimally invasive technique for excised third eyelid cartilage correction in dogs that employs the use of low-energy cautery to remodel the cartilage. Methods: Eleven eyes of nine dogs had cautery performed under general anesthesia to correct eversion of the third eyelid. The tip of a high frequency electric cautery handpiece (Sabre 2400 Electrosurgical Unit) or an electrosurgery handpiece (Sahre 2400 Electrosurgical Unit) was applied to the bulbar conjunctival surface of the third eyelid, at the central location of cartilage convexity and treated to effect. This resulted in gradual conjunctival contraction and cartilage softening that remodeled the third eyelid to return to a more normal, physiologic position. When the tips of the cartilage bar were also cauterized, cautery was briefly applied to the convex surface to straighten the cartilage in a similar manner. Results: Blanching of the conjunctiva at the site of treatment occurred. Cartilages were sometimes present and was gently removed with a scalpel blade to improve postoperative patient comfort. Mild conjunctival hyperemia was noted in a few patients for 1–2 days after surgery but there were no signs of discomfort or swelling. All dogs had good results in terms of cartilage correction with no recurrence; however, one of the Great Danes that had concurrent third eyelid gland prolapse required gland replacement surgery. Conclusions: Thermal cautery is a simple, inexpensive means of correcting third eyelid cartilage eversion in dogs with a high rate of success that preserves normal tissue while restoring function. None.
values <0.05 are considered significant and when r is close to 1 is correlated. Results: The mean IOP was 17.3 mmHg and in the area with neovascularization was 18.3 mmHg. The correlation coefficient (r) between the two measurements was 0.826 and P < 0.000. The most prevalent breed used for the study was with 58.9% (60 eyes), average age is 4.6 years, the eye condition was more evident on the right eye OD 57.9% (22 eyes) and left eye OS 42.1% (16 eyes) also male were more affected 63.2% (24 eyes) versus females 36.8% (14 eyes). The most frequent diagnosis was pigmentary keratitis syndrome 51.6% (11 eyes). Conclusions: Corneal pannus formation can influence the tonometry test with Tonovet® rebound tonometer. Commercial interest: None.

ABSTRACT NO.: 07
Ocular abnormalities, intraocular pressure and central corneal thickness in a captive flock of common penguins (Fratercula arctica)
RA Atkins,* JA Hyman,* CA Hadfield,† LA Clayton† and L Arnett†
*Eye Care for Animals, MD; †National Aquarium in Baltimore
Purpose: To describe ocular abnormalities, mean intraocular pressure (IOP) and central corneal thickness (CCT) in a flock of common penguins at the National Aquarium. Methods: A cross-sectional descriptive study was conducted. Ten penguins used at the National Aquarium were examined with direct and indirect ophthalmoscopy under manual restraint. IOP was measured using a Tonovet tonometer (Tonovet rebound tonometer, TiOLAT, Helsinki, Finland) and OCT with the January 11th, 2021 release of the device. Results: No pathology was noted on corneal evaluation. Bilateral cataracts were present in 80% (8/10) of the birds examined. Six birds had punctate anterior subcapsular opacities. One bird had a hypermetropic cataract and was excluded from the calculations. The mean, SD, and 95% CI for IOP were 13.61 mmHg, 2.26 mmHg, and 11.87-15.35 mmHg respectively (n=9). The mean, SD, and 95% CI for CCT were 512.28±22.94 µm and 510.09-514.47 µm respectively. No significant difference in IOP was found between right and left eyes. Conclusions: A high incidence of bilateral cataracts was observed in a flock of captive penguins. The mean, standard deviation, and 95% confidence interval of IOP and CCT were reported. The IOP observed was lower than previously reported in captive black-footed penguins while the CCT was similar to other avian species. None.

ABSTRACT NO.: 08
A facemask for gaseous anesthesia in mice and chicks that allows easy access to the eyes for ophthalmitic procedures
M Bascell, J Querubin and SM Petersen-Jones
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Purpose: Commercially available facemasks designed for delivery of gaseous anesthesia in laboratory rodents are expensive. We therefore sought to develop a cheap and effective anesthetic facemask that would be suitable for ophthalmitic procedures such as retroviroctography (ERG) and optical coherence tomography (OCT). Methods: We developed a facemask from a bulb syringe and medicine dropper. The bulb syringe was removed and a small hole near the closed end was made into which the narrow end of the plastic cone was fitted. The two pieces were glued with hot glue and the cone was trimmed. Results: No pathology was noted on corneal evaluation. Bilateral cataracts were present in 80% (8/10) of the birds examined. Six birds had punctate anterior subcapsular opacities. One bird had a hypermetropic cataract and was excluded from the calculations. The mean, SD, and 95% CI for IOP were 13.61 mmHg, 2.26 mmHg, and 11.87-15.35 mmHg respectively (n=9). The mean, SD, and 95% CI for CCT were 512.28±22.94 µm and 510.09-514.47 µm respectively. No significant difference in IOP was found between right and left eyes. Conclusions: A high incidence of bilateral cataracts was observed in a flock of captive penguins. The mean, standard deviation, and 95% confidence interval of IOP and CCT were reported. The IOP observed was lower than previously reported in captive black-footed penguins while the CCT was similar to other avian species. None.

ABSTRACT NO.: 09
Human retinal progenitor cell replacement therapy as a treatment for retinal degenerative blindness
G Ben-Shlomo,*, MJ Young,† P Baranov,‡ M La Cout,‡ J Kiffsgard,§ R Mullins,§ E Stone§ and BA Tucker§
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Purpose: Photoreceptor degenerative diseases such as Retinitis Pigmentosa and Age related Macular Degeneration (ARMD) are currently the leading cause of blindness in the western world. The purpose of this study was to evaluate the effect of human retinal progenitor cell replacement therapy on retinal function of a transgenic miniature pig model of retinitis pigmentosa (p23h). Methods: Seven-month-old miniature pigs (p23h) were used. Human retinal progenitor cells were injected into the subretinal space of six eyes. Three eyes were injected with 500,000 cells and the other 3 were injected with 2,500,000 cells. The other 6 eyes served as a control: three of which were injected with the vehicle alone (NAC/HBSS), and three were not injected at all. EOG/ERG was performed at 6 hours after the injection and was repeated after 1, 2, 4, 6, 8, 12, 18, and 24 months of observation with the EOG/ERG equipment. Results: Injected eyes (in all groups) were associated with ocular abnormalities including corneal edema, uveitis, anterior synchiae, cataract and retinal tear. The non-injected control eyes were free of abnormalities. Only one eye injected with 500,000 cells demonstrated residual rod function in response to scotopic stimuli 3 months after the injection (b-wave amplitude = 21µV). All of the other eyes from all groups did not have recordable rod activity at any time point. All injected eyes demonstrated lower combined rod-cone function compared to the non-injected controls. Eyes injected with 500,000 cells demonstrated the lowest rod-cone function compared to the other groups. Conclusions: No rod function was restored in the p23h pigs after subretinal injection of human retinal progenitor cells 12 weeks post treatment. Subretinal injections at all doses were associated with ocular abnormalities and overall decreased retinal function, 12 weeks post injection.

ABSTRACT NO.: 10
Suture anchor placement technique for the replacement of the prolapsed gland of the third eyelid in 97 dogs
AM Beyer, JS Sapeniza and A Maydormo
Department of Ophthalmology, Long Island Veterinary Specialists
Purpose: To evaluate a rapid technique to anchor the prolapsed gland of the third eyelid in dogs. Methods: A retrospective study of dogs with third eyelid prolapse that were surgically anchored with a non-absorbable suture. Postoperative insertion of the ventral rectus muscle was performed. Ninety-seven dogs with 127 eyes were included in this study. The right eye was affected in 59 cases and the left eye in 60 cases. Sixteen eyes were previously operated at another facility prior to referral. Nine different breeds were represented with the average age of the patients being 2.18 years (57 days to 11 years). Rechecks were performed 3–4 weeks postoperatively. Results: No recurrences of gland prolapse were observed over the course of study. Minor conjunctival perforations were observed and easily repaired intraoperatively. Five cases presented with keratoconjunctivitis sicca prior to surgery and all had resolution of their disease process following surgical intervention and were treated with a lubricating agent for 6 weeks. The suture anchor placement technique provides a cosmetic, rapid and successful replacement of the prolapsed gland of the third eyelid in dogs. No recurrences were noted. Complications were addressed successfully and with ease. None.

ABSTRACT NO.: 11
Efficacy and safety of vorinostat in the treatment of canine corneal fibrosis
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Purpose: To evaluate the safety and efficacy of the FDA-approved drug vorinostat (Sigma-Aldrich, St. Louis, MO) in the treatment of canine corneal fibrosis using an in-vitro model. Methods: Healthy donor canine corneas were collected and used to generate primary canine corneal fibroblasts (CCFs). Canine corneal myofibroblasts were produced by CCF cultures containing transforming growth factor (TGF)-β1 (1 ng/ml) and represented a model for corneal fibrosis. Trypan blue exclusion assays were used to determine optimal vorinostat dose. CCF cultures were treated with 0.06% vorinostat for 1 min (group 1) and 24 h (group 2), representing single and multiple dose treatment regimes, respectively. Trypan blue exclusion, immunocytochemistry, and TUNEL assays were used to evaluate the cytotoxicity of vorinostat. Real-time PCR, western blot analysis, and immunocytochemistry determined the efficacy of vorinostat. Results: none. Conclusions: Vorinostat significantly decreased TGF-β1-induced sXMA expression, a marker for myofibroblast activation in both group 1 (p < 0.05) and group 2 (p < 0.05) when compared to the TGF-β1 control group. The comparison of sXMA immunodetection between vorinostat treatment groups 1 and 2 showed no significant difference in sXMA levels. Tested vorinostat did not affect CCF proliferation or cellular viability and did not cause significant cell death. Conclusions: Vorinostat safely and effectively inhibits TGF-β1-induced myofibroblast proliferation in the canine cornea in vitro. Supported by a University of Missouri Clinician Scientist Research Award. None.

ABSTRACT NO.: 12
Fundocochanges in diabetic dogs
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Purpose: Diabetes mellitus affect different tissues including eyes. Suddenly bilateral cataracts are the most common oculom manifestation in diabetic dogs resulting blindness. Cataract impairs fundoscopic examination, however, the diagnosis of diabetic retinopathy in dogs is not commonly investigated. The aim of this study is to detect the vascular changes by fundoscopic examination in diabetic dogs without ocular media opacities. Methods: Seventeen diabetic dogs (11 normophakic or normal visual, 6 phakic or diabetic retinal new vascularization at the second visit. The average of diabetes mellitus duration were 9,1 months (1 to 19 months). All animals presented significant glycemic alterations. On the first visit, the average of fasting glucose levels were 321 mg/dl (range 57 to 840mg/dl) and 145 mg/dl (range 45 to 289mg/dl) for before and after the meal respectively. None of the dogs had ketonemia (range 0.0 to 689µmol/l). Blood sugar levels remained high after four months follow-up. Conclusions: The present findings seem to be consistent with diabetic retinopathy. Supported by EAFESP grant normol, 2011/07791-8. None.
ABSTRACT NO.: 13
Tear film vascular endothelial growth factor in dogs with vascularizing corneal disease
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Department of Small Animal Clinical Sciences, Ophthalmology, Virginia Maryland Regional College of Veterinary Medicine, Virginia Tech;†Department of Biomedical Sciences and Pathobiology, Virginia Maryland Regional College of Veterinary Medicine, Virginia Tech
Purpose: This study aims to characterize VEGF-A (VEGF) concentrations in tears of dogs with normal corneas and dogs with vascularizing corneal disease. Methods: Tear samples were harvested from both eyes of dogs with vascularizing corneal disease (including non-vascularized eyes with unilateral vascular corneal vascularization). Eyes of ophthalmologically normal dogs served as controls. Corneal vascularization scores were assigned to diseased eyes based upon evaluation by slit-lamp biomicroscopy, and photodocumentation. VEGF concentration was evaluated using a commercially available enzyme-linked immunosorbent assay (ELISA). Results: Tears were collected from 63 eyes of control dogs, 17 non-vascularized eyes of dogs with unilateral vascularizing corneal disease, and 81 eyes with vascularizing corneal disease. Disease categories represented included corneal stromal ulceration/perforation, superficial ulceration, endothelial degeneration, lipid dystrophy/degeneration, facets, avascular, glaucoma and “other”. Mean tear film VEGF concentration of diseased eyes was 6.15 ng/mL and did not differ significantly from control eyes. Conclusions: Concentrations of non-vascularized eyes of dogs with unilat- eral vascularizing corneal disease were significantly higher (mean 9.86 ng/mL) than control and vascularized eyes. VEGF concentrations of diseased eyes did not differ significantly by disease process, degree of corneal vascularization, or use of topical or oral anti-inflammatory medica- tions. Conclusions: VEGF concentrations in the canine tear film detected by ELISA exceed known biologically active concentrations of VEGF, but do not correlate to state of corneal vas- cularization. VEGF-related control of corneal vascularization may be mediated by VEGF receptor expression and regulation, or a balance between proangiogenic and antiangiogenic VEGF splice variants indistinguishable by the current testing method. Supported by VVMA Research Fund.

ABSTRACT NO.: 14
Comparison of tonometric values obtained by an experienced and inexperienced tonometer utilizing three different tonometers in normotensive dogs and horses
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Purpose: To determine the effect of tonometer experience on intraocular pressure (IOP) measurement in clinically normal dogs and horses using three different tonometers. Methods: Six dogs (2, 2 and 2 eyes) and 6 horses (12 eyes) were used in this study. An examination including slit lamp biomicroscopy, fundoscopy, and Schirmer tear test (STT) was performed. All eyes were found to be free of ocular disease. Two application of TonoPenXL® and i-pen Vet® and one rebound tonometer (TonoVet®) were used to measure IOP by an experienced and an inex- perienced operator. All horses were chemically restrained and an auriculopalpebral nerve block was performed. Topical anesthesia was applied to both corneas at least 1 minute prior to tonom- etry in all animals. Tonometry was recorded bilaterally using the TonoPenXL® followed by TonoVet® and then i-pen Vet®. The IOP measurements were analyzed by utilizing the Bland- Altman test (95% CI) and paired t-tests. Results: No significant statistical differences were found between tonometry values obtained by experienced and inexperienced tonometers (p=0.1) for all animals. Tonometers were used in each of the three species. Conclusions: The study was able to obtain comparable IOP values to an experienced tonometerist in normotensive dogs and horses, using these three different tonometers. Hence, IOP values obtained by veterinary students or general practitioners with no extensive tonometer experience may yield reliable measurements as long as basic tonometric principles are practiced and tonometer manufacturer instructions are followed. None.

ABSTRACT NO.: 15
Efficacy of COX-2 inhibitors in controlling inflammation and capsular opacification after phacoemulsification cataract removal
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*Animal Eye Care Associates;†North Carolina State University
Purpose: To evaluate the efficacy of topical COX-2 inhibitor (loxoxefenc 0.9% (Xibrom)); or COX-2 (celecoxib) impregnated intraocular lens (IOL) compared to topical 1% prednisolone acetate (PA) in treating postoperative intraocular inflammation and capsular opacification (PCO) after phacoemulsification cataract removal in the dog. Methods: A prospective study involving 50 dogs undergoing bilateral cataract extraction and 10 dogs undergoing unilateral cataract extraction. Eyes were randomly assigned to receive Xibrom, or celecoxib-IOL plus Xibrom for one eye, and PA in the contralateral eye. All patients were randomly assigned to receive Xibrom or PA. Inflammation and PCO were evaluated using slit lamp biomicroscopy, fundoscopy, and Schirmer tear test (STT) was performed. Results: No significant difference was found in postoperative inflammation or IOP between eyes treated with PA, Xibrom, or PA/celecoxib-IOL. Results were supported by masked observer evaluation of digital images. Conclusions: There were no significant differ- ences in postoperative inflammation or IOP between eyes treated with PA, Xibrom, or PA/celecoxib-IOL plus Xibrom. Results were not supported by the absence of differences in the STT. None.

ABSTRACT NO.: 16
A case of metastatic spindle cell tumor of blue-eyed dogs
DK Brudnell,* EM Scott,† LBC Teixeira,† FD Duke† and RR Dubielzig†
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Purpose: To describe a case of a spindle cell tumor in two dogs with blue eyes. Methods: A 12-month-old female blue-eyed Beagle was presented to the veterinary teaching hospital at the University of Wisconsin-Madison with a progressive gait disturbance. A 7-month-old male blue-eyed Beagle dog was presented with a paresis of the left hindlimb and a palpable mass in the inguinal region. Findings included a pelvic mass and a mass in the inguinal region. Two samples of the pelvic mass and one sample of the mass in the inguinal region were submitted for histopathology. D100, D200 and D300 were used as an adjuvant. Conclusions: This is the first documented case of SCTBED in dogs. The treatment consists of chemotherapy and surgery. All of the cases were surgical excision. None.

ABSTRACT NO.: 17
Evaluation of the in vitro effect of Tricide™ on corneal tissue explants
EM Camacho and RT Carter
Department of Veterinary Clinical Sciences, Louisiana State University
Purpose: To assess the impact of the chelating agent, Tricide™, on the morphology of equine corneal explants by light microscopy. Methods: Twenty-eight eyes were obtained from fourteen horses with a normal anterior segment examination. Goblets were collected immediately after enucleation for this study. One eye of each horse was randomly assigned to either the treatment or control group. Corneas were collected aseptically, sectioned full-thickness and placed in RPMI media-epidermal growth factor (10% for 2 hours). Explants were maintained at 37°C and 5% CO2 and exposed to Tricide™ at concentrations ranging from 1%-6%. Controls were incubated in RPMI with equal concentrations of PBS. Samples were harvested at day 1 and were evaluated for primate, trichrome and eosin staining. Conclusions: Evaluation of the in vitro effect of Tricide™ showed little effect on morphology of corneal explants at concentrations up to 4%. Studies evaluating higher concentrations need to be conducted. Supported by a Charles V. Casimano FHSP Grant None.

ABSTRACT NO.: 18
Feline ocular sporotrichosis: three case reports
EL Caminotto,* PPS Souza,* RCM Botton,* JT Pereira,* AK Kune† and PDC Cavalcanti†
*Universidade Federal Rural de Janeiro;†Vet Service Clinic
Purpose: To report three cases of ocular injury caused by Sporothrix schenckii, including clinical presentation and outcome after treatment in cats. Methods: In all three cases the cats were male, non-castrated, unknown breed, free-living and ranging in age from one to three years old. In the first two cases, the material collected by scraping and fine needle aspiration was posed on the surface of microscope slide, stained and observed under an optical microscope. In the third case, the material collected by imaging collected on a 2D digital image analysis. The data consist of different sampling sites were identified on the cytological examination the presence of structures suggestive of S. Schenckii yeast forms. The treatment consisted on using the antifungal agent, ketoconazole and itraconazole 45mg/kg q24h and topical 1% miconazole q24h for 28 days. Conclusions: This is the first documented case of SCTBED in dogs. The treatment consists of chemotherapy and surgery. All of the cases were surgical excision. None.

ABSTRACT NO.: 19
Oxidative stress in retinas of dogs with acute glaucoma
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Purpose: To test the hypothesis that oxidative stress occurs early in the pathogenesis of glau- coma in dogs. Methods: Sections from 12 control and 24 glaucomatous dog retinas embedded in plastic or paraffin. Plastic sections were stained for total glutathione, tauine, glutamine synthetase, and glutamate. Paraffin sections were stained for malondialdehyde (MDA) and 3-nitrotyrosine (NT). Using image analysis, staining density was compared between and within samples. Statistical differences were assessed with ANOVA and Tukey-Kramer multiple comparisons tests. Results: Increased staining for MDA & NT noted in neurons within mild to moderately damaged regions but not in severely damaged areas. In mildly damaged region, immunostaining for malondialdehyde was minimal while many retinal cell types, including photoreceptors, and Muller cell processes. In more severely damaged regions, immunostaining for glutatione
was near normal in the few remaining RGCs and near normal or increased in glia. Many RGCs
had lost their usual perikaryal immunostaining which is consistent with apoptosis.

**Abstract NO.: 20**

The retinal protective and antioxidative effects by topical antiglaucoma
drugs in high IOP induced retinal ischemia in rats

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**Purpose:** To investigate retinal protective and antioxidative effects by topical antiglaucoma
eye drops and systemic neuroprotective drugs on glaucomatous neuropathy in rats. **Methods:** A rat model of high intracranial pressure (IOP) induced retinal ischemia was used to assess the anti-
oxidative and retinal protective effects by different drugs on glaucomatous neuropathy. Brin-
olamine (1%) and timolol (0.5%) were administered topically three times a day after ischemia.

**Results:** The antioxidative activity and functional protective effect for the retina was determined by electroretinogram (ERG), histopathological, and antioxidative analysis. The findings of this study suggest that timolol, methylprednisolone and minocycline possessed both antioxidative and neuroprotective effects. Brinolamine and minocycline provided both antioxidative.

**Conclusions:** An order of neuroprotective and anti-oxidative efficacy of treated animals with retinal ischemia in this study is listed as follows: Methylprednisolone > minocycline > timolol > loxone > brinolamine. Supported by Research grant 101-B-062-02S. None.

**Abstract NO.: 21**

Preliminary intraocular pressure measurements from 4 cetacean species in various body positions

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**Purpose:** To measure and compare intraocular pressures in a variety of cetaceans using appla-
nation and rebound tonometry. **Methods:** Application tonometry was measured to use IOP in 4 Atlantic bottlenose dolphins. Rebound tonometry was used to measure IOP in Atlantic bottl-
encode (Tursiops truncatus, n=16), Pacific bottlenose dolphins (Tursiops gilli, n=14), one Atlantic-Pacific hybrid, harbor porpoise (Phocoena phocoena, n=1), Beluga whales, (Delphinapterus leucas, n=2) and Pilot whales (Globicephala melaena, n=2). **Results:** Average IOP in Atlantic bottlenose dolphins using application tonometry was 28.91 mmHg OD, 39.64 mmHg OS. Average IOP in Beluga whales was 32.07 mmHg OD, 37.34 mmHg OS. Average IOP in Pacific bottlenose dolphins using rebound tonometry was 40.43 mmHg OD, 40.57 mmHg OS. There was no significant difference between the two methods in any of the species.

**Conclusions:** This preliminary study shows that intraocular pressure can be accurately measured in various cetacean species using either application or rebound tonometry. Further studies with a larger sample size are needed to confirm these findings.

**Abstract NO.: 22**

Papillomatosis of the posterior surface of the third eyelid in a dog

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**Purpose:** Papillomas may present as a single or multiple stalk-like mass with color varying from white to pink and cauliflower-like appearance. This benign neoplasia is often associated to virus.

**Methods:** Papillomatosis was found in a 6-month-old female American Cocker Spaniel with a history of abnormal growth of whitish mass in the medial canthus of the left eye. Ocular examination revealed two white masses of approxi-
mately 0.5 cm diameter located on the bulbar surface of the third eyelid of the left eye. As the location of the mass, surgical excision was proposed. The glandular portion of the nictitating and its hyaline cartilage were preserved. The surgical wound was left to heal by second intention. The excised tissue was submitted to histology. **Results:** Histopathological results were consistent with papillomatosis. Hyperplasia of the stratified squamous epithelium was observed restricted to the anterior epithelium of the conjunctiva. Lymphocytes have been implicated in the regres-
sion of the tumor. No age-related changes were observed. None.

**Conclusions:** They were common in animals kept in indoor environments. None.

**Abstract NO.: 23**

Cryopreservation of canine corneoscleral tissue: histological, microbiological and ultrastructural study

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*Fundacio´ Hospital Clinic & Departament de Medicina i Cirurgia Animals, Facultat de Veterinari, Universitat Autonoma de Barcelona; †Departamento de Medicina y Cirugia Animal, Facultad de Veterinaria, Universi-
dad Complutense de Madrid; ‡Laboratory of Biostatistics & Epidemiology, Universitat Autonoma de Barcelona, Biosecurity and Data Management Platform, IDIBAPS, Hospital Clinic, Barcelona, Spain

**Purpose:** To evaluate the histological, microbiological and ultrastructural characteristics of short-term cryopreserved (STC) (20°C) canine corneoscleral tissue (cyclops tissue), and to compare them with long-term cryopreserved (LTC) tissue (−60°C). **Methods:** Fifteen canine globes were obtained from 2004 to 2012 after a decontamination protocol, globes were emulsified in sterile conditions and stored at −20°C in an environment with broad-spectrum antibiotics. Cor-
neal scrapings were evaluated at the end of the storage period: (1 year or 5 years). Microbiological protocol included culture in blood, McConkey and Saboraud agar and in brain-heart infusion broth. Cryopreservation artifacts were evaluated by hematoxylin-eosin staining. The integrity of corneal, neoscleral and cartilage was evaluated by SEM. Keratocones were classified as normal, apototic or necrotic. Statis-
tics were made by Mann-Whitney U test for normal distribution and Kruskal-Wallis for non-normal distribution. **Conclusions:** While the majority of keratocones were significantly higher in STC (p<0.015), being predominantly normal in STC (80%) and apoptotic in LTC corneas (90%) (p=0.008). No differences were detected in the integrity of neoscleral collagen in both storage periods (p=0.077).

**Abstract NO.: 24**

Equine glaucoma: a histopathological retrospective study of cases (1999–2012)

EM Carito and AJ Gemensky-Metzler

College of Veterinary Medicine, The Ohio State University

**Purpose:** To characterize the histopathological findings in equine globes which were emul-
sed and used for research. **Methods:** A case series of 71 cases were collected from The Ohio State University Veterinary Hospital. **Results:** Equine glaucoma most commonly occurs secondary to uveitis and older horses are predisposed. Twenty-three eyes from 23 horses in beached position, averaged 62.8 mmHg OD and 60.7 mmHg OS. The harbor por-
phins in beached position had average IOP 57.67 mmHg OD, 57.33 mmHg OS. IOP in eleven
ated due to glaucoma. To characterize the histopathological findings in equine globes which were enucle-
ated due to glaucoma. To characterize the histopathological findings in equine globes which were enucle-
ated due to glaucoma.

**Conclusions:** To characterize the histopathological findings in equine globes which were enucle-
ated due to glaucoma.

**Abstract NO.: 25**

Diamond burr spectaclectomy in refractory ocular dysyescis on a corn snake: a video-presentation

EG da Silva,*† M Johnston,*‡ CC Powell* and JR Ginfriddo†

*Animal Eye Center, Rocklin, CA, USA; †Department of Small Animal Clinical Sciences, Colorado State University, Fort Collins, CO, USA

**Purpose:** Management of a severely retarded spectaculum unresponsive to therapy includes man-
ual removal as a final option. However, no specific modality in any spectaculum has been shown to be superior in any spectaculum. The purpose of this presentation is to report for the first time the use of a motorized diamond burr in the removal of retained spectacles. **Case description:** A 2-year-old male corn snake was presented to the Ophthalmology Service of CU, with a his-
tory of anorexia of 3 weeks duration and chronic bilateral ocular dysyescis. The condition was unaltered by logyantibiotics and was refractory to standard medical treatment. Upon ocular exam, multiple layers of unshed spectacle were present bilaterally and the animal had severe visual impairment. Because the snake had vision prior to acquiring the spectaculum, despite...
the small spectacle diameter (5x4mm), surgical removal of the retained spectacle was elected on the basis of veterinary suspicion of endophthalmitis. The animal recovered uneventfully; it had been referred to a veterinary ophthalmologist for pre-existing cataract. The use of ferrous brown pigmented prosthetic should be avoided when the potential for subsequent MRI exists. None.

ABSTRACT NO.: 28
Efficacy of prophylactic medications in canine primary angle-closure glaucoma: a multicenter retrospective study (2004–2012)

DD Dees,† KJ Fritz,‡ AM Sheehan,§ RM Atkins,§ DW Esson,† AM Knollinger* and NE MacLaren*
*Eye Care for Animals, Salt Lake City, UT, USA; †Eye Care for Animals, Tustin, CA, USA; ‡Eye Care for Animals, Chicago, IL, USA; §Eye Care for Animals, Annapolis, MD, USA

Purpose: To evaluate efficacy of four anti-glaucoma medications with or without adjunctive topical corticosteroids in preventing iOP and clinical signs of pigment dispersion/glaucoma.

Methods: Retrospective analysis identified canine patients presenting with unilateral acute con- gestionary angle-closure glaucoma (IOP > 25 mm Hg) and gonioscopic findings of pericat- aneal lipodialysis (PI) that is narrow or closed iris trabecular meshwork angle in the contralateral eye. The following factors were assessed: breed, sex, age, time to medical failure for each anti-glaucoma medication, and use of topical anti-inflammatory medications. A Wilcoxon test was used to eval- uate for statistical differences with significance set at p < 0.05.

Results: Eighty-two patients fit the inclusion criteria for evaluation of anti-glaucoma medications and eighty-eight for evaluation of anti-inflammatory medications. The most common purebreds were the American Cocker Spaniel and Basset Hound. The patients on Demecarium bromide 0.125% (Wedgewood Pharmacy, Madison, WI) (n=31) had the longest estimated median time to medical failure at 330.0 days, followed by a single drop OD of 0.005% LAT. OS was treated concurrently with vehicle. During each stage, IOP and PD were measured OU at 0.1, 2, 4, 6, and 8 post-treatment. HRUS was performed at the same time-points to evaluate a number of AS parameters including scleral thickness (ST), angle recess area (ARA); length (CCL) width (CCW) and area (ACC) of the ciliary cleft; trabecular meshwork-iris distance (TMID); iridociliary process distance (ICPD); peripheral iris thickness (PIT) and iris-lens contact (ILC). Data were evaluated using student’s t-tests and repeated measures ANOVA. Significance was set at p<0.05. Results: In normal cats PILO and LAT treatment both led to significant miosis but no significant reduction in IOP. In PCG cats, PILO treatment led to reductions in both PD and IOP but neither were statistically significant, whereas LAT treatment resulted in significant miosis and IOP reduction OD. In PIG cats, CCL, CCW and ACC were significantly smaller than in normal cats. In PCG cats, latanoprost treatment was associated with increase in CCW. No other consistent changes in AS were identified in PCG or normal cats. Conclusions: In PCG cats, topical latanoprost alters the morphol- ogy of the ciliary cleft and lowers IOP. Supported by NIH Grants K08 EY018609 and P30 EY016665; a research grant from the UW Foundation Companion Animal Fund; Research to Prevent Blindness and a Merial Summer Research Scholarship. None.

ABSTRACT NO.: 31
Polyethyleneimine nanoparticles (PEI-NPs): a potential vector for equine corneal gene delivery

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Purpose: To determine if polyethyleneimine nanoparticles (PEI-NPs) can be safely used to deliver therapeutic genes in equine cornea using an established in vitro model. Specifically, study aims were to (1) evaluate efficacy of PEI to deliver enhanced green fluorescent protein (EGFP) in normal rabbit eyes. None.

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The use of lens capsular retractors to overcome significant lenticular instability during canine phacoemulsification

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Purpose: Single-port phacoemulsification may be challenging when complicated by significant lenticular instability. The use of capsular retractors has been variably described. Conclusions: A 9-year old male neutered Chinese Crested dog presented for elective phacoemulsification. The patient’s right eye vision had been lost to pain and lens luxation. Preoperatively, significant zonulal instability was noted OS, marked by an irregular anterior chamber and phacodonesis. Intraoperatively, capsular instability was confirmed during capsulotomy. Retraction of the lens capsule and capsulotomy was performed with two capsular retractors. The capsular bag was placed through 1.1mm limbal incisions, prior to single-port phacoemulsification andiol placement. Results: Surgery was completed without complication or vitreous prolapse. Postoperative healing and six month follow-up were unremarkable. Conclusions: In contrast to CTRs, capsular retractors anchor the capsular bag to the sclera during surgery and provide increased rotational stability as well as anterior-posterior motion support. The use of capsular retractors may be indicated in selected cases of significant lenticular instability when performing canine phacoemulsification. None.

Comparison of two methods of tear sampling in dogs for protein quantification by Bradford method

E Farias,† KL Yasunaga,† RV Peixoto,‡ MP Fonseca,‡† W Fontes* and PD Galera†

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Purpose: To compare two methods of dog’s tear sampling for protein quantification. Methods: Tear samples were collected from 29 healthy dogs (15 F1) using Schirmer tear test (STT) strip and micropipette tubes. The samples were frozen at −80 °C and analyzed by Bradford method. Results: Protein concentration and standard deviation from tears collected with micropipette tube were 4.45 mg/mL ± 0.35 and 4.52 mg/mL ± 0.29 for right and left eyes, respectively. The average protein concentration and standard deviation from tears collected with Schirmer Tear Test (STT) strip were and 5.45 mg/mL ± 0.63 and 5.14 mg/mL ± 0.65 for right and left eyes, respectively. Statistic significant difference was found (p < 0.001) were found between the methods. In the conditions in which this study was conducted, the average protein concentration obtained with Bradford test from tear samples obtained by Schirmer Tear Test (STT) strip showed values higher than those obtained with micropipette tubes. It is important that concentration of tear protein pattern values should be analyzed according the method used to collect tear samples. Supported by CNPq-Brazil. None.

Comparison of two methods of tear sampling in dogs for protein quantification by Bradford method

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The effect of intracameral dexamethasone on the incidence of postoperative ocular hypertension following routine phacoemulsification in canine patients

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Purpose: To determine the effect of the administration of 2mg of intracameral preservative-free, dexamethasone sodium phosphate (Decadron, 10mg/ml, APP Pharmaceuticals) on the incidence of postoperative ocular hypertension following routine phacoemulsification in canine patients. Methods: One hundred and four canine lenses (of sixty-nine patients) underwent routine phacoemulsification. Patients, age, sex & diabetic status were recorded. Patients were randomly assigned to receive an intracameral injection of 0.2 ml of Decadron or 0.2 ml of balanced salt solution (BSS, Alcon) at the conclusion of the surgery. Pre- and post-surgical medication protocols were consistent across both groups, with the exception of systemic anti-inflammatory therapy which comprised either Carprofen (Rimadyl®, Pfizer Animal Health) or prednisone (West-ward Pharmaceutical Corp) depending on the patient’s diabetic status. Intraocular pressures were estimated by rebound tonometry at 4 hours, 24 hours, and 1 week postoperatively. Results: POH was defined as an IOP > 25 mmHg. A Chi-square test was used to evaluate for statistical differences with significance set at p ≤ 0.05. Results: POH was identified in two patients in the Decadron group, compared with 4 patients in the BSS group at 4 hours. Four patients in each group demonstrated POH at 24 hours. No statistically significant difference in the incidence of POH was noted between the groups at 4 hours (p=0.25) and 1 week (p=0.25). Conclusions: In this study, the administration of intracameral dexamethasone immediately following phacoemulsification did not significantly affect the incidence of postoperative ocular hypertension. None.

Common histopathologic findings in Labrador retriever globes enucleated as a result of glaucoma following phacoemulsification

Purpose: Labrador retrievers have been shown to be at an increased risk of post-operative glaucoma following phacoemulsification. The purpose of this study was to identify and describe the...
ABSTRACT NO.: 39

A review of the breed-associated frequency of canine patients presented for retinal re-attachment surgery

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Purpose: To evaluate the breed-associated frequency of canine patients presented for retinal re-attachment surgery. Methods: A retrospective chart review of canine patients that underwent retinal re-attachment surgery between 2005 and 2009 were retrospectively reviewed. The following factors were assessed: breed, age, sex, and prior lensectomy. Results: A total of 145 patients (168 eyes) were identified representing 130 pure-bred dogs (36 breeds) and 15 mixed-breed dogs. Overall, the most frequently represented breeds were the Shih Tzu (30%), Bichon Frise (16%), Labrador Retriever (13%), and Toy Poodle (3%). Ninety-one patients (107 eyes) presented for primary retinal re-attachment surgery. Purpose:

ABSTRACT NO.: 40

Equine amniotic stromal protein analysis by 2-D gel electrophoresis and shotgun proteomics

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Purpose: To evaluate the overall success of pharmacologic ciliary ablation to manage canine eyes affected by absolute glaucoma and to identify prognostic indicators of success. Methods: A

ABSTRACT NO.: 41

total of 102 globes underwent pharmacologic ciliary ablation using 25mg gentamicin (Vesico, Inc., MO). Only eyes with 6 months follow-up were included in the study. The following factors were assessed: breed, age, sex, primary vs. secondary glaucoma, use of sedation/anesthesia, concurrent uveitis/vitrectomy, use of post-operative topical anti-inflammatories, use of post-operative anti-glaucoma therapy and the development of post-operative phthisis bulbi. Success was defined as an IOP £ 25mmHg.

Results: 48/54 globes (88%) became phthisical at 6 months. 22/54 were affected by primary glaucoma with 16 successfully managed at 6 months (94%). 3/54 of Golden retriever uveitis, 9/9 cases of chronic lens-induced uveitis & 8/9 cases post-phacoemulsification were successfully managed at 6 months. 15/54 globes became phthisical at 6 months (28%). Two globes required a second procedure. Two globes failed to manage post-operative follow-up. Conclusion: Pharmacologic ciliary ablation was considered effective at treating glaucoma within 6 months, with IOP being successfully controlled at one month in most cases. Phthisis bulbi was most commonly associated with primary glaucoma. The use of sedation/anesthesia, aqueocentesis/vitrectomy and concurrent uveitis/vitrectomy had no statistically significant effect on outcome. Phthisis bulbi was a relatively common complication.


ABSTRACT NO.: 42

Equine amniotic stromal protein analysis by 2-D gel electrophoresis and shotgun proteomics
ABSTRACT NO.: 45
Effect of semiconductor diode transscleral cyclocyclophotocoagulation (TSCP) in buphthalmic equine globes

AJ Gemensky-Metzler,* DA Wilkie,* SE Weisbrode* and S Kuhn†
Veterinary Medicine, University of Tennessee

Purpose: To determine if previously described location and energy settings for TSCP are appropriate for buphthalmic equine globes. Methods: Nine blind buphthalmic globes were measured and lasered under general anesthesia immediately prior to enucleation. Axial globe length was measured with a 10 MHz ultrasound probe and horizontal and vertical corneal diameters were measured with a Jamieson caliper. Sixty eyes were laser ed 4 mm posterior to the limbus in the dorsoventral and ventrodorsal quadrants at settings of 1500 milliwatts and 1 millisecond. Globes were emulsicated, fixed in 10% formalin, then sectioned sagittally over the temporal aspect of the globe in two blocks. Five histologic sections per block were stained with hematoxylin and eosin. Photomicroscopic examination of the photocoagulated sections was used to measure the distance from limbus to pars plicata. Results: Histologic lesions included coagulation of the sclera and stroma of the pars plicata, iris base and pectinate ligament; coagulation was observed in the pigment epithelium and uveal pigment dispersion. In all globes, coagulation of the iris base and/or pectinate ligament and anterior ciliary body was noted in the non proliferated iris planes or choroid. The distance from limbus to pars plicata varied by anastomotic location and ranged from 2.5-6.1 mm dorsally to 4.3-5.2 mm ventrally. Conclusions: Recommended settings for TSCP can damage the iris and iris base and may not be the best placement for TSCP in buphthalmic equine globes. None.

ABSTRACT NO.: 46
Characterization of the oculocardiac reflex during compression of the globes in rabbits

AJ Giannico, MOB Sampaio, JS Pereira, L Lima and F Montani-Ferreira
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Purpose: To describe the clinical course of protothecosis in a dog. Methods: A 7 year old, intact male, mixed breed dog was referred for vision loss, following intentional injury to the eye by a red jellyfish. The patient was observed for clinical signs and for subretinal and subconjunctival collections. Results: A chronic, sterile subretinal collection was observed in the left eye. No treatment was recommended. Subretinal aspirates were performed to provide a cytologic sample of granulomatous tissue. Diagnoses: Diagnosis of retrobulbar neuritis was made. Conclusion: Topographically localized peripheral neuritis was diagnosed due to intractable glaucoma confirmed the diagnosis of Protothecosis. This is an unusual case in that Protothecal organisms were absent in both the abdominal aspirates and serum. The final diagnosis for this patient was based on cytologic analysis of subretinal fluid. None.

ABSTRACT NO.: 47
Treatment of equine periocular sarcoid with surgical resection and photodynamic therapy: 7 cases

EA Giuliani, PJ Johnson, JW Pearce and CP Moore
Department of Veterinary Medicine and Surgery, College of Veterinary Medicine, University of Missouri, Columbia, MO, USA

Purpose: To report the successful treatment of 7 cases of equine periocular sarcoid with surgical resection and photodynamic therapy (PDT) using verteporfin (Visudyne®, Novartis Corp., East Hanover, New Jersey). Methods: 7 horses with naturally occurring periocular sarcoid confirmed by histopathology were included. Evaluated signs: Exophthalmos, conjunctival and corneal distortion, reduced visual acuity, third eyelid function, chemosis, episcleral fibrosis, staphyloma, and decreased corneal sensitivity. Conclusions: PDT was performed using a 2 mg/ml Visudyne® (treatment dose: 1 mg/cm² of tumor bed) and immediately irradiated with a light emitting diode (688 ± 7 nm; light dose: 150 J/cm²; fluence rate: 200 mW/cm²). Horses had a minimum follow-up time of 16 months (range 36-79). 2 horses had histologic evidence of tumor recurrence at 1 and 10 months respectively. 5 horses underwent a single therapy session with PDT. 2 horses had 2 treatments as PDT was ineffective in the treatment of a large tumor. All horses had favorable clinical outcomes at final follow-up. Conclusions: To the authors' knowledge, this is the first report of local PDT using Visudyne® as the phototoxic agent in the treatment of equine periocular sarcoid. Supported by MU Clinician Scientist Grant. None.

ABSTRACT NO.: 48
Corneal sensitivity after phacoemulsification surgery in dogs

ACA Goes, AMV Safatle, PSM Barros and AA Bolzan
College of Veterinary Medicine, University of São Paulo

Purpose: To investigate corneal sensitivity after phacoemulsification surgery in dogs. Methods: 40 eyes of 38 dogs (14 males and 24 females) of different breeds (except brachycephalics) ranging in age from 2 to 10 years. The conventional ultrasound-guided phacoemulsification was performed through a 2.75 mm clear corneal incision using a Laurate machine. Central corneal sensitivity was evaluated in both eyes, and fellow unoperated eye was considered as a control. A Cochet-Bonnet aesthesiometer was used to measure the number of hours with a heart rate >180 bpm. Results: Basal mean values were 31.2 ± 6.0 mm and 31.2 ± 6.6 mm for the operated and fellow unoperated eyes, respectively. Post-surgical values were: OE = 30.0 ± 7.1 mm and UE = 30.4 ± 7.9 mm (day 7), OE = 28.8 ± 7.8 mm and UE = 29.2 ± 7.6 mm (day 15), OE = 26.8 ± 6.3 mm and UE = 29.2 ± 7.6 mm (day 30). Statistical analysis by Wilcoxon and repeated measures ANOVA tests showed a statistically significant decrease in corneal sensitivity (p=0.05) only day 10 in operated eyes. Conclusions: Corneal sensitivity decreases after phacoemulsification surgery in dogs, being more evident at 30 days following the surgery. Supported by FAPESP grants 2010/5533-9. None.

ABSTRACT NO.: 49
Ocular manifestation of protothecosis in a dog

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Purpose: To investigate corneal sensitivity after phacoemulsification surgery in dogs. Methods: 40 eyes of 38 dogs (14 males and 24 females) of different breeds (except brachycephalics) ranging in age from 2 to 10 years. The conventional ultrasound-guided phacoemulsification was performed through a 2.75 mm clear corneal incision using a Laurate machine. Central corneal sensitivity was evaluated in both eyes, and fellow unoperated eye was considered as a control. A Cochet-Bonnet aesthesiometer was used to measure the number of hours with a heart rate >180 bpm. Results: Basal mean values were 31.2 ± 6.0 mm and 31.2 ± 6.6 mm for the operated and fellow unoperated eyes, respectively. Post-surgical values were: OE = 30.0 ± 7.1 mm and UE = 30.4 ± 7.9 mm (day 7), OE = 28.8 ± 7.8 mm and UE = 29.2 ± 7.6 mm (day 15), OE = 26.8 ± 6.3 mm and UE = 29.2 ± 7.6 mm (day 30). Statistical analysis by Wilcoxon and repeated measures ANOVA tests showed a statistically significant decrease in corneal sensitivity (p=0.05) only day 10 in operated eyes. Conclusions: Corneal sensitivity decreases after phacoemulsification surgery in dogs, being more evident at 30 days following the surgery. Supported by FAPESP grants 2010/5533-9. None.

ABSTRACT NO.: 50
The effect of topical atropine 1% on heart rate and rhythm in normal dogs

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Purpose: To determine if topically administered atropine (Bausch & Lomb Inc, Tampa, Florida) affects heart rate or rhythm in normal dogs. Methods: Two groups of 12 healthy dogs were evaluated, weighing 12-14 kg. Dogs were randomly assigned to a control group or a treated group. Treated group dogs were instilled with 1 drop of atropine (Mydriacyl®) into each eye for 7 days. Results: No changes were observed in heart rate or rhythm. Conclusion: Topically administered atropine causes a small but significant increase in heart rate in healthy dogs. None.
obtained canine eyes were utilized within one hour of euthanasia. One long ciliary artery was cannulated with a 30-gauge needle and perfused using a peristaltic cassette pump with a combination of Dulbecco’s Modified Eagle Medium (DMEM, Gibco®) and a gas mixture of 95% oxygen and 5% carbon dioxide maintained at physiologic temperatures (38°C). Each eye received a single administration of 0.2 mL of either 1% voriconazole or 0.02% fluconazole, administered either topically or intracameral. Globes were removed from the perfusion set-up and samples were collected at one of four time points following drug administration: 30 minutes, 1 hour, 2 hours, or 4 hours. All samples were conducted in duplicate, in regards to drug, route of administration and time period. Sodium fluorescein administered during perfusion was measured using a confocal measurement of intraocular pressure and measurement of glucose consumption and lactate dehydrogenase activity in venous perfusate. Drug levels in the cornea, aqueous humor (AH), anterior chamber (AC), and vitreous were measured by high performance liquid chromatography.

Results: Voriconazole administered via both topical and intracameral routes rapidly achieved high concentrations [above previously reported minimum inhibitory concentrations (MIC) for common veterinary fungal pathogens] in all tissues and at all time points, except for within the vitreous. The MIC of fluconazole for common fungal pathogens was only achieved in the AH after topical administration. In both dogs, the corneal drug concentration was much greater and lasted longer following intracameral administration. Conclusions: This canine ex vivo model enables evaluation of entire global pharmacokinetics. Further, this study demonstrates that the corneal tissue, which is the target tissue of greatest interest in treating keratomycosis, achieves higher magnitude concentrations than those in the AH, yet corneal concentrations remain elevated for a longer duration than those of the AH regardless of administration route. In cases where expeditious, high corneal drug concentrations are desired, an initial intracamer al dose may be considered.

None. Voriconazole and Fluconazole, Pfizer Ltd, Global Research and Development, Sandwich, Kent, United Kingdom.

ABSTRACT NO.: 52

Effect of topical brinzolamide, demecarium bromide, or oral citicoline on preservation of retinal ganglion cell function during acute elevation of intraocular pressure in normal canine eyes

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Purpose: To evaluate the efficacy of pre-treatment with either topical 1% brinzolamide (ACI®; Allergan, Inc., Irvine, CA, USA), topical 0.03% demecarium bromide (VEP®; W. Prestwick Veterinary Pharmaceuticals, Inc., New York, NY, USA), or oral citicoline (Cognizin®; Nutricia, Sint Quintin, The Netherlands) on preservation of the pattern electroretinogram during ocular stress brought about by acute elevation of intraocular pressure (AEP) in normal canine eyes. Methods: 7 eyes of 4 healthy male beagles without history of eye problems were used. AEP was performed on all 7 dogs at baseline and after one month of pre-treatment with: 1) topical 1% brinzolamide BID, 2) topical 0.03% DB and then 3) oral citicoline (500 mg daily). A one month wash-out period was used between each pre-treatment. Pattern evoked electroretinograms (pERG) were recorded to evaluate the retinal ganglion cell (RGC) function during AEP at the end of each one month of pre-treatment. Recordings were obtained at baseline IOP and then at 30, 40 and 50 mm Hg for 15 minutes at each pressure. Results: There was no significant pERG difference between baseline IOP and any of the pre-treatments at 30 mm Hg. At IOP 40 mm Hg, there was a significant difference between no pre-treatment (1.9±0.4 µV) and any of the pre-treatments, as well as between no pre-treatment (1.9±0.4 µV) but not with DB or oral citicoline (p=0.0018, ANOVA with Bonferroni post-test). Conclusions: Treatment with DB alone and brinzolamide alone resulted in better preservation of RGC function during acute elevation of intraocular pressure, but oral citicoline showed no improvement. Supported by grants: VA RR&D C0796-K, VA Center for Prevention and Treatment of Vision Loss – Iowa City. Conflicts of interest: None.

ABSTRACT NO.: 53

Canine cataract surgery: a survey of surgical techniques and management protocols employed by acvo diplomates

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Purpose: To document, compare and contrast canine cataract surgery practices and protocols currently employed by ACVO Diplomates. An electronic survey (via ACVO Diplomates) of 367 ACVO Diplomates was conducted, which included 33 questions reflecting pre-surgical, surgical and post-surgical management choices. Responses were analyzed for significant associations with specific variables and results were compared to previously published surveys. Results: 229 individuals responded to the survey (62% response rate). The majority of surgeons (73%) were in private practice. Associations between specific variables were analyzed using the Pearson’s chi-square test. Significant associations were found with respect to surgical and post-surgical management choices. Conclusion: This study may provide the basis for the development of evidence-based practice guidelines for canine cataract surgery.

ABSTRACT NO.: 54

Effects of sevoflurane concentration on pattern reversal visual evoked potentials in dogs

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Purpose: To investigate the influence of sevoflurane on pattern reversal visual evoked potentials (pVEP in Beagle dogs. Methods: Six beagle dogs (3 males and 3 females) aged 3 to 4 years old were anesthetized with sevoflurane. Pulmonary ventilation was controlled throughout. Records were obtained after 0.5 and 7 MAC concentrations for 1 to 4 hours. pVEP recording was performed for 20 minutes. Each of the checkerboard pattern stimulus was set at 3 1/sec, and the length of the side of each square pattern was 7.31 mm. Needle-type electrodes were positioned at the center at 0.5 m, 1 m from stimulus distance, respectively, and showed no significant changes. Conclusions: Sevoflurane showed no influence for pVEP at 0.5 m from stimulus. The latency of 1.5 m from stimulus was longer at 0.5 m than at 1.5 m from stimulus distance. Supported by grants: Japanese Society for the Promotion of Science, No. 25880020. None.

ABSTRACT NO.: 55

Investigation of visual acuity with pattern reversal visual evoked potentials in laboratory beagles

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Purpose: To investigate the visual acuity of Beagle dogs using visual evoked potentials with pattern reversal visual evoked potentials (pVEP). Methods: Six eyes of 6 normal Beagles were assessed. pVEP were measured using computer software with a visual evoked potentials equipment. Recordings were performed under optimal conditions after the induction of anesthesia. Results: pVEP was measured with monocular stimulation under general anesthesia, with needle-type electrodes positioned at the cornea and the plate-type electrode positioned at the ear auricle region. The frequency of checkerboard pattern stimulus was set at 3 1/sec, and the length of the side of each square pattern was 1.22 mm (Visual angle: 8.39, 4.20 and 2.0 arc min for 0.5, 1 and 2 m of stimulus distance, respectively. Conclusions: pVEP response was evaluated by latency of P100. Results: pVEP responses were obtained from all recorded eyes and each stimulus distance. P100 latencies recorded from 0.5, 1 and 2 m were 3.7, 3.6 and 3.5 ms, respectively, and showed no significant differences. Visual evoked response was recorded for 1 to 4 hours after 0.5 m from stimulus. Supported by EY-2.5 m from stimulus, latency of P100 increased significantly at 2 m from stimulus distance. Supported by grants: Japanese Society for the Promotion of Science, No. 25880020. None.

ABSTRACT NO.: 56

Assessment of visual function and retinal structure following acute light exposure in the light sensitive T4R rhodopsin mutant dog retina

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Purpose: To evaluate the effect of acute exposure to various intensities of white light on visual function and retinal structure in T4R (Rhodopsin Mutant Retina) dogs. Methods: Three homozygous T4R RHO mutant dogs were used in this study. Following overnight dark adaptation, total retinal exposure (LET) to bright white light was given to one eye while the contralateral right eye was shielded. Each of the 3 T4R RHO dogs had a single unilateral LE to a different dose of white light (corneal irradiances: 0.1 mW/cm², 0.5 mW/cm² or 1 mW/cm² for 1min). Visual function prior to LE and at 24 hours, 2 weeks and 8 weeks post exposure was assessed by objective vision testing in a 3.6 m long obstacle course. Corneal shields were used to occlude vision from one eye, and test vision from the contralateral eye. Transit time was measured under standard conditions (1.1±0.1 sec, at 0.0, 0.009, 0.01, 0.1, 1.0 and 60 lux). Morphological retinal changes were evaluated by non-invasive in vivo CSL-O/A/OCT imaging before, 2 weeks and 8 weeks post exposure, using a method described at this meeting. Results: T4R mutant dogs were analyzed individually. The T4R retina exposed to the lowest dose (0.1 mW/cm² for 1 min) of white light showed no significant changes in ONL thickness at 2 weeks, but a 20% decrease at 8 weeks. The T4R retina exposed to the medium dose (0.5 mW/cm² for 1 min) and high (1 mW/cm² for 1 min) dose showed an 88% and 98.1% decrease in ONL thickness, respectively, by 2 weeks after LE. However, no differences in transt time through the obstacle course were observed in any of the dogs at 2 weeks and 3 weeks post LE under the 7 ambient light intensities. Conclusions: A short exposure to medium intensity of high doses of white light exposure can be used to assess the influence of photoreceptor cell death in peripheral T4R RHO retina. However, this severe loss of photoreceptors does not affect visual behavior probably because intact peripheral photoreceptors are sufficient for visual function in the obstacle course. On-going studies.
are aimed at optimizing this light damage paradigm by using brighter and longer light exposures. This could be useful to assess the outcome of therapeutic intervention. Supported by NIH/NEI EY06855, EY17349, 2P20EY018241, R24EY21126, FFB. None.

ABSTRACT NO.: 57
Evaluation of retina by optical coherence tomography in a dog with chorioretinitis

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Purpose: To report image of optical coherence tomography (OCT) in a dog with chorioretinitis. Methods: A 6-year old female Yorkshire terrier was referred to the ophthalmology service with a 1-week history of blindness. Results: In both eyes, menace responses were absent and Schirmer tear test and intraocular pressure values were within normal reference ranges. There were no abnormalities in anterior segment by slit lamp examination. The indirect ophthalmoscopy revealed multiple small gray-white lesions in nonperipapillary area in both eyes, resulting in slight elevation of the surrounding oval retinal atrophy in both eyes. Scopistic, electoretinograms (ERGs) showed normal waveform and parameters of a and b-wave. The OCT revealed detachment between the photoreceptors and pigment epithelium in the small gray-white lesion in both the fundus. After 1 week of treatment using topical and systemic steroid and antibiotic, the patient can negotiate obstacles. The indirect ophthalmoscopy showed that irregular patches of loss of retinal pigment epithelium (RPE), some white-colored retinal surface. Reattachment of neurosensory retina to RPE was observed by the OCT. Conclusions: The results indicate that OCT scanning is considered to be useful method for retinal evaluation in dogs with chorioretinitis.

None.

ABSTRACT NO.: 58
Canine diabetic keratopathy: an in vivo confocal investigation

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Purpose: To compare the corneal morphology and innervation in relation to the duration of diagnosed diabetes mellitus, corneal sensitivity, precorneal tearfilm quality and quantity among diabetic cataractous (DM) and non diabetic cataractous dogs (nonDM). Methods: Twenty DM and 25 nonDM dogs underwent assessment of central corneal touch threshold (CTT), tearfilm break-up time (TFBUT), and corneal sensitivity. Results: Diabetic change in CTT (P=0.022), TFBUT (P=0.004) were significantly lower in DM than nonDM. NFD and NFL were determined manually using Image j, NIH software. (NFD) and nerve fiber length (NFL) of the subbasal nerve fiber plexus, basement membrane reflectivity (grade 0–2) and endothelial cell density (ECD). IVCM images of 18 DM and 21 nonDM patients were suitable for image analyses and were evaluated single masked by one observer. The difference in NFL and NFD was not statistically different between both groups. There was a trend in DM patients to have lower endothelial reflectivity than nonDM patients. The NFD (P=0.037) and NFL (P=0.031) of the subbasal nerve plexus were significantly lower in DM than in nonDM dogs, but could be assessed in only 12/14 DM and 14/21 nonDM dogs. A hyperreflective layer (grade 2) in the area of the basement membrane (BM) was present in 11/18 DM and absent in nonDM patients (P=0.001). Anterior stromal diffuse hyperreflective irregularity (deposits) were present in 12/18 DM and absent in 13/21 nonDM patients (P=0.001). The ECD in both groups was not significantly different. There was no correlation between age or duration of diagnosed diabetes mellitus to the ECD parameters. There was no correlation between age or duration of diagnosed diabetes mellitus to the CTT or TFBUT. Conclusions: There was a trend in DM patients to have lower endothelial reflectivity than nonDM patients. The NFD and NFL were significantly lower in DM than in nonDM dogs, but could be assessed in only 12/14 DM and 14/21 nonDM dogs. None.

ABSTRACT NO.: 59
Anti-inflammatory potency of oral disulfiram compared with dexamethasone on endotoxin-induced uveitis in rats

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Purpose: To investigate the effect of oral disulfiram (DSF) on endotoxin induced uveitis (EIIU) in rats. Methods: We investigated its effect upon cellular infiltration and protein leakage, as well as chemiluminescence of inflammatory mediators in the aqueous humor (AqH). Some eyes were enucleated for histologic examination and immunohistochemical analysis. One hour before the LPS injection, either 250, 500 or 1000mg/kg DSF was administered orally. Twenty-four hours later, the aqueous humor was collected from both eyes, and the number of infiltrating cells and protein concentration in the AqH were determined. Immunohistochemical analysis of the aqueous body (EIIU) was performed to determine expression of activating nuclear factor kappa B (NF-κB), inducible nitric oxide synthase (iNOS) and cyclooxygenase-2 (COX-2). Results: The oral administration with DSF suppressed, in a dose-dependent manner, the number of inflammatory cells, the protein concentration, and the levels of tumor necrosis factor-α (TNF-α), nitric oxide (NO) and prostaglandin E2 (PGE2) in the AqH and improved the histologic status of the ocular tissue. The expression of activated NF-κB-positive cells in the iris ciliary body (ICB) was significantly inhibited by oral administration with DSF 2 hours after the LPS injection. The LPS-induced increased expressions of iNOS and COX-2 proteins in the ICB was also inhibited by oral administration with DSF 2 hours after the LPS injection. None.

ABSTRACT NO.: 60
Evaluation of fluid leakage into the canine vitreous humour during phacoemulsification using contrast-enhanced magnetic resonance imaging

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Purpose: To evaluate the effects of fluidic parameters on the leakage of irrigation fluid into the vitreous cavity during phacoemulsification of the canine eye by use of contrast-enhanced MRI (C211). Methods: Phacoemulsification with IOL implantation was performed on 10 pairs of enucleated normal eyes from euthanized beagles. Irrigation fluid containing dissolved MRI contrast agent was used, with the bottle height being set at 50 cm for one eye (Group L) and 120 cm for the other eye (Group H). Results: There was no significant difference in the amount of irrigation fluid used and used for each eye in the 10 pairs of eyes. The amount of irrigation solution used and used for each eye in the 10 pairs of eyes was significantly greater in Group H than that in Group L (P=0.01). None.

ABSTRACT NO.: 61
Cytokines and chemokines in aqueous humor during phacoemulsification

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Purpose: To determine whether or not there is a difference in the expression of cytokines and chemokines in the aqueous humor during phacoemulsification. Methods: Aqueous humor was collected from 28 cataractous and 7 normal ACSs by using an enzyme-linked immunosorbent assay (ELISA). Alpha-crystallin was purified by Sepha-rose CL-6b gel filtration. Candidate cytokines were determined from a sequence analysis of proteins from the aqueous humor of American Cocker Spaniels (ACSs) and visualized by Lasereng software (DNASTAR, USA). Three synthetic cytokide peptides were prepared: these included P7204 (GKINER/DODGHYSR, 98–112 aa), P7205 (EHHRRRLPSNTQM, 113–127 aa) and P7206 (SEFFKESPNSSS, 162–173 aa). The EC50 (a dose of peptide to give 50% of the maximum expression) of alpha-crystallin was measured by ELISA. The titer index was determined as a unit times the reciprocal of the dilution of the control serum. The group was considered to be immunoreactive against alpha-crystallin. Results: Antibodies against P7204 and P7205 peptides, but not P7206 peptide, were detected. The difference between positive- and negative-amyloidogenic alpha-crystallin in sera was significant in the titers of antibodies against P7204 and P7205 peptides. However, no significant differences were observed between the various stages of cataract formation. The difference between positive- and negative-amyloidogenic alpha-crystallin in sera of mature cataractous dogs was significant in the titer of anti-P7204 peptide, and the difference in sera of normal dogs was clear in that of anti-P7205 peptide. Conclusions: Differential epitope sites of alpha-crystallin may exist in various stages of cataract formation in ACSs. None.

ABSTRACT NO.: 62
Evaluation of the effects of oral disulfiram on endotoxin-induced uveitis in rats

K Kanai,*† Y Ito,† N Nagai†, S Chikazawa,* Y Hori,*† F Hoshi,*† N Itoh* and S Higuchi* *Department of Small Animal Internal Medicine, University of Kitasato; †Department of Advanced Design for Pharmaceuticals, University of Kinki

Purpose: To investigate the effect of oral disulfiram (DSF) on endotoxin induced uveitis (EIIU) in rats. Methods: We investigated its effect upon cellular infiltration and protein leakage, as well as chemiluminescence of inflammatory mediators in the aqueous humor (AqH). Some eyes were enucleated for histologic examination and immunohistochemical analysis. One hour before the LPS injection, either 250, 500 or 1000mg/kg DSF was administered orally. Twenty-four hours later, the aqueous humor was collected from both eyes, and the number of infiltrating cells and protein concentration in the AqH were determined. Immunohistochemical analysis of the aqueous body (EIIU) was performed to determine expression of activating nuclear factor kappa B (NF-κB), inducible nitric oxide synthase (iNOS) and cyclooxygenase-2 (COX-2). Results: The oral administration with DSF suppressed, in a dose-dependent manner, the number of inflammatory cells, the protein concentration, and the levels of tumor necrosis factor-α (TNF-α), nitric oxide (NO) and prostaglandin E2 (PGE2) in the AqH and improved the histologic status of the ocular tissue. The expression of activated NF-κB-positive cells in the iris ciliary body (ICB) was significantly inhibited by oral administration with DSF 2 hours after the LPS injection. The LPS-induced increased expressions of iNOS and COX-2 proteins in the ICB was also inhibited by oral administration with DSF 2 hours after the LPS injection. None.

None.

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humour. These may also lead to reduced surgical stress on the intraocular tissues by decreasing the amount of irritation solution used during phacoemulsification in the dog. None.

**ABSTRACT NO.: 63**

Brinzolamide potentiates protective effect of cholinergic drugs on optic nerve function in glaucoma

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Purpose: To evaluate neuroprotective effects of topical brinzolamide in combination with topical (deacetyl bromide-D) and systemic (citrucine-cit) cholinergic drugs on optic nerve (ON) function in canine model of primary angle closure glaucoma. Methods: Healthy and glaucomatous Basen Hounds (BH/GBH) were subjected to stress testing of ON function by acute elevation of intraocular pressure (AEIOP) with concurrent pattern ERG (pERG) recording. All dogs were treated with 1% brinzolamide BID (Azopt®) and treated with 0.03% timolol BID (Timoptic®). None. Conclusions: While cholinergic drugs significantly improved ON function in latently infected dogs, the combination of brinzolamide further potentiated this protective effect. Brinzolamide should be considered in combination with cholinergic agents as possible neuroprotective therapy for treatment of glaucomas. Funding source: Delaware Valley Ophthalmology Fund.

**ABSTRACT NO.: 64**

Characterization of the immune system during experimental reactivation of latent canine herpesvirus-1 in adult dogs

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Purpose: To characterize the immune status during canine herpesvirus-1 (CH-1) reactivation in latently infected dogs. Methods: Adult beagles with experimentally induced CH-1 latent infections were administered a viral reactivation stimulus (prednisolone 1mg/kg orally once daily for 5 days). All dogs had completed ophthalmic examinations performed every 3 days for the duration of the 30-day study. Conjunctival swabs and blood samples were collected at intervals for CH-1 PCR, CH-1 neutralizing antibody titers, complete blood counts, lymphocyte phenotypes and proportions, flow cytometry, and interferon gamma (IFN-gamma) production in vitro using ELISA. Results: Clinical examination revealed abnormal white blood cell counts in 37% of dogs by study day 10 by study day 24. CH-1 shedding was detected by PCR in 3 dogs (30%) between study days 9 and 15. CH-1 neutralizing antibody titer elevations (1.3 to 4-fold) were detected in 7 dogs (70%) by study day 15. Mean lymphocyte count did not vary during the study period. Proportion of lymphocytes expressing CD4, CD8, CD21, and MHC class I and II markers increased by study day 7 and, returned to baseline values on study days 14 and 21. Lymphocyte proliferation index and IFN-gamma production in vitro were maintained during the study period. Conclusions: Viral reactivation was achieved using immunosuppressive therapy; however, immunologic testing did not reveal an expected systemic immunosuppression. These findings contrast with previous publications that indicate a direct effect of prednisolone alone on lymphocyte number, distribution and function in dogs. It is possible that concomitant viral reactivation changes the systemic immunologic effects associated with immunosuppressive agents. Supported by Cornell University Internal Collaborative Research Grant Program.

**ABSTRACT NO.: 65**

Determination of the ablated corneal depth following the modified big bubble technique in order to standardization of corneal ulcer models

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Purpose: To determine the depth of the ablated cornea resulting from the modified big bubble technique with the objective of standardization of corneal ulcer models. Methods: Thirty porcine eyes were harvested from a slaughterhouse and were divided into 3 groups. The center of the cornea was trephined 250 (G1), 500 (G2) and 750 (G3) µm using the Barraquer radial vacuum trephine. Fixation was performed in 4% formaldehyde in the trephined corneal stroma until intrastralional blanching was observed. The blanched cornea was removed using a corneal dissector and corneal scissors. The central corneal thickness (CCT) was measured by ultrasonic pachymetry before and after trephination. Analysis of results was performed using the paired t-test. Results: Before trephination, the mean CCT was 992.2 ± 49.9 µm. After trephination, the calculated thickness of the ablated cornea was 416.9 ± 53.1 µm in G1 (p < 0.001), 495.9 ± 57.2 µm in G2 (p = 0.576) and 762.5 ± 24.8 µm in G3 (p = 0.291). There was no significant difference between the trephination depth and the ablated corneal thickness in the G2 and G3 groups. Conclusions: This study suggests that the modified big bubble technique could achieve a desired ablated corneal depth when the trephined corneal thickness is sufficiently deep, which could in turn contribute to the improved standardization of corneal ulcer model. Supported by Institute for Veterinary Science and Technology through the National Research Foundation of Korea (NRF) funded by the Ministry of Education, Science and Technology grants 2012RTI003848. None.

**ABSTRACT NO.: 66**

Long term follow-up of optic neuritis associated with meningoencephalitis in a Maltese dog

J Kim, YH Kwon, JH Bae, KS Kim, SH Kim, DB Lee, JH Kim, HJ Kim, HB Lee, KC Lee, NS Kim and MS Kim

College of Veterinary Medicine, Chonbuk National University

Purpose: Long term follow-up of fundus with optic neuritis for three years in a dog. Methods: A 6-year-old Maltese dog was presented to the Animal Medical Center of the Chonbuk national University with a history of ataxia and blindness. After MRI examination, the dog was tentatively diagnosed meningoencephalitis of unknown etiology. funduscopy revealed papillitis with loss of PLR and menace response in OD. Especially, mild papillary edema was initially presented in OD. A full funduscopy was performed to monitor the pathological change of optic disc. The patient has been maintained with oral prednisolone. Results: The fundus images were serially obtained for three years. At first, there were little changes except indistinct margin of the optic disc on OS, while the papillipral edema and the swollen optic nerve head were observed in OD. After two months, the optic disc in OD was presented optic neuritis with hyperemic nerve head and tortuous retinal vessel. During the three years follow-up, funduscopy, optic neuritis has progressed to severe optic atrophy in OU. Conclusions: There have been few descriptions of serial change in optic disc affected with optic neuritis due to MUE in dogs. By the long term follow-up, this case gives information about the pathological change of optic disc affected with optic neuritis in dogs. Supported by Basic Science Research Program through the National Research Foundation of Korea (NRF) grant funded by the Korea government (2009-0072677). None.

**ABSTRACT NO.: 67**

Determination of genetic variance in English Springer spaniels with refractive myopia

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Purpose: To determine whether naturally occurring refractive myopia in English Springer spaniels (ESS) has a genetic component and determine possible mode of inheritance. Methods: Streak retinoscopy was performed on 226 related ESS 30 minutes after the onset of pharmacologic mydriasis and cycloplegia. A pedigree was constructed to determine relationships between affected offspring and parents. Estimation of heritability was done in a Bayesian analysis of refractive error in a model including terms for sex and coat color. In addition, a complex segregation analysis (CSA) was used to evaluate the mode of inheritance for myopic ESS. Results: The mean refractive error for ESS was 0.23 ± 4.5 D. Median age was 1.2 years (range 0.1–15 years). The prevalence of myopia in related ESS was 19% (42/226). ESS had a strong correlation (r = 0.95) for refractive error between the two eyes. Moderate heritability was estimated for refractive error with a component in ESS, suggesting a breeding program could be designed to decrease refractive myopia and improve vision. This study provides support for investigation of genes responsible for refractive error and subsequent refractive myopia. ESS may provide a spontaneous disease model for refractive myopia. Supported by Migraine Ophthalmology Fund and University of Illinois Travel Grant. None.

**ABSTRACT NO.: 68**

Sparc expression in eyes of canine glaucoma cases: an immunohistochimical study

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†Veterinary Eye Care Service; ‡Rakuno Gakuen University

Purpose: To investigate the SPARC expression in eyes of normal dogs, primary and secondary glaucoma cases. Methods: Immunohistochemical staining for SPARC was performed on 5 histologically normal eyes from 4 Beagles and a Shiba Inu, 3 eyes of primary glaucoma cases from a Shiba Inu and a Miniature Dachshund, 2 eyes of secondary glaucoma cases for a Shih Tzu and a Miniature Poodle. ESS and a French Bulldog (retinal detachment and intraocular hemorrhage). Results: The SPARC immunostaining was observed in normal and conjunctival epithelium, ciliary nonpigmented epithelium, retinal ganglion cells and inner and outer nuclear layer and selerast of stroma of normal eyes. The immunostaining of these tissues decreased remarkably in primary glaucoma cases. In secondary glaucoma cases the immunostaining of intraocular tissue significantly decreased. However, the immunostaining of extraocular tissue found in only primary glaucoma cases might be the specific finding of primary glaucoma. None.
ABSTRACT NO.: 69
Biometry, keratometry and calculation of intraocular lens power for the bald eagle (Haliaeetus leucocephalus)

SE Kuhn,* DVH Hendrix,* DA Ward,* MP Jones,* KH Baine* and SR Franklin†
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Purpose: To document intraspecific distances and predict intraocular lens (IOL) power specific to captive bald eagles. Methods: Axial globe length (AGL), pre-operative anterior chamber depth (preACD), anterior-posterior lens thickness (APLT) and the distance from the cornea to the posterior lens capsule (CPLC) were measured in ten adult bald eagles using A-mode with reference to B-mode ultrasound. Keratometry was done on four eagles. Two estimates for post-operative anterior chamber depth were obtained from aphakic eyes from three eagles: measuring from the apex of the anterior cornea to the anterior lens capsule (poACD1) and measuring from the apex of the anterior cornea to halfway between the anterior and posterior lens capsule (poACD2). Results: Mean biometry for normal eyes were: AGL = 26.53 ± 0.33 mm, preACD = 4.40 ± 0.22 mm, APLT = 5.57 ± 0.24 mm and CPLC = 6.02 ± 0.29 mm. Mean predicted poACD1 = 6.1 ± 0.66 mm and poACD2 = 6.4 ± 0.70 mm. Mean horizontal and vertical corneal refractive power were 19.91 ± 0.43 diopters (D) and 40.02 ± 0.08 D, respectively. Calculated IOL power was as follows:

<table>
<thead>
<tr>
<th>Formula</th>
<th>IOL using poACD1 (D)</th>
<th>IOL using poACD2 (D)</th>
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<tr>
<td>16.0</td>
<td>17.1</td>
<td></td>
</tr>
<tr>
<td>16.3</td>
<td>16.8</td>
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<tr>
<td>16.5</td>
<td>17.0</td>
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Conclusions: Calculations using ultrasonographic keratometry and keratometry suggest that the stronger poACD1 is the IOL power. The mean IOL power calculated in this study is similar to that reported with the A-scan technique.

ABSTRACT NO.: 70
Normal ocular parameters and characterization of ophthalmic lesions in a group of captive bald eagles (Haliaeetus leucocephalus)

SE Kuhn, MP Jones, DVH Hendrix, DA Ward and KH Baine

College of Veterinary Medicine, University of Tennessee

Purpose: To assess normal corneal and ocular parameters and describe ophthalmic lesions specific to a population of captive bald eagles. Methods: Sixteen adult, captive bald eagles underwent a complete bilateral ocular examination, including assessment of menace response, pupillary light responses, 3D scan of both eyes, and indirect ophthalmoscopy. Tear production was measured with the Schirmer tear test and tear film break-up time (TBUT). Keratometry was done on four eagles. Results: None. Conclusions: Ocular lesions are common in captive bald eagles, and cataracts appear to be more prevalent in geriatric eagles. None.

ABSTRACT NO.: 71
Periocular and intraocular lymphomas in dogs and cats: a retrospective review of 16 cases (2001–2011)

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*College of Veterinary Medicine, University of Missouri; †Midwest Veterinary Referral Center; ‡College of Veterinary Medicine, Kansas State University; §New Mexico Department of Agriculture; ¶School of Veterinary Medicine, Louisiana State University

Purpose: To immunologically phenotype canine and feline periocular and intraocular lymphomas. Methods: Sixteen adult, captive bald eagles underwent a complete bilateral ocular examination, including assessment of menace response, pupillary light responses, 3D scan of both eyes, and indirect ophthalmoscopy. Tear production was measured with the Schirmer tear test and tear film break-up time (TBUT). Keratometry was done on four eagles. Results: None. Conclusions: Ocular lesions are common in captive bald eagles, and cataracts appear to be more prevalent in geriatric eagles. None.
ABSTRACT NO.: 75
The effect of topical carbonic anhydrase inhibitor monotherapy vs. combination of topical and systemic therapy in the treatment of secondary glaucoma in dogs
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Purpose: To assess the benefits and risks of combined topical and systemic carbonic anhydrase inhibitor (CAI) therapy in the treatment of secondary glaucoma in dogs.

Methods: The medical records of the UGA-VTH 2005–2010 were searched for dogs with secondary glaucoma (IOP ≥ 25). Eyes were divided into two groups: topical 2% dorzolamide or combination therapy and sorted by cause: lens-induced uveitis, postoperative (phacomulization or ICLE) and other. Significance was defined at P<0.05. Changes in IOP over time effects of concurrent medications were compared by repeated measures analysis. Systemic and ocular side effects and bloodwork parameters were compared by Fisher’s exact test.

Results: 111 medical records met search criteria. 63 patients were included in statistical analysis: topical CAI alone (patients N=29, eyes N=47) and combination (patients N=34, eyes N=50). The average follow up was 365 days. 9 dogs (10 eyes) never achieved IOP control, dogs with IOP control had an average time to failure of 234 days. 35 contralateral eyes never developed glaucoma. There were no significant differences in the probability of glaucoma being controlled between treatment groups for all eyes (p=0.0008) and post-op pseudophakia (p=0.0001). There was no significant difference in the incidence of systemic or ocular side effects. MCV was the only bloodwork parameter significantly different: Combination therapy with oral and topical CAI is no more likely to control secondary glaucoma in dogs; however, the combination is not associated with increased incidence of ocular and systemic side effects. Supported by University of Georgia Ophthalmology Research Fund. None.

ABSTRACT NO.: 76
Retinal and retrobulbar conditions at rabbits treated with sildenafil citrate
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Purpose: The aim of this research was to study the effects of sildenafil in retinal and retrobulbar circulation in 27 adult male New Zealand White rabbits, albino homozygote, randomly assigned to three groups, 9 animals in each group. Animals were treated with sildenafil citrate at a dose of 3.5 mg/kg every 24 hours for 7, 15 and 30 days. Nine rabbits were assigned as control group. Prior and after treatment, ocular B-mode ultrasound were performed to evaluate the external diameter of the ophthalmic artery. Electroretinography, fluorescein angiography and systemic arterial blood pressure were also evaluated. The results showed a significant increase on the ophthalmic artery diameter and thickness seven and 10 days after treatment, respectively. At 30 days, however, no significant difference was observed. Moreover, although not statistically significant, an increase on B-wave amplitude and implicit time was observed while evaluating rod response after 7, 15 and 30 days of treatment. Fluorescein angiography showed that the arterial phase, venous phase and arterial-venous phase mimetated more rapidly in animals after 7, 15 and 30 days of treatment compared to baseline. However, no significant difference was identified. Supported by FAPESP - Fundação de Amparo à Pesquisa do Estado de São Paulo. None.

ABSTRACT NO.: 77
Intraocular pressure, endothelial aspects and aqueous humor prostaglandin E2 staining in dogs with senile mature or hypermature cataract
JL Laus,* R Renzo,† AP Rihele,‡ ML Silva,* GA Silva,* KP Ortencio,* TWP Mineo* and BC Martins*†

*Optomathology Service, College of Agricultural andVeterinarian Sciences (FCAV), Sao Paulo State University (UNESP), Jaboticabal, SP, Brazil; †College of Agronomy and Veterinary Service, Federal University of Maranhão, Galinhos, MA, Brazil; ‡Institute of Biomedical Sciences, Federal University of Uberlândia, Uberlândia, MG, Brazil

Purpose: The aim of this study was to evaluate the intraocular pressure (IOP), the endothelial cells density and hexagonality, prostaglandin E2 and their correlation with senile mature cataract (SM group, n=9) or senile hypermature cataract (SH group, n=8) in dogs. Intracocular pressure was measured by application tonometry (TonoPac XL). Endothelial cells density and hexagonality were verified by non-contact specular biomicroscopy (SP-1000 FT-Topocon). Methods: In addition, 2% methylcellulose 0.2 mL, of aqueous humor was collected by anterior chamber paracentesis and submitted for prostaglandin E2 quantification by enzymatic immune assay (EIA). Aqueous humor samples were taken from anesthetized dogs prior to the surgical intervention. The prostaglandin E2 levels were compared by Student’s t-test. Differences were considered significant when P<0.05.

Results: A significant decrease on IOP was observed in both groups, however there was no difference between groups (P=0.9). Mean cell density was 2313 ± 36 cells/μm 2 and 2082 ± 32 cells/mm 2 for SM and SH groups respectively. Endothelial cell density (CD) and hexagonality (HEX) decreased significantly in both groups, although there was no statistically significant difference between groups (CD P=0.201; HEX P=0.61). Values of PGE2 were increased in both groups, however there was no significant difference between groups (P=0.54).

ABSTRACT NO.: 78
No correlation was found between IOP, endothelial cells density, endothelial cells hexagonality and PG-E2 values. Supported by CNPq - Conselho Nacional de Desenvolvimento Científico e Tecnológico. None.

A novel prepping technique for phacoemulsification surgery – description of the use of a novel instrument, “the microsnare”: a preliminary report
L Lima, ÍS Pereira and F Montani-Ferreira

Departamento de Medicina Veterinária, Universidade Federal do Paraná

Purpose: During phacoemulsification (PE), to facilitate the surgical procedure and decrease the use of ultrasound (US) power, prepping techniques such as Akahoshi have been developed. We describe a new technique that fractures the nucleus using a novel ophthalmic instrument prototype dubbed microsnare (MS). Methods: MS is a unique instrument developed after the principle of the nylon loop technique. It can be inserted under the lens equator to intracapsularly and post-capsularly. Results: MS instrument effectively cut the lens manually, apparently reducing the time of US during PE. Post-surgical inflammatory response was mild and was equivalent of regular PE. Future studies will be made to statistically evaluate the US power time used to fragmanted nucleus of various cases of cataract in order to avoid the above-mentioned instrument to be an alternative instrument for phacoemulsification hard lens nucleus during PE for medical and veterinary ophthalmologists. None. Keywords: Dogs, veterinary ophthalmology, phacoemulsification, manual prepper.

ABSTRACT NO.: 79
Retrospective study of the incidence of keratoconjunctivitis sicca (KCS) in diabetic and non-diabetic dogs after phacoemulsification surgery
J Lu,‡ AJ Gemensky-Metzler,† DA Wilkie† and P Rajala-Schultz†

†Animal Eye Care, Annapolis, MD, USA; ‡College of Veterinary Medicine, The Ohio State University

Purpose: To determine if diabetic dogs are more predisposed than non-diabetic dogs to development of KCS after phacoemulsification. Methods: Medical records were reviewed for signalment, body weight, and diabetes mellitus status and Schirmer tear test (STT) values were compared in postoperative examinations at 3 months and at the final examination after 1 year postoperatively. Results: One hundred eighteen non-diabetic dogs and 119 diabetic dogs were evaluated. KCS was diagnosed in twice as many diabetic as non-diabetics (27% vs. 11.7%) at the first postoperative visit. Postoperatively, across all time points, diabetic dogs were 1.5 times more likely to be diagnosed with KCS than non-diabetics. STT for both diabetes and non-diabetics trended up over time postoperatively. Small breed (≤10 kg) dogs were 1.75 times more likely to be diagnosed with KCS compared to large breed dogs. Additionally, diabetic small breed dogs were at higher risk to have KCS than non-diabetic small breeds. In large breed dogs, however, diabetes was not a significant risk factor for KCS. When STTs for all dogs were averaged, the diabetic group had a 1.28 decrease in STT compared to non-diabetics. STT for all dogs was ≤ 15 mm/min with each year of age. For each year of life in a large breed dog, there is a 1.15% increased chance of developing KCS. Conclusions: The diabetic dog is more likely than a non-diabetic dog to develop KCS after phacoemulsification, especially in the small breeds. None.

ABSTRACT NO.: 80
Epidemiology and risk factors for feline glaucoma: a retrospective study of 124 eyes (1990–2011)
M Luescher,* NS Gallohofer,* SA Pot,* C Watten† and M Dohr† and BM Spies§

*Vetsuisse Faculty, University of Zurich, Switzerland; †Vetsuisse Faculty, University of Bern, Switzerland

Purpose: To investigate the epidemiology of and risk factors for glaucoma in a population of cats seen in a referral clinical and research setting – a 21-year period. Methods: The 1990 to 2011 case records of the Ophthalmology Unit, Vetsuisse Faculty Zurich were searched for feline glaucoma. Case inclusion criteria: posttraumatic buphthalmos, intraocular pressure (IOP) ≥ 25 mmHg, IOP difference between eyes ≥ 8 mmHg. Data were evaluated for breed, gender, age at presentation, laterality, glaucoma type and etiology and uveitis etiology (for 2000–2011 cases). Breed predisposition and laterality were evaluated using Fisher’s exact test. Odds ratios were calculated for identified risk factors. Results: 114 cats (124 eyes) of 10 breeds were included in the study. The mean age at diagnosis was 9.7 ± 5.1 years (range 10 days–24 years). Out of 124 glaucomatous eyes, two were classified as congenital, five as primary, 114 as secondary and three as end-stage. Male cats were predisposed. Anterior uveits, intracocular neoplasia, lens luxation, hypertensive retinopathy, and papilledema were identified as risk factors for secondary glaucoma. Anterior uveits (07/114) and intracocular neoplasia (20/114) were the most prevalent risk factors (respective ORs: 11.1 and 2.76). Hypertensive uveitis, toxoplasmosis and KCS were associated with 32/60 uveits-induced glaucoma cases between 2000 and 2011. Iris melanoma was the most common ocular neoplasms (17/20). Primary glaucoma was caused by POAG in 4/3 eyes.

Conclusions: The correlation of age with disease severity, congenital and idiopathic glaucoma need further investigation. None.
ABSTRACT NO.: 81

Combined lensectomy and diode laser endoscopic cyclophotocoagulation as prophylactic therapy in non-glaucomatous canine eyes with primary lens instability

EA Lutz, DA Wilkie and AJ Gemensky-Metzler

College of Veterinary Medicine, The Ohio State University

Purpose: To evaluate the use of diode laser cyclophotocoagulation (ECP) as prophylactic therapy in non-glaucomatous canine eyes with primary lens instability.

Methods: Medical records from 13 dogs (n=17 eyes) with primary lens instability and without preoperative glaucoma treated with lensectomy at The Ohio State University (2002-2022) were retrospectively reviewed. 11/17 eyes (65%) without preoperative glaucoma (ALL, n=5; postoperative lens subluxation (PLS), n=6) postoperatively were treated with ECP following lensectomy. Six eyes (n=4 ALL, n=2 PLS) received lensectomy only. Results: 11/17 eyes (65%) without preoperative glaucoma, and average 5.5 ± 1.5 years) received lensectomy with ECP (2.1 ± 0.7 years follow-up) 6 eyes (four purebreeds and one mixed breed, average age 6.7 ± 4.3 years) received lensectomy only (2.1 ± 1.2 years follow-up). All patients were visual preoperatively. Postoperative blindness was associated with retinal detachment. At last recheck exam, 10/11 (91%) eyes treated with lensectomy and ECP were visual, average IOP was 12mmHg (range 5-18mmHg), and 7/11 (64%) eyes were managed without medications. Conclusions: Canines with primary lens instability that received combined lensectomy and endo-laser had improved visual outcome and intraocular pressure control, and required less postoperative glaucoma treatment than patients treated with lensectomy alone.

ABSTRACT NO.: 82

Investigation of prognostic indicators for human uveal melanoma as biomarkers of canine uveal melanoma metastasis

P Malho, * K Dunn, † D Donaldson,* RR Dubiljevíc† and MP Starky* †Animal Health Trust; ‡Focus Eye Path Lab; ††University of Wisconsin-Madison

Purpose: The study was a preliminary evaluation of potential biomarkers of canine uveal melanoma metastasis. The specific objective was to evaluate whether 14 genes with discriminating metastasizing and non-metastasizing human uveal melanomas on the basis of expression displayed statistically significant differences in expression between metastasizing and non-metastasizing canine uveal melanomas. Methods: Nineteen archival biopsies of canine primary uveal melanoma with a histopathological classification of benign (9 dogs) and malignant (10 dogs) were selected. Thoracic and/or abdominal metastasis of malignant uveal melanoma was found in 7 of the 10 dogs. Gene expression was assayed by TaqMan probe quantitative PCR (qPCR) assay, and statistical analysis performed using ANOVA and P values adjusted using the Benjamini-Hochberg false-discovery rate (FDR) controlling procedure. Results: Four genes demonstrated statistically significant increased expression in the metastasizing uveal melanomas.

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<tr>
<td>FXR1</td>
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Conclusions: This study illustrates the potential utility of gene expression markers for predicting canine uveal melanoma metastasis. Further work featuring larger numbers of tumor samples is required to validate the observations made. However, the genes that display statistically significant up-regulation in the canine metastasizing tumors are part of a 12 discriminating gene set intended for use in a routine clinical assay for predicting metastasis of human uveal melanoma. The sensitivity of qPCR means that prognostic assay can be performed on fine needle aspirate biopsies collected as oto. Supported by BSAVA Petasys Clinical Research Project grant. None.

ABSTRACT NO.: 83

Sterility of equine amniotic membrane homogenate to be used as topical solution

RL Mathes, CA Creek, PA Moore and KE Myrna

Department of Small Animal Medicine and Surgery, College of Veterinary Medicine, University of Georgia, Athens, GA, USA

Purpose: To describe and evaluate a novel eyelid marginal closure for blepharoplasty in dogs: description and evaluation of post-surgical outcome in 146 eyes

Results:

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Conclusions:

The described closure was performed on eighty two cats (164 eyes) representing twenty-four breeds for marginal eyelid margin removal (16), entropion correction (84), medial canthoplasty (18) or lateral canthal closure (30). Follow up (0.5 – 31 months) was available for 141 eyes. All closures were successful with no suture-related corneal dehiscence, no lid distortion, no dehiscence and no postoperative tearing. Advantages of this technique is easy to execute, attains ideal marginal apposition, has application to numerous adnexal surgeries and causes no corneal irritation, indicating that it may be superior to figure-of-eight and U-form pattern marginal closures. None.

ABSTRACT NO.: 84

Clinical outcomes after viscoelastic deep anterior lamellar keratoplasty (DALK), big-bubble dalk and penetrating keratoplasty in rabbits

BC Martins,*† DE Brooks,* LF Conceição,*‡ SVSG Barros,*‡ FA Marinho,*† IRM Padau,† LCC Lacerda* and JL Lautz†

*University of Florida, Gainesville, FL, USA; †São Paulo State University, Botucatu, Brazil

Purpose: To compare the clinical outcomes of viscodissection deep anterior lamellar keratoplasty (DALK), big-bubble DALK and penetrating keratoplasty in rabbits.

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Conclusions: A novel modified intradermal closure for blepharoplasty in dogs: description and evaluation of post-surgical outcome in 146 eyes

RL Mathes, CA Creek, PA Moore and KE Myrna

Department of Small Animal Medicine and Surgery, College of Veterinary Medicine, University of Georgia, Athens, GA, USA

Purpose: To describe and evaluate a novel eyelid marginal closure for blepharoplasty in dogs: description and evaluation of post-surgical outcome in 146 eyes

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Conclusions:

This technique is easy to execute, attains ideal marginal apposition, has application to numerous adnexal surgeries and causes no corneal irritation, indicating that it may be superior to figure-of-eight and U-form pattern marginal closures. None.

ABSTRACT NO.: 85

A new modified intradermal closure for blepharoplasty in dogs: description and evaluation of post-surgical outcome in 146 eyes

RL Mathes, CA Creek, PA Moore and KE Myrna

Department of Small Animal Medicine and Surgery, College of Veterinary Medicine, University of Georgia, Athens, GA, USA

Purpose: To describe and evaluate a novel eyelid marginal closure for blepharoplasty in dogs: description and evaluation of post-surgical outcome in 146 eyes

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This technique is easy to execute, attains ideal marginal apposition, has application to numerous adnexal surgeries and causes no corneal irritation, indicating that it may be superior to figure-of-eight and U-form pattern marginal closures. None.

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ABSTRACT NO.: 87
C Miller, ML Utter and KL Wotman
New Bolton Center, School of Veterinary Medicine, University of Pennsylvania

Purpose: To review the signalment, clinical characteristics, predisposing factors, and outcome of equine eosinophilic keratitis (EK) diagnosed in the Mid-Atlantic region of the United States.

Methods: Medical records of 20 horses diagnosed with EK based on clinical signs and population of predominately eosinophils on corneal cytology were reviewed. Follow-up information was obtained by telephone interviews of primary veterinarians and/or owners.

Results: Eosinophilic keratitis was diagnosed in horses ranging from 1–23 years of age. Horses identified with EK included 8 geldings and 12 mares. Breeds represented included Thoroughbred (n=12), Quarter Horse (n=4), and Warmblood-type breed (n=4). Cases presented to the hospital between June 1st and August 15th with a history of 3–60 days duration of clinical signs (bilaterally (n=10), unilaterally (n=10)). Clinical signs ranged from severe blepharospasm and epiphora, miosis, lenticular ocular discharge, and chemosis (Group Severe, n=5), to mild blepharospasm and epiphora, and only (≤3mm diameter) superficial corneal ulcers posterior to the third nystal (Group Mild, n=5). Horses were treated with a combination of topical corticosteroids, antimicrobials, antifungals, and cycloplegics in addition to systemic corticosteroids, non-steroidal anti-inflammatory drugs, and immunosuppressants. Two horses were euthanized at 6–9 weeks post-therapy, likely due to clinical signs.

Conclusions: This study illustrates the longevity of EK in the horse, spectrum of severity, and unique presentation and required treatment, with the disease in the Mid-Atlantic region. None.

ABSTRACT NO.: 88
The concentration of endogenous cortisone in equine tears and blood at rest and after a stimulated stress event CS Mond,* KA Hart,† PA Moore‡ and KE Myrna§
*College of Veterinary Medicine, University of Georgia; †Department of Large Animal Medicine and Surgery; ‡Department of Small Animal Medicine and Surgery

Purpose: Endogenous serum glucocorticoid (cortisone) concentrations may be increased in horses with general stressors such as present in treats, could impact corneal healing. This study evaluates levels of endogenous cortisone in normal equine tears at rest and after a stimulated stress event. Methods: Paired tear and serum total and free cortisone concentrations were measured with ELISA, chemiluminescence immunoassay, and ultrafiltration methodology, respectively in 10 healthy, adult horses under resting conditions once daily for 5 consecutive days. In an additional 4 healthy, adult horses, tear and serum samples were collected for measurement of cortisone before and at 30, 60, 90, 120, 180 and 360 min after ACTH stimulation testing (cosyntropin, 1 mg/kg IV) to simulate stress. Results: Cortisone was present in resting equine tears (0.01–2.83 ng/ml). After ACTH stimulation, serum cortisone increased to 10.1–11.5-fold in tears at 60–120 minutes (p-value ≤ 0.001). Serum total and free cortisone significantly increased at 30–180 minutes after ACTH stimulation (p-value ≤ 0.001) with both concentrations returning to rest by 360 minutes. Cortisone in tears most closely correlated to total serum cortisone as opposed to free serum cortisone. Conclusions: Cortisone is present in equine tears and the concentration increases in concert with the release of ACTH stimulating ACTH synthesis. Endogenous cortisone in tears may play a role in propagating or intensifying ocular pathology. Supported by the University of Georgia College of Veterinary Medicine Ocular Research Fund. None.

ABSTRACT NO.: 89
Ocular toxicity and distribution of allogeneic and autologous mesenchymal stem cells (MSCs) following intravitreal injection into normal equine eyes SB Moore,* SR Hollingsworth,* DL Borjesson,† CM Reilly,† RJ Brosnan,* TH Ferreira,† LD Galuppo,* DL Holve,* JA Wood,* P Russell,* PH Kass,* DD Carrade,* NJ Walker† and CJ Murphy*†
*Department of Surgical and Radiological Sciences, School of Veterinary Medicine; †Department of Pathology, Microbiology, and Immunology, School of Veterinary Medicine; ‡Department of Population Health and Reproduction, School of Veterinary Medicine; §Department of Ophthalmology and Vision Science, School of Medicine, University of California-Davis

Purpose: To evaluate the safety of intravitreal injections of MSCs into normal equine eyes, as a potential immunomodulatory treatment for equine recurrent uveitis (ERU). Methods: Ten equine eyes from normal adult horses were used. Seven healthy adult horses were injected with an escalating dosage (25 million, 50 million) of allogeneic MSCs (n=6) or autologous MSCs (n=1) 2 weeks before the primary recording. Corneas were harvested at 12 weeks. Results: All MSC injected eyes developed uveitis, of varying severity and duration. No long-term adverse effects were seen in vehicle injected control eyes. There was significant difference between uveitis scores in the allogeneic vs. autologous groups at the same dosage. Conclusions: This study successfully extended the autologous and allogeneic MSCs into equine eyes from Group 2. MRL results showed a trend towards decreasing systemic inflammation following intravitreal MSC injection. Histopathologically, the MSC injected eyes showed varying degrees of lymphoplasmacytic uveitis, retinal detachment, cataract, and phthisis bulbi. Immunohistochemistry of the horses’ right dorsal colon confirmed the presence of donor MSCs in the submucosa. Conclusions: Severe toxicity was demonstrated after injection of high doses of MSCs into normal healthy horse eyes. Supported by the Randall Grant for Stem Cell Research and the Center for Equine Health, Grant number V453129, NIH Core Grant P30EY12576, and an unrestricted grant from Research to Prevent Blindness (RPB). None.

ABSTRACT NO.: 90
Histopathological and immunohistochemical evaluation of a single amniotic membrane technique for the transplantation of limbal epithelial cells
PA Moore,* J Kim,† A Ellis‡ and JD Lauderdale†
*Department of Small Animal Medicine and Surgery, College Veterinary Medicine; †Department of Cellular Biology, Franklin College of Arts and Sciences; ‡Department of Pathology, Athens Veterinary Diagnostic Laboratory, The University of Georgia, Athens, GA, USA

Purpose: Histopathological evaluation of a single amniotic membrane technique for the transplantation of limbal epithelial cells. Methods: A limbal stem cell deficiency (LSCD) was created in the right eye of normal New Zealand white rabbits by performing a 360° limbal pteryoni and limbalectomies. Intact human amniotic membranes (AM), with or without cultured limbal epithelial cells (LEC), were secured to the cornea. The LEC-AM graft was sutured with the cells facing the conjunctiva. Animals were euthanized at 4 weeks (AMs only) or 6 weeks (AM-LEC). The eyes were fixed in Davidson’s solution and embedded in paraffin. Four micron sections were stained with Hematoxylin and Eosin. Corneal morphology was compared between animals with AM and AM-LEC, and normal rabbit eyes. All eyes were immunohistochemically stained for progenitor epithelial cell markers (including p63 and ABCG2). Results: All animals treated with AM resulted with only 4–7% donor cell contamination. Immunohistochemically normal basal epithelial cells and 2–3 layers of polygonal cells that did not specifically identify features but were presumed to be wing cells. The cornea of eyes with AM and LEC were morphologically similar to normal eyes. Eyes with both LEC and AM-LEC cells consisting of normal basal and wing cells that blended into the adjacent, unaltered corneal epithelium. The immunohistochemical expression of p63 and ABCG2 in the LEC-AM graft rabbit was similar to normal rabbit eyes. Conclusions: The single membrane LEC transplant technique described is an effective technique in functionally reconstructing the corneal epithelium. Supported by the National Eye Institute, National Institutes of Health/ARVO, and the Nancy and Robert Pritzker Fund. None.

ABSTRACT NO.: 91
Retinal PDE6A gene therapy effects on rod photoreceptor function and preservation in the PDE6A mutant dog EM Momow,* JT Barote,* K Gornick,* AR Bruewer,* A Dinuclesco,* S Boye,*‡ WW Hauswirth† and SM Petersen-Jones*
*Department of Small Animal Clinical Sciences, Michigan State University, East Lansing, MI, USA; †Department of Ophthalmology, University of Florida College of Medicine, Gainesville, FL, USA; ‡Department of Ophthalmology, University of California-Davis, Davis, CA, USA

Purpose: The PDE6A mutant dog has a null mutation in the phosphodiesterase-6A gene (PDE6A), resulting in a lack of retinal PDE6 expression and absent rod function and rapid rod degeneration. Our objectives are to test the viability of viral gene therapy in a canine model of retinal degeneration. Methods: Three-week-old PDE6A mutant dogs received an intravitreal injection of AAV8 (25e13 vector copies) following corneal keratectomy. Results: There was evidence of rod function in treated eyes. ERGs showed improved threshold with a scotopic threshold response and small rod-shaped ERG responses. A small improvement in vision was detected in a subset of animals. In treated eyes, photoreceptor preservation and improved localization of rhodopsin to the rod outer-segment membrane in a LSCD model. Supported by the Children’s Glaucoma Foundation, Sharon Stewart Aniridia Research Trust, Vision for Tomorrow Foundation, and UGA Veterinary Ophthalmology Research Fund. None.

ABSTRACT NO.: 92
Pigmentary keratitis and Iris hypoplasia in pigs is not associated with a PAX6 gene mutation KE Myrna,‡ AL Labelle,† J Giarochi,‡ PM Moore‡ and JD Lauderdale†
†College of Veterinary Medicine, University of Georgia; ‡College of Veterinary Medicine, University of Illinois; 4Department of Cellular Biologym, University of California-Davis

Purpose: The Pug is susceptible to a myriad of ocular diseases due to its brachycephalic anatomy. The Pug is the most frequently affected breed for retinal degeneration. Our attempts to rescue this severe phenotype with an adeno-associated viral vector for the PAX6 gene failed. Methods: Pug eyes were examined from birth to adulthood. Results: Both photoreceptor preservation and improved localization of rhodopsin to the rod outer-segment membrane in a LSCD model. Supported by the Children’s Glaucoma Foundation, Sharon Stewart Aniridia Research Trust, Vision for Tomorrow Foundation, and UGA Veterinary Ophthalmology Research Fund. None.

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Pugs and one unaffected mixed breed dog. The eleven coding exons included in two miRNA iso-
forms of canine PAX6 were sequenced. These exons were amplified in a polymerase chain reac-
tion (PCR) with primers located in the introns. The PCR products were sequenced using either the
samePCRprimersormoreinternalprimers. Bi-directional sequence was analyzed and com-
pared to the published gene sequence (NM_0010957944). Potential mutations were identi-
cified as differences relative to the published sequence. Results: Sequence analysis indicated no
pathological mutations in the coding regions or splice sites of the Pug gene. Conclusions: Mutations
in the PAX6 gene do not appear to be linked with pigmentary keratitis and iris hypo-
plasia in the Pug. Other candidate genes should be considered in future investigations of this
disease. Supported by the College of Veterinary Medicine, University of Georgia and the Col-
lege of Veterinary Medicine, University of Illinois Urbana-Champaign.

ABSTRACT NO.: 93
Effects of topical 0.5% timolol, 0.5% levobunolol, and 0.5% apraclonidine on intraocular pressure, pupil size, blood pressure and heart rate in clinically normal beagles IRM Padua, AP Ribeiro, PPM Padua, PJ Guimarães, BC Martins, AA Camacho and JLL Laus

ABSTRACT NO.: 94
Multifocal retinopathy in a colony of miniature longhaired dachshunds with late infantile neuronal ceroid lipofuscinosis

ABSTRACT NO.: 95
Heat shock protein 70 expression in canine cornal wound healing

ABSTRACT NO.: 96
Corneal thickness measurements in several avian species using a portable spectral-domain optical coherence
tomography (SD-OCT) device

ABSTRACT NO.: 97
A new non-invasive device for assessing corneal epithelial function in vivo, by means of electrical impedance measurements

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ABSTRACT NO.: 98

Comparison of lidocaine/bupivacaine infused Gelfoam® to lidocaine/bupivacaine retrobulbar injections as methods of providing post-operative analgesia for dogs following an enucleation.

**CL Ploog,** † J Paul,* K Quandt,* R Swinger* and M Mitchell†
†VCA Aurora Animal Hospital; ‡College of Veterinary Medicine, University of Illinois

**Purpose:** To compare the use of lidocaine/bupivacaine infused Gelfoam® to lidocaine/bupivacaine retrobulbar injections as methods of providing post-operative analgesia to dogs following an enucleation.

**Methods:** Nineteen client-owned dogs admitted to VCA Aurora Animal Hospital for routine eye enucleation were enrolled with owner consent and randomization into one of two treatment groups; a Gelfoam® group (orbital Gelfoam® infused with 1ml lidocaine and 1ml bupivacaine placed after globe removal) or a retrobulbar group (retrobulbar injection of 1ml lidocaine and 1ml bupivacaine given before globe removal). Baseline subjective pain scores were recorded. Anesthesia consisted of hydromorphone, midazolam, and glycopyrrolate preoperatively, propofol for induction, and isoflurane in oxygen for maintenance. Transpalpebral eye enucleation was performed. Pain scores were recorded at extirpation, 15 and 30 minutes, and 1, 2, 4, 6, 8, and 24 hours after extirpation by trained observers masked to treatment groups. A heart rate was taken at each reading. Dogs were given hydrocortisone as rescue analgesia if the subjective pain score exceeded that considered to be expectable pain management.

**Results:** One dog in the Gelfoam® group required rescue hydrocortisone. There were no significant differences found between treatment groups. Conclusion: The Gelfoam® method proved effective in providing local analgesia for canine enucleations. This method would serve as an alternative method to provide local analgesia following canine enucleations. None.

ABSTRACT NO.: 99

Feline bacterial keratitis: isolates and in vitro antimicrobial susceptibility patterns

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**Purpose:** To determine bacterial populations and in vitro antimicrobial susceptibility patterns for domestic cats with bacterial keratitis. **Methods:** Medical records of cats with a clinical diagnosis of bacterial keratitis, confirmed by corneal culture, were reviewed from the years 2006 to 2012. Animal signalment, bacterial isolates, aerobic bacterial isolates, antimicrobial susceptibility test results for topical ophthalmic antimicrobials, and past pertinent medical history were recorded. Percentages of susceptible aerobic bacterial isolates were statistically compared among antimicrobials for all isolates grouped together and for Staphylococcus isolates individually.

**Results:** In total, 61 aerobic bacterial isolates from 49 cats were identified with antimicrobial susceptibility test results. The most frequent bacterial genera isolated were Staphylococcus (n = 43), Pasteurella (n = 6), Enterococcus (n = 6), and Streptococcus (n = 6). Grouped aerobic bacterial isolates had the highest percentage of susceptibility to chloramphenicol, ciprofloxacin, gentamicin, and ticarcillin. Grouped aerobic bacterial isolates had the lowest percentage of susceptibility to bacitracin, erythromycin, and oxytetracycline. Staphylococcus isolates had the highest percentage of susceptibility to amikacin, chloramphenicol, gentamicin, neomycin, and ticarcillin. Staphylococcus isolates had the lowest percentage of susceptibility to bacitracin and erythromycin. **Conclusions:** Members of the Staphylococcus genus were the most frequent isolates in cats with bacterial keratitis. On the basis of in vitro susceptibility testing of aerobic bacterial isolates and bacterial virulence mechanisms of action, ticarcillin, gentamicin, or ciprofloxacin are recommended for initial topical antimicrobial therapy of suspected bacterial keratitis in cats. None.

ABSTRACT NO.: 100

Inhibition of paracentesis-induced blood-aqueous barrier breakdown by oral administration of anti-inflammatory medications in normal cats

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**Purpose:** To compare the effects of orally administered aspirin (Piroxic, Allergan, MI), meloxicam (Mometam, Boehringer Ingelheim Veturmedica Inc., St. Joseph, MO), prednisolone (Qua line, Huntsville, AL), and prednisolone (Lloyd, Inc., Sherwood, IA) on paracentesis-induced anterior uveitis in cats. **Methods:** Cats were randomly assigned to 1 of 5 groups consisting of a control group (n=6) and 4 treatment groups (6 each). Cats in each treatment group received an anti-inflammatory drug medicated once daily at 7AM by PO for 2 days prior to breakdown of the blood-aqueous barrier (BAB) and continuing 2 days after breakdown of the BAB. Parameters of the anterior chamber were performed in one randomly selected eye of each cat. Fluorophotometry was performed in both eyes of each cat prior to breakdown of the BAB and at 6, 24, and 48 hours after paracentesis.

**Results:** At 24 and 48 hours post paracentesis, the concentration of fluorescein in the paracentral eye of the prednisolone-treated cats decreased relative to controls (P = 0.012 and 0.014, respectively). At 48 hours, a decrease was also apparent in the meloxicam-treated cats relative to controls (P = 0.041). There was no evidence for any treatment effects of aspirin or prednisone. In the unparacentesed eye, there was no evidence for treatment effects (P = 0.900). **Conclusions:** Oral prednisolone or meloxicam may be an effective treatment in cats with uveitis. Supported by a Kansas State University Small Research Grant. None.

ABSTRACT NO.: 101

Primary retinal dysplasia in crab-eaten fox (Cerdocyon thous)

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**Purpose:** The primary retinal dysplasia is a congenital developmental abnormality. Described in canine and feline domestic animals, it is characterized by focal or multifocal forms, geographic and complete. **Methods:** One Crab-eaten Fox (Cerdocyon thous), free-living, male, 3 months old was referred to Ophthalmology Unit – Department of Medicine and Surgery – Sao Paulo State University (UNESP) to have a normal general condition, without changes in the hematomatological and serological exams and there were no signs of visual impairment. Schirmer’s test (Schirmer tear test-Ophthalmos®) showed values of 15 mm/min in the left eye, and 17 mm/min in the right eye. In the slit lamp biomicroscopy (Sli Lamp – Kowa®), cornea, anterior chamber, lens and vitreous cavity of both eyes were normal. **Results:** Digital applanation tonometry (Tono-Pen-XL-Medimatic®) from the right eye showed values of 9 mmHg and from the right eye of 10 mmHg. Gonioscopy (Koeppe Medium Diagnostic Lens 16 mm – Acular®) showed normal drainage angle of both eyes. Binocular Indirect Ophthal- moscopy (Indirect Ophthalmoscope Eye Tech) showed retinal alterations in the left eye, distributed in the tapetial area in form of gray folds and rosettes. In affected areas, tapetel reflectivity was reduced. The findings were compatible with multifocal retinal dysplasia. Supported by CNPq: 103460/2007-5.

ABSTRACT NO.: 102

The eye of the striped owl: biometric findings and reference values for selected ophthalmic diagnostic tests

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**Purpose:** The investigation aimed to determine normal morphologic parameters and values for ophthalmic tests on the striped owl (Asio clamator). **Methods:** Three macerated skulls and 32 eyes were measured in cadavers, 30 eyes of healthy birds were characterized. **Data:** The clinical tests were collected, including: Schirmer Tear Test (STT), bacterial culture of the normal conjunctiva, exosimetry, intraocular pressure (IOP), central corneal thickness (CCT), length of the corneal curvature radius (A). **Results:** The corneal thickness of the striped owl may be considered thinner than in human species. The mean CCT value for the left eye was 5.05 ± 0.28 mm, for the right eye was 5.12 ± 0.17 mm. In males palpebral fissure was significantly wider than in females (P = 0.027). In young owls palpebral fissure was significantly smaller than in adults (P = 0.008). Twenty two eyes of 32 birds were identified in twelve owls, the most frequent type of fixation was the Glaucomatous. Horizontal corneal diameter (limbus to limbus) was 15.7 ± 2.74 mm, which was different from B. virginianus. The mean IOP value for exosimetry was 0.80 ± 0.59 mmHg. Mean IOP was 13.81 ± 5.62 mmHg and it was significantly higher in young birds than in adults (P = 0.016). Mean CCT was 0.28 ± 0.03 mm. In females mean CCT value was significantly lower (P = 0.03) than in males. **Conclusions:** This study established normal morphologic and diagnostic data for the striped owl’s eye. None.

ABSTRACT NO.: 103

An inherited retinal dysplasia in pit bull terriers – pedigree analysis and characterization of the phenotype

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†College of Veterinary Medicine, Federal University of Parana, PR, Brazil

**Purpose:** To describe and characterize an autosomal dominant form of inherited retinal dysplasia in pit bulls. **Methods:** A colony of forty-three pit bulls was formed and observed for six years; twenty-four animals were submitted to ophthalmologic tests such as slit lamp biomicroscopy, indirect ophthalmoscopy, indirect fundus photography. **Results:** Twenty dogs showed clinical signs of retinal dysplasia, and seventeen were considered phenotypically normal in this colony. Funduscopy revealed a combination of the different classical clinical presentation forms of retinal dysplasia, sometimes in the same dog such as focal folds, multifocal folds, geographic folds and total retinal detachments. An abnormally formed optic disc was observed in most of the affected animals. **Conclusions:** These findings demonstrate an inherited form of retinal dysplasia with an unexpected clinical presentation in pit bulls. Further molecular biologic investigations are currently being performed on candidate genes. None.
Abstracts

ABSTRACT NO.: 104
Evaluation of B/A ratio of diabetic and non diabetic poodles with cataracts
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Purpose: Considering h-wave to a-wave (b/a) ratio as a convenient indicator of visual function alterations and retinal disfunctions in human diabetic patients, the purpose of this study was to evaluate b/a ratio recorded from diabetic and non diabetic poodles with cataracts. Methods: Seventy five dogs, 21 males and 54 females, with age ranging from 5 to 14 years old. Presence or hypermetamorphic or hypometamorphic cataracts in both eyes, were divided in two groups: non diabetic poodles (n=30, non diabetic group) and poodles presenting diabetes mellitus for 2 months to 7 years (n=25, DG-diabetic group). Single-flash electroretinograms (ERGs) were recorded simulaneous- taneously from both eyes at the highest stimulus luminance, utilizing bipolar contact lens elec- trodes. Comparison between NDG and 2.0 in DG, showing no statistically significant difference between groups (P=0,657).

Conclusions: Our data suggests that diabetes mellitus must not induce retinal disorders capable to decrease b/a ratio of diabetic poodles with cataracts. Supported by FAPESP grant n° 2009- 07149-3. None.

ABSTRACT NO.: 105
A 10-year clinical experience with a rapid, quantitative ocular double staining technique
A Saito, Y Umeda and S Wakaiki
Triangle Animal Eye Clinic

Purpose: To describe the gross, histopathological, and ultrastructural findings in a dog with tapetalmic fundus inferior to the optic nerve, and a non-tapetal fundus with a mild scattering of tapetal tissue superior to the optic nerve. Histologically, there was decreased pigmentation of the RPE with only a few melanin granules in the peripheral retina. The affected tapetum was relatively acellular and fibrous with occasional tapetal cells scattered throughout the invaginated or displaced into the vascular outer choroid. Streaks of inflammation were observed superior to the tapetum that was mostly composed of collagen (Masson's trichrom) and failed to express Melan-A on IHC unlike a normal canine control tapetum. Ultrastructurally, the tapetum was markedly disorganized in the absence of uniformly arranged tapetal cells with regularly arranged cytoplasmic rods. The few cells identified within the tapetum contained irregularly arranged and disor- ganized electron-dense structures within their cytoplasm. In conclusion, the study has identified a previously unreported tapetal lesion in a dog that based on microscopic and ultrastructural findings, we propose to classify as tapetal dysplasia. None.

ABSTRACT NO.: 108
Efficacy and tolerance of topical 0.1% pilocarpine in management of canine neurogenic keratoconjunctivitis sicca
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Eye Care for Animals, IL, USA

Purpose: To evaluate the efficacy and tolerance of topical 0.1% pilocarpine in management of canine neurogenic keratoconjunctivitis sicca (CKCS). Methods: Retrospective analysis of canine CKCS cases (n=1) and age (n=20) was performed using Mann-Whitney non-parametric t test, and p<0.05 was considered statistically significant. Results: B/A ratio median was 2.2 in NDG and 2.0 in DG, showing no statistically significant difference between groups (P=0.657).

ABSTRACT NO.: 109
Comparative evaluation of the effects of xylazine, roxifidine, and detomidine on intraocular pressure in horses submitted to anterior chamber paracentesis
LR Silva, CJT Fátima, LA Prieto, TBA Moura, RF Ferreira II, PD Galéra and RM Almeida
Colégio de Agricultura e Veterinary Medicine, University of Brasilia

Purpose: To determine the effect of clinic vs home environment on intraocular pressure (IOP) in horses submitted to anterior chamber paracentesis (ACP). Methods: Following EACUC approval, 18 adult healthy horses, weighing 487±49.7 kg (mean±SD) (n=18) were allocated in three groups (n=6). The XG group received 1% xylazine (König, Avellaneda, Argentina), RG group received 0.02 mg/kg of 1% roxifidine (Boehringer Ingelheim, México), and DG group received 0.02 mg/kg of 1% detomidine (Uniao Quimica, Emilia-Guaçu, Brasil). The IOP of both eyes was measured by an application tonometer before (T0) and five minutes after intravenous drugs administration (T5). Immediately after T5 assessments, ACP was performed in the left eye, and then, IOP was re-evaluated at T6 minutes up to 60 minutes (T10-T60). Data were analyzed using repeated measures ANOVA (P<0.05). Results: Significant differences were observed in all groups over time, however, there was no significance in relation to T0 was visually recorded in RG at T5. After ACP, a significant reduction of IOP occurred from T0 to T6 in RG and XG, and between T4 and T6 in DG (Figure 1). Comparison between eyes revealed that IOP was significantly lower in left eye from T6 to T0 in RG and DG, and from T4 to T6 in XG. Statistical analysis did not differ among groups. Conclusions: Roxifidine induces a faster and longer-lasting decrease of IOP, whereas detomidine allows an earlier restoration of IOP. Therefore, the latter is more recommended for ACP in horses. Supported by FAPDF. None.

ABSTRACT NO.: 110
Intraocular pressure in dogs is influenced by the white coat effect
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*School of Veterinary Medicine,†McPherson Eye Research Institute,‡School of Veterinary Medicine and Public Health, University of Wisconsin-Madison

Purpose: To determine the effect of clinic vs home environment on intraocular pressure (IOP) in horses submitted to anterior chamber paracentesis (ACP). Methods: Forty dogs, determined to be normal on complete ophthalmic examination, were included in the study. For each dog, IOP was measured in both eyes using a rebound tonometer (Tono-Vet™ Icare Oy, Finland) in both the clinic and home setting by a single observer, between 10am and 5pm. For the home measurements, IOP was measured on initial entry into the residence (t0) in all dogs and then 10 minutes later (t10) in 35/40 dogs. Clinic IOP measurements were conducted once following the ophthalmic examination. 18/20 dogs were evaluated in the clinic setting first and 22/40 were initially evaluated at home. Differences in IOP between groups were evaluated by student’s t-test or unpaired t-test. Results:
There were no significant differences between OD vs. OS. Test site sequence had no effect on IOP. Mean(SD) IOP in the home at t=0 was significantly lower (14.2 mm Hg (2.25)) than mean IOP in the clinic (15.7 mm Hg (2.69); p<0.0001). Mean IOP at t=10 (12.9 mm Hg (1.85)) was significantly lower than at t=0 (p<0.01). Conclusions: In the clinic, IOP measurements may be increased relative to IOP in the home (by up to 7.5 mmHg in our study). IOP changes may be rapid, as evidenced by the significant reduction over 10 min in the home. This effect may be an important consideration for veterinarians when interpreting IOP values, particularly in a dog that appears stressed by the clinic environment. Supported by NIH grant K08 EY018669 and by Research to Prevent Blindness. None.

ABSTRACT NO.: 111
Biochemical composition of precorneal tear film in normal dogs and horses
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Purpose: The goal of this study was to analyze the electrolyte content of equine and canine tear and compare it to the serum and plasma obtained by utilizing 2 different anticoagulants. Methods: Nine horses (17 eyes) and 9 dogs (18 eyes) were used in this study. An eye examination including slit lamp biomicroscopy, fundoscopy, and Schirmer tear test (STT) was performed. All eyes were found to be free of ocular disease. All horses were sedated with 0.5 mg/kg of xylazine (Lloyd Laboratories, Shenandoah, IA) intravenously. No chemical restraint was needed for the dogs. Tears and blood were collected from all animals. Blood was collected for serum and plasma, which was made by using two different anticoagulants Citrate Phosphate Dextrose (CPD) and heparin. Results: Most of the electrolyte values in tears were statistically different than electrolyte values in serum and plasma in both dogs and horses. In both dogs and horses, potassium, and chloride values were significantly different (P<0.01) between tears, serum, and plasma. In equine tears, a significant difference (P<0.01) in phosphorus content was found only between tears and plasma made by use of CPD. In dogs, phosphorus, potassium, chloride, sodium, and calcium concentrations were higher in serum and plasma, regardless of the anticoagulant used. Conclusions: Although we found statistical differences between electrolytes in tears compared to serum and plasma in dogs and horses, these differences are not likely to be clinically significant when applying topical serum or plasma to the cornea. None.

ABSTRACT NO.: 112
Zonular ligament dysplasia in beagles with hereditary primary open angle glaucoma
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*School of Veterinary Medicine, University of Wisconsin; †College of Veterinary Medicine, Michigan State University
Purpose: To characterize the microscopic and ultrastructural morphology of the anterior uvea and sclera of POAG-affected Beagles. Methods: Four eyes from affected beagles, a 6-month-old (6m-/-) and a 1-year-old (y-/-) non-affected dog, and two age-matched affected dogs homozygous for the mutation (6m-/-;3 y-/-G), the last with clinical glaucoma. Results: Grossly, the y-/- animal presented marked irregularity in the cornea and sclera of POAG-affected Beagles. None.

ABSTRACT NO.: 113
The effects of topical administration of diquafosol tetrasodium in dogs
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Department of Veterinary Surgery, School of Veterinary Medicine, Nippon Veterinary and Life Science University
Purpose: To evaluate the effects of topical administration of diquafosol tetrasodium 1% (Diqua- sans, Pharmaceutical Co., Inc., Osaka) on the secretion of mucin-5 subtype AC (MUC5AC) and mucous cells in normal dogs and dogs with corneal ulcers. Methods: Seven healthy adult Beagles were used in this study. Tears from these dogs were collected using capillary tubes before the administration of 1 drop of diquafosol tetrasodium 1%. Tears were collected 10, 30, 60, 120, and 180 min after instillation and tested using the canine MUC5AC ELISA kit (TSI ELISA, Framingham, MA). The volume of tear production was measured using the Schirmer tear test (STT) (in the right eye) and phagocytized red cell in the left eye (OS) before instillation and 10, 30, 60, 120, and 180 min after instillation. After a washout period of 1 day, the measurements were repeated after interchanging the procedures performed on OD and OS. Results: Significantly higher levels of MUC5AC were confirmed after 180 min of instillation compared to before instillation and 10, 30, 60 and 120 min after instillation (p<0.001). The findings of the STT and phago- cytized red cell were also significantly different. Conclusions: An increase in the level of MUC5AC in tears was confirmed following topical administration of diquafosol tetrasodium 1%. None.

ABSTRACT NO.: 114
Elastic modulus of the rabbit cornea as measured by atomic force microscopy: epithelium to endothelium
SM Thomasy,* CT McKee,* AR Sadeli,* VK Raghunathan,* CR Reilly†, P Russell‡ and CJ Murphy††
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Purpose: Despite the wide use of the rabbit to study corneal biology and develop ocular therapeutics and devices, the biophysical attributes of the rabbit cornea have not been fully characterized. We present a measure of the elastic modulus (a measure of stiffness) of the components of the rabbit cornea which would inform design and fabrication of bioartificial substitutes that may improve the relevance of disease models obtained from the rabbit. Methods: Twenty Dutch Belted rabbits were assigned to 5 groups (n=3/group) and the following corneal regions (anterior stroma, posterior stroma, epithelium, endothelium and ABM/DM) were exposed from rabbits in each group. To isolate anterior and posterior stroma, the epithelium was removed and stromal photobleaching was performed to a depth of 100 and 250 μm, respectively, prior to euthanasia. The corneal tissues received no treatment prior to euthanasia. Following euthanasia, an 8 mm corneal button was harvested from one eye of each rabbit. To expose ABM and DM, corneal sections were decellularized by incubation in 2.5 mM EDTA at 37 °C for 2.5 and 0.5 hr, respectively, and sonication for 5 min. AFM and histology were performed on corneal sections. Results: Histologic examination of corneal specimens used in AFM analysis confirmed that the corneal layer of interest was intact and exposed. Elastic modulus for each corneal layer as determined by AFM was: epithelium 0.52 ± 0.26 kPa (mean ± std. dev.); ABM 4.70 ± 1.90 kPa, anterior stroma 1.11 ± 0.59 kPa, posterior stroma 3.52 ± 1.83 kPa, DM 4.57 ± 1.07 kPa, and endothelium 3.23 ± 0.67 kPa. Conclusions: Biophysical properties, including elastic modulus, are unique for each layer of the rabbit cornea and differ significantly from other species. This study incorporates mechanical properties of one species from primates may not be optimal for rabbits that have extremely different elastic moduli. Supported by NIH grants K08 EY021142, RO1 EY019970, and P30 EY12576, and Research to Prevent Blindness. None.

ABSTRACT NO.: 115
Characterization of non-pathologic intracocular ossification in the domestic goat (Capra aegagrus hircus) using histology and computed tomography
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Purpose: To qualitatively and quantitatively characterize the histologic and computed tomographic appearance of bony and cartilaginous foci in ocular tissues of domestic goats. Methods: All goats were euthanized as per protocol to have ocular tissues removed. Signalement and medical history were recorded for all goats. Histologic sections of 40 eyes from 31 goats were reviewed and 20 fixed globes from 11 goats were imaged using multidetector computed tomography. Results: Five goat eyes were characterized as normal. Signalement and medical history were recorded for all goats. Histologic sections of 40 eyes from 31 goats were reviewed and 20 fixed globes from 11 goats were imaged using multidetector computed tomography. Conclusions: Biophysical properties, including elastic modulus, are unique for each layer of the rabbit cornea and differ significantly from other species. This study incorporates mechanical properties of one species from primates may not be optimal for rabbits that have extremely different elastic moduli. Supported by NIH grants K08 EY021142, RO1 EY019970, and P30 EY12576, and Research to Prevent Blindness. None.

ABSTRACT NO.: 116
Treatment of nonhealing corneal ulcers in horses with diamond burr debridement/keratotomy
ML Utter,* TJ Cutler† and TM Michaud††
*New Bolton Center, University of Pennsylvania; †Equine Eye Care; ‡Surgi-Care Center for Horses
Purpose: To describe the outcome of treatment of horses with nonhealing corneal ulcers with diamond burr debridement/keratotomy (DBDK) with or without placement of a bandage contact lens. Methods: Retrospective study and review was performed on 20 corneal ulcers in 20 horses. The inclusion criteria for diagnosis of a nonhealing ulcer and treatment with DBDK by a veterinary ophthalmologist. Variables studied included patient breed, age, sex, eye affected; results from corneal cytology or culture if performed; duration of clinical signs prior to presentation; ulcer size before and after DBDK; whether a contact lens was placed and retained; days until ulcer confirmed fluorescein negative; and other therapeutic procedures performed. Conclusions: None.

ABSTRACT NO.: 117
Treatment of nonhealing corneal ulcers in horses with diamond burr debridement/keratotomy (DBDK) with or without placement of a bandage contact lens
ML Utter,* TJ Cutler† and TM Michaud††
*New Bolton Center, University of Pennsylvania; †Equine Eye Care; ‡Surgi-Care Center for Horses
Purpose: To describe the outcome of treatment of horses with nonhealing corneal ulcers with diamond burr debridement/keratotomy (DBDK) with or without placement of a bandage contact lens. Methods: Retrospective study and review was performed on 20 corneal ulcers in 20 horses. The inclusion criteria for diagnosis of a nonhealing ulcer and treatment with DBDK by a veterinary ophthalmologist. Variables studied included patient breed, age, sex, eye affected; results from corneal cytology or culture if performed; duration of clinical signs prior to presentation; ulcer size before and after DBDK; whether a contact lens was placed and retained; days until ulcer confirmed fluorescein negative; and other therapeutic procedures performed. Conclusions: None.

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ABSTRACT NO.: 117
Adjunctive topical mitomycin-C or 5-fluouracil chemotherapy combined with keratectomy and cryotherapy for limbal squamous cell carcinoma in 37 eyes of 30 horses (2009–12)
ML Utter, H Stewart and KL Wotman
New Bolton Center, School of Veterinary Medicine, University of Pennsylvania
Purpose: To compare nonrecurrence rates following adjunctive chemotherapy with topical mitomycin C (MMC) or 5-fluorouracil (5FU) in horses with limbal squamous cell carcinoma (LSCC) treated initially with keratectomy and cryotherapy.
Method: Retrospective medical record review was used to identify 30 horses with histopathologically confirmed LSCC that had been treated with keratectomy and intraoperative cryotherapy, followed by MMC (18 eyes of 13 horses) or 5FU (19 eyes of 15 horses) used after the keratectomy site had epithelialized. Results: Included horses had an average age of 12.2 years, with Haflinger horses overrepresented (27%). There was no statistical difference in nonrecurrence rate between eyes treated with MMC (89%) and 5FU (84%) although subjectively more owners complained of topical irritation with 5FU.
Conclusions: Chemotherapy with either drug may be associated with resolution.

ABSTRACT NO.: 118
Topical kinostat™ ameliorates the clinical development and progression of cataracts in dogs with diabetes mellitus – an update
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Purpose: In early 2007, a randomized, prospective, double-masked placebo control pilot study was initiated to evaluate whether a topical aldose reductase inhibitor (Kinostat™) could delay cataract formation in diabetic dogs with minimal or no lens changes at the time of enrollment.
Methods: Dogs were enrolled by a board certified veterinary ophthalmologist at time of enrollment, followed by monthly for 13 months, then every 6 months thereafter. Results: The results published in Vet Ophthalmol 15: 363–8, 2010 reported that after 12 months of treatment, the cataract score in the placebo group significantly increased with seven dogs (14 eyes) developing mature cataracts, two dogs (4 eyes) developing cortical opacities, and one dog (2 eyes) developing equatorial vacuoles with mild punctate cortical opacities. In contrast, the cataract score in the 28 Kinostat treated dogs was significantly less with seven developing anterior r Perry's naturol vacuoles, two developing incipient anterior cortical cataracts, and four developing mature cataracts. In fact, the cataract scores of the Kinostat group at 12 months did not significantly increase from the score at the time of enrollment. Of the original 28 dogs enrolled in the trial that receiving Kinostat™ OU/TID, 4 remain on the drug to date. These include a 7 year old short haired Dachshund, an 11 year old Pomeranian, a 13 years old Chow Mix and a 16 year old medium mixed breed dog. None have signs of diabetic cataracts at the time of last examination by a board-certified ophthalmologist. Two entered the study with no signs of cataracts and two entered the study with some opacities that subsequently reversed upon Kinostat™ treatment. Conclusions: These updated results demonstrate that continued treatment with Kinostat™ likely does not delay diabetic cataract formation, but that Kinostat™ treatment may prevent the need for cataract surgery in dogs with diabetes mellitus, without any reported side effects. Kador I, Wyman L.

ABSTRACT NO.: 119
Prevention of cataract formation in diabetic dogs using antioxidant blend, Ocu-GLO Rx™: a placebo controlled masked study
DL Williams* and CMH Colitz†‡
*Department of Veterinary Medicine, University of Cambridge, UK; †Animal HealthQuest Solutions, LLC, USA
Purpose: To evaluate Ocu-GLO Rx™, an orally administered antioxidant/vitamin blend, containing aldose reductase inhibitor alpha lipoic acid (ALA) to prevent diabetic cataracts in dogs.
Method: Dogs with diabetes mellitus, recent cataract surgery or no cataracts were randomly assigned to groups. One group received Ocu-GLO Rx™ daily. The other received placebo which was devoid of ALA, grape seed extract, carotenoids, omega-3 fatty acids, Green Tea Extract, and Coenzyme Q10. Daily. All dogs received full ophthalmological examinations and lens clarity was recorded photographically using a Genesis D Fundus camera at +30D after pharmacological mydriasis. Dogs were followed for up to one year with examinations monthly. Duration of time without changes in lens opacification was documented for each dog and the two groups compared using Kaplan-Meier survival curve statistics.
Results: Mean time without change in lens opacification was 136±66 days with OcuGLO Rx™ and for the placebo group it was 91±54 days; however, the difference was not statistically significant at p=0.007. None of 15 dogs taking the placebo developed significant cataract while only 1 of 15 dogs taking OcuGLO Rx™ developed significant cataract. These three dogs did not receive daily Ocu-GLO Rx™ as directed due to unrelated illness or owner non-compliance. Conclusions: This small preliminary study demonstrates that oral Ocu-GLO Rx™ has beneficial effects in preventing cataract formation in dogs with diabetes mellitus. DL Williams, None; CMH Colitz, P.

ABSTRACT NO.: 120
The effect of contact lens on intraocular pressure measurement in canines
KL Wotman,* JE Bowersox† and ML Utter†
*Veterinary Specialty Center of Delaware, New Castle, DE, USA; †New Bolton Center, School of Veterinary Medicine, University of Pennsylvania
Purpose: To determine if intraocular pressure (IOP) measurement is affected by wearing a contact lens in the normal and diseased canine eye. To determine if application versus rebound tonometry is more affected by wearing a contact lens in place.
Methods: Complete ophthalmic examinations were performed on all dogs. IOP measurements were taken in the sitting position and in the supine position with a rebound tonometer (RHeal and Loma Pure Vision) ± contact lenses. Contact lenses were placed in both eyes. The IOP measurement was repeated with the TonopenXL and TonoVet.
Results: The mean IOP across tonometer with contact lenses in place was 10.16±4.19mmHg and with a contact lens in place was 10.47±4.51mmHg. This difference was not statistically significant (p=0.01). There was no effect of having a contact lens in place in either eye.
Conclusions: A contact lens can remain in place when checking IOPs with either the TonopenXL or TonoVet.

ABSTRACT NO.: 121
Treating both L/M- and S-cones with the IRBP/GNAT2 promoter rescues function in canine CNGB3-achromatopsia
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Purpose: Cone function can be rescued in day-blind dogs with CNGB3-achromatopsia using rAAV3-mediated gene augmentation therapy. The human red cone opsin promoter allows treatment of the canine L/M- but not the S-cones. The purpose of this study was to test if a promoter based on the IRBP enhancer and GNAT2 promoter can target both canine cone subclasses and rescue their function.
Methods: Targeting of cones with the RBP/IRBP promoter has been shown to be promising in the retina using the STRA6 promoter. The RBP/IRBP/GNAT2-GFP was injected subretinally in 2 normal adult dogs. In vivo imaging and immunohistochemistry (GABA) were performed in mice in vivo and in vitro. Subsequently, 26 eyes in 13 CNGB3-mutant dogs (ages 9–11 weeks) were subretinally injected with vectors containing the wild type CNGB3 transgene (either rAAV3-IRBP/IRBP-GNAT2/IRBP or rAAV3-IRBP/IRBP/IRBP-GNAT2). Treatment outcome was assessed at 6 and 30 weeks post-injection by both scotopic and photopic electroretinography. Successful rescue of function was based on recoverable 29-Hz cone flicker. Results: The rAAV3/IRBP/GNAT2 promoter led to robust and specific GFP expression in both L/M and S-cones. Rescue of cone function was achieved with both rAAV3-IRBP/IRBP-GNAT2/IRBP and rAAV3-IRBP/IRBP/GNAT2. However, the success rate was concentration- and serotype-dependent. Best outcome was obtained with rAAV8 at a concentration of 4.76 x 1012 vector genomes per mL (5 of 6 treated eyes responding).
Conclusions: The rAAV3/IRBP促进子represent an effective tool for targeting of gene expression to both L/M and S cones. These results expand on the potential of trans-sclerional injection of intravitreal rAAV vectors into both S and L/M-cones of diabetics. Supported by NIH grants R01-EY019194, T32-R000763, R01-EY006835, R01-EY011512, R01-EY017549, R01-EY016122, T32-007132, P30-EY00181, P30-EY008571, F32, MRVF, ONCE International Prize. WWH AGTC (P).

ABSTRACT NO.: 122
Intraorbital silicon prostheses for canine enucleation
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Purpose: To describe MRI and autopsy findings after intraorbital silicon implant in a horse.
Methods: A 23-year-old male (castrated) thoroughbred horse was referred to the Animal Farm, Nippon Veterinary and Life Science University, after a complication of trans-sclerional enucleation caused by corneal penetration in the left eye. Ophthalmal examination revealed entropion, severe conjunctivitis, and ocular mucopurulent discharge in the left eye. Eye-wash and topical antibiotics did not improve the condition. After 3 months, the horse was referred to referring veterinarian for further management. Results: Postmortem MRI and autopsy revealed an increase in amount of connective tissue and no fluid accumulation around the intraorbital implant. Conclusion: MRI and autopsy in cases of intraorbital silicone enucleation shows that the use of intraorbital silicone enucleation in horses is implausible due to the formation of glial tissue and nonequilibrium osmotic pressure.
ABSTRACT NO.: 123
Radiation-induced keratoconjunctivitis sicca in four dogs with nasal tumors
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Purpose: To evaluate keratoconjunctivitis sicca (KCS) after radiation therapy for nasal tumors in 4 dogs.
Methods: The study was conducted at the Nippon Veterinary and Life Science University. Results of the Schirmer tear test (STT), performed on the selected patients, were <15 mm/min after radiation therapy for nasal tumors. Case 1: A 10-year-old, intact, male miniature dachshund showed KCS in OS. Case 2: A 10-year-old, castrated, male French bulldog showed KCS in OS. Case 3: An 8-year-old, intact, male miniature dachshund showed KCS in OD. Case 4: A 10-year-old, castrated male papillon showed KCS in OS. Results: All canine eyes were affected with KCS on the ipsilateral nasal tumor side. The average and median dates of KCS diagnosis post-radiation were 146 ± 80.6 (standard deviation [SD]) and 146 days, respectively. The average and median radiation dose was 35.5 ± 4.1 (SD) and 35.5 Gy, respectively. Conclusions: When external radiation is used to irradiate the eye for the treatment of nasal tumors, long-term care with artificial tears is necessary. None.

ABSTRACT NO.: 124
Intracorneal hemorrhage in 6 small breed dogs
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Purpose: To report clinical data on patients of intracorneal hemorrhage (ICH) in canine small breeds.
Methods: The medical records of small breed dogs with ICH were reviewed between January 2007 and November 2011. The breed, age, gender, lesion location of cornea, treatment, and follow-up were investigated. Results: Eight eyes of canine ICH were identified in 6 dogs (4 Yorkshire terriers, 1 Poodle, and 1 Maltese). For the first presentation, unilateral ICH (OD) was observed in 5 dogs and bilateral in one dog. The mean age at the first diagnosis was 12.3 years. Two Yorkshire terriers were recurrent in other area of same cornea for at least 2 years of follow-up period and one Yorkshire terrier in both corneas in almost 1 year. No sex predisposition was established. Most of ICH was recorded in superior and nasal area with mid-peripheral cornea. Neovascularization was indentified in intraocular cornea more often with long-term loss of transparency. There was no a specific systemic or ocular disease related to the development of ICH. Conclusions: The ICH lesion appeared to be recurrent in the small breed dogs, leading to long-term corneal surface and/or intracorneal diseases. Therefore, further study would be needed to indentify a specific disease for the intracorneal hemorrhage. None.