Veterinary Student Abstracts

1: UROPERITONEUM SECONDARY TO PUBIC EXOSTOSIS IN A HORSE

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A 10-year-old Warmblood gelding presented for persistent and progressive acute abdominal discomfort and a 2-day history of stranguria. Abdominal ultrasound revealed increased free peritoneal fluid. Abdominocentesis yielded fluid with a low TNCC (340/µL) and total solids (<2 g/dL). However, the fluid creatinine (12.8 mg/dL) was more than double the serum creatinine (5.8 mg/dL) and contained calcium carbonate crystals, consistent with uroperitoneum. Initial cystoscopy identified a full-thickness tear on the caudoventral surface of the urinary bladder. Perineal urethrotomy was performed for further evaluation and attempted intervention, and repeat cystoscopy revealed a bony projection extending through the bladder defect. The patient's discomfort progressed further and, with the bony projection raising concern for potential pelvic trauma, humane euthanasia was pursued. On necropsy, approximately 7 L of pale-yellow fluid, consistent with urine, was present in the abdominal cavity, alongside a full-thickness tear of the urinary bladder. Directly underneath the defect, a 3 cm long x 0.8 cm wide irregular, pointed osseous outgrowth projected dorsally from the pubic symphysis. Histologically, this outgrowth consisted of mature lamellar bone covered by periosteum, consistent with an exostosis. A second, smaller osseous outgrowth not associated with bladder injury was discovered and diagnosed as an osteochondroma due to the presence of cartilage. The final anatomic diagnosis was an acute urinary bladder perforation caused by the exostosis, with an incidental osteochondroma. We report the first known case of an exostosis rupturing the urinary bladder of an equine, a rare event previously documented only once with an osteochondroma.

Discipline: Both, **Topic:** General pathology, **Species:** Equine, **Systems:** Urinary

2: DISSEMINATED HISTIOCYTIC SARCOMA IN A BERNESE MOUNTAIN DOG

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Disseminated histiocytic sarcoma (DHS) is a highly aggressive neoplasm of dendritic cell/macrophage origin that commonly affects Bernese Mountain Dogs and can mimic other poorly differentiated malignancies. Although breed predisposition and morphologic features may strongly suggest the diagnosis, immunophenotyping is required for definitive diagnosis. An 8-year-old neutered male Bernese Mountain Dog presented with two pulmonary masses previously diagnosed cytologically as malignant neoplasia with histiocytic sarcoma prioritized. Despite lomustine (CCNU) therapy, the patient developed progressive systemic illness characterized by persistent fever, hypoglycemia, dyspnea, melena, and nonregenerative anemia and was euthanized. Necropsy

confirmed the two pulmonary masses, and highlighted related findings including enlarged mediastinal, mesenteric, and submandibular lymph nodes, and multifocal gastrointestinal ulceration. Histologically, the pulmonary masses consisted of an unencapsulated infiltrative neoplasm composed of markedly pleomorphic round to spindled cells with severe anisocytosis, anisokaryosis, frequent mitotic figures, multinucleated giant cells, vascular invasion, and multifocal necrosis which effaced the normal parenchyma. Similar neoplastic cells (suspected histiocytes) are observed in the vasculature and parenchyma of multiple organs, including lymph nodes, liver, spleen, kidney, adrenal gland, and cerebrum, consistent with disseminated disease. This case highlights the aggressive multisystemic nature of disseminated histiocytic sarcoma in a predisposed breed and demonstrates that histologic morphology, although highly suggestive, should be confirmed with immunohistochemistry to establish a definitive diagnosis and exclude important differential diagnoses.

Discipline: Anatomic pathology, **Topic:** Oncology, **Species:** Canine, **Systems:** Systemic

3: RVOT NEUROENDOCRINE CARCINOMA WITH PULMONARY METASTASIS IN A DOG

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A 14-year-old FS mixed-breed dog was presented for necropsy with an intracardiac mass and pulmonary metastases. Nineteen months prior, echocardiography and computed tomography identified a 3 x 1.8 x 1.5 cm mass arising from the caudal right ventricular free wall and extending into the right ventricular outflow tract and pulmonic valve, causing severe obstruction. Following 15 daily fractions (42Gy total dose) of a definitive-intent radiation therapy protocol, the dog developed suspected syncopal episodes 17 months later, and thoracic radiographs identified pulmonary masses. The patient was humanely euthanized. Necropsy identified a 3 x 1.5 x 1.5 cm dark red, soft, bilobed mass within the right ventricle, immediately below the pulmonic valve and extending into the lumen of the pulmonary artery. Throughout all lung lobes, there were numerous 0.3-1.0 cm diameter, pale tan to white, well-demarcated, soft, friable nodules within the lung parenchyma. Additionally, there was mild right ventricular hypertrophy. Histopathologic examination of both cardiac and pulmonary masses revealed a multilobular, densely cellular, non-encapsulated, infiltrative neoplasm composed of polygonal cells with eosinophilic granular cytoplasm arranged in packets consistent with neuroendocrine carcinoma. On immunohistochemistry, the neoplastic cells were negative for thyroglobulin, calcitonin, and myogenin. The neoplastic cells showed weak immunolabeling for cytokeratin and synaptophysin, supporting the diagnosis of neuroendocrine carcinoma. Primary intracardiac neuroendocrine carcinomas are exceedingly rare in dogs, with metastatic neuroendocrine tumors being more common. The right ventricular location excluded an aortic body tumor (chemodectoma), while negative immunolabeling for thyroglobulin, calcitonin, and myogenin ruled out ectopic thyroid carcinoma and alveolar rhabdomyosarcoma.

Discipline: Anatomic pathology, **Topic:** Oncology, **Species:** Canine, **Systems:** Cardiovascular

4: PNEUMO- AND NEURO- TROPIC CRYPTOCOCCUS GATTII IN A SCHMIDT'S RED-TAILED MONKEY (CERCOPITHECUS ASCANIUS SCHMIDTI)

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Case Presentation
A 10-year-old female intact Schmidt's Red-Tailed Monkey had a 9-day history of progressive right-sided weakness starting 5/20/2026. MRI performed 5/29/2026 demonstrated multiple T2W hyperintense, T1W hypointense round lesions in both cerebral lobes, brainstem, and cranial spinal cord. The guenon was submitted to Johns Hopkins from The Maryland Zoo after euthanasia on 5/29/2026.

Results
Gross necropsy revealed the left lung was largely effaced by an 8×2×3 cm firm mass adherent to the thoracic body wall, with a purulent core on sectioning. A lung impression smear stained with modified Wright-Giemsa revealed abundant large, dark-staining organisms with narrow-based budding and prominent clear capsules, consistent with *Cryptococcus* spp. Serial sectioning of the formalin-fixed brain revealed multifocal nodules corresponding to the lesions seen on MRI. Histologically, the cerebrum exhibited multifocal chronic severe meningoencephalitis with gliosis and intralesional yeasts. The lung showed multifocal chronic severe bronchopneumonia with pyogranulomatous fibrosis and intralesional yeasts. The organisms in both tissues were mucicarmine positive. PCR amplification and ITS4/5 sequencing on lung tissue confirmed *Cryptococcus gattii*. Whole genome sequencing identified the isolate as molecular type VGI.

Discussion
The primary pathologic finding and cause for clinical decline is severe disseminated meningoencephalitis and bronchopneumonia with intralesional *C. gattii* organisms. The distribution of the lesions suggests hematogenous dissemination following inhalation of spores. This is the first molecularly confirmed case of *C. gattii* infection in a guenon. The presentation of cerebral cryptococcomas in an immunocompetent host reinforces the status of *C. gattii* as a primary pathogen with a broad and expanding host range.

Discipline: Anatomic pathology, **Topic:** Infectious disease, **Species:** NHP, **Systems:** Nervous

5: TUMORS IN PARADISE: A RETROSPECTIVE STUDY OF NEOPLASIA IN CARIBBEAN AFRICAN GREEN MONKEYS

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A retrospective histopathologic study was conducted to characterize spontaneous lesions in African green monkeys (*Chlorocebus sabaeus*) from two colonies in St. Kitts and Nevis between 2010 and 2026. Nineteen lesions were identified in 18 animals, with one animal diagnosed with two distinct lesions. Age information was available for 18 animals, with affected animals ranging from 9 to 33 years (mean, 19.4 years). Lesions occurred predominantly in aged animals (>15 years; 13/18, 72.2%), followed by young adults (4–8 years; 3/18, 16.7%) and adults (8–15 years; 2/18, 11.1%); no juveniles (0–4 years) were affected. Twelve affected animals (66.7%) were female and six (33.3%) were male. Colony history included 11 colony-born animals (57.9%), 7 wild-caught animals (36.8%), and 1 animal of unknown origin (5.3%).
Seventeen lesions were neoplasms, comprising 8 benign (47.1%), including papilloma, leiomyoma, pheochromocytoma, and ameloblastoma, and 9 malignant (52.9%), including squamous cell carcinoma, mammary gland carcinoma, cutaneous melanoma, histiocytic sarcoma, malignant pheochromocytoma, and microcystic meningioma; 2 lesions (10.5%) were diagnosed as calcinosis circumscripta. The integumentary system was the most frequently affected organ system (7/19, 36.8%), followed by the reproductive system (3/19, 15.8%), alimentary system (3/19, 15.8%), adrenal gland (2/19, 10.5%), respiratory system (2/19, 10.5%), musculoskeletal system (1/19, 5.3%), and central nervous system (1/19, 5.3%). These findings establish baseline data on the spectrum and distribution of spontaneous neoplastic and tumor-like lesions in captive African green monkeys and contribute to the comparative pathology literature for this species.

Discipline: Anatomic pathology, **Topic:** Oncology, **Species:** Non-rodent lab animals, **Systems:** Systemic

6: FORENSIC POSTMORTEM EXAMINATION OF DOGS INVOLVED IN HUMAN-DIRECTED AGGRESSION INCIDENTS: A CASE SERIES AND PROPOSAL FOR A REPORTING TEMPLATE

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When a dog involved in a human-directed aggression incident is destroyed, postmortem examination becomes the sole investigative window into its physical status. Published evidence on postmortem findings in such examinations is limited, and no aggression-specific examination framework currently exists.

To characterize postmortem findings in dogs examined following human-directed aggression incidents, identify procedural and interpretive limitations, and propose an examination and reporting framework.

Retrospective study of forensic postmortem examination reports of 13 dogs involved in 12 human-directed aggression incidents, examined at a university-based veterinary forensic pathology service between 2017 and 2026. Variables included signalment, referral instructions, postmortem findings across all modalities, and interpretation limitations.

No definitive pathological explanation for the aggressive incident was identified. Musculoskeletal findings representing anatomically plausible sources of chronic pain were identified in four dogs. Welfare-relevant findings were documented in several cases, independently of whether welfare had been queried. A cocaine metabolite was detected in one dog. Neurological assessment, including gross and histopathological examination of the brain, was severely limited or not possible in nine dogs due to intracranial ballistic injury and freeze-thaw artifact. Findings supported a minimum framework including standardized referral questions, welfare and musculoskeletal assessment, toxicology sample retention, documentation of neuropathological limitations and reporting language distinguishing potentially behavior-modulating, welfare-relevant and incidental findings.

Postmortem examination yields forensically relevant findings across welfare, musculoskeletal, toxicological and neurological domains, but is constrained by the circumstances of death and the absence of a standardized examination framework. An aggression-specific examination and reporting framework is proposed to improve consistency and preserve evidential opportunities.

Discipline: Anatomic pathology, **Topic:** Forensic, **Species:** Canine, **Systems:** Systemic

7: METASTATIC HISTIOCYTIC SARCOMA IN A SHROPSHIRE EWE

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A 6-year-old ewe was presented for postmortem examination after euthanasia due to chronic wasting. Postmortem examination showed multifocal white, firm, coalescing nodules roughly 1 cm in diameter effacing the splenic parenchyma. The liver was diffusely pale brown with an enhanced reticular pattern. Histologically, the splenic parenchyma was multifocally infiltrated and effaced by poorly demarcated, coalescing, expansile nodules composed of densely packed round cells supported by a moderate amount of fibrovascular stroma. Individual cells were round to spindloid with variably distinct cell borders, a moderate amount of clear to eosinophilic cytoplasm and a reniform to oval nucleus with finely stippled to vesiculated chromatin and occasionally large, prominent nucleoli. Anisocytosis and anisokaryosis were marked and there were scattered multinucleated cells. Mitoses were 16 in 10 HPF (2.37mm2) with occasional bizarre mitotic figures. Multifocal vessels contained variably sized aggregates of neoplastic cells. Additionally, hepatic portal regions were markedly expanded by similar neoplastic cells and fibrovascular stroma admixed with fewer lymphocytes, plasma cells and neutrophils. A focal nodule composed of atypical cells similar to the previously

described neoplastic cells was also appreciated in the pituitary gland. Approximately 90% of the neoplastic cells displayed strong cytoplasmic immunoreactivity to IBA-1. These findings are consistent with splenic histiocytic sarcoma, with metastases to the liver and pituitary gland. Spontaneous neoplasia is quite uncommon in sheep, with most reported cases being virus-associated, such as nasal and pulmonary adenocarcinomas. To the authors' knowledge, histiocytic sarcoma has never been reported in sheep.

Discipline: Anatomic pathology, **Topic:** Oncology, **Species:** Small ruminants, **Systems:** Systemic

8: EVALUATION OF URINE PROTEIN BANDING PATTERNS IN DOGS WITH LYME-ASSOCIATED IMMUNE COMPLEX-MEDIATED GLOMERULONEPHRITIS

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Background: Immune complex glomerulonephritis (ICGN) is seen in 1-2% of *Borrelia burgdorferi* (Lyme)-seropositive dogs and can cause fatal renal disease. The pathophysiology of Lyme-associated ICGN is poorly understood, and putative diagnosis requires a renal biopsy. Urine SDS-PAGE is a noninvasive diagnostic for localizing glomerular versus tubulointerstitial proteinuria but has not been validated for different causes of glomerular disease.
Hypothesis: Lyme-seropositive (Lyme+) dogs with ICGN will display distinct urine SDS-PAGE protein banding patterns compared to seronegative (Lyme-) dogs.
Objectives: Determine if Lyme+ dogs with ICGN have a specific urine SDS-PAGE phenotype.
Methods: Retrospective study of 141 dogs with known Lyme serology status, biopsy-confirmed ICGN, and urine SDS-PAGE performed by the International Veterinary Renal Pathology Service between 2008-2023. Urinalyses were available for 121 dogs. Urinalysis findings and SDS-PAGE band numbers (total and by molecular weight category) were compared between Lyme+ and Lyme- dogs with the Mann-Whitney U-test.
Results: Total bands did not differ between groups. However, Lyme+ dogs with a membranoproliferative pattern of ICGN (MPGN) had more bands above 200 kDa ($p=0.0469$), fewer bands between 116.3-200 kDa ($p=0.0011$), higher sediment erythrocyte scores ($p=0.0124$), and higher dipstick blood scores ($p=0.0003$) compared with Lyme- dogs with MPGN. There was no difference in banding patterns between Lyme+ and Lyme- dogs with non-MPGN patterns of ICGN.
Conclusion: Lyme+ dogs with MPGN exhibit a distinct protein banding pattern compared to Lyme- dogs. Increased bands >200kDa may indicate more severe glomerular damage in Lyme+ dogs. Additional studies are necessary to identify specific urine protein biomarkers of Lyme-associated ICGN.

Discipline: Clinical pathology, **Topic:** Immunology, **Species:** Canine, **Systems:** Urinary

9: MENINGOENCEPHALOMYELITIS AND POLYRADICULONEURITIS IN A BOTTLENOSE DOLPHIN – A DIAGNOSTIC CHALLENGE

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A code 1 adult male bottlenose dolphin (Tursiops truncatus) stranded in Biloxi, MS, and was subsequently euthanized due to the presence of multiple, severe shark bite wounds. Gross examination revealed a poor body condition, multifocal shark bite wounds, diffuse granular oral mucosa, numerous species of parasites in various organs, and a plaque-like penile lesion. The brain and spinal cord was grossly unremarkable. Histopathological examination demonstrated marked lymphohistiocytic meningitis present in the brain and spinal cord, often extending along nerve roots. Additional lesions included perivascular inflammation, neuropil vacuolation, gliosis, Wallerian-like degeneration, and digestion chambers. No protozoal organisms were identified. Ancillary testing for Brucella RT-PCR (lung, spinal cord, cerebrospinal fluid), cetacean morbillivirus RT-PCR (lung, spinal cord), mammalian influenza RT-PCR (lung, brain), astern equine encephalitis virus RT-PCR (brain), West Nile virus RT-PCR (brain), panherpesvirus PCR (brain), and PCR assays for Sarcocystis neurona, Toxoplasma gondii, and Neospora spp. (brain) were negative. Postmortem culture of cerebrospinal fluid yielded a faint growth of Vibrio sp. Brucella qPCR on spinal cord yielded a suspect result, with inconclusive sequencing. At the time of submission, Brucella in situ hybridization is pending.
Despite inconclusive molecular results, brucellosis remains the leading differential diagnosis based on the characteristic histologic lesions and the high prevalence of Brucella-positive cetaceans in the Gulf. This case highlights the diagnostic challenges of confirming cetacean brucellosis, even in fresh tissues. Given the potential zoonotic significance of Brucella ceti, improved diagnostic approaches remain an important area for investigation.

Discipline: Anatomic pathology, **Topic:** Infectious disease, **Species:** Bovine, **Systems:** Nervous

10: EVALUATION OF BROWN ADIPOSE REGRESSION IN NON-HUMAN PRIMATES

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Adipose tissue is essential for whole-body energy homeostasis and metabolism through increasing energy expenditure and glucose and lipid metabolism via non-shivering thermogenesis, which converts metabolic energy sources into heat. BAT presence is associated with lower risks of many cardiovascular and energy dysregulation diseases.

In both humans and primates, BAT regresses with age, but the factors that determine the severity and rate are unknown.
Thymic regression has been linked to inflammaging, a state of prolonged basal inflammation. During aging, the intestinal barrier deteriorates, leading to an of bacteria entering the bloodstream, chronic antigenic stimulation, and accumulation of senescent T cells. This cyclic activation of the immune system accelerates immune aging and thymic shrinkage. We propose that BAT regression undergoes the same process.
To determine if the natural regression of (BAT) with age in Vervets is linked to leakage of bacteria from the intestinal microbiome and corresponding levels of chronic inflammation, we analyzed BAT deposits and plasma from subjects across a large age range paired with histopathology on biopsies for the amount of BAT vs. WAT content, tissue morphology, and detection of bacterial presence via Gram-staining and RNAscope fluorescent *in situ* hybridization. ELISA assays on plasma assessed the following inflammatory and immune biomarkers: LBP1, CD14, CRP, IL-6, and insulin. Aging was found to be related to increasing insulin resistance, inflammation, microbial translocation, and whitening of adipose tissue. Together, our findings suggest that the loss of BAT is a developmental process driven by inflammatory porcesses related to microbial translocation.

Discipline: Both, **Topic:** Metabolic disease, **Species:** NHP, **Systems:** Endocrine

11: HISTOPATHOLOGIC DESCRIPTION OF AVIAN PHILOPHTHALMIASIS: LESIONS AND IMPLICATIONS

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Philophthalmus gralli is a zoonotic ocular trematode that can be found in waterfowl worldwide. Philophthalmiasis has been described in only a few species of birds and a fully comprehensive histopathologic description of its lesions has not been performed to date. A full description of these lesions would help further elucidate the pathogenesis and life cycle of *P. gralli*. American coots from the Southeastern Cooperative Wildlife Disease Study in Georgia were found to be infected with *P. gralli.* Eleven samples were submitted to TRAP labs for histopathology and photomicrographs of characteristic lesions were obtained. Six out of the 11 coots were infected with the trematode, with the most common site of infection in the conjunctiva. Pathological lesions ranged from mild epithelial hyperplasia to lymphocytic and heterophilic conjunctivitis with hyperplasia and severe edema. Interestingly, flukes were also found in the infraorbital sinus of some birds, which is not a commonly reported site of infection. Molecular genomics were used to confirm that these flukes were also *P. gralli.* The flukes found in the infraorbital sinus all appeared to be large and gravid, which could indicate that this is the primary site of colonization and maturation of the infective metacercariae stage. As *P. gralli* is a zoonotic trematode that is increasing its range worldwide, understanding its life cycle and the pathologic lesions it causes is essential in order to avoid exposure and

diagnose potential infections in humans and other avian species, as infection has been documented in chickens.

Discipline: Anatomic pathology, **Topic:** Infectious disease, **Species:** Wildlife/Zoo, **Systems:** Eye/ear

12: CERVICAL BACTERIAL GRANULOMAS AND HEMATOGENOUS DISSEMINATION IN ZOO-MANAGED HORNED LIZARDS WITH EVIDENCE FOR TRAUMATIC INOCULATION

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Between 2019 and 2026, ten zoo-managed horned lizards (nine Texas horned lizards (*Phrynosoma cornutum*) and one greater short-horned lizard (*Phrynosoma hernandesi*)) developed a previously unrecognized syndrome characterized by cervical connective tissue granulomas with frequent systemic bacterial dissemination. In nine of ten cases, death was attributed primarily to these lesions. Histologically, granulomas were composed of central necrotic debris and heterophils with variable numbers of intralesional bacteria surrounded by concentric layers of epithelioid macrophages, lymphocytes, and reactive fibroblasts. Eight cases had evidence of dissemination in one or more tissues, including the heart (n=3), connective tissue (n=3), colon (n=2), liver (n=2), skin (n=1), and brain (n=1). Intravascular bacteria were identified in multiple tissues in several animals, consistent with hematogenous spread. Rather than a single etiology, aerobic culture yielded multiple Gram-negative bacteria including *Morganella*, *Serratia*, and *Proteus* spp., indicating an opportunistic infection. In one animal, fragments of presumed harvester ant stinger were found within the lesion, suggesting traumatic inoculation from the oral cavity as a possible route of entry for bacteria. Additionally, all cases occurred between January and March, potentially suggesting a correlation with recent brumation. Given the conservation importance of these assurance populations of horned lizards and their reliance on a highly specialized harvester ant diet, recognition of this lesion complex may inform husbandry practices, preventive medicine, and ex situ conservation efforts.

Discipline: Anatomic pathology, **Topic:** General pathology, **Species:** Wildlife/Zoo, **Systems:** Systemic

13: USING HEMATOLOGICAL METHODS TO CHARACTERIZE ANTIVIRAL RESPONSE OF FEMALE ARTIBEUS JAMAICENSIS TO H18N11 INFECTION

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Background
Some bat species host viruses that cause severe disease when they spill over into

humans or domestic animals. Spillover risk is driven by shedding pulses (periods of elevated viral excretion) in wild populations, possibly influenced by pregnancy. However, the underlying immunological mechanisms of this hypothesis are understudied.
Objective
To address this knowledge gap, we investigated quantitative and morphological differences in leukocyte profiles of pregnant and non-pregnant adult female captive Jamaican fruit bats (*Artibeus jamaicensus*) infected with H18N11, a bat-adapted influenza A virus. We hypothesize a weaker cellular adaptive immune response against H18N11 in pregnant infected bats compared to non-pregnant infected bats. Therefore, in pregnant females, we expect to observe an increased neutrophil-to-lymphocyte (N:L) ratio, while in non-pregnant females, we expect to observe a decreased N:L ratio and increased counts of effector phenotype lymphocytes.
Methods
Pregnant (n=10) and non-pregnant (n=10) female bats were inoculated oronasally with H18N11 (n=14) or sterile PBS (n=6). Blood smears were made on day 0 (inoculation) and day 28 (post-inoculation), then fixed with methanol and stained with DipQuick. Standard leukocyte differentials with morphological assessments were performed.
Results
We expect to observe a decreased N:L ratio in non-pregnant female infected bats, with higher effector lymphocyte counts. We anticipate an increased N:L ratio in pregnant infected bats, compared to other experimental groups.
Conclusion
These results would provide evidence of differences in antiviral immune response strength between pregnant and non-pregnant bats, contributing to a stronger understanding of viral spillover dynamics.

Discipline: Clinical pathology, **Topic:** Immunology, **Species:** Non-rodent lab animals, **Systems:** Hematopoietic

14: GRANULOMATOUS COLITIS WITH EXTRAINTESTINAL DISSEMINATION IN A CAT: AN UNEXPECTED CLINICAL VARIANT

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A 5-year-old male castrated domestic shorthair cat with a history of suspected urethral obstruction presented to Lloyd Veterinary Medical Center at Iowa State University with hyporexia, weight loss, diarrhea, and episodic vomiting. Abdominal ultrasound showed ileocecal and mesenteric lymphadenopathy, as well as abnormal architecture of the liver and spleen. Cytologic evaluation of splenic and mesenteric lymph node aspirates revealed histiocytic inflammation. Serum cryptococcal antigen (LA), urine Histoplasma antigen (EIA), and lymph node feline coronavirus PCR were all negative. Three weeks later, the patient re-presented with severe neurological signs, suspected to be secondary to hepatic encephalopathy based on an increased blood ammonia. Necropsy revealed liver, spleen, mesenteric, and ileocecal lymph node enlargement. The ileum and colon were mildly ulcerated. Histopathology revealed ileal and colonic transmural

lymphohistiocytic inflammation, and granulomatous inflammation in the spleen and lymph nodes. Macrophages within all affected organs were highlighted with Periodic acid-Schiff stain. These findings are compatible with granulomatous colitis (GC) with extraintestinal dissemination. GC is well recognized in dogs, especially Boxers, and strongly associated with adherent and invasive *Escherichia coli* (AIEC). In spite of finding intralesional bacilli within the histiocytes using Warthin-Starry stain, fluorescent in situ hybridization and immunohistochemistry failed to identify *E. coli*, suggesting that feline GC may not exclusively be associated with AIEC infection. The absence of *E. coli* expands the limited literature and known clinical presentation of GC in felines, as only 6 other reports of feline GC cases have been documented.

Discipline: Anatomic pathology, **Topic:** Infectious disease, **Species:** Feline, **Systems:** Gastrointestinal

15: AMPLIFIED IMMUNOHISTOCHEMISTRY (AMP-IHC) IMPROVES DETECTION OF CHRONIC WASTING DISEASE PRIONS IN FREE-RANGING WHITE-TAILED DEER

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Background:
Chronic wasting disease (CWD) is primarily diagnosed using conventional immunohistochemistry (IHC) and enzyme-linked immunosorbent assay (ELISA). However, conventional IHC may have reduced ability to visualize low-level prion accumulation or subtle patterns of deposition. Enhanced histologic detection methods may improve visualization and characterization of pathological cervid prion protein (PrP^{CWD}) distribution.
Objective:
To evaluate an optimized amplified immunohistochemistry (AMP-IHC) protocol incorporating tyramide signal amplification (TSA) and biotin-streptavidin-horseradish peroxidase (HRP) detection for improved visualization and histologic detection sensitivity of PrPCWD in free-ranging white-tailed deer (WTD).
Methods:
Obex, recto-anal mucosa-associated lymphoid tissue (RAMALT), tonsil, and retropharyngeal lymph node (RPLN) samples from sixteen free-ranging WTD (n=16) were evaluated using conventional IHC and AMP-IHC. Immunolabeling intensity, tissue-specific PrPCWD distribution, and the proportion of PrPCWD-positive lymphoid follicles identified by each method were compared.
Results:
AMP-IHC produced stronger and more discrete immunolabeling of PrP^{CWD} deposition across all evaluated tissues compared with conventional IHC. AMP-IHC increased histologic detection sensitivity by identifying a greater proportion of PrP^{CWD}-positive lymphoid follicles across evaluated tissues, with increases ranging from 11.9% to 57.1% compared with conventional IHC. Enhanced signal amplification improved visualization of tissue-associated prion deposition and tissue-specific distribution patterns.

Conclusions:
AMP-IHC improves histologic detection sensitivity for PrP^{CWD} by increasing identification of prion-positive lymphoid follicles and enhancing visualization of prion deposition in free-ranging WTD. This approach represents a valuable complementary tool for CWD diagnostic research and surveillance applications.

Discipline: Anatomic pathology, **Topic:** Methods/technology, **Species:** Wildlife/Zoo, **Systems:** Nervous

16: FIRST CASE OF CERVIDPOXVIRUS IN WASHINGTON STATE

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A juvenile mule deer fawn (Odocoileus hemionus) was discovered and dispatched by the Washington Department of Fish and Wildlife in Grant County, Washington due to lethargy, hypothermia, widespread alopecia and lichenification of the neck and head, and proliferative and ulcerative cutaneous nodules on the muzzle and around the eyes and mucocutaneous junctions. The lower limbs, particularly at the coronary bands, exhibited multifocal ulcers and necrotizing lesions including partial separation of the hooves and dewclaws. Necropsy, histopathology, and molecular diagnostics were performed at the Washington Animal Disease Diagnostic Laboratory. Nodular and plaque-like multifocal hyperkeratotic, acanthotic, and eroded and ulcerated cutaneous lesions were suggestive of poxvirus, although crusts also contained abundant bacteria consistent with Dermatophilus congolensis. PCR using low GC pan-pox primers followed by direct sequencing produced an amplicon with 100% and 98.7% match to white-tailed deerpoxvirus (GenBank acc # MF966153) and mule deerpox (QG923126), respectively. Illumina sequencing recovered a near-complete cervidpoxvirus genome. This is the first case of cervidpoxvirus diagnosed in Washington State, and may be evidence of expanding geographical range of this virus.

Discipline: Anatomic pathology, **Topic:** Infectious disease, **Species:** Wildlife/Zoo, **Systems:** Integument

17: DOMESTIC CATS HAVE VARIABLE SEROPOSITIVITY FOR SARS-COV-2 OMICRON B.1.1.529 AND WUHAN-HU-1 VARIANTS SEVERAL YEARS AFTER VIRUS EMERGENCE (2024, 2026)

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Background: SARS-CoV-2 has evolved into several variant lineages since emerging in December 2019, and sub-variants of Omicron still circulate today. Domestic cats are susceptible to multiple variants following exposure to infected people or other cats. While the risk of cat-to-human transmission is low, cross-species spillover results in higher mutation rates and potential variant emergence.
Objective: Estimate variant-specific seroprevalence of SARS-CoV-2 in domestic cats using novel Omicron seroassays.
Methods: We assessed seroprevalence in owned domestic cats using sera samples submitted to the Colorado State University Veterinary Diagnostic Laboratory in 2024 and 2026 (n=350). We developed enzyme-linked immunosorbent assays to detect feline antibodies against spike (S1+S2) and receptor binding domain (RBD) antigens for Omicron B.1.1.529 (Omicron) and Wuhan-Hu-1 (Wuhan) antigens.
Results: We found 4.6% (16/350) SARS-CoV-2 seroprevalence for Omicron and Wuhan variants combined. Several cats were positive for the Wuhan variant only (n=8/16), and the majority of cats positive for Omicron were also positive for Wuhan (n=7/8). One individual was positive for the Omicron variant only.
Conclusion: Our results indicate Wuhan-based assays have enhanced sensitivity compared to Omicron. This may imply Wuhan antigens are more immunodominant, point to Omicron's immune evasion properties, or suggest cats infected earlier in the pandemic may have generated persistent antibodies. Most feline seroprevalence studies during the peak of human infections found less than 5% feline seroprevalence. Our study using contemporary samples found seroprevalence levels similar to those at the height of the pandemic, highlighting the importance of including domestic cats in future One Health disease monitoring.

Discipline: Clinical pathology, **Topic:** Immunology, **Species:** Feline, **Systems:** Systemic

18: A CASE OF HEPATOCYTOTROPHIC T-CELL LYMPHOMA IN A DOMESTIC SHORTHAIR CAT

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A 12-year-old spayed female domestic short hair cat was presented with severe neurological deficits that began in the left pelvic limb with loss of extensor tone. Signs progressed over two months to involve both hind limbs with bladder atony accompanied by marked muscle atrophy and loss of 30% of body weight. Clinicopathological findings included moderately elevated liver enzymes, hyperbilirubinemia, moderate azotemia, hyposthenuria, proteinuria, pyuria, and hematuria. Humane euthanasia was elected as the cat was non-ambulatory and hyporexic. A myeloradiculopathy secondary to lumbosacral neoplasia, intervertebral disc or cauda equina disease was suspected. Necropsy was performed by the veterinarian, and reported findings included hind end muscle atrophy, a small left kidney, hepatomegaly with pale-brown discoloration, and multifocal white-tan nodules along the lumbosacral spinal cord. Peripheral lymphadenopathy and splenomegaly were not identified. Samples of lumbosacral spinal cord, liver, kidneys, and heart were submitted for histopathology. Lumbar and sacral spinal nerves, right renal pelvis, left renal nervous plexus, and hepatic sinusoids were

infiltrated by intermediate to large neoplastic lymphocytes. The lymphocytes invaded hepatic cords consistent with hepatocytotrophic lymphoma. Immunohistochemistry was performed, and neoplastic cells expressed CD3 and were negative for CD79b. Additional findings included chronic tubulointerstitial nephritis and hypertrophic cardiomyopathy. Hepatocytotrophic T lymphoma and hepatic cord emperipolesis-like invasion are rarely reported in domestic animals. Similar to reports in dogs with hepatocytotrophic lymphoma, there was liver enzyme elevation with hyperbilirubinemia and a lack of peripheral lymphadenopathy. However, in this case initial presentation differed due to nervous system involvement.

Discipline: Anatomic pathology, **Topic:** Oncology, **Species:** Feline, **Systems:** Hepatobiliary

19: PROSTATIC ABSCESSATION TRIGGERING MULTISYSTEMIC UROSEPTIC DISEASE IN AN INTACT DOG

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A 32.2 kg, 5-year-old, intact male Dogo Argentino presented dead-on-arrival at an emergency hospital. He was previously diagnosed with a new heart murmur and a urinary tract infection (Proteus mirabilis and Klebsiella pneumoniae). The day before death, he was non-ambulatory with decreased appetite, heavy breathing, and diarrhea. The dog was submitted for postmortem examination. The right kidney was enlarged, irregular, and distorted and compressed by subcapsular red-brown purulent tissue that was also adhered to the capsule. The urinary bladder contained cloudy urine and its wall was thickened and hemorrhagic. The left kidney, urethra, and both ureters appeared grossly normal. The prostate gland was enlarged with surface hemorrhagic foci. The lungs were wet with multifocal, coalescing, circular, dark red-black, soft to firm lesions throughout all lobes. In the heart, a small nodular aggregate of soft pink-red, granular material was adhered to the left atrioventricular valve (LAVV). Histopathology confirmed: necrosuppurativepyelonephritis and papillitis in the right kidney; prostatic abscessation and glandular hyperplasia; necrohemorrhagic and fibrinosuppurative pneumonia; LAVV vegetative endocarditis; and necrotizing myocarditis. Considering the multisystemic findings in this intact male dog, the prostatic abscess was likely the primary site of infection, with pyelonephritis arising by ascending infection or hematogenous spread. Persistent bacteremia likely resulted in bacterial colonization of the LAVV and vegetative endocarditis, with hematogenous dissemination to the lung and heart. The combination of prostatic abscessation, pyelonephritis, LAVV endocarditis, necrotizing myocarditis, and necrohemorrhagic pneumonia in a canine patient is uncommon, underscoring the ability of prostatic infections to initiate fulminant multisystemic uroseptic disease.

Discipline: Anatomic pathology, **Topic:** Infectious disease, **Species:** Canine, **Systems:** Systemic

20: DEATH DUE TO SEVERE HEARTWORM (ACANTHOCHEILONEMA SPIROCAUDA) INFECTION IN A STRANDED HOODED SEAL (CYSTOPHORA CRISTATA) FROM THE NORTHEAST ATLANTIC OCEAN.

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A 41.7 kg, juvenile, male hooded seal (Cystophora cristata) was admitted to a rehab setting.
Physical exam revealed moderate dehydration, pulmonary congestion, and multiple wounds.
Initial bloodwork revealed pre-renal azotemia, neutrophilic leukocytosis, and microfilaremia
consistent with Dirofilaria immitis. The seal was found dead 10 days later in its pool and submitted for necropsy. Postmortem examination confirmed skin lacerations, puncture wounds,
serosanguinous nasal discharge, and tooth fractures. The heart appeared rounded and was
subjectively enlarged (left ventricular free wall, 2.5 cm thick; right ventricular free wall, 0.5 cm
thick). Numerous heartworm nematodes (5 to 15 cm length, 1 mm diameter) were found in the
right ventricle and embedded in a thrombus in the pulmonary artery. The lungs were heavy, wet,
and dark red in color. The tracheal lumen contained bloody foam, and numerous lungworm
nematodes (5 to 11 cm length, 1 mm diameter) were in the left and right bronchi. Nematodes (3
to 4 cm length, 0.5 mm diameter) were also in the esophagus and stomach. Histopathology
confirmed nematode fragments in the pulmonary arterial thrombus, lungs, and stomach. The
cause of death was determined to be obstructive and cardiopulmonary compromise associated
with heartworm (Acanthoeilonema spirocauda, presumptive) disease, with other contributing
factors, including multisystemic nematodiasis. This case highlights the critical value of stranding
network surveillance and thorough postmortem examinations in tracking shifting pathogen
dynamics. Documenting Acanthocheilonema spirocauda in a stranded hooded seal in New York
provides vital baseline data on parasite distribution and mortality factors in understudied, pelagic
marine mammals.

Discipline: Anatomic pathology, **Topic:** Infectious disease, **Species:** Aquatic, **Systems:** Cardiovascular

21: PRESUMPTIVE INBORN ERROR OF METABOLISM IN A CAIRN TERRIER WITH METABOLIC MYOPATHY AND ACUTE ENCEPHALOPATHY

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A 3-year-old spayed female Cairn Terrier presented with peracute neurologic dysfunction localized to the brainstem and possibly forebrain. Magnetic resonance imaging identified cerebellar swelling, hemorrhage, and herniation through the foramen magnum, and a mixed pleocytosis was diagnosed on cerebrospinal fluid analysis. The dog died approximately 36 hours after the onset of symptoms despite intensive care. The gross postmortem examination confirmed cerebellar herniation through the foramen magnum but was otherwise unremarkable. On post-fixation sectioning of the brain, there was central cavitation in the cerebellum with surrounding hemorrhage. Histologically, this corresponded with regionally extensive cerebellar encephalomalacia with microthrombi, hemorrhage, and rare polyglucosan bodies. Additionally, histology of skeletal muscle, tongue, and esophagus revealed widespread Periodic acid-Schiff (PAS) positive, variably diastase-resistant eosinophilic intrasarcoplasmic inclusions consistent with complex polysaccharide accumulation. Moderate, diffuse renal tubular lipidosis and occasional, mild hepatocellular microvesicular lipidosis were also present, and some affected myocytes contained discrete sarcoplasmic vacuoles interpreted as lipid. Concurrent central nervous system polyglucosan body formation, widespread intrasarcoplasmic polysaccharide accumulation in striated muscle, and multiorgan lipidosis support a presumptive inborn error of carbohydrate and/or lipid metabolism as the cause of the fatal encephalopathy and metabolic myopathy in this dog. Genetic testing is pending and may clarify whether this represents a disorder of glycogen or polyglucosan metabolism, a defect of mitochondrial fatty acid oxidation, or another inborn error of energy metabolism.

Discipline: Anatomic pathology, **Topic:** Metabolic disease, **Species:** Canine, **Systems:** Muscle

22: USING IMMUNOFLUORESCENCE TO EVALUATE THE EXPRESSION OF FOLATE ALPHA RECEPTORS AS A NEW DIAGNOSTIC TEST IN THE HEPATOCYTES OF DOGS WITH HEPATOCELLULAR CARCINOMA COMPARED WITH HEPATOCELLULAR HYPERPLASIA

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Background: Hepatocellular carcinoma (HCC) and hepatocellular nodular hyperplasia (HCH) are two liver diseases with different prognosis in older dogs. Cytology alone cannot differentiate between them, and a biopsy with histopathology examination is required for a definitive diagnosis. Folate receptor alpha (FRα) has been overexpressed in certain neoplasia of dogs.
Hypothesis: 1) We will identify expression of FRα in hepatocytes of dogs with benign and malignant liver diseases. 2) We will identify higher expression of FRα in dogs with HCC.
Objectives: 1) Determine the expression of FRα in hepatocytes of dogs. 2) Identify the expression of FRα in HCC compared with HCH.
Methods: Ten dogs with HCC, six dogs with HCH, and five normal dogs with a confirmed histopathology diagnosis were included. Immunofluorescence staining (IF) was performed on formalin-fixed paraffin embedded tissue using FRα (Anti-rabbit 594) and pan-cytokeratin (Alexa Fluor 488). Fluorescence intensity and quantification using QuPath software, along with expression patterns (e.g. cytoplasmic vs. membranous) were examined.
Results: There was a significant difference between fluorescent intensity per cell of HCC vs. HCH (P-value=0.034) and HCC vs. normal (P-value=0.016); There was no significant difference between HCH and normal (P-value=0.272). All HCC cases (10/10) showed a diffuse, cytoplasmic FRα expression. For HCH cases, 4/6 had membranous expression while 2/6 had cytoplasmic expression. All normal livers (5/5) had a membranous expression.
Conclusion: FRα fluorescent intensity and pattern may be used as a new diagnostic tool in differentiating HCC from HCH in dogs, which warrants further research on cytologic samples of canine liver.

Discipline: Both, **Topic:** Oncology, **Species:** Canine, **Systems:** Hepatobiliary

23: CYTOLOGIC AND HISTOPATHOLOGIC ANALYSIS OF A MALIGNANT PERIPHERAL NERVE SHEATH TUMOR WITH CHONDROID METAPLASIA IN A CANINE

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A 4-year-old female spayed German Shepherd canine presented to the Ohio State University Veterinary Medical Center Neurology Service for evaluation of chronic progressive right forelimb lameness suspected by the rDVM to be neurologic in origin. Physical examination revealed marked lameness and muscle atrophy of the right forelimb. Neurologic examination was consistent with a right brachial plexus radiculopathy or secondary to musculoskeletal disease. A right brachial plexus MRI revealed a nodule with minimal perineural effusion and mild neuritis of the right radial nerve. Cytology of the radial nerve nodule revealed occasional moderately atypical mesenchymal cells and occasional multinucleated cells interpreted as mesenchymal cell proliferation with concern for sarcoma, and surgical biopsy was recommended.

Greater than 90% of atypical cells demonstrated strong positive cytoplasmic and membranous staining with alkaline phosphatase cytochemical stain. Amputation of the right thoracic limb with proximal radial nerve resection was performed. Histopathology of the right radial nerve revealed a poorly demarcated, unencapsulated, moderately cellular mass comprised of mesenchymal cells arranged in short bundles and streams supported by tendrils of brightly eosinophilic fibrovascular stroma. Approximately 60% of one tissue sample was composed of multifocal islands of chondroid matrix (chondroid metaplasia) encapsulating the neoplastic cell population. These findings were interpreted as sarcoma with marked chondroid metaplasia, and malignant peripheral nerve sheath tumor (PNST) with marked chondroid metaplasia was the primary differential. This case report details cytologic and histologic findings associated with a rare case of canine malignant PNST with chondroid metaplasia.

Discipline: Both, **Topic:** Oncology, **Species:** Canine, **Systems:** Nervous

24: THE COLLABORATIVE CROSS MOUSE MODEL REVEALS GENETIC BASIS FOR SUSCEPTIBILITY AND RESISTANCE TO PRIMARY AMEBIC MENINGOENCEPHALITIS

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Background: *Naegleria fowleri (Nf)* is the causative agent of Primary Amebic Meningoencephalitis (PAM), a disease with a >97% mortality rate in infected individuals, with an average of five cases per year in the United States. Previous work in the lab showed that genetically diverse mice from the Collaborative Cross mouse model had differing survival outcomes post-*Nf* challenge as assessed by both survival time and detected amoebic burdens.
Objectives: To explore gross pathology and immune response variations between genetically distinct mice challenged with lowly and highly virulent *Nf* amoebae.
Methods: Seven mouse lines representing a gradient of previously phenotyped PAM survival outcomes were challenged with either V067 (5,000) or Villa Jose (500) parasites. Mice were euthanized according to approved AUP parameters based on symptomology (greater than 20% weight loss or neurological symptoms). Whole brains were formalin-fixed, paraffin-embedded, and H&E stained for pathological analysis via QuPath to compare their immune responses.
Results: Refractory mice (CC032, CC058) showed survival patterns suggesting improved outcomes in comparison to more susceptible mice (CC039, CC012, AJ). This is especially true for CC058, which showed improved survival outcomes with both lowly (V067) and highly (Villa Jose) virulent *Nf* isolates. Histopathology showed notable differences in neutrophil responses between refractory, susceptible, and control C57/Bl6J mice.
Conclusion: Genetically diverse mice had survival outcomes comparable to previous studies. Differences in neutrophil response may play a notable role in survival outcomes. Future studies will further characterize how these responses correlate with improved or reduced survival outcomes.

Discipline: Clinical pathology, **Topic:** Infectious disease, **Species:** Rodents, **Systems:** Nervous

25: YOLK EMBOLI IN A SNAKE

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An 11-year-old, intact female 0.4kg Corn snake presented for necropsy with a recurrent history of retained eggs. Five weeks prior to necropsy, the patient had been evaluated for a 90-day history of anorexia and a 1-day history of abnormal mentation and loss of righting reflex. Three retained eggs were visible on point of care ultrasound, and blood culture tested positive for salmonella and enterococcus. Despite treatment with broad spectrum antibiotics and initial clinical improvement, the patient was discovered acutely dead. Gross necropsy revealed chronic salpingitis with two, 2-cm, inspissated egg yolks in the oviducts and a firm, yellow mass 2-cm in diameter adhered to the presumptive right ovary. Histopathology revealed variably sized basophilic, proteinaceous globules indicative of multifocal yolk emboli in the liver, kidney, and heart; hemorrhagic, multifocal granulomatous salpingitis; and mineralized encapsulated egg yolk adhered to the right ovary. In this case, the yolk emboli most significantly affected the liver. Additional histopathology provided evidence of discrete lipid vacuoles in the liver and significant interstitial fibrosis in the heart. Yolk emboli have been primarily described in birds, particularly cockatiels, as secondary to severe inflammatory reactions and anecdotally described in reptiles, particularly lizards, as causes of fatality. However, the authors are unaware of any literature regarding the prevalence or significance of yolk emboli in snakes. The authors note that this animal's significant interstitial cardiac fibrosis may have also contributed to its sudden death through development of an arrhythmia.

Discipline: Both, **Topic:** General pathology, **Species:** Wildlife/Zoo, **Systems:** Reproductive

26: COMPARATIVE CASE DESCRIPTION OF PRIMARY VERSUS SECONDARY RUMINAL TYMPANY ASSOCIATED WITH THYMOMA IN SMALL RUMINANTS

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Ruminal tympany is the overdistention of the ruminoreticulum caused by gas produced from ruminal fermentation. While predominantly observed in cattle, ruminal tympany can also affect small ruminants. This can either be presented as frothy bloat (primary ruminal tympany) or free gas bloat (secondary ruminal tympany). Here, two cases representing each form in small ruminants are described. An approximately 10-year-old female pygmy goat and an 8-year-old female Icelandic sheep were submitted for postmortem examination to the Lewyt College of Veterinary Medicine. Both animals had a history of dyspnea and markedly distended rumen. In the pygmy goat, gross findings included the presence of a large (up to 20 cm) pale yellow, moderately firm, lobulated

and partially cystic cranial mediastinal mass which focally compressed the esophagus at the thoracic inlet. Microscopic features of this mass were consistent with those of thymoma. In the Icelandic sheep, the markedly distended rumen was filled with green, frothy fluid and a well demarcated “bloat line” was present in the esophagus at the level of the thoracic inlet. In both animals, ruminal tympany caused severe compression of the thorax and fatal cardiorespiratory collapse. In the Icelandic sheep, normal eructation was prevented by the formation of stable foam which led to the entrapment of fermentation gases (primary ruminal tympany). In contrast, in the pygmy goat, the eructation of free gas was impaired by focal esophageal compression caused by the mediastinal thymoma. Thymomas are not uncommon tumors in old goats, but secondary bloat is an unusual clinical complication.

Discipline: Anatomic pathology, **Topic:** Comparative pathology, **Species:** Small ruminants, **Systems:** Gastrointestinal

27: ANATOMOPATHOLOGICAL ASPECTS OF TRYPANOSOMA EVANSI INFECTION IN DOGS IN SOUTHERN BRAZIL

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Background: *Trypanosoma evansi* infection has been reported in Rio Grande do Sul, Brazil's southernmost state, since 2004; however, in recent years, there has been an increase in canine cases.

Objective: Describe a series of cases of *T. evansi* trypanosomiasis in dogs in the southernmost region of Brazil.

Methods: All dogs subjected to necropsy had diagnosis of *T. evansi* infection, established via examination of blood smears and confirmed by PCR reactions targeted a 205 bp fragment of the RoTat 1.2 VSG gene.

Results: All dogs necropsied had the same lesions with varying degrees of severity: pale mucous membranes, hepatomegaly, splenomegaly, and lymphadenomegaly. Histologically, the lymph nodes showed lymphoid hyperplasia and expansion of the medullary cords by plasma cells, plasmablasts, and Mott cells. In the spleen, there was lymphoid hyperplasia and plasmacytosis of the red pulp. In the liver, there was Kupffer cell hypertrophy. Variable nodal, splenic, and hepatic hemosiderosis was also present. Additionally, there was membranoproliferative glomerulonephritis and nonsuppurative myocarditis. Blood smears revealed the presence of free organisms with characteristics of *Trypanosoma* sp. trypomastigotes.

Conclusions: The lesions observed are typical of a chronic hemolytic crisis. The presence of flagellated organisms in the blood allowed for a diagnosis of trypanosomiasis. Molecular testing established the etiological diagnosis as *T. evansi*.

Discipline: Anatomic pathology, **Topic:** Infectious disease, **Species:** Canine, **Systems:** Systemic

28: RUPTURE OF A PULMONARY GIANT CELL SARCOMA CAUSING PNEUMOTHORAX IN A RABBIT

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A 10-year-old, male, castrated, mixed-breed rabbit presented dead on arrival to the referring veterinarian after a two-day history of mild decreased appetite and fecal production. The owner found the patient deceased shortly after hearing a scream. The patient received routine preventative care and had no significant medical history. On necropsy, the thoracic cavity lacked negative pressure, and the lungs were diffusely atelectatic. Within the right caudal lung lobe, there was a 3 X 2.5 X 2.5 cm mass, composed of a peripheral rim of white tissue with a collapsed, hollow center and focal region of disruption of the pleura. Additional masses were present in the lungs, liver, and kidney. Together, gross pathologic findings identified severe pneumothorax with secondary atelectasis, due to rupture of the large pulmonary mass. Histopathologic examination of the mass revealed a highly infiltrative, pleomorphic neoplasm with frequent large, multinucleated cells. Neoplastic cells were organized in sheets, round to spindle shaped, and supported by a scant fibrovascular stroma. Throughout the neoplasm were variably sized regions of necrosis and cavitation with heterophil infiltration. The liver and kidney masses were identified as metastases of the pulmonary neoplasm. Findings were consistent with previous descriptions of pulmonary giant cell sarcoma in rabbits. There have been rare reports of pneumothorax secondary to rupture of pulmonary giant cell sarcomas in rabbits; however, to the authors' knowledge, this represents the first report of a sudden death.

Discipline: Both, **Topic:** Oncology, **Species:** Rabbits, **Systems:** Respiratory

29: GLÄSSER'S-ASSOCIATED MENINGOENCEPHALITIS IN A GROWING PIG

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Herd health on a farm with about 50 pigs in all stages of production and a variety of breeds was declining after the producer switched from bagged feed to bulk feed in a newly built silo. A 4 month-old, female, Gloucester Old Spotted pig presented for necropsy after inability to rise in the hind end and seizure-like activity shortly followed by death. Upon gross examination, mild periarticular edema on the right hock was found with no fibrinous arthritis. The lungs had moderate, diffuse edema and failed to collapse when the thorax was opened, consistent with acute interstitial pneumonia presumptively caused by sepsis. The liver had mild, multifocal fibrosis consistent with milk spots from Ascaris suum, and the peritoneum had mild, diffuse, fibrinous peritonitis. All lymph nodes were mildly enlarged. With further microscopic examination of the brain, there was diffuse, marked infiltrates of neutrophils and fewer macrophages with marked fibrin expanding the meninges and Virchow-robins spaces that extended into the rarefied submeningeal neuroparenchyma. There were many fibrin thrombi occluding blood

vessels along with evidence of vasculitis. Although no bacteria was evident with Gram staining, Glaesserella parasuis was detected by PCR in the brain. Additionally, PCV2/3 was not detected by PCR in the lung, brain, or intestine and Streptococcus suis was not detected in the brain. Glaesserella parasuis is a gram-negative bacteria that causes Glässer's Disease often in nursery pigs. Cases of Glässer's-associated meningoencephalitis with little to no involvement of other serosal spaces are scantly reported in the literature.

Discipline: Anatomic pathology, **Topic:** Infectious disease, **Species:** Porcine, **Systems:** Systemic

30: PULMONARY HYALINOSIS IN TWO EASTERN GRAY SQUIRRELS (SCIURUS CAROLINENSIS)

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Background: Pulmonary hyalinosis is a rare alveolar-filling disorder characterized by multifocal accumulation of hyaline material within the alveolar spaces. Pulmonary hyalinosis has been reported in few species, but not previously in squirrels.
Objective: This study characterizes the gross, histopathologic, histochemical, and ultrastructural features of pulmonary hyalinosis in two squirrels and compares these findings with those previously reported in other species.
Methods: Two juvenile squirrels were presented to the Wildlife Hospital of Louisiana following traumatic events. During hospitalization, both squirrels developed respiratory distress and were eventually found deceased in their cages and submitted for postmortem evaluation. Pulmonary lesions were characterized by hematoxylin and eosin staining, periodic acid-Schiff (PAS) reaction, and birefringence under polarized light. Formalin-fixed lung samples from both squirrels were submitted to a referral diagnostic laboratory for further characterization by transmission electron microscopy.
Results: Postmortem findings were similar in both animals. Grossly, the lungs were diffusely red, and histologic examination revealed alveolar accumulation of acellular amphophilic, variably PAS-positive, birefringent material accompanied by alveolar macrophages and multinucleated giant cells. Ultrastructural examination of one sample demonstrated laminated to irregular whorl-like structures with or without a dense osmiophilic core within the alveolar spaces and macrophages, supporting a diagnosis of pulmonary hyalinosis.
Conclusion: The morphologic, histochemical, and ultrastructural features were largely consistent with pulmonary hyalinosis previously reported in dogs and sugar gliders. This report expands the range of species in which pulmonary hyalinosis has been

recognized and suggests that pulmonary hyalinosis should be considered among the differential diagnoses for alveolar-filling disorders in squirrels.

Discipline: Anatomic pathology, **Topic:** Comparative pathology, **Species:** Wildlife/Zoo, **Systems:** Respiratory

31: DIAGNOSTIC PERFORMANCE OF ADVIA 2120/2120I DELTA TOTAL NUCLEATED CELL COUNT AND AN EFFUSION INDEX FOR FELINE INFECTIOUS PERITONITIS

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Background: Acid-induced protein precipitation in the Sysmex XT-2000iV basophil channel traps cells in feline infectious peritonitis (FIP) effusions, increasing delta total nucleated cell count (ΔTNC). Whether analogous ADVIA 2120/2120i measurements are diagnostically useful is unknown.
Objective: To evaluate ADVIA-derived ΔTNC and a composite FIP Effusion Index for identifying FIP-associated effusions.
Methods: Archived feline body cavity effusions analyzed with ADVIA 2120/2120i analyzers at Auburn and Tufts Universities were retrospectively reviewed. FIP cases had compatible clinical findings and positive effusion feline coronavirus PCR or tissue immunohistochemistry; controls had an alternative diagnosis explaining the effusion. ΔTNC was the peroxidase-to-basophil channel count ratio. The Effusion Index was ΔTNC divided by the effusion albumin:globulin ratio (A:G). Groups were compared using Mann-Whitney U tests; diagnostic performance was assessed by receiver operating characteristic (ROC) curve analysis.
Results: ΔTNC was higher in 41 FIP effusions (median, 1.55; IQR, 0.91-3.28) than in 198 controls (0.76; 0.52-0.92; $P<0.001$), with an area under the curve (AUC) of 0.811. A cutoff >1.44 was 53.7% sensitive and 97.5% specific. The Effusion Index was higher in 32 FIP effusions (4.50; 2.20-6.59) than in 145 controls (0.94; 0.64-1.22; $P<0.001$), with an AUC of 0.925. A cutoff >1.56 was 90.6% sensitive and 86.9% specific. In the matched chemistry subset, A:G alone performed similarly (AUC, 0.926).
Conclusions: High ADVIA-derived ΔTNC is highly specific but insensitive for FIP-associated effusions when compared with all other effusion types. The Effusion Index increases sensitivity but does not improve discrimination beyond A:G alone.

Discipline: Clinical pathology, **Topic:** Infectious disease, **Species:** Feline, **Systems:** Systemic

32: CAVERNOUS SINUS SYNDROME IN A CAT WITH METASTATIC ADENOCARCINOMA

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Cavernous sinus syndrome (CSS) is a clinical disorder characterized by a deficit in more than one of the cranial nerves III, IV, V, and VI, which can be caused by a mass in the cavernous sinus (CS). An 8-year-old female spayed domestic shorthair cat was euthanized and submitted for necropsy following a 6-month history of suspected pulmonary neoplasm, which was treated with radiation therapy and chemotherapy. The cat was diagnosed with CSS 2 months before euthanasia after presenting with right unilateral internal ophthalmoplegia, external ophthalmoparesis, and absent corneal sensation. Computed tomography confirmed the presence of a mass in the cavernous sinus. Gross examination revealed pleural effusion and 3-5 mm diameter bilateral pulmonary nodules. Histologically, the pulmonary nodules were composed of neoplastic epithelial cells arranged in tubules and chords supported by a fibrous connective tissue stroma. Similar neoplastic epithelial cells infiltrated multiple cranial nerves in the area of the sella turcica. Neoplastic epithelial cells were positive for cytokeratin and negative for thyroid transcription factor by immunohistochemistry. Given the absence of previously reported tumors and the microscopic findings, a diagnosis of metastatic pulmonary adenocarcinoma was made. This case highlights metastatic pulmonary adenocarcinoma as a cause of unilateral cavernous sinus syndrome in cats.

Discipline: Anatomic pathology, **Topic:** Oncology, **Species:** Feline, **Systems:** Respiratory

33: PRE-CLINICAL ASTROCYTIC CHARACTERIZATION IN THE DORSAL VAGAL COMPLEX AND HIPPOCAMPUS OF PRION INFECTED SYRIAN HAMSTERS

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Background: Prion infections are caused by conversion of normal, cellular prion protein into the misfolded form (PrPSc). Accumulation of PrPSc in the central nervous system of mammalian hosts causes fatal neurodegenerative diseases. Despite PrPSc being the causative agent driving prion diseases, they are not inherently neurotoxic. Instead, neurodegeneration has been linked to astrocytic and microglial activation. In Syrian hamsters infected with a prion disease called HaMSP, statistically significant increases in astrocytic activation were found at 120 days post infection (dpi) but not at 40dpi in the dorsal vagal complex (DVC) of the brain stem. While neurological signs start at approximately 120dpi, we aim to identify when significant astrocytic activation occurs relative to uninfected controls. Hypothesis: We hypothesize that astrogliosis in the DVC and hippocampus in response to HaMSP infection occurs concurrently with characteristic preclinical obesity, observed between 60 and 100dpi. **Objectives:** We will quantify astrocytic activation in the DVC and hippocampus of HaMSP infected and uninfected Syrian hamsters. **Methods:** Astrocytes will be identified with anti-GFAP immunohistochemical staining on 7µm sections from hamsters collected at 60 and 100dpi. Signal quantification will be performed in QuPath, reported as percent region of

interest. **Results:** Significant astrocytic recruitment occurs in the hippocampus at 100 dpi with HaMSP but not at 60 dpi. No significant astrocytic recruitment occurs in the DVC at 60 or 100 dpi. **Conclusion:** These findings provide insight into the sequential pathogenesis of prion infection. They support astrogliosis as an early source of neurodegeneration linked to preclinical obesity as a defined outcome.

Discipline: Anatomic pathology, **Topic:** Infectious disease, **Species:** Rodents, **Systems:** Nervous

34: INVESTIGATION OF SPECIES-SPECIFIC PESTICIDE PROFILES IN MISSOURI BAT HAIR USING LC-MS/MS

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Background – Bats provide important natural pest control, yet many species in Missouri are experiencing significant population declines. Both habitat loss and disease are cited concerns; however, the contribution of pesticide exposure remains poorly understood. Widespread adoption of neonicotinoid insecticides beginning in the mid2000s has increased concern over chronic pesticide exposure in bats.
Hypothesis – We hypothesize that bat species will have distinct pesticide profiles due to differences in foraging ecology, diet, and habitat use.
Objectives – Compare pesticide residue profiles among Missouri bat species and evaluate differences between samples collected before and after the widespread adoption of neonicotinoid insecticides.
Methods – Approximately 15 mg of hair from archived, rabies-negative bats of different species from across Missouri were washed, pulverized, extracted, and analyzed by LCMS for 2,4-D, clothianidin, dicamba, glyphosate, imidacloprid, and thiamethoxam. Pesticide concentrations will be compared among species and chronologically.
Results – We expect neonicotinoids to be detected more frequently and at higher concentrations in more recently collected samples due to their wide acceptance. We also expect species-specific differences in pesticide residue profiles.
Conclusion – This study investigates species-specific pesticide residue profiles in Missouri bats, expanding from previous research that identified a non-invasive method utilizing LC-MS. A better understanding of chronic pesticide exposure may help identify potential environmental factors contributing to population declines and reinforces the use of hair in non-lethal ecotoxicological studies.

Discipline: Anatomic pathology, **Topic:** Toxicology, **Species:** Wildlife/Zoo, **Systems:** Systemic

35: DETECTION OF CYSTOISOSPORA SPP. IN BILE FLUID FROM AN IMMUNOSUPPRESED DOG

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Background: An 11-month-old, female spayed, mixed breed dog presented to Michigan State University (MSU) Veterinary Medical Center (VMC) for masticatory muscle myositis. Immunosuppressive treatment (initially 1.7mg/kg prednisone orally once daily then tapered to 1mg/kg and 5mg/kg cyclosporine orally twice daily added a few weeks later) was initiated. The patient presented 10 weeks later with liquid diarrhea, inappetence, and lethargy. Laboratory testing consisted of a CBC, chemistry profile, ionized calcium, urinalysis, ultrasound guided fine needle aspirates with cytology of liver and bile, cultures (urine, bile), qualitative fecal analysis, and Giardia SNAP test.
Results: Laboratory data were unremarkable aside from increases in total bilirubin (0.8 mg/dL) and ALT (334 IU/L). Qualitative fecal, Giardia SNAP test, and bile culture results were negative, but urine cultured positive for E. coli (×104 cfu/ml). The liver cytology was reported as mild multifocal hepatocellular rarefaction/clearing supportive for glycogen accumulation or hydropic change. Pleomorphic linear to curvilinear structures measuring ~1-4 x 10-20 µm were observed on concentrated bile fluid cytocentrifuge preparations. These structures had rounded, pointed, or blunted ends, a single nucleus, and 1-2 perinuclear vacuoles consistent with reported Cystoisospora spp.. A fecal sample spiked with bile fluid was negative for Cystoisospora spp. PCR (likely below detection limits). The dog recovered following appropriate antibiotic therapy for parasitic and bacterial infections.
Conclusion: Detection of structures consistent with Cystoisospora spp. merozoites, only reported once previously in bile, highlights the importance of bile fluid examination in patients with gastrointestinal signs because neither qualitative fecal analysis nor fecal PCR detected this parasite.

Discipline: Clinical pathology, **Topic:** General pathology, **Species:** Canine, **Systems:** Hepatobiliary

36: CANINE DIFFUSE GLIOMA CEREBRI WITH LEPTOMENINGEAL GLIOMATOSIS: A CASE REVIEW

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Background: Canine diffuse glioma, historically known as canine gliomatosis cerebri, is a rare presentation of glioma in dogs characterized by infiltrative spread of neoplastic glial cells without a focal mass. Leptomeningeal gliomatosis (LG) is characterized by leptomeningeal spread of neoplastic glial cells. Cases of diffuse glioma with SLG have been described in both human and veterinary medicine.

Case Presentation: An 8-year-old castrated male Husky presented with abnormal behavior over the previous few months. MRI demonstrated bilateral leukoencephalopathy, resulting in an extensive list of differentials. Four months later, repeat MRI revealed mild diffuse meningeal thickening. Euthanasia was elected.
Pathologic Evaluation: Sectioning of the brain revealed poor demarcation between the gray and white matter without a focal mass. Histologically, the white matter was expanded by an infiltrative population of spindle-shaped neoplastic cells with indistinct cell borders and oval nuclei containing condensed chromatin. Mitoses, necrosis, and microvascular proliferation were absent. Multifocally, neoplastic cells extended into and

expanded the leptomeninges. Immunohistochemistry demonstrated strong nuclear OLIG2 immunoreactivity and strong cytoplasmic GFAP immunoreactivity, supporting a diagnosis of low-grade diffuse glioma with leptomeningeal gliomatosis.

Discussion: Rissi et al. (2021) reported leptomeningeal spread in 9 of 24 canine diffuse gliomas, with most cases (6/9) diagnosed as low grade. Similar to those cases, this low-grade diffuse glioma exhibited extensive leptomeningeal spread, suggesting this subtype may behave more aggressively than its histologic grade alone would indicate.

Discipline: Anatomic pathology, **Topic:** Oncology, **Species:** Canine, **Systems:** Nervous

37: SEVERE MUCOPOLYSACCHARIDOSIS TYPE VI IN A DOMESTIC CAT

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A juvenile male domestic shorthair cat was presented for evaluation of worsening gait and poor mobility. Radiographic examination revealed widespread skeletal malformations with secondary degenerative changes consistent with a congenital or hormonal growth disorder. Metabolic testing confirmed mucopolysaccharidosis (MPS) type VI. The cat was palliatively managed for approximately one year until his clinical status deteriorated at 2 years of age. He was then presented to the University of Georgia for euthanasia and necropsy.
The musculoskeletal system was dysplastic and extensively remodeled. Changes included vertebral fusion from C2-C5 and T13-L2 with dysplastic and reduced dorsal spinal processes, osseus proliferation and osteophytosis in the cranium, pelvis, femurs, scapulae, and humeri, articular cartilage degeneration in the humeri and femurs, and epaxial muscle pallor. The left atrioventricular valves were mildly thickened. Histopathology revealed widespread mesenchymal cellular vacuolation in the femur, tibia, humerus, trachea, lung, heart, arteries, liver, and along with skeletal muscle degeneration. The cytoplasmic vacuoles had strong Alcian blue pH 2.5 reactivity with variable diastase-resistant Periodic acid-Schiff staining, indicating glycosaminoglycan (GAG) accumulation. These findings support the diagnosis of MPS VI, an inherited lysosomal storage disease characterized by arylsulfatase B deficiency and GAG accumulation, resulting in skeletal dysplasia in addition to myxomatous mitral valve degeneration. Cellular GAG-positive vacuolation was most prominent within chondrocytes and smooth muscle, consistent with MPS VI's predilection towards the musculoskeletal and cardiovascular systems. Both severe and mild forms of MPS VI occur in cats and the mode of inheritance is autosomal recessive.

Discipline: Anatomic pathology, **Topic:** Genetic/hereditary disorders, **Species:** Feline, **Systems:** Systemic

38: QUANTITATIVE ANALYSIS OF T CELL SUBSETS IN HISTOTRISPY-TREATED MURINE OSTEOSARCOMAS USING QUPATH

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Background: Histotripsy is a non-ionizing, non-thermal focused ultrasound ablation method that causes cell death though acoustic cavitation. It is a potential treatment for osteosarcomas, due to being minimally invasive. Furthermore, histotripsy may possibly activate adaptive immunity by releasing intact tumor antigens, which is crucial for reducing metastasis. This project explores how histotripsy affects T cell subsets in an orthotopic mouse model of osteosarcoma.
Hypothesis: We hypothesized that histotripsy-treated tumors would have a significantly higher percentage of CD4+ and CD8+ cells and a lower percentage of FoxP3 cells than untreated tumors.
Objectives: To quantify CD4+, CD8+, and FoxP3 T cells in histotripsy-treated and untreated osteosarcomas using digital image analysis.
Methods: Tumors from 22 histotripsy-treated and 3 untreated mice were sectioned and stained with H&E for qualitative assessment. Multiplex immunohistochemistry was performed with antibodies against FoxP3, CD4, and CD8. Slides were converted into whole slide images using a motic scanner and assessed using QuPath. An object classifier was trained in QuPath to distinguish FoxP3, CD4+, and CD8+ cells. This classifier was run on five non-overlapping annotations per slide. The percentages of T cell subsets were compared with a two-way ANOVA test.
Results: There was no significant difference between the average percentages of T cell subsets of untreated and treated tumors, or between percentages from different sacrifice timepoints.
Conclusion: Based on our results, histotripsy alone is insufficient for eliciting adaptive immune activity in osteosarcoma. Histotripsy as sole therapy is thus unlikely to significantly reduce metastasis in osteosarcoma.

Discipline: Anatomic pathology, **Topic:** Oncology, **Species:** Rodents, **Systems:** Bone and joints

39: RHABDOMYOSARCOMA IN A GREEN TREE FROG

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A 9-year-old, female Green Tree Frog was presented for necropsy at the University of Melbourne. Two weeks prior she presented due to a mass on the back along with signs of sepsis and generalized edema. Antibiotics were started but the frog died spontaneously.

The frog had generalized edema with a solid mass on the caudaldorsal aspect within the subcutaneous tissue, measuring 2.0 cm by 1.5 cm by 1.0 cm, and extending between the muscles of the left hindleg. Other findings included an enlarged liver and

multiple pale nodules within the kidneys.

An impression smear of the mass revealed rounded to highly elongated, individualized, mesenchymal cells with marked criteria of malignancy. Many multi-nucleated cells, where the nuclei lined up in rows, were seen.

On histopathology, the subcutaneous mass consisted of a non-encapsulated, poorly circumscribed neoplasm composed of streams of highly pleomorphic cells with indistinct borders, occasionally fibrillar cytoplasm and prominent nucleoli. Frequent multinucleated cells appeared consistent with “strap cells”. Neoplastic cells were also noted in the kidney, mesentery, ovaries and heart.

The diagnosis was rhabdomyosarcoma with systemic metastasis. Rhabdomyosarcoma is a rare musculoskeletal neoplasia in animals. Special stains that are helpful to confirm the diagnosis include muscle and sarcomeric actin, myoglobin, desmin, Masson’s Trichrome, Mallory’s PTAH, and Best’s Carmine. This case report describes an uncommon tumor in an uncommon species that shows classic cytologic and histologic findings of the neoplasm.

Discipline: Both, **Topic:** Oncology, **Species:** Wildlife/Zoo, **Systems:** Muscle

40: COMPARISON OF HISTOLOGIC LESIONS IN THE FLORIDA PINK MILLIPEDE (NARCEUS AMERICANUS) AND THE GIANT AFRICAN MILLIPEDE (ARCHISPIROSTREPTUS GIGAS)

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Background: Millipedes are sentinel invertebrates, reflecting soil health in ecosystems, and are increasingly propagated by hobbyists for the pet trade and housed at zoological institutions for exhibition and education. Histologic analyses of millipedes are limited and pathology of only one species, the giant African millipede (*Archispirostreptus gigas*) has been thoroughly described in surveyed English literature.
Objective: In this retrospective study, histologic lesions were described for Florida pink millipedes (*Narceus americanus*) from a zoological institution between 2014 and 2018 and compared to previously reported lesions of *A. gigas* from the same zoological institution.
Methods: Available *N. americanus* cases submitted to the Zoological Pathology Program from 2014–2018 were collated. Reports and slides were reevaluated and compared to findings of *A. gigas*. Statistical analyses were completed using R to generate descriptive statistical plots and inferential statistical results.
Results: Compared to previous reports from *A. gigas*, *N. americanus* showed similar frequency of inflammatory lesions in the digestive and respiratory tracts, decreased perivisceral fat body lesions, increased nematodiasis, and novel acanthocephaliasis. Histologic lesions seen in both species were similar morphologically.
Conclusion: Histopathology is an important and powerful tool to better understand

health and disease of millipedes and other terrestrial invertebrates. Considering their roles as sentinel species and ecosystem health indicators, further histologic investigations are warranted.

Discipline: Anatomic pathology, **Topic:** Comparative pathology, **Species:** Invertebrates, **Systems:** Systemic

41: BILATERAL BLINDNESS IN A MOLLY MULE CONSEQUENT TO SQUAMOUS CELL CARCINOMA OF THE SPHENOPALATINE SINUS

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Squamous cell carcinoma (SCC) is one of the most prevalent neoplasms of equids; however, malignancies of the paranasal sinuses are uncommonly identified. A 21-year-old molly mule presented for sudden bilateral blindness. Neuro-ophthalmic examination revealed decreased direct and consensual pupillary light reflexes (PLR), intact dazzle reflexes, and an absent menace response in both eyes. No significant structural abnormalities were identified, and electroretinogram concluded normal retinal function. Computed tomography of the head and neck revealed a mass of the sphenopalatine sinus. At necropsy, a 6 cm diameter, tan-pink, firm to fleshy, irregularly shaped, sharply demarcated mass involving the sphenoid bone and sphenopalatine sinus was confirmed. Extending rostrally to the ethmoid turbinates, the mass displaced the ventral aspect of the calvarium dorsally and enveloped the optic chiasm. Histopathology revealed a highly cellular, infiltrative neoplasm composed of polygonal cells arranged in anastomosing trabeculae and nests within a desmoplastic stroma. Also appreciated were 56 mitoses in ten 400x fields, multifocal keratinization, and marked anisocytosis and anisokaryosis. Sections of the optic chiasm and optic nerves compressed by the tumor displayed multifocal dilated axon sheaths and rare digestion chambers. Compression and subsequent degeneration of the optic chiasm was sufficient to explain central blindness in this mule.

Discipline: Anatomic pathology, **Topic:** General pathology, **Species:** Equine, **Systems:** Nervous

42: CHARACTERIZING AGE-RELATED CHANGES IN THE TESTES AND EPIDIDYMIDES OF ZOO-MANAGED LYCAON PICTUS

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Background: African painted dogs (APD; *Lycaon pictus*) are among Africa's most endangered carnivores. Complex social and reproductive hierarchies find APDs living in packs with breeding largely restricted to a dominant pair. Male fertility is a critical determinant of reproductive success. Age-related accumulation of lesions within the reproductive tract is common in many male species but is not yet described in APD males. We hypothesize that the prevalence and severity of lesions in the male APD reproductive tract will increase with age.

Objectives: 1) Characterize and score histologic abnormalities in the testes and epididymides of zoo-managed APDs; and **2)** Determine the age at which gonadal health significantly declines.

Methods: Testes and epididymides were collected from 31 zoo-managed APDs following necropsy or castration. Tissues underwent standard preparation for histology. Histologic sections were evaluated for the presence and distribution of inflammatory, neoplastic, or degenerative change. A degeneration rubric was used to semi-quantitatively grade testicular degeneration. Area and density of seminiferous tubules was calculated with Qupath®. Demographic data was compiled to assess association with lesion patterns. Statistical analyses were performed in GraphPad prism.

Results: Testicular degeneration showed a positive trend with age. Area of seminiferous tubules tended to increase, and density tended to decrease with advancing age. Histologic findings included seminomas, hemorrhage, tubular and cellular degeneration, epididymal hyperplasia, and epididymitis. Seminomas were observed exclusively in males over 10 years of age (7/23 cases, χ^2 p=0.017).

Conclusion: Male APDs over 10 years old are significantly more likely to develop seminomas, supporting age-related decline in fertility.

Discipline: Anatomic pathology, **Topic:** General pathology, **Species:** Wildlife/Zoo, **Systems:** Reproductive

43: AN ASSESSMENT OF THE PROTECTIVE ABILITY OF SUPPLEMENTAL BLF ON GUT EPITHELIAL INTEGRITY AGAINST AN AVIAN COCCIDIOSIS VACCINE CHALLENGE

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Background: Coccidiosis, caused by *Eimeria* spp., causes intestinal damage and reduced feed intake, leading to major economic losses in the poultry industry. Bovine lactoferrin (bLF) possesses antimicrobial and immunomodulatory properties but remains understudied as a therapeutic or prophylactic strategy for avian coccidiosis.
Hypothesis: We hypothesize that compared with the unsupplemented, *Eimeria*-challenged chickens; the bLF-supplemented chickens will have fewer intestinal lesions, lower numbers of coccidia life stages, and a higher expression of tight junction proteins.
Objectives: This study aims to evaluate the efficacy of bLF in enhancing the immune

response and reducing the severity of damage to gut epithelial integrity in coccidia-inoculated chickens.
Methods: Intestinal tissues from Cornish Rock chickens assigned to three treatment groups (bLF-supplemented vaccine-challenged, vaccine-challenged, and unchallenged controls) were evaluated using brightfield and immunofluorescent histology. Immunofluorescent markers were quantified via imageJ/Fiji. Statistical analyses were performed via JASP where significance was considered as ($p < 0.05$).
Results: Total mucosal area differed among treatment groups (ANOVA, $p = 0.023$), with a significant difference between challenged and unchallenged chickens ($p = 0.022$). Absolute IL-10 immunoreactive area also differed ($p = 0.020$), whereas IL-10 normalized to mucosal area ($p = 0.422$) and IFN-γ immunoreactivity were not significantly different. Quantitative analysis of Giemsa-stained sections to assess parasite burden is ongoing.
Conclusions: bLF supplementation was associated with alterations in intestinal morphology and absolute IL-10 immunoreactivity following an Eimeria challenge. Apparent ZO-1 immunoreactivity associated with morphologically consistent intracellular Eimeria developmental stages warrants further investigation.

Discipline: Anatomic pathology, **Topic:** Immunology, **Species:** Avian, **Systems:** Gastrointestinal

44: CONCURRENT MASTITIS AND EXTENSIVE REPRODUCTIVE TRACT INFECTION IN A MIXED BREED GOAT

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A 15-year-old, female mixed breed goat presented with a distended abdomen and possible mammary gland tumors. Due to poor prognosis, humane euthanasia was elected. Gross necropsy revealed a markedly distended rumen filled with thick green feed material mixed with gas. The spiral colon and small intestine were displaced dorsally by the rumen. Within the vagina and extending past the cervix and into the uterus was a moderate amount of thick, white, purulent material mixed with fibrin and necrotic debris. The vaginal epithelium is diffusely and moderately thickened, and a 2x2x2 cm round tan to red mass was adhered to the vaginal epithelium. The uterine wall was mildly thickened. The mammary glands were mild to moderately distended along the caudal and middle aspects. Upon cut section, a moderate amount of similar purulent, thin material mixed with white clotted material oozes from inner parenchyma. Bacterial culture identified a minimal growth of Escherichia coli with no identified toxins. Histopathology of the reproductive tract revealed extensive suppurative inflammation of the vagina, cervix, uterus, and oviduct with intralesional short bacterial rods. The uterine wall demonstrated cystic endometrial hyperplasia, and the vaginal mass was consistent with a large granuloma with central necrosis and suppurative inflammation admixed with bacteria and occasional Splendore-Hoeppli material. Mammary gland histopathology revealed mild to moderate glandular dilation and hyperplasia. Collectively, these findings are consistent with an extensive reproductive tract infection with extension into the mammary gland, resulting in a mass effect noted clinically.

Discipline: Both, **Topic:** Infectious disease, **Species:** Small ruminants, **Systems:** Reproductive

45: UNILATERAL OVARIAN TORSION IN A LEOPARD GECKO (EUBLEPHARIS MACULARIUS)

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A 1-year-old intact female Leopard gecko (*Eublepharis macularis*) was found dead with no previous history of disease. External examination revealed generalized pallor with a markedly red and enlarged abdomen. Upon internal examination the left ovary was bright red and severely enlarged, displacing adjacent tissues, with torsion of the ovarian ligament. On microscopic examination the left ovarian capillaries were diffusely and markedly congested with multifocal marked hemorrhage. Cause of death was determined to be hypovolemic shock due to hemorrhage secondary to torsion of the ovarian ligament. A cause for the torsion was not found as no cysts, visible trauma, or congenital defects were seen. Ovarian torsion refers to the partial or complete rotation of the ovarian supporting structures and constitutes a gynecological emergency. Reports of ovarian torsion in veterinary medicine are rare, but this condition is becoming increasingly reported in reptiles. To the best of the authors' knowledge this is the first case of ovarian torsion reported in leopard geckos. In other reptile species ovarian torsion has been the result of reproductive failure, lethargy related to ovarian activity, folliculostasis, ovostasis, or behavioral abnormalities. In classes other than reptiles, ovarian torsion has also been caused by excessive mobility of the ovarian adnexa due to lengthening of the infundibular ligaments, neoplasia, & abnormal configuration of the uterine horns, but these causes have yet to be reported in reptiles.

Discipline: Anatomic pathology, **Topic:** General pathology, **Species:** Other (Reptile: Leopard gecko), **Systems:** Reproductive

46: ALTERED CYTOKERATIN EXPRESSION IN EQUINE PENILE AND PREPUTIAL SQUAMOUS CELL CARCINOMA

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Background: Equine penile and preputial squamous cell carcinoma (EPPSCC) is a genital neoplasm of horses frequently associated with Equus caballus papillomavirus type 2 (EcPV2). Cytokeratins (CKs) are markers of epithelial differentiation; however, their expression in both non-neoplastic penile and preputial epithelium and EPPSCC remains incompletely characterized. In human stratified squamous epithelium, CK5/6 is normally confined to basal layers, whereas in human oral squamous cell carcinoma (OSCC), aberrant CK19 expression has been correlated with more aggressive neoplastic behavior. We hypothesized that EPPSCC exhibits altered CK5/6 and CK19

expression compared with non-neoplastic penile and preputial epithelium.
Objectives: To characterize CK5/6 and CK19 expression in EPPSCC and paired non-neoplastic epithelium using immunohistochemistry.
Methods: Six FFPE EPPSCC cases, each with paired non-neoplastic epithelium, were selected from the OSU case archives. Immunohistochemistry was performed on sections from all cases using validated CK5/6 and CK19 antibodies.
Results: Non-neoplastic epithelium exhibited maturation-associated attenuation of CK5/6 from basal to superficial layers, with CK19 expression absent from normal mucosal epithelium. CK5/6 immunolabeling extended through the full thickness of the epithelium in all EPPSCC cases, whereas CK19 exhibited a mosaic labeling pattern in tumor cords and nests within the dermis in two of six cases.
Conclusion: The loss of the normal CK5/6 maturation gradient supports the hypothesis that CK expression is altered in EPPSCC. CK19 labeling in EPPSCC localized to deeply invasive nests in a subset of cases may parallel the reported association of CK19 with aggressive human OSCC. These findings suggest EPPSCC merits evaluation as a comparative OSCC model.

Discipline: Anatomic pathology, **Topic:** Oncology, **Species:** Equine, **Systems:** Integument

47: RHABDOMYOSARCOMA IN A DOMESTIC CHICKEN: A CASE REPORT
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Rhabdomyosarcoma is a rare malignant mesenchymal neoplasm originating from skeletal muscle. These tumors exhibit considerable variation in gross appearance and histologic morphology, which can make diagnosis challenging. The tumor is most commonly described in dogs and spontaneous cases in avian species are rare. We describe a case of rhabdomyosarcoma in a backyard chicken. A 3-year-old hen died following a 24-hour history of lethargy and weakness. Gross examination revealed poor body condition with severe muscle atrophy, absence of adipose stores, and moderate postmortem autolysis. Two poorly demarcated, firm, white to off-white masses, each measuring approximately 5.0 cm in diameter, were present: one within the right pectoral muscle and the other within the musculature of the right crus. Microscopically, the masses were unencapsulated, poorly circumscribed, infiltrative, and composed of a densely cellular spindle cell population arranged in interlacing streams and bundles with scant eosinophilic fibrillar stroma. There was 1 mitotic figure per 2.37 mm², and moderate to marked pleomorphism. Immunohistochemically, the neoplastic cells showed strong immuno-signaling for desmin and pan-muscle actin and were negative for smooth muscle actin, supporting skeletal muscle origin. Based on

the gross, histologic, and immunohistochemical findings, the masses were consistent with rhabdomyosarcoma. Spontaneous cases of this tumor in avian species are exceptionally rare and this case contributes to the limited description of rhabdomyosarcomas in chickens warranting consideration.

Discipline: Anatomic pathology, **Topic:** General pathology, **Species:** Avian, **Systems:** Muscle

48: PRESUMPTIVE LEPTOMENINGEAL CARCINOMATOSIS IN A GERMAN SHEPHERD

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Carcinomatosis is an aggressive manifestation of epithelial neoplasia resulting in cell dissemination in body cavities, including the peritoneal, pleural, and subarachnoid space. Leptomeningeal carcinomatosis is rarely reported in dogs and a primary tumor has been reported in nearly all cases, with origins including mammary, colonic, gastric, nasal, and ovarian carcinoma.
A 10-year-old female intact German Shepherd dog was referred to the University of Florida Small Animal Hospital Emergency Service after experiencing multiple generalized seizures. Neurologic examination identified anisocoria (miotic OD), incomplete PLRs, ambulatory tetraparesis, and delayed TL/absent PL placing. Thoracic radiographs were unremarkable. MRI identified multifocal intra-axial nodules and a small hemorrhagic nodule in the right frontal lobe. CSF analysis revealed a marked neutrophilic pleocytosis, high protein and an atypical, often cohesive cell population displaying criteria of malignancy. Abdominal ultrasound showed bilateral, enlarged cystic ovaries.
Due to progressive neurologic decline and refractory seizures, humane euthanasia was elected. On necropsy, no primary tumor was found. Histopathology identified infiltrates of round to polygonal, typically individualized neoplastic cells multifocally tracking along the leptomeninges, with round to polygonal, individual to cohesive aggregates of cells infiltrating the neuroparenchyma. Metastases were identified in the lung, with frequent intravascular neoplastic emboli. Immunohistochemistry for vimentin and cytokeratin is pending.
This case was unusual as both a rare manifestation of presumptive carcinomatosis and the absence of an identified primary tumor. Cytologic evaluation of the CSF supported epithelial origin and may aid in recognizing carcinomatosis in cases of multifocal CNS neoplasia, even without primary tumor identification.

Discipline: Clinical pathology, **Topic:** Oncology, **Species:** Canine, **Systems:** Nervous

49: FLAVIVIRAL OCULAR PATHOLOGY IN EXPERIMENTALLY INFECTED PASSERINE BIRDS

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West Nile Virus (WNV), St. Louis encephalitis virus (SLEV), and Usutu Virus (USUV) are mosquito-borne flaviviruses that can cause neurologic disease and mortality in birds. Ocular lesions for naturally acquired WNV and USUV have previously been described in gallinaceous birds and raptors; however, there is a paucity of literature that describes flavivirus-associated ocular lesions in passerines. In two studies investigating infection kinetics of WNV, SLEV, and USUV in experimentally infected passerine birds, ocular pathology was evaluated in the birds that succumbed to either WNV or USUV. Four American robins (*Turdus migratorius*) were infected with USUV, and 16 house sparrows (*Passer domesticus*) were infected with WNV and/or SLEV in singular or heterologous infections. Observed pathology in both American robins and sparrows included mild to moderate lymphocytic pectenitis (2/4 robins, 50%; 8/16 sparrows, 50%), lymphocytic choroiditis (2/4 robins, 50%; 1/16 sparrows, 6.25%), and mild vacuolization of the optic nerve (1/4 robins, 25%; 1/16 sparrows, 6.25%). These findings generally mirror those seen in prior studies assessing ocular lesions among naturally infected birds, suggesting that experimental infection recapitulates natural pathogenesis; however, choroiditis was less commonly observed compared to the pre-existing literature. Additionally, moderate ulcerative or non-ulcerative lymphocytic conjunctivitis was found in 10% of birds but is likely unrelated to primary viral infection; rather, it was deemed likely secondary to chronic *Mycoplasma* spp. infection or an environmental irritant. Future studies could leverage different timepoints of infection to assess severity and lesional distribution over time, and immunohistochemical staining can be integrated to illustrate virus localization.

Discipline: Anatomic pathology, **Topic:** Infectious disease, **Species:** Avian, **Systems:** Eye/ear

50: PATHOLOGIC FEATURES AND EMERGING DISEASE TOLERANCE IN NOSEMOSIS INFECTION OF HONEY BEES

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Nosema ceranae is an intracellular microsporidian parasite that infects the ventricular epithelium of honey bees, reducing colony productivity and contributing to colony decline. The pathologic mechanisms underlying host susceptibility and disease tolerance remain incompletely understood. This study systematically characterized Nosema pathobiology, emphasizing histopathologic lesions, host immune responses, and mechanisms of disease tolerance. Web of Science and PubMed (2017–2026) were searched following PRISMA guidelines using predefined inclusion criteria for histopathologic, cytologic, ultrastructural, and immunologic outcomes. A total of 318 studies were included. Additionally, midguts from 12 experimentally infected worker bees representing California and commercial stocks (n = 6/group at 14 and 21 days post infection) were processed for routine histopathology to evaluate temporal lesions associated with disease tolerance. Based on literature review, early apoptosis of

infected epithelial cells was associated with reduced parasite replication, whereas apoptosis suppression favored parasite proliferation, demonstrating apoptosis-mediated epithelial turnover as a significant mechanism of disease tolerance. Histologically, commercial bees showed more severe epithelial swelling and peritrophic matrix disruption at 14 dpi, progressing to epithelial desquamation, irregular ventricular architecture, and extensive peritrophic matrix loss by 21 dpi. California bees had more organized epithelial architecture and comparatively preserved epithelial integrity despite infection, consistent with increased disease tolerance. Therefore, initial comparative histopathology of California and commercial honey bees demonstrates temporal differences in lesion progression consistent with published mechanisms of host resistance, however additional samples are being processed and analyzed to further validate our findings.

Discipline: Anatomic pathology, **Topic:** General pathology, **Species:** Invertebrates, **Systems:** Gastrointestinal

51: HORN-ASSOCIATED ADENOCARCINOMA WITH PULMONARY METASTASIS IN A TEXAS LONGHORN COW

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A 12-year-old Texas Longhorn cow was presented to the Oklahoma State University veterinary teaching hospital for a mass on the right forehead. Four years prior to presentation, a draining tract developed at the base of the right horn and gradually progressed to a large expansile mass involving most of the right forehead. Radiographs demonstrated marked frontal bone remodeling with soft tissue opacity filling the right horn. Following euthanasia, the submitting veterinarian dissected the mass and identified necrotic cavitations communicating with the right cornual process and frontal sinus. The carcass and mass were submitted to the Oklahoma Animal Disease Diagnostic Laboratory for postmortem evaluation. Grossly, the forehead mass was 25 cm in diameter, domed, and covered by horn. On cut surface, it was yellow-tan, firm, and contained multifocal areas of necrosis, mineralization, and dense fibrous septa. Several similar, 1–5 cm diameter, firm, yellow-tan nodules were scattered throughout the lungs. Histologically, the mass was unencapsulated and consisted of nests and tubules of markedly pleomorphic cuboidal to polygonal cells separated by abundant fibrous stroma. Mitotic figures were frequent (25/10 HPF) and multifocal intratumoral necrosis was present. Pulmonary masses were histologically similar. Presence of tubular differentiation and absence of squamous features favored a diagnosis of adenocarcinoma, with apocrine gland origin suspected. Carcinomas of the horn base in cattle are uncommon, and most reported cases are squamous cell carcinoma (SCC of horn; Horn core carcinoma). This unusual case of a horn-associated adenocarcinoma highlights differentials for horn tumors in bovids beyond the typical SCC.

Discipline: Anatomic pathology, **Topic:** Oncology, **Species:** Bovine, **Systems:** Integument

52: HEPATIC ALVEOLAR ECHINOCOCCUS (ECHINOCOCCUS MULTILOCULARIS IN AN AUSTRALIAN SHEPHERD DOG

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Background
Echinococcus multilocularis is a zoonotic cestode for which domestic canids and humans may serve as aberrant intermediate hosts. Eggs passed in feces of definitive hosts (typically wild canids) are ingested by intermediate hosts (small mammals, rodents) and form hydatid cysts in viscera, primarily liver. Definitive host consumption of infected intermediate hosts leads to completion of the parasite's life cycle (two-host predator-prey system). Alveolar echinococcus causes severe clinical symptoms following prolonged incubation periods. As shown in a recent study, *Echinococcus multilocularis* distribution has expanded to more southern states, including Illinois.
Objectives
To describe the pathologic findings of canine alveolar echinococcus and characterize the infecting strain.
Methods
Diagnostics included cytology of fluid from a liver mass, liver mass biopsy, and abdominal fluid cytology. Upon death, the patient submitted for necropsy. RT-PCR confirmed *Echinococcus multilocularis* infection.
Results
Biopsy revealed cyst-like structures lined by hypereosinophilic hyaline membranes and surrounded by histiocytic granulomatous inflammation, indicating *Echinococcus multilocularis* infection. Abdominal fluid analysis revealed membrane-like pink structures with folded contours and overlying calcareous corpuscles consistent with hydatid cysts. On necropsy, the hepatic parenchyma was largely replaced by cystic structures associated with pyogranulomatous and eosinophilic hepatitis on histopathology with intralesional degenerate metacestodes. Numerous similar cystic structures containing degenerate cestodes were also scattered throughout the abdominal cavity.
Conclusions
This case demonstrates *Echinococcus multilocularis* infection causing hydatid cysts in a dog. Because of expanding distribution and zoonotic potential of *Echinococcus multilocularis*, it is recommended that dogs exposed to wild rodents and canids should be dewormed monthly with a cestocide.

Discipline: Anatomic pathology, **Topic:** Infectious disease, **Species:** Canine, **Systems:** Hepatobiliary

53: DISSEMINATED CRYPTOCOCCOSIS IN TWO SWINE CASES

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Cryptococcosis, associated with *Cryptococcus neoformans/Cryptococcus gattii* species complex, is a severe systemic mycosis that is typically observed in felines but has been reported in canines, equines, and ruminants. Case reports are overall rare in swine.

Between October 2025 and March 2026, two pot-bellied pigs from the same property (n=2) were admitted to the Auburn University Large Animal Teaching Hospital for anorexia and lethargy. While hospitalized, the first pig was found to be lethargic and tachypneic, with oral mucosal petechiation. While undergoing diagnostic imaging, the patient developed cardiopulmonary arrest and died. The second pig was treated for signs of dehydration and sepsis before experiencing an acute neurological decline and dying.

On gross examination, the first pig was found to have pulmonary edema, bi-cavitary effusion, and proliferative, chronic pleuritis. Histopathology revealed fibrinohemorrhagic interstitial pneumonia, granulomatous meningoencephalitis, and interstitial nephritis. Intra-lesional infiltration of yeast-like organisms was identified in affected tissues. Pulmonary edema was also identified on gross examination of the second pig. Histopathological findings mirrored the first pig, with yeast-like infiltration in the lungs and cerebral tissue.

A panfungal PCR was performed on the first pig, and the results were consistent with *Cryptococcus gattii*. Fungal culture from the second pig was also consistent with *C. gattii*.

The mechanism for infection in these cases remains unclear, but there is concern for environmental exposure and concurrent immunocompromise which likely predisposed these pigs to a severe, disseminated cryptococcosis. These cases provide valuable insight into the clinical manifestation of cryptococcosis in pigs, for which data are limited.

Discipline: Anatomic pathology, **Topic:** Infectious disease, **Species:** Porcine, **Systems:** Systemic

54: MYCOBACTERIUM AVIUM GRANULOMAS ON THE LEG OF A RACING PIGEON

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Background: *Mycobacterium avium* complex is the most common cause of avian mycobacteriosis. The disease is characterized by chronic granulomas typically affecting internal parenchymal organs. Pigeons are considered less susceptible to avian mycobacteriosis compared to domestic poultry. Here we described a case of mycobacteriosis in a pigeon with granulomas restricted to the leg.

Case-Summary: A 6-year-old male homing pigeon presented to the University of Missouri (MU) Veterinary Medical Diagnostic Laboratory for masses on the leg. The pigeon had been imported from Germany in 2021 and utilized as a racing pigeon. The owner and rDVM were concerned about the cause and risk to other valuable racing pigeons on the property. Postmortem examination revealed approximately 3 cm and 4

cm diameter firm tan masses over the metatarsus and tibiotarsus on the right leg, respectively. No other gross lesions were observed. Microscopically, the leg masses were composed of severe granulomatous inflammation with numerous macrophages and multinucleated giant cells surrounding central lakes of necrosis. There were large numbers of acid-fast positive rod-shaped bacteria, consistent with *Mycobacterium* spp. Additionally, the liver sinusoids were expanded by multifocal aggregates of pale eosinophilic, glassy, amorphous material that stained with Congo Red and exhibited “apple-green” birefringence with polarized light, consistent with amyloid. PCR identified *Mycobacterium avium* (100% sequence identity) in the samples from the leg.

Conclusion: This case highlights an unusual presentation of *Mycobacterium avium* infection in a pigeon and illustrates the diagnostic value of histopathologic examination.

Discipline: Anatomic pathology, **Topic:** General pathology, **Species:** Avian, **Systems:** Integument

55: ASSESSMENT OF FEMORAL HEAD TISSUE CHANGES IN RESPONSE TO DRILLING IN A PIGLET MODEL OF LEGG-CALVÉ-PERTHES DISEASE

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Background: Legg-Calvé-Perthes Disease (LCPD) causes ischemic damage to the femoral head in children and toy-breed dogs, leading to necrosis of the bone, marrow, and growth cartilage. Surgical drilling of the ischemic femoral head is one treatment option to initiate bone healing and new bone formation. The exact mechanism of this healing response is not well characterized. We hypothesized that the presence of fibrovascular tissue and osteoid (immature unmineralized bone) within the epiphysis of the femoral head will be increased near the drill tract vs. far from the drill tract and as compared to the contralateral control femoral head.

Methods: Samples were collected from drilled piglet femoral heads and contralateral controls at 1-3 weeks post-drilling (3-5 weeks post-ischemia). Samples were fixed in 10% NBF, decalcified in 10% EDTA, and sections were stained with H&E and RGB-Trichrome. A tissue classifier was trained to categorize and quantify the area of mineralized bone, unmineralized bone (osteoid), cartilage, marrow, and fibrovascular tissue within the femoral head from scanned slides using HALO.

Results: A repeated-measures ANOVA and/or Friedman test (based on normality of data for each tissue type) showed significant differences in the percentage area of mineralized bone, cartilage, marrow, and fibrosis across groups.

Conclusion: Compared to control, drilling of the ischemic femoral head did cause an increase in fibrovascular tissue near the drilling tract but did not alter the amount of unmineralized (new) bone in the near or far samples. Marrow and mineralized bone decreased in ischemic femoral heads and cartilage area increased.

Discipline: Anatomic pathology, **Topic:** Comparative pathology, **Species:** Porcine, **Systems:** Bone and joints

56: PRIMARY CARDIAC HEMANGIOSARCOMA ORIGINATING AT THE RIGHT ATRIOVENTRICULAR VALVE AND PROJECTING INTO THE RIGHT VENTRICULAR OUTFLOW TRACT IN A DOG.

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A 4-year-old female spayed Boxer mix was evaluated for a 2-3-month history of chronic cough. Thoracic computed tomography revealed multifocal pulmonary nodules and patchy alveolar infiltrates suspicious for metastatic neoplasia. No primary mass was identified on abdominal radiographs. Despite medical management, the patient developed progressive dyspnea and died spontaneously.
Postmortem examination revealed a mass originating from the ventricular aspect of the septal leaflet of the right atrioventricular valve. The cardiac mass formed a conglomerate of intertwined, stringy, firm, white and pink tissue extending through the right ventricular outflow tract into the pulmonary artery, resulting in near-complete luminal occlusion.
Histologically, the mass was composed of densely proliferating neoplastic spindle cells sustained in a variably fibrous stroma, forming slit-like vascular channels. The extensive meshwork initially raised suspicion for secondary thrombus formation within the right ventricular outflow tract. However, histopathologic evaluation revealed that the meshwork was composed of highly atypical neoplastic spindle cells identical to those comprising the primary mass. Immunohistochemistry for factor VIII revealed diffuse cytoplasmic immunoreactivity of the neoplastic cells, conferring a final diagnosis of hemangiosarcoma and confirming that the extensive intraluminal tissue represented neoplastic extension rather than thrombus formation.
This case highlights the uncommon anatomic presentation of cardiac hemangiosarcoma characterized by an unusual obstructive intraluminal growth pattern that likely contributed to the patient's progressive dyspnea and eventual acute collapse.

Discipline: Anatomic pathology, **Topic:** General pathology, **Species:** Canine, **Systems:** Cardiovascular

57: AORTIC VALVE MYXOSARCOMA CAUSING SUDDEN DEATH IN A FRENCH BULLDOG

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A 2-year-old, intact male, French Bulldog presented for necropsy following a sudden collapse and natural death at home. He had no significant medical history and had been behaving normally earlier that evening. Necropsy revealed a 6.5 x 2.0 x 1.8 cm, firm, multilobular, white to light gray mass arising from the septal cusp of the aortic valve, nearly completely obstructing the lumen of the ascending aorta. The lungs were diffusely dark red, wet, and heavy, with a large amount of frothy white fluid filling the airways, consistent with severe, acute pulmonary edema. Histopathology of the valvular

mass revealed a moderately cellular neoplasm forming exophytic villiform projections supported by abundant, Alcian blue-positive myxomatous stroma. Neoplastic cells were spindle-shaped to stellate with marked anisocytosis, anisokaryosis, and a high mitotic count of 36 per 10 high-power fields. Histomorphology confirmed a diagnosis of myxosarcoma. Primary cardiac valvular neoplasms are rare in dogs. Although myxoid tumors are the most frequently reported valvular neoplasms, they occur predominantly in the tricuspid valve, making aortic valve involvement rare. Differential diagnoses for valvular masses include vegetative endocarditis, which can mimic neoplastic growth on diagnostic imaging. In humans, cardiac myxomas are the most common primary cardiac tumors; however, valvular involvement is rare. This case is notable for the unusual location of the tumor within the aortic valve and the young age of the patient. The mass caused near-complete obstruction of the ascending aorta, likely resulting in sudden death through severe mechanical obstruction of left ventricular outflow.

Discipline: Anatomic pathology, **Topic:** Oncology, **Species:** Canine, **Systems:** Cardiovascular

58: VASCULAR MALFORMATIONS OF THE EYELIDS IN AFRICAN GREEN MONKEYS (CHLOROCEBUS SABAEUS)

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Background: African Green monkey eyes are used in biomedical and ophthalmic research, but spontaneous lesions of the ocular adnexa remain poorly characterized in this species. Recognition of incidental eyelid lesions is important for diagnostic pathology, colony health surveillance, and interpretation of ophthalmic studies.
Objective: To describe the histological and immunohistochemical features of previously uncharacterized eyelid vascular lesions in African green monkeys.
Methods: Eyes and ocular adnexa from 45 African Green Monkeys (AGM), 27 wild caught and 18 colony-born at the Behavioral Science Foundation, St. Kitts and Nevis were examined between 2023 and 2026 as part of a survey for age-associated ocular and periocular pathology. Eyelid sections were examined histologically, and selected lesions were assessed by immunohistochemistry for CD31.
Results: No corresponding gross lesions were identified. Histologically, four incidental vascular lesions were detected in the upper eyelids of wild caught AGMs. Lesions were non-encapsulated and composed of irregular, variably sized, ectatic, blood-filled vascular channels embedded within collagenous stroma. The channels were lined by single layer of flattened, bland endothelial cells. Endothelial stratification, solid proliferative growth, significant atypia, necrosis and mitotic activity were not identified. CD31 immunohistochemistry labelled endothelial cells lining the vascular channels, supporting vascular differentiation.
Conclusion: The lesions are most consistent with benign vascular malformations or vascular nevi. They share morphological similarities with human periocular vascular malformations, including arteriovenous hemangioma (cirsoid aneurysms), although further characterization of vessel-wall phenotype is required to confirm arteriovenous

nature. To the authors' knowledge, comparable eyelid vascular lesions have not been reported in African green monkeys.

Discipline: Anatomic pathology, **Topic:** Comparative pathology, **Species:** NHP, **Systems:** Cardiovascular

59: CYTOLOGIC AND HISTOLOGIC ANALYSIS OF A PERIPHERAL PRIMITIVE NEUROECTODERMAL TUMOR IN A HORSE

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An 8-year-old American Paint Horse gelding was referred to the Ohio State University Galbreath Equine Center following one week of mild right-sided epistaxis and exercise intolerance. Endoscopy by the rDVM revealed multiple masses in the right guttural pouch. Computed tomography upon presentation revealed a large mass (11.7 cm x 6 cm x 7.4 cm) in the right guttural pouch, smaller nodules in the retropharyngeal and cranial deep cervical lymph nodes, and an enlarged right submandibular lymph node. Fine needle aspiration of the right submandibular lymph node was performed. Cytology revealed necrosis and aggregates of variably preserved pleomorphic cells with a mild to moderate amount of basophilic cytoplasm and irregularly round to oval nuclei that occasionally displayed one to multiple prominent nucleoli. Cytomorphology was consistent with metastatic neoplasia. Surgical biopsies of the right guttural pouch and submandibular lymph node revealed an unencapsulated, densely cellular neoplasm comprised of spindle to polygonal neoplastic cells arranged in pseudorosettes, streams, bundles, and sheets supported by a fine fibrovascular stroma. Immunohistochemistry on the guttural pouch sample was negative for cytokeratin AE1/AE3 and positive for vimentin, leading to a differential diagnosis of neuroectodermal origin tumor (i.e. peripheral primitive neuroectodermal tumor (pPNET)) or primitive sarcoma. Due to poor prognosis and inoperable location of the neoplasm, euthanasia was elected. Histopathologic examination at necropsy confirmed the differential diagnosis of pPNET. To the author's knowledge, this case represents the first comprehensive documentation of cytologic, histologic, and diagnostic imaging of a primitive neuroectodermal tumor in the guttural pouch of a horse.

Discipline: Both, **Topic:** Comparative pathology, **Species:** Equine, **Systems:** Nervous

60: PRIMARY ATLANTO-OCCIPITAL HISTIOCYTIC SARCOMA WITH MULTIFOCAL INTRACRANIAL LESIONS IN A DOG

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A 7-year-old castrated male Golden Retriever cross presented for evaluation of progressive cervical hyperesthesia previously diagnosed as musculoskeletal injury. Examination revealed an ambulatory tetraparesis with mild proprioceptive and motor deficits. Bloodwork, thoracic radiographs, and abdominal ultrasound were

unremarkable. MRI identified an extra-axial, contrast-enhancing atlanto-occipital mass with an associated dural tail causing spinal cord compression, along with nodules involving the tectum, cerebellum, and fourth ventricle. A suboccipital craniectomy and dorsal C1 laminectomy were performed. Impression smears of the mass revealed an abundant population of large, round to occasionally spindloid, singly dispersed cells with abundant vacuolated cytoplasm. Anisocytosis and anisokaryosis were marked, and the nucleus-to-cytoplasm ratio was moderate-to-low. Given the morphology and presence of occasional erythrophagocytosis, histiocytic sarcoma was considered the main differential diagnosis. Histopathology identified a high-grade pleomorphic malignant neoplasm, further characterizing the population by polygonal-to-round cells within a collagenous stroma, abundant eosinophilic cytoplasm, high mitotic activity (25 / 2.37 mm2), and numerous multinucleated giant cells. Immunohistochemistry for IBA1 showed strong cytoplasmic and membranous immunoreactivity, confirming the neoplasm's histiocytic origin and the diagnosis of histiocytic sarcoma. Histiocytic sarcoma is an uncommon primary or metastatic neoplasm of the central nervous system (CNS), although Golden Retrievers may be overrepresented. The patient survived to discharge and is alive at the time of writing, although the owners do not currently intend to pursue chemotherapy or radiation therapy. This case highlights the diagnostic challenge posed by primary CNS histiocytic sarcoma, whose clinicopathologic and MRI features may closely resemble those of a meningioma despite multifocal intracranial dissemination.

Discipline: Both, **Topic:** Oncology, **Species:** Canine, **Systems:** Nervous

61: BRSV-INDUCED BRONCHOINTERSTITIAL PNEUMONIA IN A ONE-MONTH-OLD DAIRY CALF WITH MULTIPLE CONGENITAL HEART DEFECTS

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A 4-week-old Jersey female calf (weight: 34.8 Kg) was submitted for necropsy to the Lewyt College of Veterinary Medicine. The calf, reported as a "poor doer", was euthanized after a 2- weeks history of scours and respiratory distress. Findings were confined to the subcutaneous tissue of the ventral body wall, which appeared wet (edematous), the intestine, lungs, liver and heart.
The liver was pale tan/orange, moderately enlarged and had mottled dark red to pale tan cut surfaces. Intestinal contents were greenish-brown pasty or watery. No well-formed feces were observed in the distal colon or rectum.
The lungs were slightly enlarged, moist, pale pink and with a few brownish areas of consolation in the cranial lobes and ventral portions of the caudal lobes. Samples of these areas sunk when placed in formalin. The heart was enlarged and rounded due to biventricular dilatation and right ventricular hypertrophy. Close examination revealed the presence of a small (3mm) patent ductus arteriosum, patent foramen oval, and a high ventricular septal defect, 1.5 cm in diameter. The endocardium of the right atrium was thickened (endocardial fibrosis, "jet lesion"). Microscopic assessment of the consolidated lungs revealed thickened alveolar septa and small clusters of neutrophils and necrotic debris

within bronchioles and alveoli. In addition, type II pneumocyte hyperplasia and numerous multinucleated syncytial cells were present within alveoli and occasionally, within the bronchiolar epithelium. Lung samples were positive for BRSV (RT-PCR and IHC). In this dairy calf, multiple cardiac abnormalities were likely a predisposing factor for BRSV-induced bronchointerstitial pneumonia.

Discipline: Anatomic pathology, **Topic:** General pathology, **Species:** Bovine, **Systems:** Systemic

63: CHRONIC KIDNEY DISEASE WITH SECONDARY RENAL HYPERPARATHYROIDISM, METASTATIC MINERALIZATION, AND CONCURRENT ATHEROSCLEROSIS IN A SOUTHERN TAMANDUA (TAMANDUA TETRADACTYLA)

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Signalment and History: A 19-year-old intact female Southern tamandua (Tamandua tetradactyla) was presented to the University of Arizona Veterinary Diagnostic Laboratory for necropsy following humane euthanasia. The patient had a history of chronic azotemia, hyporexia, progressive weight loss, and acute deterioration characterized by ataxia, hypothermia, anemia, and worsening azotemia.

Post-Mortem Findings: Gross examination revealed bilaterally small, irregular kidneys with multiple cortical cysts. Extensive mineralization of the thoracic and abdominal aorta, coronary and mesenteric arteries, kidneys, spleen, and diaphragm was observed. Histologically, the kidneys exhibited chronic tubulointerstitial nephritis with interstitial fibrosis, glomerulosclerosis, tubular degeneration and loss, and multifocal mineralization. Chief cell hyperplasia of the parathyroid gland supported secondary renal hyperparathyroidism. Affected arteries had extensive medial mineralization with chondroid and osseous metaplasia. Concurrent atherosclerosis was identified by the presence of cholesterol clefts, intimal fibrosis, and foamy macrophages.

Conclusions: Findings supported chronic kidney disease with secondary renal hyperparathyroidism resulting in widespread metastatic mineralization and associated systemic vascular changes. Concurrent atherosclerosis is rarely reported in this species and may reflect age-related vascular degeneration or chronic metabolic disturbances.

Significance: Reports describing vascular mineralization and atherosclerosis in xenarthrans are limited. This case highlights the systemic consequences of chronic kidney disease in a geriatric Southern tamandua and expands the spectrum of spontaneous vascular lesions reported in this species, providing valuable comparative pathology information for zoological medicine and exotic animal pathology.

Discipline: Anatomic pathology, **Topic:** Degenerative, **Species:** Wildlife/Zoo, **Systems:** Urinary

64: POSSIBLE STERILE NODULAR PANNICULITIS IN A DOG

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A 6 year old female spayed mixed breed dog presented with a two week history of a left sided facial mass and multiple pyogranulomatous inflammatory masses on the face, neck and scapula which showed no response to antibiotic treatment. Microscopic evaluation found dense aggregates of macrophages alongside various regions of neutrophils within the granulomatous inflammation or in aggregates. Special stains of the lesions for fungi and acid fast bacteria yielded no pathogen. This inflammation of subcutaneous fat is regarded as uncommon with both a poorly understood pathogenesis and clinical progression. This case report is meant to bring light to an often idiopathic condition that may not be well known, but can be easily treatable with the use of corticosteroid or immunomodulatory therapies.

Discipline: Anatomic pathology, **Topic:** General pathology, **Species:** Canine, **Systems:** Integument

65: OPPORTUNISTIC FUNGAL INFECTIONS IN IMMUNOSUPPRESSED CANINES IN WISCONSIN: SIX CASES

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Background: Opportunistic fungal infections in immunosuppressed dogs are uncommonly reported but can have devastating consequences, potentially worsening prognosis and complicating treatment for the primary disease. Immunosuppression can develop due to multiple reasons, including cancer, concurrent infections, or immunosuppressive therapies.

Methods and Objective: Six dogs presented to University of Wisconsin Veterinary Care between 2015 and 2026 with secondary fungal infections. Included cases have a history of iatrogenic or disease-related immunosuppression and a diagnosis of a fungal infection on light microscopy. This survey aims to compare the clinical histories, modes of immunosuppression, diagnostic findings, and species and histomorphology of fungal organisms found in these cases.

Results: The average age of the dogs included in this study was 6.7+/-3.8 years. Retrievers were overrepresented (4/6); the other two dogs were a basset hound and a mixed-breed dog. Four dogs received oral corticosteroid treatment for primary diseases. One dog was prescribed a prednisolone ophthalmic solution. One dog was treated sequentially with the CHOP protocol, lomustine, and mitoxantrone. The presentation of fungal diseases included dermatitis (3/6), oral mucositis (2/6), and panophthalmitis (1/6). Defining features of fungal organisms were yeasts (3/6), hyphae (2/6), or both (1/6). Grocott-Gomori methenamine staining was frequently used. Cultures of 3 cases revealed *Blastomyces dermatitidis*, *Lichtheimia corymbifera*, *Malassezia pachydermatis*, and *Trichosporon asahii*.

Conclusion: Opportunistic fungal infections can present as a complication in canine patients with a history of immunosuppression. If a fungal infection develops, cytochemistry, culture, and molecular testing can improve diagnosis accuracy and treatment efficacy.

Discipline: Anatomic pathology, **Topic:** Infectious disease, **Species:** Canine, **Systems:** Systemic

66: HEPATIC HEMANGIOSARCOMA IN A FERRET (MUSTELA FURO)

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Background: A 7-year-old, female spayed ferret presented to the urgent care for severe hypovolemic shock with collapse, severe hypothermia, and suspect melena. The primary differential was acute severe abdominal hemorrhage of undetermined origin, and humane euthanasia was elected due to the grave prognosis.

Results: Significant gross findings included 20mL of dark red thick fluid within the peritoneal cavity, a soft fluctuant mass (3.5 x 3.0 x 0.8 cm) expanding the right medial liver lobe that exuded dark red thick fluid on cut section. Histologic examination of the liver revealed a poorly demarcated, infiltrative mass composed of spindloid neoplastic cells forming numerous irregular channels filled with erythrocytes and wrapping small bundles of collagen. The neoplastic cells had indistinct cell borders and a small to moderate amount of eosinophilic cytoplasm. Neoplastic cells were positive for endothelial cell markers (Factor VIII, CD31), consistent with hemangiosarcoma.

Conclusion: Histological findings in this ferret are consistent with hepatic hemangiosarcoma. Hemangiosarcoma is a malignant tumor of endothelial cells that usually arises in the right auricle, spleen, and skin, and is mostly seen in dogs but rarely found in ferrets. In ferrets, adrenocortical neoplasia, malignant lymphoma, and insulinomas are more commonly found tumors, but hemangiosarcoma has been reported in the skin, subcutis, spleen, liver, peritoneum, and mesenteric node. Although a grossly appreciable rupture of the mass was not appreciated on gross exam, the hemangiosarcoma is likely the underlying cause of the blood loss leading to the hemoabdomen and hypovolemic shock.

Discipline: Anatomic pathology, **Topic:** Oncology, **Species:** Other (Mustela furo), **Systems:** Cardiovascular

67: COMPARATIVE ANALYSIS OF PIK3CA SEQUENCE VARIANTS IN CANINE HEMANGIOSARCOMA AND NORMAL HEART AND SPLEEN TISSUE

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Background*:* Canine hemangiosarcoma is a highly invasive malignant tumor that arises from vascular endothelial cells. Canine hemangiosarcoma shares similarities with human angiosarcoma. Identifying recurrent PIK3CA sequence variants may improve understanding of hemangiosarcoma pathogenesis and support future molecular diagnostic approaches.
Objectives: To identify PIK3CA sequence variants in canine hemangiosarcoma by amplifying target regions with conventional PCR followed by Sanger sequencing and comparing the resulting sequences with those from normal canine heart and spleen tissues.
Methods: Genomic DNA was extracted from formalin-fixed, paraffin-embedded canine hemangiosarcoma (n = 45), heart (n = 12), and spleen (n = 9) tissues using the Qiagen DNeasy Blood & Tissue Kit. Targeted regions of the PIK3CA gene were amplified by conventional PCR. PCR products were verified by agarose gel electrophoresis, submitted for Sanger sequencing, and the resulting sequences were compared with CanFam6 to identify sequence variations.
Results: A single synonymous (silent) variant was identified at codon 92 of PIK3CA in one hemangiosarcoma sample. The reference PIK3CA has the codon GAA at codon 92. A single hemangiosarcoma sample contained the codon GAG at this position, representing a synonymous GAA-to-GAG variant. Both GAA and GAG codons encode glutamic acid.
Conclusion: A synonymous (silent) codon variant (GAA-to-GAG) did not alter the amino acid sequence, as both codons encode glutamic acid. Larger cohorts with matched tumor and normal tissues are needed to determine the biological significance of this synonymous variant.

Discipline: Clinical pathology, **Topic:** Oncology, **Species:** Canine, **Systems:** Hematopoietic

68: CEREBROSPINAL FLUID AS A DIAGNOSTIC SAMPLE FOR CONFIRMATION OF NEUROBRUCELLOSIS IN A STRANDED STRIPED DOLPHIN (STENELLA COERULEOALBA) USING BACTERIAL ISOLATION, SEQUENCING, AND ANTIBODY TESTING

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Background: A female striped dolphin (Stenella coeruleoalba) washed ashore dead on the coast of New Jersey in September 2024. Brucella ceti infection is a prevalent cause of neurological disease and stranding in this species. In the USA, routine diagnosis in strandings relies on direct tissue PCR; however, low bacterial load can lead to false negative results. Comprehensive testing combining bacterial isolation, serology, and

histopathology is recommended.
Objective: To support cerebrospinal fluid testing for neurobrucellosis using serology and bacterial isolation in combination with general histopathology.
Methods: A comprehensive necropsy and histopathology were performed. Cerebrospinal fluid was used for card agglutination and culture with whole genome sequencing (WGS).
Results: Gross findings on necropsy consisted of rare pleural parasitic granulomas and intraluminal nematodes in the lower respiratory tract, severe nematodiasis in the non-glandular stomach, and mild left lateral ventriculomegaly. Histopathology revealed severe lymphohistiocytic and plasmacytic meningoencephalomyelitis. Bacterial culture and card agglutination were positive and WGS confirmed B. ceti sequence type (ST) 26.
Conclusion: The gross findings, histopathology, and serological analysis all supported a neurobrucellosis diagnosis. On necropsy, the ventriculomegaly indicates hydrocephalus due to the inflammatory response associated with infection. Lung nematode infection has been recorded concurrently in a number of Brucella infections, but a clear relationship has not been established. Isolation of B. ceti ST26 accompanied by serology indicates the presence of an active infection and antibody presence in the cerebrospinal fluid. This case demonstrates the utility of cerebrospinal fluid as a matrix for confirmatory testing of Brucella ceti infection associated with neurobrucellosis.

Discipline: Anatomic pathology, **Topic:** Infectious disease, **Species:** Wildlife/Zoo, **Systems:** Nervous

69: CHOLEDOCHOLITHIASIS IN A HORSE

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Choledocholithiasis is a condition in which calculi are formed and located in the common bile duct. This is relatively uncommon in animals, with an estimated prevalence of 0.08%, and is the primary cause of biliary obstruction in horses. Anatomic features specific to the horse extrahepatic biliary tree, including the short length and wide caliber of the common bile duct as well as lack of a gallbladder, may contribute to the occurrence of this phenomenon. This report describes the post-mortem findings in a 20-year-old Thoroughbred gelding presented with a three-week history of lethargy, fever, colic, and inappetence. Clinical evaluation revealed marked increase in liver enzymes and leukocytosis, and hepatomegaly and dilated bile ducts on ultrasonography. Despite treatment for cholangiohepatitis and liver failure, the horse developed progressive anorexia, weight loss, and worsening cholestasis, leading to euthanasia due to poor prognosis. Necropsy identified a 6.5 cm choledocholith completely obstructing the common bile duct, accompanied by diffuse hepatomegaly and orange-yellow discoloration of the liver. Histologically, the liver exhibited severe bridging portal fibrosis with nodular regeneration, multifocal bile duct hyperplasia, and marked cholestasis. These findings supported the diagnosis of

choledocholithiasis with complete extrahepatic biliary obstruction and secondary chronic hepatopathy. This case highlights the severe hepatic consequences of prolonged biliary obstruction in horses and emphasizes the importance of considering choledocholithiasis as a differential diagnosis in older horses presenting with chronic liver disease, cholestasis, and recurrent colic.

Discipline: Anatomic pathology, **Topic:** General pathology, **Species:** Equine, **Systems:** Hepatobiliary

70: FATAL CANINE PEMPHIGUS FOLIACEUS: THE IMPORTANCE OF TIMELY DIAGNOSIS AND TREATMENT IN MANAGING AUTOIMMUNE DISEASE

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Pemphigus foliaceus (PF) is one of the most common canine autoimmune skin diseases. In PF, IgG autoantibodies target desmocollin-1 in the superficial epidermis, leading to breakdown of desmosomes, acantholysis, and prominent neutrophilic inflammation. Patients with PF present with pustules, superficial erosions, crusting, alopecia, and scaling on the nasal planum, muzzle, pinnae, paw pads, and trunk. However, differentiation of PF from other skin diseases can prove difficult without histopathology. A 5-year-old male intact Pitbull mix presented to a private clinic for a spreading rash on the caudodorsal trunk accompanied by alopecia, crusting, and significant pruritus. The patient was initially diagnosed with bacterial pyoderma and treated with Bravecto, cefpodoxime, and 1.2 mg/kg/day of prednisone. The patient later re-presented for worsening skin lesions and anorexia. At this time, prednisone treatment was discontinued and the patient was prescribed fluconazole, Keratolux shampoo, and Mal-A-ket wipes. The patient underwent a medicated bath at another clinic; biopsy was offered but declined. The patient subsequently stopped eating and drinking, and died three days later. Gross necropsy revealed sunken eyes, generalized lichenification, scaling, erythema, and alopecia, with prominent involvement of the face and paw pads. Foul-smelling purulent discharge was present in the inguinal region and ear canals. Histologic findings included subcorneal pustulation with acantholysis, neutrophilic inflammation, and abundant Gram-positive bacterial cocci. Death was attributed to severe PF with secondary pyoderma resulting in dehydration and septicemia. This case of fatal PF is an important reminder that early diagnosis and appropriate treatment are essential in managing autoimmune disease.

Discipline: Anatomic pathology, **Topic:** General pathology, **Species:** Canine, **Systems:** Integument

71: CANINE DISTEMPER VIRUS (CANINE MORBILLIVIRUS) INFECTION IN NINE-BANDED ARMADILLO (DASYPUS NOVEMCINCTUS)

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Background: Canine distemper virus (CDV) is a single-stranded RNA virus that is seen in a wide range of terrestrial carnivores. It has also been documented to affect species in the superorder Xenarthra.

Signalment and History: A free-ranging intact female nine-banded armadillo presented to the Zoological Medicine Service of Oklahoma State University Veterinary Medical Teaching Hospital. Finders reported observing foaming at the mouth. Physical examination findings included dyspnea and severe soft tissue swelling in nares.

Methods and **Results:** The animal was euthanized and submitted to the Oklahoma Animal Disease Diagnostic Laboratory (OADDL) for rabies testing and necropsy. Grossly, severe chronic rhinitis was observed and resulted in a complete obstruction of nasal passages with semi-solid, caseous purulent maternal present within the turbinates. Nasal turbinates were swabbed and retained frozen for culture or PCR. Microscopically, severe rhinitis was confirmed and pneumonia was present. Additionally, eosinophilic intracytoplasmic inclusion bodies were present in bronchiolar and nasal epithelium. These inclusion bodies were highly suggestive of CDV infection. CDV was not detected by PCR, likely due to the gel substrate interfering with PCR amplification. Immunohistochemistry for CDV was performed. Immunohistochemistry resulted in moderate levels of immunoreactivity present in cytoplasm of many epithelial cells in the bronchi and bronchioles.

Conclusion: CDV likely played a significant role in the clinical presentation of this animal. Potential pathogenesis is severe rhinitis resulting in increased transient body temperature facilitating CDV infection. To the best of our knowledge, this is the first reported case of CDV in a nine-banded armadillo.

Discipline: Anatomic pathology, **Topic:** Infectious disease, **Species:** Wildlife/Zoo, **Systems:** Respiratory

72: WHEN COLIC WAS CANCER

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A 27-year-old, female Quarter Horse (*Equus caballus*) presented with progressive weight loss, inappetence, intermittent colic, and hematochezia. Clinical evaluation identified hepatomegaly with a “starry sky” appearance consistent with parasitic migration, marked hyperglycemia, mild hypoproteinemia and hypoalbuminemia, mild leukocytosis with neutrophilia and lymphopenia, and mild anemia. Despite supportive treatment, the horse experienced progressive clinical decline, prompting humane euthanasia. Gross necropsy revealed a poor body condition with minimal subcutaneous fat. A moderate amount of yellow, clear fluid was found in the abdominal cavity. A

15x15x15 cm segmental portion of the right dorsal and associated right ventral colon was firm and dark red to tan. Cut section of the region showed the colonic wall was markedly thickened and disorganized with extensive ulceration of the associated mucosa. Histopathologic examination revealed invasive epithelial neoplastic cells infiltrating throughout the submucosa and into the tunica muscularis. Extensive mucosal ulceration and granulation tissue were associated with the neoplasm. Metastatic epithelial neoplastic cells were identified within the mesenteric and colonic lymph nodes, confirming regional lymphatic spread. Colonic adenocarcinoma is an uncommon neoplasm in horses and is often associated with nonspecific clinical signs, resulting in delayed diagnosis. This case highlights the importance of considering intestinal adenocarcinoma as a differential diagnosis in geriatric horses presenting with chronic hematochezia, weight loss, and recurrent colic, and demonstrates the locally invasive and metastatic nature of this neoplasm.

Discipline: Anatomic pathology, **Topic:** Oncology, **Species:** Equine, **Systems:** Gastrointestinal

73: DISEASE INVESTIGATIONS OF ALLEGHENY WOODRATS (NEOTOMA MAGISTER): FINDINGS FROM DIAGNOSTIC NECROPSIES OF A THREATENED SPECIES

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The Allegheny woodrat (*Neotoma magister*) is a cryptic, nocturnal rodent species experiencing progressive population decline and fragmentation along the eastern United States' Appalachian Mountains. These declines have resulted in classification of Allegheny woodrats as a threatened, priority species in multiple states, including Pennsylvania. Progress on understanding and addressing these declines remains limited due to the species' behavior and challenging habitats, impeding studying live animals as well as carcass recovery for postmortem examination. Beyond *Baylisascaris procyonis,* literature regarding disease processes is rare in this species, further hindering confidently assessing causes of mortality and subsequent management. This case series describes three semi-captive and two free-ranging specimens which were submitted to the Pennsylvania and Virginia animal diagnostic laboratories for necropsy. Postmortem gross and microscopic examination yielded primary diagnoses of intestinal intussusception with hepatic capillariasis in one semi-captive woodrat and septicemia secondary to gastrointestinal dysbiosis in the second, and primary bacterial enteritis in the third. One wild woodrat was found to have died from predation with concurrent hepatic capillariasis, while spinal trauma was present in the other. The presence of gastrointestinal disease in semi-captive specimens highlights the importance of further investigation into potential management changes to increase the success of translocation and reintroduction. The diverse array of findings contributing to the mortality of these woodrats are among the first to be described and emphasizes the

value of integrating pathologic examination into wildlife conservation efforts, and the ongoing need for long-term disease surveillance in this threatened species.

Discipline: Anatomic pathology, **Topic:** General pathology, **Species:** Wildlife/Zoo, **Systems:** Systemic

74: INTESTINAL METAPLASIA OF THE CAUDAL ESOPHAGUS IN A 6-YEAR-OLD DOMESTIC CAT

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Background: Intestinal metaplasia of the esophagus is the replacement of stratified squamous epithelium by intestinal-type columnar epithelium with goblet cells in response to chronic mucosal injury. In humans, the condition is known as Barrett's esophagus and is commonly associated with chronic gastroesophageal reflux secondary to structural and functional abnormalities.

Objective: To describe the clinical presentation and anatomic pathology of a case of intestinal metaplasia of the esophagus in a domestic cat.

Methods: A 6-year-old male castrated domestic cat presented for recheck evaluation following empirical treatment for chronic enteropathy. The owner reported a several-year history of postprandial vomiting associated with solid food that persisted despite treatment. In vivo imaging included a videofluoroscopic swallow study (VFSS), radiography, and endoscopy. Endoscopically guided biopsies of esophageal, gastric, and duodenal tissue were submitted to the Oregon Veterinary Diagnostic Laboratory, and sections were stained with hematoxylin and eosin and Alcian blue for histopathology.

Results: VFSS showed a caudal esophageal stricture with an estimated narrowed luminal diameter of 6.37mm. Endoscopy revealed multiple bubble-like protrusions within the mucosa of the caudal esophagus near the cardia. Histologically, these protrusions corresponded to plump projections of markedly edematous lamina propria lined by intestinal-type columnar epithelium. Alcian blue-positive goblet cells were present within the metaplastic epithelium. The tissue showed no convincing evidence of neoplasia.

Conclusions: Intestinal metaplasia of the esophagus is rare in domestic cats and veterinary species in general. Recognition of the characteristic endoscopic appearance and confirmation with histopathology may improve diagnosis in cats with chronic vomiting and suspected reflux esophagitis.

Discipline: Anatomic pathology, **Topic:** General pathology, **Species:** Feline, **Systems:** Gastrointestinal

75: PATHOLOGICAL AND MOLECULAR CHARACTERIZATION OF YOKENELLA REGENSBURGEI INFECTION IN ALLIGATORS

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Background: A resurgence of the rare opportunistic pathogen, *Yokenella regensburgei*, has been linked to acute, fatal septicemia in juvenile farmed alligators, mirroring human cases and raising zoonotic concerns.

Objective: This research compared gross, histopathologic and genomic findings of alligators and with human isolate data to evaluate zoonotic transmission potential and pathogenicity.

Case Description: A mass mortality event involving over 100 juvenile alligators occurred within three months. Twelve alligators were examined, of which six were affected.

Methods: Necropsy was performed and lesions examined via hematoxylin and eosin and Gram staining. Aerobic bacterial cultures and MALDI-TOF MS were performed for species identification. Whole-genome short-read next-generation sequencing and bioinformatic analysis was conducted on three bacterial isolates to confirm species and characterize antimicrobial resistance and virulence genes.

Results: Primary findings include pleuropneumonia (6/6), uveitis (6/6), pericarditis/myocarditis (6/6), and meningitis (5/6) with gram-negative small bacilli. *Chlamydia* sp. (6/6), West Nile virus (6/6) and *Mycoplasma* sp. (2/2) were negative. *Salmonella* sp. was isolated in two of the three ocular swabs (2/3). *Y. regensburgei* was consistently isolated from pleural (3/3), ocular (3/3), epicardial (2/2), and cloacal (2/3) regions and was considered the primary cause of disease. Genomic analysis of *Y. regensburgei* isolates from three animals revealed conserved virulence genes between alligator and human.

Conclusions:
We observed similar gross and histopathologic lesions in all affected alligators caused by *Y. regensburgei*. Molecular characterization of three isolates elucidated similarity with human isolates, highlighting a potential zoonosis.

Discipline: Anatomic pathology, **Topic:** Infectious disease, **Species:** Wildlife/Zoo, **Systems:** Systemic

76: SYSTEMIC SPIRORCHIIDIASIS AND GRANULOMATOUS MENINGOENCEPHALITIS ASSOCIATED WITH LEAREDIUS LEAREDI IN A GREEN SEA TURTLE (CHELONIA MYDAS)

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Spirorchiid trematodes are important pathogens of sea turtles and are recognized causes of chronic disease, stranding, and mortality worldwide. Tissue injury results primarily from embolization and accumulation of eggs within tissues, leading to granulomatous inflammation and vascular injury. This report describes severe systemic spirorchiidiasis caused by Learedius learedi in a green sea turtle (Chelonia mydas). An adult male green sea turtle was found dead in St. Kitts and Nevis and submitted for necropsy. Gross findings included poor body condition, multifocal ulcerative dermatitis, focal pericardial fibrosis, and a focally extensive aneurysmal lesion of the left aorta. Histologically, numerous trematode eggs were present in the skin, heart, kidneys, urinary bladder, liver, lungs, gastrointestinal tract, thyroid gland, epididymis, and brain and were usually associated with mild granulomatous inflammation. The most severe lesions occurred in the central nervous system and consisted of multifocal granulomatous meningoencephalitis centered on trematode eggs with marked endothelial and pericytic proliferation resulting in proliferative vasculopathy. Rarely, parasite eggs were present within the neuroparenchyma. Additional renal lesions included membranoproliferative glomerulopathy, urate tophi, and interstitial fibrosis. PCR performed on DNA extracted from frozen tissues confirmed Learedius learedi (Family Spirorchiidae), while PCR of cutaneous lesions identified Phoma spp. This case documents severe multisystemic L. learedi infection with prominent central nervous system involvement and emphasizes the importance of recognizing spirorchiidiasis during investigations of mortality, neurological disease, skin lesions, and health surveillance in free-ranging green sea turtles.

Discipline: Anatomic pathology, **Topic:** Infectious disease, **Species:** Wildlife/Zoo, **Systems:** Systemic

77: CANINE HERPESVIRUS-1 ASSOCIATED RESPIRATORY DISEASE IN THREE YOUNG ADULT DOGS

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Background: Canine Herpesvirus (CHV-1) is an established cause of reproductive failure in bitches and severe neonatal systemic illness. CHV-1 has been isolated from the respiratory tract of adult dogs with mild to severe respiratory disease. Few cases documenting CHV-1 concurrently with pathologic changes have been reported, and thus the role of CHV-1 as a primary respiratory pathogen remains poorly understood. **Objective:** To describe the pathologic findings of three cases of fatal or previous respiratory disease in young adult dogs with CHV-1 and to evaluate potential factors contributing to disease severity.

Cases: Two dogs were euthanized due to severe respiratory disease. One animal previously had upper respiratory clinical signs but was euthanized for unrelated causes. Necropsy was performed in all cases. Histopathologic findings included severe chronic active rhinitis, severe necrotizing bronchitis and bronchiolitis with diffuse alveolar damage, pulmonary edema, pulmonary hemorrhage, and erosive tracheitis. CHV-1 was detected in postmortem lung tissue via 12 pathogen respiratory panel in each case. One dog tested positive for canine pneumovirus, and one had tested positive antemortem for canine pneumovirus and Mycoplasma cynos. In situ hybridization identified CHV-1 genomic material within associated lesions in 2/3 cases. Tissues were severely autolyzed in the third case.
Discussion: These cases demonstrate association between histopathologic changes, PCR positivity, and ISH detection of CHV-1 in the respiratory tract of adult dogs. Further investigation is needed to understand the interaction between CHV-1, coinfections with other pathogens, and underlying host factors.

Discipline: Anatomic pathology, **Topic:** Infectious disease, **Species:** Canine, **Systems:** Respiratory

78: HEPATOZOON SPP. PARASITEMIA WITH UNUSUAL MORPHOLOGY AND CLINICAL COURSE IN AN EMERALD TREE MONITOR (VARANUS PRASINUS)

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An adult male emerald tree monitor (*Varanus prasinus*) was evaluated via complete blood count (CBC) as part of a routine quarantine examination prior to introduction into a zoological collection. Blood smear evaluation revealed many erythrocytes containing spindle-shaped apicomplexan parasites compatible with hemogregarines. These organisms were thin and elongate with a centrally located nuclear structure that occasionally displaced the nucleus of the host erythrocyte. Consensus *Hepatozoon* spp. 18s rRNA PCR produced an 863 base pair product with greater than 99 percent sequence identity to multiple *Hepatozoon* spp. sequences in GenBank from snakes, geckos, caimans, and monitor lizards. Repeat CBCs performed twelve days and one month later demonstrated polychromasia, rare immature erythrocytes, and few erythrocytes containing the same intracellular parasites. Other than thin body condition, the patient remained clinically unremarkable until he was found deceased on exhibit 4 months after initial presentation. Necropsy and histopathology showed evidence of anemia, multifocal skeletal muscle atrophy, and myocyte necrosis. No specific cause of acute death aside from anemia was evident. This case highlights the importance of combining morphologic and molecular diagnostics for parasite identification. Although PCR followed by genetic sequencing identified the organism as *Hepatozoon* spp., its morphology differed from closely related species, which suggested the possibility of a previously undescribed species. Hemogregarines are often considered incidental in wild reptiles but were a potential cause of mortality in this individual. Further sequencing of larger genomic regions is needed to better characterize species identity and determine whether this organism represents a novel *Hepatozoon* sp.

Discipline: Clinical pathology, **Topic:** Infectious disease, **Species:** Wildlife/Zoo, **Systems:** Hematopoietic

79: A RETROSPECTIVE ANALYSIS OF REPRODUCTIVE TRACT LESIONS AND RISK FACTORS IN ZOO-MANAGED FEMALE URSIDS

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Background: In many species, reproductive tract lesions have been associated with age, parity, and progestin contraceptives. Few studies have characterized reproductive lesions in zoo-managed bears or identified demographic and management factors that increase the likelihood of lesion development.
Objective: To describe the prevalence of lesions found in the female ursid reproductive tract and identify associated risk factors.
Methods: Tissue samples from 51 bears across 6 species were utilized from the Reproductive Health Surveillance Program (RHSP) archive. Five µm histologic sections of the ovaries and uterus were routinely prepared and examined, with ovarian activity and lesion presence recorded. Observations were assessed for associations with potential risk factors via logistic regressions and Fisher's exact tests.
Results: Increased age was significantly associated with both uterine (p=0.0007) and ovarian (p=0.0006) lesions, while longer parturition gap was associated with ovarian lesions only (p=0.0232). Hyalinization of uterine blood vessels was associated with having at least one litter (p=0.0050). Progestin use was associated with clinically significant endometrial hyperplasia (p=0.0254). Unlike other species, all spectacled bears (*Tremarctos ornatus*) examined were found to have endometrial hyperplasia (9/9). Being not of the *Ursus* genus (3/6 species) was associated with adenomyosis (p=0.0156).
Conclusion: Caution should be exercised when using progestin contraceptives in ursids and alternative contraceptive methods should be considered. Controlled studies isolating the effects of risk factors and further investigating species differences would be important next steps. Through better understanding of reproductive disease in ursids, facilities housing bears can improve their care and breeding management while minimizing reproductive consequences.

Discipline: Anatomic pathology, **Topic:** General pathology, **Species:** Wildlife/Zoo, **Systems:** Reproductive

80: NOT SO SWEET: EUGLYCEMIC DIABETIC KETOACIDOSIS IN TWO CATS ON SGLT2 INHIBITORS

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Euglycemic diabetic ketoacidosis (EDKA) is a condition wherein patients with diabetes mellitus (DM) present with ketoacidosis (ketonemia/ketonuria and blood pH <7.35)

without hyperglycemia (blood glucose <250 mg/dL). EDKA incidence is increasing in cats with the use of two recently approved Sodium-Glucose Cotransporter-2 (SGLT2) inhibitors bexagliflozin and velagliflozin. SGLT2 inhibitors lower blood glucose by inhibiting glucose resorption in the renal proximal convoluted tubule with aims of recovering pancreatic beta cells and restoring insulin-producing capacity, avoiding the need for insulin injections. The most severe adverse effect of these medications is EDKA, and the lack of hyperglycemia typically seen with DKA may make recognition and prompt treatment challenging. Several risk factors may increase the likelihood of developing EDKA during treatment with SLGT2 inhibitors including rapid weight loss, previous insulin therapy, triglyceride elevations, dehydration and concurrent illness. We present two cases of SGLT2 inhibitor associated EDKA. One cat had a significant delay between DM diagnosis and initiation with bexagliflozin therapy, and ketone levels were not re-checked during this period. Both cats had evidence of pancreatitis, which has been identified as a potential risk factor for developing EDKA. The manufacturers of bexagliflozin and velagliflozin have recommended contraindications for instituting therapy including the presence of concurrent diseases, anorexia, dehydration or lethargy, previous insulin therapy, previous or current pancreatitis, and ketonuria/emia. Pathologists should be aware of the increasing use of SGLT2 inhibitors for DM management in cats and the potential for development of EDKA when assisting veterinarians and clients with disease diagnosis or treatment management.

Discipline: Clinical pathology, **Topic:** Metabolic disease, **Species:** Feline, **Systems:** Endocrine

81: NEURONAL CEROID-LIPOFUCINOSIS IN AN EQUINE

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A 2-year old Fox Trotter gelding presented to NC State's Large Animal hospital for evaluation of chronic progressive spinal ataxia. The patient had been treated for presumptive equine protozoal myeloencephalitis and no response to treatment was noted. The patient was ultimately euthanized. Clinicians were suspicious of equine degenerative myeloencephalopathy and sought a histologic diagnosis. On necropsy the patient was mildly emaciated with a body condition score of 3/9 and mild hypertrichosis over the neck, forelimbs, trunk and ventrum. The brain and spinal cord were grossly unremarkable. Histopathology of the medulla oblongata, brain stem, thalamus, and multiple spinal cord segments identified numerous neuronal cell bodies expanded by discrete eosinophilic cytoplasmic vacuoles that, in some cases, displace the nucleus and Nissl bodies peripherally. The intracytoplasmic vacuoles were also uniformly positive on Periodic acid-Schiff and Luxol-fast blue stains. Histopathological findings are consistent with Neuronal ceroid-lipofuscinosis (NCL). This is a rare lysosomal storage disorder most often seen in specific breeds dogs, cats, sheep, and cattle though it has been previously reported in horses. The mechanism for the disease in horses is not known. In other species underlying causes include an autosomal recessive gene that leads to an accumulation of subunit c of mitochondrial ATPase or sphingolipid activating protein. The accumulation of these proteins is

what leads to the characteristic findings on histopathology and clinical signs. This case documents a rare congenital neurologic in horses and serves as a reminder to place NCL on the differential list for young horses presenting with ataxia.

Discipline: Anatomic pathology, **Topic:** Genetic/hereditary disorders, **Species:** Equine, **Systems:** Nervous

82: EOSNIOPHILIC PULMONARY GRANULOMATOSIS: A CASE SERIES

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Three cases of eosinophilic pulmonary granulomatosis (EPG) presented to MSU-CVM within the previous 10 years. Case #1 was a 5-year-old male intact American Bully who underwent surgery to remove an ulcerated perianal mass and died under anesthesia. A mail-in necropsy was submitted. Case #2 was a 7-year-old male neutered Labrador retriever that presented with chronic intermittent coughing/vomiting and was heartworm positive. Case #3 was a 3-year-old male neutered Cane Corso who presented with a 1.5-month history of respiratory impairment progressing to distress; and was Ehrlichia positive. Cases #2-3 were euthanized. On gross examination of cases #2-3, the cranial lung lobes had multifocal consolidated masses or nodules that were firm and tan on cut surface and occasionally surrounded by areas of green-black friable material (necrosis). On histologic examination of all three cases, the pulmonary nodules had abundant eosinophilic and histiocytic inflammation mixed with lesser lymphocytic inflammation, surrounded by fibrosis.
EPG is a rare disease that is not completely understood in both human and veterinary medicine. Etiologies proposed include type III hypersensitivity and infection with Dirofilaria immitis in small animals, but there is currently no definitive pathophysiology. There is no breed, age, or sex predilection. EPG is diagnosed based on the presence of nodular and/or bronchial pulmonary disease, with infiltration of predominately eosinophils and histiocytes, with fewer neutrophils, lymphocytes, plasma cells, and basophils. There is no definitive treatment for EPG, although a few case reports have had success with the use of steroids.

Discipline: Anatomic pathology, **Topic:** General pathology, **Species:** Canine, **Systems:** Respiratory

83: THE PATHOPHYSIOLOGICAL SIGNIFICANCE OF ERYTHROCYTE DEVIATIONS IN VETERINARY PERIPHERAL BLOOD ASSESSMENTS

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Poikilocyte is the general terminology used to notate a red blood cell (RBC) that is abnormal in shape, inclusive of acanthocytes, echinocytes, and spherocytes, among others. Current literature does notate that feline and equine often display abnormalities while clinically healthy; however, little research relating to the presence of these abnormalities with disease exists. In this study, small and large animal peripheral blood

smears were analyzed for evidence of poikilocytes, recorded, and compared to the patients' diagnosis to correlate found RBC abnormalities to the overall health of the animal. Blood smears were prepared; Wright's stained, air dried, and cover slipped prior to analysis. Results show canines have moderate dacrocytes and moderate to marked echinocytes. In felines, moderate to marked dacrocytes, elliptocytes, and echinocytes were reported, while equine showed slight degmacytes and echinocytes, and marked rouleaux. In ovine and caprine, moderate elliptocytes and echinocytes were recorded, while caprine also reported moderate to marked acanthocytes and schistocytes. At this stage, there is enough evidence to support diagnoses of poor dehydration and liver function, most notably in the canine population. Such data underscores the diagnostic necessity of manual smear examinations for naming morphological deviations. Future investigations involving larger animal cohorts must definitively categorize these cellular biomarkers in relation to patient diagnoses.

Discipline: Clinical pathology, **Topic:** Comparative pathology, **Species:** Other (feline, canine, bovine, caprine, equine, ovine), **Systems:** Hematopoietic

84: MORE THAN MEETS THE TOOTH

Daniel Soto, Stephanie Myers
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A 12.5-year-old Quarter horse gelding presented for swelling of the left maxillary region. Tooth 209 was previously extracted at least 1.5 years prior to presentation. Physical exam revealed palpable root fragments and a fistula tracking to and communicating with the mass, which was consistent clinically with an abscess. Skull radiographs confirmed retained 209 root fragments. Despite surgical removal of the root fragments and extensive medical treatment, the abscess continued to progress, leading to profound osteolysis of the alveolar bone. Biopsy of the tissue surrounding the previous root fragments revealed differentiation to a carcinoma. Due to poor prognosis, the patient was humanely euthanized. Necropsy confirmed a firm, round, approximately12x12x6 cm mass on the left rostrodorsal maxillary region that encompassed the frontal as well as the rostral and caudal maxillary sinuses. Within the mass and extending to the affected sinuses as well as the left nasal cavity was a large amount of caseous and fibrinonecrotic material. Culture of the material identified Streptococcus zooepidemicus and Actinobacillus rossii. Additionally, the submandibular and ventral cervical lymph nodes were mild to moderately enlarged with multifocal tan to white, well-demarcated foci. Histopathology of the facial mass revealed an invasive squamous cell carcinoma admixed among marked granulation tissue and extensive fibrinoulcerative sinusitis. Similar neoplastic cells were identified in affected regional lymph nodes, thus confirming metastasis. This is a unique case of a chronic periodontal infection that likely contributed to the development of an aggressive squamous cell carcinoma.

Discipline: Both, **Topic:** Oncology, **Species:** Equine, **Systems:** Gastrointestinal

85: MALIGNANT CATARRHAL FEVER IN HOLSTEIN CATTLE FROM VIRGINIA

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A 22-month-old Holstein heifer was submitted for necropsy by the referring veterinarian after exhibiting a high fever, bloody feces, an ulcer on the tongue and nasal discharge. Treatment with antibiotics and anti-inflammatories was unsuccessful. Due to poor prognosis, the animal was euthanized. On gross examination, there was mucosal ulceration of multiple tissues, most notably in the oral cavity, esophagus, and trachea. Multifocal hemorrhages were identified throughout the gastrointestinal tract, spleen, liver, kidney, endocardium, and trachea. Generalized lymphadenomegaly was also noted. Microscopic examination of tissues revealed lymphoplasmacytic vasculitis, lymphoplasmacytic inflammation in multiple organs, hemorrhages, and thrombosis, suggestive of Malignant Catarrhal Fever (MCF) from ovine herpesvirus-2 (OvHV-2). Spleen was submitted for OvHV-2 PCR, which tested positive and confirmed the diagnosis of MCF. Over a two-week period, a total of four heifers from this farm exhibited similar lesions, and the three that were tested were positive for OvHV-2. Upon achieving the diagnosis, further investigation revealed the farm was located in proximity to an unaffiliated herd of sheep, which was considered the source of infection. While European breeds of cattle have shown resistance to this virus, sporadic cases do occur in younger domestic cattle. Additionally, OvHV-2 infections may become latent for several months, and cases of MCF do not always uniformly display the classic clinical signs or lesions. This indicates to clinicians, diagnosticians, and pathologists the importance of having MCF in a list of differential diagnoses, as a history of contact with sheep, clinical signs, or gross lesions may not be evident.

Discipline: Anatomic pathology, **Topic:** Infectious disease, **Species:** Bovine, **Systems:** Systemic

86: CANINE LIPID-RICH MAMMARY CARCINOMA

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A 4-year-old female-spayed golden retriever presented to the UC Davis Soft Tissue Surgery Service for removal of a left caudal mammary mass that had metastasized to the left medial iliac lymph node. A wide resection was not possible, so a marginal resection was performed.

On gross examination, the mass was 13.5 x 9 x 5 cm, homogenous, firm, tan, with occasional red, discrete areas (hemorrhage). Histologically, the mammary gland was infiltrated by an encapsulated, well-circumscribed, and well-demarcated neoplasm composed of poorly differentiated round to ovoid epithelial cells arranged in dense cellular aggregates and variably sized lobules within a fibrovascular stroma. The cells had vacuolated granular cytoplasm with either multiple small vacuoles or one large vacuole (presumed lipid) that occasionally peripheralized the nucleus. Up to 80% of the neoplastic cells had these vacuolations. Aggregates of eosinophilic material, interpreted as amyloid (Congo red positive), were within the neoplasm. The neoplastic cells had round to ovoid, vesicular nuclei that contained 1 to 2 nucleoli. Anisocytosis and

anisokaryosis were marked with occasional karyomegaly, rare multinucleation, and 3 mitotic figures in ten 400x fields. Pan-CK immunopositivity supported that the neoplastic population was epithelial in origin.

The tumor was consistent with a lipid-rich carcinoma, which is a rare and aggressive histotype of mammary neoplasia in the canine. This was a unique subtype that also contained amyloid, which has been associated with higher grade mammary neoplasms.

Discipline: Anatomic pathology, **Topic:** Oncology, **Species:** Canine, **Systems:** Mammary

87: GOSSYPIBOMA-ASSOCIATED SARCOMA IN A 7-YEAR-OLD DOG

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A 7-year-old female spayed Australian Shepherd presented for distended abdomen of two weeks duration and hyporexia progressing to anorexia. Thoracic and abdominal radiographs revealed bicavitary effusion and a large, multilobulated soft tissue mass within the abdomen, displacing the small intestines caudodorsally. On computed tomography, the mass was multiloculated with multifocal fat-attenuated regions. The cytology of fine-needle aspirates revealed a population of moderately pleomorphic mesenchymal cells with concurrent neutrophilic inflammation. An exploratory laparotomy was performed to remove a 14 x 12 x 10 cm, pale tan to red mass originating from the mesentery and subsequently submitted for histopathology. Although evidence of metastasis was appreciated intra-operatively, no additional samples were obtained. On cut surface, the mass was centered around a consolidated region composed of a thin, soft, highly porous, loosely woven cotton cloth that correlated histologically with refractile, birefringent linear to circular foreign material consistent with surgical gauze. Surrounding the foreign material, there was a large amount of granulation tissue with an infiltrative neoplastic population forming irregular vascular channels with 35 mitotic figures appreciated within ten 400x high-power fields (2.37mm2). Lymphovascular invasion was present occasionally. Immunohistochemistry was performed, and the neoplastic cells were negative for Factor VIII. Although many cells exhibited IBA1 immunolabeling, the finding was inconsistent. Therefore, a diagnosis of undifferentiated sarcoma was favored. Gossypiboma-associated sarcomas are uncommonly reported within the veterinary literature, prompting further evaluation of the tumorigenesis and inflammation solicited by implanted surgical gauze.

Discipline: Both, **Topic:** Oncology, **Species:** Canine, **Systems:** Systemic

88: INVESTIGATING THE INTERMEDIATE HOST AND PUTATIVE ACTINOSPORE STAGE OF MYXIDIUM STREISINGERI

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M. streisingeri was recently recognised as a novel and widespread renal parasite, thriving within zebrafish (*Danio rerio*) in controlled husbandry facilities. However, a key

gap remains in understanding the full life cycle, which is the identity of the intermediate invertebrate host. This study builds upon previous investigations by Lim (2020) and Ang (2022), to identify the putative intermediate host and characterise the associated actinospore stage. Specifically, we aimed to co-localise *M. streisingeri* actinospores with their intermediate host using direct microscopic examination and PCR.

To investigate this, putative intermediate hosts, morphologically identified as belonging to the genus *Nais*, were isolated from zebrafish tanks. Although the protocol described in previous investigations was closely followed, spontaneous release of the putative myxozoan actinospores were not observed. Instead, actinospore release was successfully induced using varying concentrations of ethanol. The material released was subsequently collected, fixed and subjected to molecular analysis by PCR. Microscopic examination of the induced material revealed a consistent morphology with uniformly sized, spherical structures embedded within a mucus-like matrix. As their morphology differed from that described by Ang (2022), the recovered material has been submitted for PCR analysis to determine whether these structures represent the actinospore stage of *M. streisingeri*. Detailed microscopic examination enabled further morphological characterization of the putative *Nais* host, facilitating its taxonomic classification.

These findings indicate that ethanol-induced release may provide a practical method for recovering putative actinospores from the intermediate host, generating material suitable for molecular identification and future investigations into the life cycle of *Myxidium streisingeri.*

Discipline: Anatomic pathology, **Topic:** Infectious disease, **Species:** Aquatic, **Systems:** Urinary

89: BABESIA SP. INFECTION IN A FREE-RANGING CHIPPING SPARROW (SPIZELLA PASSERINA) OPPORTUNISTICALLY COLLECTED IN GLENDALE, ARIZONA

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In April, an 11.5 g adult male Chipping Sparrow (*Spizella passerina*) was recovered during a bird-window collision survey. Necropsy revealed abundant fat stores and good pectoral muscle mass. There was acute trauma consistent with a fatal window collision, including a left coracoid fracture, multifocal muscle hemorrhage, and a calvarium fracture with cerebellar disruption and hemorrhage. Impressions of the heart and liver revealed moderate numbers of intraerythrocytic trophozoites and fewer schizonts that lacked hemozoin pigment, which were suspected to represent *Babesia spp*. There were fewer intra-erythrocytic gametocytes that contained hemozoin pigment, consistent for *Haemoproteus sp.* PCR on liver detected a *Babesia sp.* and *Haemoproteus tartakovskyi* coinfection.

Babesia spp. are arthropod-transmitted erythrocytic parasites of many vertebrate species with a poorly understood transmission ecology. Avian babesiosis is sparsely

reported in North America. Documented instances include *B. uriae* in Common Murres (*Uria aalge*) from coastal California and *B. moshkovskii* in Prairie Falcons (*Falco mexicanus*) from Wyoming. To our knowledge, Babesia has not been previously documented in a Chipping Sparrow. No arthropods were recovered from this individual and therefore transmission details remain unknown. However; one possible mechanism for infection may be from a viable tick vector that fed from a previously infected migratory bird, but further research is required. Based on existing literature, this case identifies a novel host species and is the first reported case of avian babesiosis in Arizona.

Discipline: Clinical pathology, **Topic:** Infectious disease, **Species:** Avian, **Systems:** Hematopoietic

90: SEVERE ENDOPARATISM BY TRICHURIS SUIS WITH CONCURRENT PORCINE CIRCOVIRUS INFECTION IN A 3 MONTH OLD DOMESTIC PIG.

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History: A 3-month-old castrated-male Yorkshire pig presented for post-mortem evaluation following euthanaisa. There was a 2 week history of weight loss and hemorrhagic diarrhea. No other pigs in the group were affected. The animal was reported recumbent and minimally responsive. Blood work indicated a marked hypoglycemia of 31 mg/dL, PCV between 16-33%, and total solids between 2.5-10 g/dL. The BCS was estimated as ⅕.

Findings: There was little visceral adipose tissue. Multifocal raised nodules were visualized in the duodenal and spiral colon, some with a central ulceration and pale yellow caseous exudate (“button ulcers”). There were multifocal mucosal ulcers present as well. The mucosal surface of the large intestine had several white 1 cm length nematodes. A mesenteric lymph node near the spiral colon was moderately and diffusely enlarged.

Microscopic examination of the large intestine showed colitis and marked lymphoplasmacytic Peyer’s patch depletion. There was crypt herniation with abundant adult Trichuris nematodes and eggs, alongside intraneutrophilic and intracellular bacterial rods. The small intestine was positive for enteritis, eosinophilic inflammation and lymphoid depletion. The liver was consistent with acute reactive hepatitis. Mild lymphocytic adrenalitis was present. Porcine circovirus was detected via in-situ hybridization in multiple spleen and few gut-associated lymphoid follicles by Michigan State Veterinary Diagnostic Laboratory. Bacterial multiplex PCR on the colon was negative for Brachyspira, Lawsonia intracellularis, Salmonella spp.

Severe Trichuris infection contributed to the cause of death. This highlights the importance of deworming in piglets, as injectable dewormers like ivermectin have limited efficacy against whipworms.

Discipline: Anatomic pathology, **Topic:** Infectious disease, **Species:** Porcine, **Systems:** Gastrointestinal

91: AN OUTBREAK OF SPOTTY LIVER DISEASE CAUSED BY CAMPYLOBACTER JEJUNI IN BLUE-AND- YELLOW MACAW, ARA ARARAUNA

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Background: Campylobacter spp. occasionally cause spotty liver disease (SLD). We encountered Campylobacter jejuni–associated SLD outbreak in a blue-and-yellow macaws
(Ara ararauna).
Objective: We aimed to elucidate the pathological features of C. jejuni–associated SLD in
A. ararauna.
Methods: Four of ten juvenile A. ararauna died within 13 days after importation. Two birds
underwent pathological examinations. In Case 1, immunohistochemistry for C. jejuni was
performed on the liver, duodenum, colon, pancreas, and spleen. PCR using universal bacterial primers was performed on a liver sample, and PCR assays for primary psittacine
pathogens (psittacine beak and feather disease virus, avian polyomavirus, adenovirus, psittacine herpesvirus, avian bornavirus, Chlamydia psittaci, and Mycobacterium spp.) were
performed on liver and spleen samples. PCR using C. jejuni– and C. coli–specific primers
were performed on liver samples from both cases.
Results: Marked hepatomegaly and diffuse yellowish-white mottling were evident in both
cases. Histopathological examination of case 1 revealed severe multifocal hepatocellular
necrosis with gram-negative short-rod bacteria. These occasionally formed inclusion-like
structures within hepatocytes or necrotic debris. On immunohistochemistry, the bacteria and inclusion-like structures in liver and intestinal epithelial cells were positive, whereas those in other organs were negative. Nonsuppurative splenitis and enteritis were observed.
PCR assays detected C. jejuni in both cases but no primary psittacine pathogens.
Conclusion: Multifocal necrotic hepatitis in A. ararauna aligns with previous findings. C. jejuni was distributed in hepatic lesions and intestines. This is the first report of SLD in A.
ararauna, revealing that C. jejuni can cause fatal psittacine outbreaks.

Discipline: Anatomic pathology, **Topic:** Infectious disease, **Species:** Avian, **Systems:** Hepatobiliary

92: PROPOSED APPROACH FOR REPRODUCIBLE QUANTITATIVE EVALUATION OF THE MURINE STIFLE USING QUPATH

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Background: Osteoarthritis is a painful, debilitating condition frequently evaluated in murine models. Although numerous semiquantitative grading schemes and histomorphometric approaches exist to assess joint pathology, standardizing data collection across studies remains a challenge. QuPath, an open-source digital pathology analysis software, provides a robust platform for developing reproducible quantitative image analysis methods.
Objective: To establish a standardized, repeatable QuPath histomorphometry protocol for quantifying structural joint changes in the murine stifle.
Methods: Decalcified murine stifles were sectioned coronally, H&E stained, and digitized (.svs files). Each stifle was graded for Articular Cartilage Structure (ACS), osteophytes, and chondrocyte cell death. For quantitative analysis, a 2750 px x 1500 px box was centered on each tibial plateau at 20x magnification, with 25% of the box height above the articular surface, to standardize the area of data collection across samples. Areas of articular cartilage (AC), calcified cartilage, and subchondral bone within these boxes were recorded. Spearman correlations were calculated between ACS grades and quantitative parameters (cartilage area, mean thickness, cellularity).
Results: Quantitative articular cartilage measures for the medial tibial plateau (MTP) demonstrated a strong negative correlation with semiquantitative ACS scores ($r < -0.7$). Correlations at the lateral tibial plateau (LTP) were weak, reflecting reduced disease severity compared to the weight-bearing MTP.
Conclusion: This standardized QuPath workflow effectively quantifies murine joint pathology, demonstrating strong concordance with semiquantitative scoring at the primary weight-bearing surface. This repeatable protocol provides a scalable tool to characterize distinct structural patterns across diverse murine OA models.

Discipline: Anatomic pathology, **Topic:** Comparative pathology, **Species:** Rodents, **Systems:** Bone and joints

93: DISSEMINATED COCCIDIOIDES (VALLEY FEVER) INFECTION IN AN AMERICAN QUARTER HORSE

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A 9-year-old American Quarter Horse mare presented to MWU Large Animal Clinic for a three-month history of persistent lethargy and fever following a pneumonia diagnosis that was refractory to Doxycycline. Ultrasound revealed a large splenic mass which was sampled for impression cytology and biopsy. Cytology and histopathology revealed pyogranulomatous inflammation; however fungal spherules consistent with *Coccidioides* were only appreciated on cytology. Despite treatment, the patient deteriorated and was euthanized approximately a year following presentation. Necropsy revealed marked splenomegaly, a splenic mass, and numerous multifocal, tan, well demarcated nodules throughout the liver. The lungs had minor petechial hemorrhage, and areas of pleural fibrosis in the right and left caudal-dorsal lung lobes. The entire cranial mesenteric root was occluded by thrombi which extended into the portal and splenic veins, and colonic branch. Histology of spleen and liver revealed marked mixed inflammation with intralesional fungal spherules consistent with *Coccidioides* species. The liver and spleen had extensive deposition of amyloid which, in addition to the thrombi, was presumed secondary to prolonged inflammation. *Coccidioides* infection is uncommon in equids and has been associated with immunocompromise, however this patient had no evidence to support diminished immune response. Coccidiomycosis in horses most commonly presents with pulmonary lesions, although rare systemic infections following the suspected resolution of an initial lung lesion have been reported. This case is an example of a rare, systemic *Coccidioides* infection based on the presence of mixed inflammation and fungal spherules in the spleen and liver, with bronchitis and fibrosis in the lungs.

Discipline: Both, **Topic:** Infectious disease, **Species:** Equine, **Systems:** Systemic

94: DISSEMINATED MALIGNANT MELANOMA WITH VERTEBRAL CANAL METASTASIS IN A GREY QUARTER HORSE MARE

Julia Warren, Stephanie Myers
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A 17-year-old grey Quarter Horse mare presented with a history of progressive neurologic deficits in the hindlimbs that was attributed clinically to equine protozoal myeloencephalitis (EPM). Clinical signs continued to progress, and the mare was subsequently euthanized and submitted for necropsy. External examination revealed multiple, well-demarcated, perineal cutaneous masses consistent with melanoma. Internal examination revealed several similar masses involving the mesenteric, peri-renal, and axillary lymph nodes, right parotid salivary gland, ileocecal ligament, and intercostal space. Notably, a 4x2.5x2 cm well-demarcated, black extradural mass was present within the spinal canal at T14–T15 causing compression of the associated spinal cord. Impression cytology of multiple sites supported a diagnosis of melanoma. Histopathologic examination of the extradural mass revealed numerous neoplastic melanocytes with marked anisocytosis and anisokaryosis, consistent with an aggressive melanoma. Similar histologic findings were noted for all other masses and lymph nodes, confirming a diagnosis of metastatic malignant melanoma. Cutaneous melanoma is one of the most common dermal tumors of horses, particularly grey horses, and metastasis and internal tissue invasion are generally uncommon. However, melanoma occurring within the spinal canal is exceptionally rare with very few case reports noted in the

literature. In this case, the melanoma located within the spinal canal was the primary cause of the observed neurologic deficits through spinal cord compression, highlighting the potential aggressive biologic behavior of these tumors. Furthermore, melanoma should be considered an important differential diagnosis in horses presenting with progressive neurologic disease.

Discipline: Anatomic pathology, **Topic:** Oncology, **Species:** Equine, **Systems:** Nervous

95: HUMAN PATHOLOGY FOUNDATION MODELS MATCH INTER-PATHOLOGIST AGREEMENT ON CANINE MITOTIC FIGURES BUT FAIL ON DISPUTED CELLS

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Canine mammary carcinoma is a spontaneous model of human breast cancer, yet mitotic count remains the least reproducible component of histologic grading despite its prognostic importance. Foundation-model benchmarks for mitotic figure classification have attributed residual error to inter-rater variability, but none have evaluated performance stratified by expert agreement.

We analyzed a public canine mammary carcinoma whole-slide dataset independently annotated by two pathologists with consensus resolution (13,907 mitotic figures; 36,379 look-alikes). Frozen embeddings from five human pathology foundation models and one natural-image model were evaluated using logistic probes under slide-grouped cross-validation, trained only on concordant cells; the 2,536 expert-discordant cells were withheld and scored separately.

The best model achieved AUROC 0.925 (95% CI 0.917–0.933) versus 0.793 for the natural-image control, and as a third rater showed agreement comparable to the two pathologists (κ 0.59 versus 0.62). Accuracy nonetheless fell from 85.2% on concordant cells to 56.5% on discordant cells. As expected from multi-rater studies in other imaging domains, model uncertainty was elevated on disputed cells (1.8-fold, 95% CI 1.7–2.0), and the probe only weakly predicted how disputes were resolved (AUROC 0.599). Confident errors on unanimously labeled cells were uncommon (2.4%) and asymmetric, favoring missed mitoses over over-called look-alikes. Difficulty was shared across architectures: 561 cells lay near all five models' decision boundaries (11-fold above chance), and 12 unanimously labeled cells were confidently misclassified by every model.

Expert disagreement, not representation quality, bounds mitotic figure classification. Models reaching inter-pathologist agreement still perform near chance on the cells pathologists dispute.

Discipline: Anatomic pathology, **Topic:** Methods/technology, **Species:** Canine, **Systems:** Mammary

96: PRIMARY RENAL UNDIFFERENTIATED PLEOMORPHIC SARCOMA IN A CAT

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A 6-year-old MC Tabby cat was submitted for necropsy following chronic polyuria, polydipsia, lethargy, hyporexia, and muscle wasting. Abdominal ultrasound had recently identified bilateral renomegaly with hydronephrosis, with greater severity in the left kidney. Gross examination revealed marked expansion of the left kidney by diffuse, firm, white fibrous tissue measuring approximately 0.5 – 1.5 cm in thickness, which compressed the renal hilar structures. The left renal parenchyma was markedly effaced and replaced by irregular, coalescing, firm white tissue. There were bilateral hydronephrosis and nephrolithiasis, with more severe changes affecting the left kidney. Histopathological examination of the left kidney showed a non-encapsulated, infiltrative, poorly demarcated neoplasm that effaced renal architecture while invading the perirenal tissue. The neoplasm was composed of moderately to highly pleomorphic spindle cells arranged in interlacing bundles and streams, with foci of numerous multinucleated giant cells, supported by a moderate collagenous stroma. On immunohistochemistry, the neoplastic cells showed strong immunoreactivity for vimentin and only patchy immunolabeling for SMA and S100, failing to demonstrate a specific line of differentiation. In conjunction with the histomorphologic features, these findings support a diagnosis of undifferentiated pleomorphic sarcoma. Primary renal sarcomas are rare in cats, and undifferentiated pleomorphic sarcomas have been infrequently reported. To the authors' knowledge, this is the first reported case of a primary renal undifferentiated pleomorphic sarcoma in a cat.

Discipline: Anatomic pathology, **Topic:** Oncology, **Species:** Feline, **Systems:** Urinary

97: A FORENSIC INVESTIGATION OF THE PANCREAS: HOW RELIABLE ARE ZYMOGEN GRANULES IN DECOMPOSED VERSUS STARVATION CASES.

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Introduction: In veterinary forensic pathology, starvation cases are overrepresented with 60% of causes of reported cruelty committed against dogs. Starvation is an extreme nutritional state resulting from long term insufficient intake of proteo-caloric food. Some cases will consist of bodies in variable stages of decomposition, and the pathognomonic histological findings of zymogen granule depletion in starvation cases can be compromised.

Objectives: The hypothesis of this study is that zymogen granules will become indistinct in canine pancreatic tissue with increasing postmortem intervals (PMI) ranging from 0 to 120 hours. The specific aims are to (1) identify the PMI at which zymogen granules become indistinct on H&E staining; and (2) identify potential special stains capable of identifying granules at later time points postmortem.

Methods: Pancreas from ten known-fed dogs, euthanized for reasons unrelated to this

project, were collected postmortem at T0h, T4h, T8h, T24h, T48h, T72h, T96h and T120h preserved at room temperature. Routine FFPE 4um slides were stained with H&E, Masson Trichrome, Toluidine Blue and Periodic Acid-Schiff. Zymogen granule detectability and autolysis were assessed using a semi-quantitative scoring system.

Results: Autolysis of pancreas was moderate at 24-48h and marked by 72h postmortem. Zymogen granules visibility decreased markedly by 48h postmortem and became indistinct by 72h on H&E, as well as all special stains.

Conclusion: Zymogen granules were indistinct in tissues decomposed for more than 72h. No special stain outperformed H&E. In decomposed tissues, the diagnosis of starvation cannot be made solely based on pancreas histopathology.

Discipline: Anatomic pathology, **Topic:** Forensic, **Species:** Canine, **Systems:** Endocrine

98: ARTIFICAL INTELLIGENCE-BASED WHOLE SLIDE IMAGE ANALYSIS FOR CLASSIFICATION OF LYMPH NODE METASTASIS IN CANINES WITH MAST CELL TUMORS

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Introduction: The Histologic Node (HN) classification system has facilitated standardized assessment of lymph node metastasis in canines with mast cell tumors (MCT) and is generally associated with prognosis and clinical outcome. However, histologic classification remains subject to interobserver variability. Whole-slide imaging (WSI) and artificial intelligence (AI)-based approaches offer the potential to improve reproducibility through comprehensive, quantitative evaluation of histologic specimens. This study evaluated the feasibility of a WSI AI-based classifier for HN classification.
Methods: Fifty extirpated lymph nodes with pathologist-assigned HN class were assessed. WSIs from 5, 40, and 5 cases were used for annotation, training, and validation, respectively, using DenseNet-V2, Nuclear Segmentation, and Object Phenotyper models in Halo AI (v4.2, Indica Labs). A five-step pipeline was developed: (1) tissue vs. background (broad classifier); (2) node vs. other tissue (node classifier); (3) nuclear segmentation for cell identification; (4) mast cell vs. non-mast cell classification; and (5) a Python-based algorithm applying established HN criteria to assign a HN class.
Results: Preliminary data shows the broad classifier achieved precision of 0.990, recall of 0.993, and F1 score of 0.992; the node classifier achieved a precision of 0.924, recall of 0.980, and F1 score of 0.950, both exceeding the 0.70 F1 threshold.
Conclusions: These preliminary results support the feasibility of an AI-assisted WSI pipeline for HN classification in canine MCT, with sub-classifiers reliably distinguishing tissue and nodal boundaries. Remaining steps, mast cell quantification, and comparison to pathologist-assigned HN classifications, are underway. This approach may ultimately reduce observer variability and improve classification reproducibility.

Discipline: Anatomic pathology, **Topic:** Methods/technology, **Species:** Canine, **Systems:** Hematopoietic

99: ADDRESSING BARRIERS TO AUTOMATED DIGITAL PATHOLOGY THROUGH AI-ASSISTED METADATA EXTRACTION AND IMAGE QUALITY CONTROL

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Digital pathology converts glass slides into whole-slide images (WSIs) that can be reviewed, analyzed, and shared across locations. Integrated with structured metadata, automated quality control (QC), and artificial intelligence (AI)-assisted decision support, it can improve the speed, consistency, and scalability of drug-development workflows. However, fragmented metadata, noninformative filenames, and manual image review create bottlenecks between high-throughput scanning and pathology review.
We developed a semi-automated, human-in-the-loop workflow combining optical character recognition, rule-based metadata validation, reference-data reconciliation, and multiresolution image QC. The metadata workflow was developed using 244 images from a single-organ post hoc study and scaled to 11,831 images from a carcinogenicity study. In the scaled study, 88% of images passed or were accepted with minor exceptions, while 12% required verification or failed, reducing an anticipated months-long process to less than one month.
Complementary image QC was tested on 48 slides. Scanner-specific macro-image checks evaluated distances between scan-region and tissue boundaries and white-balancing mark location relative to tissue, flagging risks of incomplete scanning and calibration-related color artifacts. Insufficient expert-annotated slides precluded validation of deep learning-based QC tools for color abnormalities, air bubbles, and blur at higher resolutions.
Future progress will require community-wide efforts to standardize slide labels and barcoding and to document QC failures across organs and scanners as reusable training data for AI-assisted QC. This work demonstrates the potential to connect specimen identity, image quality, and decision support within an integrated digital toxicologic pathology workflow. Ultimately, scalable automation and AI assistance could accelerate toxicologic assessment, drug development, and diagnostic innovation.

Discipline: Anatomic pathology, **Topic:** Methods/technology, **Species:** NHP, **Systems:** Systemic

100: CHARACTERIZATION OF ASTROCYTE-SPECIFIC MORPHOLOGICAL AND SUBCELLULAR GLIAL FIBRILLARY ACIDIC PROTEIN ALTERATIONS IN CANINE GRANULOMATOUS MENINGOENCEPHALITIS

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Background: Granulomatous meningoencephalomyelitis (GME) is an idiopathic inflammatory central nervous system (CNS) disease characterized by sterile granulomatous inflammation. Although its leukocytic components are well characterized, responses of resident CNS cells remain poorly understood. Astrocytes undergo reactive astrogliosis during CNS inflammation; however, recent human astrocyte-injury studies demonstrate pathology-associated glial fibrillary acidic protein (GFAP) cleavage, modification, intracellular retention, and aggregation.

Hypothesis: We hypothesized that astrocytes in GME exhibit GFAP alterations beyond those typically associated with reactive astrogliosis.

Methods: Archived FFPE CNS tissues from dogs with and without GME were examined by GFAP immunofluorescence with a high- resolution confocal microscope. Standardized telencephalic gray and white matter regions affected by GME inflammation were compared with histologically normal regions within the same dog and with corresponding regions in dogs without CNS abnormalities.

Results: Astrocytes within GME-affected regions (GME astrocytes) showed morphological alterations including atypical spherical GFAP-immunoreactive structures within the DAPI-defined nuclear space in 25 of 26 GME cases. These structures were detected by GFAP antibodies, and their intranuclear localization was confirmed by three-dimensional reconstruction. GME astrocytes also showed altered nuclear area and circularity compared with astrocytes in histologically normal regions of the same dogs and in corresponding regions of dogs without GME.

Conclusion: These findings identify an atypical intranuclear GFAP phenotype and suggest that astrocytic alterations in GME may extend beyond typical reactive astrogliosis. Following further characterization, these atypical astrocytes may prove useful as a diagnostic marker for GME.

Discipline: Anatomic pathology, **Topic:** General pathology, **Species:** Canine, **Systems:** Nervous