

Abstract of proposed student project

Proposal title: Feline Vitreous Chemistry

Proposal

- i. **Brief Introduction:** Vitreous chemistry is a commonly performed ancillary method using vitreous humor collected during the autopsy of humans to assess for renal function, dehydration, and diabetes mellitus. We routinely collect and occasionally perform vitreous chemistry on cats submitted for autopsy using an in-clinic dry chemistry analyzer in order to assess renal function. The Element DC chemistry analyzer (Heska Corporation, Loveland, CO) has been validated to use vitreous humor for the following analytes: sodium, potassium, chloride, magnesium (Mg), vitreous urea nitrogen (VUN), and creatinine (VC) (Stern AW, Muralidhar M. Postmortem Vitreous Humor Analysis in Dogs, Cats and Horses. J Anal Toxicol. 2022 Feb 14;46(1):103-107). We have successfully used vitreous chemistry to assess for azotemia/uremia (elevated VUN and VC) and Mg alterations (hypermagnesemia) from cats with renal disease.
- ii. **Problem Description and Significance:** The use of vitreous chemistry appears to be of value; however, there is limited research exploring this diagnostic test. For example, cats are commonly clinically diagnosed with diabetes mellitus; however, at autopsy there are no definitive findings that are supportive of this disease process. Therefore, the evaluation of glucose levels may provide useful information for diagnosing this disease. In forensics, alterations in vitreous potassium levels have been shown to correlate with the postmortem interval. The study of potassium and other electrolytes (such as phosphorus) may prove useful for estimating the time since death. The results of the study will increase our knowledge about the use of postmortem vitreous chemistry for the diagnosis of disease and estimating the postmortem interval.
- iii. **Hypothesis and Objectives:** The investigators expect to determine normal postmortem glucose levels in feline vitreous humor and we expect to find a subset of cats with glucose abnormalities. We expect to see alterations in potassium and phosphorus levels as they relate to time since death.
- iv. **Study Design and Methods:** Animal services and veterinary hospitals from throughout Florida will submit deceased FRCs to the Veterinary Forensic Sciences Laboratory (VFSL) for the "A Cat Has No Name" Program. Autopsies will be performed according to standard operating procedures in the laboratory and vitreous humor will be collected from these cats. Additionally, banked samples have been obtained from cats previously autopsied by the VFSL. Vitreous analysis will be performed using Element DC chemistry analyzer (Heska Corporation, Loveland, CO). Data will be recorded in a commercially available spreadsheet, and statistical analyses were conducted using a commercially available statistics program.

Role of the Veterinary Student: The student will both assist and perform autopsies of FRCs submitted to the VFSL during the summer in order to collect vitreous humor samples. The student will process the banked and newly collected vitreous humor samples. The student will analyze the data.