Digital Radiographic Evaluation of the Psittacine (Parrot) Gastrointestinal Tract in Normalcy and Disease.
Dr. Chess Adams, Department of Surgical Sciences

Gastrointestinal disease in parrots is common, leading to dehydration, weight loss and death if not identified and treated in a timely manner. Parrots with disease affecting the gastrointestinal tract present with anorexia, regurgitation, vomiting, or abnormal feces, and may sustain enlargement of the affected organ(s). Among the many causes of gastrointestinal disease, Neuropathic Gastric Dilation (NGD) is the most notorious and feared due to the inevitably fatal outcome and risk of spread to other parrots. Thus, differentiating NGD from other gastrointestinal disease is extremely important. Historically gastric enlargement has been subjectively assessed on radiographs. In a recently published study, we introduced the proventriculus (stomach):keel ratio in parrots. This study described the ratio as an objective method for assessment of stomach diameter, successfully differentiating 100 normal parrots from 19 with stomach disease.

In this study we will further evaluate and validate this ratio by investigating the effects of anesthesia, positional rotation, and size fluctuations over time on radiographs of the gastrointestinal tracts of healthy parrots. We will also evaluate the use of the ratio for radiographs of parrots with a gastrointestinal tract disease. Here we hope to validate the ability of the ratio to differentiate between different diseases. This study will be facilitated by the outstanding detail and scale of contrast attainable with our recently installed digital radiographic equipment. Digital radiography is rapidly becoming available in private practice, so practical advantages of this new technology will be explored in the historically challenging setting of the very small patient with little inherent abdominal contrast.

Molecular Characterizaion of Methicillin-Resistant Staphylococcus intermedius of Veterinary Origin.
Faye Hartmann, Department of Pathobiological Sciences

Methicillin-resistant Staphylococcus aureus (MRSA) is an important cause of hospital-acquired and more recently community-acquired infections in humans. They are resistant to the antibiotic methicillin (and related antibiotics) and are often resistant to other classes of antimicrobials used to treat staphylococcal infections. Since 2004, methicillin-resistant S. intermedius (MRSI) has become a significant cause of infections in dogs and cats. Human beings can also develop infections from MRSI and probably acquire the microorganism from colonized pets. Both MRSI and MRSA produce an altered protein which has reduced affinity for methicillin and related antibiotics and is encoded by a gene called mecA. The mecA gene is carried on variants of a structurally complex mobile genetic element (SCCmec) that can be transferred between various species of staphylococci. This study will provide new information about the variants of SCCmec harbored by MRSI from pets, will help in determining the origins of methicillin resistance in S. intermedius, and provide additional information about this potential zoonotic pathogen.
Seasonal Variation of Fecal Corticosterone concentrations in Wisconsin Sandhill Cranes (Grus canadensis).
Dr. Barry Hartup, Department of Surgical Sciences

I will use a proven non-invasive technique to evaluate corticosterone, the stress hormone of birds, in stool samples from wild cranes for the first time. Samples will be collected at roost sites of a well studied population of sandhill cranes in south-central Wisconsin during different seasons to determine normal hormone levels. I expect corticosterone concentrations will increase as the cranes shift from a non-breeding, sedentary condition in summer to migratory condition in fall. The reference information gathered by this study will be used to evaluate the impacts of social, behavioral and environmental stressors on the health of this population in future studies. The findings of this study will also have a broader application: sandhill cranes are a recognized biological model for several endangered cranes worldwide. Use of this technique would provide a non-invasive tool for assessing the health of imperiled crane populations and their ecosystems worldwide where traditional methods of health assessment are impractical.

Nociceptive Assessment and Pharmacodynamics of Nalbuphine HCL in Amazon Parrots.
Dr. Joanne Paul-Murphy, Department of Surgical Sciences

Is the presence of bacterial nucleic acids associated with chronic synovitis in horses.
Dr. Alberto Serena, Department of surgical Sciences

Increased filling of the hock (tarsocrural joint) with synovial fluid is often referred to as “bog spavin”. Many horses that develop bog spavin are not lame. However, the observation that a horse has boggy hocks may raise concerns about the horse’s joint health and future soundness, or bother the owner who has intentions of showing the horse. The veterinarian who is asked for advice is then prompted to investigate the underlying cause of the increased joint filling. Often, diagnostic tests do not reveal a definitive underlying pathology. In this case, the veterinarian will use the term “idiopathic bog spavin” or “aseptic synovitis” to describe the condition. In addition, most of the treatments, such as bandaging, hydrotherapy or draining the joint fluid and subsequent injections with steroids, only yield a temporary improvement.

Using a molecular biology technique called PCR-polymerase chain reaction-, our laboratory has recently shown a link between the presence of bacterial DNA in stifle joints and concurrent joint disease in dogs.

The purpose of our project is to find out if latent bacterial DNA can trigger joint inflammation and swelling in horses. We will collect joint fluid from horses affected with bog spavin and from normal horses, and our hypothesis is that we will find bacterial material in boggy joints much more frequently than in normal joints.
We believe that our research will help to increase the knowledge about the disease process but also permit us veterinarians to focus on a more effective treatment strategy to control and cure “idiopathic synovitis” in its early stages.

**Epidural administration of ammonium sulfate gradient-loaded liposomes containing hydromorphone provides hindlimb analgesia for greater than 1 week in an animal model of stifle arthritis.**

Dr. Lesley Smith, Department of Surgical Sciences

The goals of this study are to assess the analgesic effects, and duration of said effects, of epidurally administered liposome-encapsulated hydromorphone in arthritic rats. Hydromorphone is a potent opioid analgesic that has a duration of approximately 6-8 hours when administered epidurally in people. In general, encapsulation of opioids into liposomes increases the duration of drug release and effect. Recently, we collected pilot data in dogs after epidural administration of liposomes containing hydromorphone and found that pain relief after injury to the cruciate ligament of the stifle was profound and lasted more than 7 days. The purpose of the study proposed here is to examine the duration of analgesic effect after epidural administration of liposome-encapsulate hydromorphone in a rodent model of stifle arthritis. We will use the change in thermal latency time to assess the analgesic effect of our epidurally administered drugs. We will test relative weight bearing of the arthritic and normal (control) hind limb using an incapacitation meter, which is a force plate specifically made for rats. Additionally, we will test changes in mechanical threshold using Von frey hairs. Animals will be divided into 4 groups including two different doses of liposome-encapsulated hydromorphone, one dose of standard hydromorphone and one dose of blank liposomes. The scientific significance of this research is that, if liposome-encapsulated hydromorphone proves to have a long duration (i.e. 7 or more days) of analgesic effect after epidural administration in arthritic rats, it offers a cost-effective and clinically effective means to provide superior analgesia for many potential medical and surgical conditions in animals and in people.

**Infraorbital dental nerve blocks with mepivacaine decrease the anesthetic requirement of isoflurane in dogs undergoing dental procedures.**

Dr. Lindsey Snyder, Department of Surgical Sciences

Dental nerve blocks, modeled after human dental techniques, can be used for pain management in animals undergoing painful dental procedures such as extractions. General anesthesia, using gas anesthetics, is required for immobilization of dogs when performing dental cleanings. Gas anesthetics are associated with dose-dependant adverse effects on the cardiovascular and respiratory systems. The objective of this study is to evaluate the effects of routinely used dental nerve blocks on the gas anesthesia requirements needed for general anesthesia in dogs. Dogs will be anesthetized with gas anesthesia and the minimum amount of gas anesthesia needed to keep them from responding to a painful stimulus will be determined. A well established method of stimulating the nerves located within teeth will provide the stimulus in this study. After the minimum amount of gas anesthesia needed to keep the patient immobilized in response to stimulus has been established, a dental nerve block will be performed. The minimum amount of anesthetic will again be established with the addition of the dental nerve block. Cardiovascular and respiratory parameters will be recorded throughout the study. We
expect to prove that dental nerve blocks can reduce the amount of gas anesthesia required to keep the patient asleep and pain-free during dental procedures and therefore improve the safety of anesthesia by reducing the dose-dependant cardiovascular and respiratory side effects. Results of this study would provide additional support for widespread use of dental blocks in dogs undergoing dental procedures and subsequently minimize risks of general anesthesia in these patients.

**Effect of antioxidant supplementation on intracellular glutathione, urine isopostanes, clinical score, and survival in clinically ill dogs.**

Dr. Katrina Viviano, Department of Medical Sciences

Oxidative damage has been implicated in the ageing process and considered a contributing factor in many diseases. The body’s primary natural defense against oxidative damage is antioxidants. Glutathione is one of the many natural antioxidants that is pivotal in protecting cells from oxidative damage. Evidence supporting excessive oxidative damage or oxidative stress include decreased antioxidant levels and increased oxidative products generated from cell damage termed lipid peroxidation. Antioxidant depletion, specifically glutathione, has been reported in many systemic disease states in humans including the critically ill and associated with poor clinical outcomes. Plasma or urine 8-isoprostane concentrations are considered a specific marker for lipid peroxidation with levels correlating with disease severity in humans. Antioxidant supplementation as a means of modulating oxidative stress has been studied using many antioxidants with varying degrees of success in humans. In particular, the antioxidant N-acetylcysteine has been used to replete intracellular glutathione. In veterinary medicine therapeutic antioxidant intervention is primarily empirical or extrapolated from human medicine as limited objective scientific therapeutic trials are undertaken. A previous study in our laboratory documented decreased glutathione levels in ill dogs with the degree of depletion correlating with disease severity. The purpose of this study is to objectively evaluate the effect supplementation with N-acetylcysteine has on normalizing red blood cell glutathione, decreasing urine 8-isoprostanate concentrations, improving clinical score, and impacting outcome in a group of glutathione deficient clinically ill dogs. The results of this study may provide a therapeutic rationale for antioxidant therapy in clinically ill dogs.