Cornell University
College of Veterinary Medicine

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Clinical Investigators' Day

2022

Cornell University
College of Veterinary Medicine

Welcome to the 2022 Clinical Investigators' Day, sponsored by the Cornell University College of Veterinary Medicine. The primary goal of this forum is to provide an opportunity for residents and interns to showcase ongoing investigations carried out at Cornell University College of Veterinary Medicine. It is our hope that greater insights will be gained in the breadth and depth of clinical investigations conducted at the College and will serve as a catalyst to promote greater interactions among colleagues with clinical and basic science research interests.

Organizing Committee

Dr. Erin Daugherity, Co-Chair
Dr. Tracy Stokol, Co-Chair
Dr. Kelly Hume, Co-Chair
Mr. Doug Fink
Dr. Manuel Martin-Flores
Dr. John Parker

The organizing committee thanks the following individuals who contributed to the success of the Day:

Mr. Dave Frank
Mr. Drew Kirby
Dean Lorin Warnick

Images: iStock Photos and Drew Kirby

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Current CVM Clinical Trials

Dogs

- Determine the transcriptome of canine soft tissue sarcoma
- Drug repurposing to aid tx of canine lymphoma
- Clotting Risk Factors in IMHA
- Radiofrequency therapy for dogs with chronic osteoarthritis hind limb pain
- C1INH-complement inhibition in IMHA
- Investigating microbiome in IMHA/ITP
- RTX for chronic elbow pain
- Surgical Site Infection Surveillance in soft tissue and orthopedic surgeries in dogs and cats
- Comparing a novel insulin CRI to SOC in DKA
- Randomized controlled trial of resource efficient interventions in traumatic wounds
- Investigating use of CPAP helmet in brachycephalics during recovery from anesthesia
- Evaluating the subbasal nerve plexus in diabetic vs non-diabetic dogs
- Investigating accuracy and utility of ultrasound for diagnosing acute hip luxation
- Analyzing PK/PD of unasyn and baytril in critically ill patient

More dog trials in progress

Cats

- Investigating dietary intervention in chronic enteropathy
- Metabolomics before and after RAIT
- Determining the optimal approach to chest compressions
- Investigating earlier use of cyclosporine in FCGS
- Investigating genetics associated with diabetes

Rabbits

- Diagnosing gastric outflow obstruction

Horses

- Treatment response for equine fungal endometritis
- Looking for diagnostic markers in mares with placentitis
- Investigating low-volume uterine lavage as a diagnostic tool in mares with endometrial fibrosis or acute inflammation
- Looking at the quality of recovery with and without an endotracheal tube

For more information or to participate contact:

vet-research@cornell.edu
or call
607.253.4385

Program Schedule

Friday, April 1, 2022 ● Lecture Hall 3, Veterinary Research Tower

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9:00 am **Welcome & Introductions** – Clinical Investigator's Day Organizing Committee

9:00 am – 10:00 am **Keynote Presentation**

- **FUEL FEEDS FUNCTION - THE EFFECT OF NUTRIENT SUPPLY ON DAIRY CATTLE PHYSIOLOGY**

  Dr. Sabine Mann, Assistant Professor, Cornell Department of Population Medicine and Diagnostic Sciences

10:00 am – 11:00 am **Resident Presentations** – Moderated by Dr. Jacquelyn Evans

- **ANTHELMINTIC RESISTANCE IN SHEEP AND GOAT HERDS IN THE FINGER LAKES REGION OF NY**

  Isabelle Louge – Ambulatory and Production Medicine Resident Pg. 1

- **EVALUATION OF THE EFFECTS OF A 1:1 INSPIRATORY:EXPIRATORY RATIO IN ANESTHETIZED AND VENTILATED HORSES**

  Ella Pittman – Anesthesiology and Pain Management Resident Pg. 2

- **COMPARISON OF NERVE STAINING QUALITY OF METHYLENE BLUE, TISSUE MARKER AND FOOD DYE**

  Shanna Wong – Anesthesiology and Pain Management Intern Pg. 3

- **ULTRASOUND IS AN ACCURATE METHOD AS COMPARED TO RADIOGRAPHY FOR DIAGNOSING THE PRESENCE OF ACUTE HIP LUXATION IN CADAVER DOGS AND CAN IDENTIFY DIRECTION OF LUXATION WITH VARIABLE RELIABILITY**

  Amy Todd-Donato – Diagnostic Imaging Resident and Pg. 4
  Gretchen VanDeventer – Small Animal Surgery Resident Pg. 5

11:00 am – 11:15 am **Break**

11:15 am – 12:15 pm **Resident Presentations** – Moderated by Dr. Carrie Adler

- **DEVELOPMENT, VALIDATION, AND USE OF A NOVEL 3D-PRINTED TPLO SAW GUIDE**

  Christian Folk – Small Animal Surgery Resident Pg. 6

- **SURGERY FOLLOWED BY FRACTIONATED RADIATION THERAPY VERSUS SURGERY ALONE IN THE TREATMENT OF CANINE THYROID CARCINOMA**

  Brittany Zumbo – Medical Oncology Resident Pg. 7

Schedule (cont.)

- **A PILOT STUDY TO EVALUATE THE DIAGNOSTIC ACCURACY OF MAINSTREAM VERSUS SIDESTREAM CAPNOGRAPHY IN DETECTING AIRWAY INTUBATION OF SMALL-BORE STYLETED NASOENTERIC FEEDING TUBES**

  Molly Bechtold – Small Animal Medicine Resident **Pg. 8**

- **CLINICAL FINDINGS AND OUTCOME PREDICTORS FOR EQUINE MULTINODULAR PULMONARY FIBROSIS: 46 CASES (2009-2019)**

  Amanda Craven – Large Animal Medicine Resident **Pg. 9**

12:15 pm – 1:00 pm **Lunch**

1:00 pm – 2:15 pm **Resident Presentations and Proposal Presentations** – Moderated by Dr. Tim Hackett

- **CHARACTERIZING CLINICOPATHOLOGIC FEATURES OF EMERGING SKUNK ADENOVIRUS 1 IN NORTH AMERICAN PORCUPINES (ERETHIZON DORSATUM)**

  Shotaro Nakagun – Anatomic Pathology Resident **Pg. 10**

- **METABOLIC FEATURES OF RAPID VS. GRADUAL ENTERAL REFEEDING IN EMACIATED RED-TAILED HAWKS (BUTEO JAMAICENSIS)**

  Melissa Hanson – Zoological Medicine Resident **Pg.11**

- **PROPOSAL: EFFICACY OF ORAL ALBENDAZOLE AND FUMAGILLIN IN THE TREATMENT OF PSEUDOLOMA NEUROPHILIA IN ADULT ZEBRAFISH (DANIO RERIO)**

  Elizabeth Lavin – Laboratory Animal Medicine Resident **Pg. 12**

- **PROPOSAL: TREATMENT OF CHRONIC EQUINE HEPACIVIRUS INFECTION WITH POLYCLONAL ANTIBODIES IN CONVALESCENT HORSE PLASMA**

  Erin Pearson – Large Animal Medicine Resident **Pg. 13**

- **PROPOSAL: CAN VOLTAGE-GATED CALCIUM CHANNEL BETA SUBUNIT GENE OF DIPYLIDIUM CANINUM BE A DIAGNOSTIC DNA MARKER FOR ASSESSING PRAZIQUANTEL RESISTANCE IN CANINE AND FELINE HOSTS?**

  Ranju Manoj – Large Animal Medicine Resident **Pg. 14**

2:15 pm – 2:30 pm **Break**

Schedule (cont.)

2:30 pm – 3:30 pm **Resident Proposal Presentations** – Moderated by Megan Fahey and Sydney Womak, Combined DVM/PhD students

- **PROPOSAL: DETERMINATION OF THE MINIMUM EFFECTIVE CONCENTRATION OF EPIDURAL ROPIVACAINE WITH BUPRENORPHINE AND EVALUATION OF RECOVERY QUALITY IN DOGS UNDERGOING OVARIOHYSTERECTOMY**

  Cheyenne Cannarozzo – Anesthesiology and Pain Management Resident **Pg. 15**

- **PROPOSAL: EFFECT ON DURATION OF BLOCKADE WHEN DEXMEDETOMIDINE IS USED AS AN ADJUVANT IN PERIPHERAL NERVE BLOCKS**

  Kelly Chen – Anesthesiology and Pain Management Resident **Pg. 16**

- **PROPOSAL: THE EFFECT OF ACUTE CONTROLLED HEMORRHAGE, PHENYLEPHRINE, AND DOBUTAMINE ON THE REGIONAL DISTRIBUTION OF VENTILATION-PERFUSION RATIO IN ANESTHETIZED PIGS.**

  Shannon Larrabee – Anesthesiology and Pain Management Resident **Pg. 17**

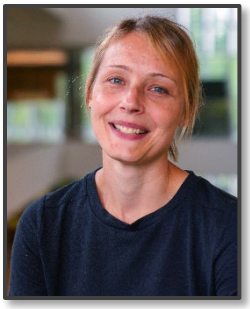
- **PROPOSAL: EVALUATION OF TRANSVERSUS ABDOMINIS PLANE BLOCK IN PIGS USING LIPOSOMAL BUPIVACAINE VERSUS BUPIVACAINE HCL**

  Emily C. Pearson – Laboratory Animal Medicine Resident **Pg. 18**

4:00 pm **Award Presentations**

Dr. Lorin Warnick, Dean, College of Veterinary Medicine

Keynote Speaker



Sabine Mann, Dr. med. vet., PhD, DACVPM
Assistant Professor, Department of Population Medicine and Diagnostic Sciences, Cornell University.

Sabine Mann is an Assistant Professor of Ambulatory Medicine. She received her DVM degree from Hannover, Germany, her veterinary doctorate from LMU Munich, Germany, and her PhD from Cornell University in transition cow nutrition and physiology and epidemiology. Her current research focuses on the intersection of metabolism, nutrition, and immunology. She is particularly interested in nutritional strategies and interventions to improve host resilience in newborn calves and postpartum cows.

Moderators

Jacquelyn Evans, PhD
Assistant Professor in the Department of Biomedical Sciences, Baker Institute for Animal Health, Cornell University

Dr. Jacquelyn Evans' research program focuses on improving the health of dogs by identifying genetic risk factors for disease, leading to genetic tests to reduce disease frequency, earlier disease detection, and potentially improved therapies. Many canine diseases have human counterparts often caused by the same mutation or mutations in the same genes/pathways. Thus, the information we learn from the dog model may also inform human disease research.

Carrie Adler, PhD
Assistant Professor in the Department of Molecular Medicine, Cornell University

Dr. Adler obtained her PhD from the University of California, San Francisco, working with Dr. Cori Bargmann. Her postdoctoral training, with Alejandro Sánchez Alvarado at the University of Utah and the Stowers Institute for Medical Research, focused on flatworm regeneration. Dr. Adler established her lab at Cornell in 2015, where she studies stem cell biology, DNA damage, and regeneration.

Tim Hackett, DVM
Professor of Emergency and Critical Care and Chair of the Department of Clinical Sciences

Dr. Hackett received his DVM in 1989 from Colorado State University. After completing an internship at VCA West Los Angeles Animal hospital and a year in private emergency practice, he completed an emergency and critical care medicine residency at Colorado State University in 1994. He spent the next 25 years on faculty at Colorado State including leadership of the emergency/critical care service, Small Animal Chief of Staff, Veterinary Teaching Hospital Director, and Associate Dean of the Veterinary Health System. He was President of the American College of Emergency and Critical Care Medicine 2011-2013. He joined the faculty at Cornell in 2021 as Professor of Emergency/Critical Care Medicine and Chair, Department of Clinical Sciences.

His early research focused on sepsis and infectious disease in critical illness, cardiopulmonary critical care, trauma, and envenomation. His current focus is in gaining an understanding of snake venom across species with a goal of economical and universally available antivenom products.

Moderators (cont.)

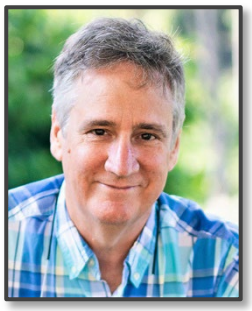
Megan Fahey
Combined DVM/PhD student

Meg is a third-year Combined DVM-PhD student currently working in Dr. Michelle Delco's lab. Meg's research focuses on mesenchymal stem cell derived therapeutics for orthopedic soft tissues.

Sydney Womack
Combined DVM/PhD student

Sydney graduated in 2021 with a Bachelor of Science degree from the University of South Carolina, where she studied Biomedical Engineering. At Cornell, she has focused her PhD rotations on the applications of data analysis techniques to veterinary medicine, participating in multispecies proteomics and dairy cow population science projects. Sydney recently presented work in the field of comparative orthopedics from her first PhD rotation at the Orthopedic Research Society in Tampa, Florida.

2022 Judges



Scott Coonrod, PhD
Judy Wilpon Professor of Cancer Biology, Department of Biomedical Sciences, Director Baker Institute for Animal Health

Dr. Coonrod earned both is MS (1991) and PhD (1995) in Biomedical Science from Texas A&M University. He was appointed Assistant Professor of Research in the Department of Cell Biology at the University of Virginia until 2003, when he came to the Weill Medical College of Cornell University. Since 2007 he has been Associate Professor of Epigenetics and Reproductive Biology at the Baker Institute ofr Animal Health, Cornell University and is currently the institute's Director.

Dr. Coonrod focuses his research attention on cancer, the out-of-control growth of cells that claims millions of animal and human lives every year. PAD2 inhibitors could represent a potent new therapy for these women who are no longer responsive to tamoxifen therapy. Given that most cases of mammary cancer in canines are estrogen receptor positive, Dr. Coonrod hopes that, once developed, PAD2 inhibitors will also represent a new therapeutic option for canine mammary cancer.

Kevin Cummings, DVM, PhD
Associate Professor, Department of Public & Ecosystem Health, Cornell University

Dr. Cummings earned both his DVM (1996) and Ph.D. in Epidemiology (2010) from Cornell University. He spent the intervening years as a practicing veterinarian and then as an instructor back at Cornell. Upon completion of his Ph.D., Dr. Cummings served as an Assistant Professor of Epidemiology at Texas A&M University. He returned to Cornell in 2017 to serve as an Associate Professor of Epidemiology and the Master of Public Health (MPH) Program. His research focuses on the ecology and transmission of foodborne pathogens (Salmonella and Campylobacter in particular), antimicrobial resistance, and emerging infectious diseases, among hosts ranging from dairy cattle to wildlife.

Dr. Cummings also has extensive experience teaching epidemiologic methods and public health topics to graduate and veterinary students.

Julia Felippe, M.V., M.Sc., Ph.D.'02, Diplomate ACVIM
Professor of Medicine and Provost's Fellow for Public Engagement, Cornell University

Dr. Felippe graduated with a Medica Veterinaria-degree from the UNESP-Botucatu Faculdade de Medicina Veterinaria e Zootecnia, Brazil in 1989. After a few years in equine practice, she performed an internship and residency in equine internal medicine at Kansas State University from 1994-1998. During that period, she also completed a M.Sc.-degree studying equine developmental immunology and immunomodulators. From 1998-2002, she pursued her Ph.D.-degree in immunology at Cornell University studying the immunomodulatory effects of the equine placenta. Dr. Felippe's research program studies the equine fetal and neonatal immune preparedness; and genetic and epigenetic mechanisms that lead to common variable immunodeficiency in horses. Dr. Felippe teaches in the DVM-curriculum and has served as a research mentor to undergraduate, graduate, and DVM students, post doctorates, and residents.

Dr. Felippe is the editor and author contributor of Equine Clinical Immunology.

2022 Judges (cont.)

Toby Pinn-Woodcock, DVM, DACVIM
Assistant Clinical Professor, Department of Population Medicine, Cornell University

Dr. Pinn-Woodcock is a member of the Veterinary Support Services team at the Cornell Animal Health Diagnostic Center (AHDC) and a clinician in Large Animal Internal Medicine at the Cornell Equine and Nemo Farm Animal Hospital. Dr. Pinn-Woodcock received her DVM degree from the University of Wisconsin, School of Veterinary Medicine in 2008, after which she completed a residency in large animal internal medicine at Cornell University. Dr. Pinn-Woodcock spent 6 years in private practice, which included equine ambulatory and referral practice, companion animal and large animal production medicine. She returned to Cornell in 2018 in her current role at the AHDC and CVM.

Her areas of interest and research include large animal infectious disease and equine endocrinology.

Isabelle M. Louge, DVM

iml23@cornell.edu

Institution and Location	Degree	Year
Cornell University, Ithaca, New York	DVM	2018
Cornell University, Ithaca, New York	Residency	2020-Present

Current Position

2nd Year Resident, Ambulatory and Production Medicine

Abstract Title:

Anthelmintic Resistance in Sheep and Goat Herds in the Finger Lakes Region of NY

Authors Names:

Isabelle Louge[1], Sabine Mann1Manigandan Lejeune[1], Mary Smith[1], Jessica A.A. McArt[1], Araceli Lucio-Forster[2], Tatiana Stanton[3], Mathew J. Edwards[1]

[1]Department of Population Medicine and Diagnostic Sciences, Cornell University, Ithaca, New York
[2]Department of Microbiology and Immunology, Cornell University, Ithaca, New York
[3]Department of Animal Science, Cornell University, Ithaca, New York

Project Mentor:

Mentor: Sabine Mann, DVM, PhD, Dip. ECBHM, Dip. ACVPM (Epidemiology), Department of Population Medicine and Diagnostic Sciences, sm682@cornell.edu
Co-Mentor: Jessica A.A. McArt, DVM, PhD, Dip. ABVP (Dairy Practice), Department of Population Medicine and Diagnostic Sciences, jmcart@cornell.edu
Co-Mentor: Mary C. Smith, Dip. ACT, Department of Population Medicine and Diagnostic Sciences, mcs8@cornell.edu

Abstract:

Anthelmintic resistance of small ruminant gastrointestinal strongyles (GIS) is of increasing concern. Our objective was to determine differences in resistance of GIS to commonly used oral anthelmintics.

Goats (n= 131) and sheep (n = 109) with a FAMACHA score of 3 or 4 from 20 herds were enrolled in a randomized block design to one of three treatments: fenbendazole, levamisole, or moxidectin. Fecal samples were obtained at enrollment and approximately 14 days later to calculate fecal egg count reduction (FECR) in animals with ≥ 50 eggs/gram at enrollment (n = 111 goats, n = 38 sheep). Results are only reported for goats given the small number of sheep meeting inclusion criteria.

Median (range) FECR for fenbendazole, levamisole, and moxidectin were 40 (-1161 to 100), 88 (-608 to 100) and 77 (-846 to 100) %, respectively. Wilcoxon test with Steel-Dwass comparisons showed that fenbendazole differed from levamisole (P = 0.01) whereas moxidectin did not differ from either group (P ≥ 0.08).Odds of resistance were determined using mixed effects logistic regression. Fenbendazole, levamisole, and moxidectin reduced FECR >90% in 14%, 47%, and 36% of goats, respectively. Fenbendazole treated goats had greater odds (aOR; 95% CI) of resistant GIS compared with levamisole (aOR = 7.8; 2.2 to 27.6]) or moxidectin (aOR = 3.8; 1.1 to 13.8); moxidectin resistance did not differ from levamisole (aOR = 2.0; 0.7 to 5.8).

We found that resistance to anthelmintics is prevalent in GIS of goats in New York's Finger Lakes Region and is most severe for fenbendazole.

Ella Pittman, DVM
ep452@cornell.edu

Institution and Location	Degree	Year
Cornell University, Ithaca, New York	DVM	2018
Cornell University, Ithaca, New York	Residency	2019-Present

Current Position
3rd Year Resident in Anesthesiology

Abstract Title:
Evaluation of the Effects of a 1:1 Inspiratory:Expiratory Ratio in Anesthetized and Ventilated Horses

Authors Names:
Ella Pittman[1], Manual Martin-Flores[1], Martina Mosing[2], Matias Lorenzutti[3], Jaime Retamal[4], Francesco Staffieri[5], Andy Adler[6], Mark Campbell[6], Joaquin Araos[1]

[1]Department of Clinical Sciences, Cornell University, Ithaca, NY, USA
[2]Equine Department, Section of Anaesthesiology, Vetsuisse Faculty, University of Zürich, Zürich, Switzerland
[3]Department of Pharmacology and Toxicology, Catholic University of Córdoba, Córdoba, Argentina
[4]Departamento de Medicina Intensiva, Pontificia Universidad Católica de Chile, Marcoleta 367, Santiago, Chile
[5]Surgery Unit, Section of Veterinary Clinics and Animal Production, Department of Emergency Transplantation D.E.O.T., "Aldo Moro" University of Bari, Bari, Italy
[6]Department of Systems and Computer Engineering, Carleton University, Ottawa, Ontario, Canada

Project Mentor(s):
Joaquin Araos MV, DACVAA, PhD, Department of Clinical Sciences, jda246@cornell.edu

Abstract:
Objective
To describe cardiorespiratory effects of an inspiratory:expiratory (IE) ratio of 1:1 compared to 1:3 in ventilated horses.

Study Design
Randomized, crossover experimental study

Animals
Eight anesthetized adult horses (444 [330-485]kg BW)

Methods
Horses were ventilated with tidal volumes of 15 mL/kg and respiratory rates of 8 breaths per minute. Horses received two IE ratios, 1:1 (IE1:1) and 1:3 (IE1:3) in random order, each for 25 minutes. Spirometry data, arterial blood gases and dobutamine requirements were recorded in all horses during each treatment. Electrical impedance tomography (EIT) data was recorded in 4 horses and used to generate functional EIT variables including regional ventilation delay (RVD), a measure of speed of lung inflation, and end-expiratory lung impedance (EELI), a surrogate of functional residual capacity (FRC). Results were assessed with linear and generalized linear mixed models. $P < 0.05$ considered significant.

Results
Horses ventilated with IE1:1 had higher mean airway pressures and respiratory system compliance ($p < 0.014$) and lower peak, end-inspiratory, and driving airway pressures compared with an IE1:3. No differences in arterial oxygenation or dobutamine requirements were observed, though $PaCO_2$ was lower during IE1:1 ($p = 0.039$). Treatment IE1:1 resulted in lower RVD ($p < 0.002$) and higher EELI ($p = 0.023$) than treatment IE1:3.

Conclusion
An IE1:1 improves respiratory system mechanics and alveolar ventilation, compared with an IE1:3, while oxygenation and dobutamine requirements are unchanged. An IE1:1 leads to a faster inflation of the lung, possibly due to an increased FRC.

Shanna Wong, DVM
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Institution and Location	Degree	Year
North Carolina State University, Raleigh, NC	DVM	2020
The Animal Medical Center, New York, NY	Internship	2020-2021
Cornell University, Ithaca, New York	Spec. Internship	2021-Present

Current Position
Specialty Intern in Anesthesia and Pain Management

Abstract Title:
Comparison of Nerve Staining Quality of Methylene Blue, Tissue Marker and Food Dye

Authors Names:
Shanna Wong[1], Cristina de Miguel Garcia[1], Stephanie Hon[1]

[1]Department of Clinical Sciences, Cornell University, Ithaca, New York

Project Mentor(s):
Cristina de Miguel Garcia, DVM, MSc, MRCVS, DECVAA, Department of Clinical Sciences

Abstract:
Development of locoregional anesthesia techniques requires the use of dyes to confirm successful targeting of the desired nerve. The objective of this study is to determine the nerve staining efficacy of different dyes commonly reported in the literature.

Brachial plexus nerves were obtained from freshly euthanized pig cadavers. A total of 36 nerves were randomized into one of three groups: group MB, 1% methylene blue; group TML, 0.1:10 mixture of tissue marker and 2% lidocaine; and group FD, 1:10 mixture of food dye and 0.5% bupivacaine and submerged in dye for one of four time periods: 1, 15, 30 or 60 minutes. Baseline, superficial nerve stain and deep nerve stain images were obtained and processed using ImageJ. The degree of staining was categorized according to pre-set saturation values as dark, medium dark, medium light and light staining.

After one minute, dark and medium dark staining were seen in 65% nerve area in the FD group, compared to 42% of nerve area in MB group; percentage of area stained was not significantly different between these two groups after 15 minutes. In group TML, only 8% of total area was stained dark/medium dark after 60 minutes. On cross-sectional area, only FD stained dark at any time point. Light staining was present in FD group on 65-87% area compared to 18-55% in group MB. No deep staining could be found on group TM.

Current data suggests that FD rapidly and consistently stains nerves, not only superficially but also within deeper layers.

Amy B. Todd-Donato, DVM

abt25@cornell.edu

Institution and Location	Degree	Year
Cornell University, Ithaca, New York	DVM	2006
Cornell University, Ithaca, New York	Residency	2019-Present

Current Position

3rd Year Resident in Diagnostic Imaging

Abstract Title:

Ultrasound Is an Accurate Method as Compared to Radiography for Diagnosing the Presence of Acute Hip Luxation in Cadaver Dogs and Can Identify Direction of Luxation With Variable Reliability.

Authors Names:

Amy B. Todd-Donato[1*], Gretchen M. VanDeventer[1*], Ian R. Porter[1], Ursula Krotscheck[1]

[1]Department of Clinical Sciences, Cornell University, Ithaca, New York
***Co-presenters**

Project Mentor(s):

Mentor: Ian R. Porter, DVM, DACVR, Department of Clinical Sciences, irp5@cornell.edu
Co-Mentor: Ursula Krotscheck, DVM, DACVS, Department of Clinical Sciences, uk28@cornell.edu

Abstract:

Acute hip luxation is a common musculoskeletal injury in dogs, with radiographs being the preferred imaging modality for confirming the diagnosis. In large animal and human medicine, ultrasound is often utilized for this purpose. The objectives of this study were to utilize a canine cadaver model to establish ultrasonographic features of hip luxation and evaluate the accuracy and reliability for diagnosing hip luxation with ultrasound. A cadaver model was developed that allowed manual luxation and subsequent ultrasonography of the hip joint while in four directions of luxation. A description of the ultrasonographic features for each direction of luxation was created. Sixteen residency-trained and intern veterinarians, without prior experience in this technique, participated in a blinded study to perform repeated ultrasound exams on cadaver hips randomly assigned as normal or luxated (equally distributed between the 4 directions). A total of 1140 hip ultrasounds were performed with good accuracy (median, 90.8%; range, 61.4-100%), sensitivity (89.5%), and specificity (80.0%) for diagnosing presence of hip luxation. Accuracy for identifying the correct quadrant of luxation was significantly lower (mean, 58.6%; range, 24.6-90.8%; $p<0.001$). Of these, identification of a dorsal versus ventral luxation and the diagnosis of craniodorsal and caudoventral luxation yielded the highest accuracies (statistical significance not reached). Intra-observer accuracy agreement varied widely from none to almost perfect agreement, and inter-observer agreement ranged from slight to moderate agreement. The results support the use of ultrasound for accurately diagnosing the presence of hip luxation, but it should not replace radiography for diagnosing the direction of luxation.

Gretchen M. VanDeventer, DVM

gmv32@cornell.edu

Institution and Location	Degree	Year
Cornell University, Ithaca, New York	DVM	2016
Cornell University, Ithaca, New York	Residency	2019-Present

Current Position

3rd Year Resident in Small Animal Surgery

Abstract Title:

Ultrasound Is an Accurate Method as Compared to Radiography for Diagnosing the Presence of Acute Hip Luxation in Cadaver Dogs and Can Identify Direction of Luxation With Variable Reliability.

Authors Names:

Amy B. Todd-Donato[1*], Gretchen M. VanDeventer[1*], Ian R. Porter[1], Ursula Krotscheck[1]

[1]Department of Clinical Sciences, Cornell University, Ithaca, New York
***Co-presenters**

Project Mentor(s):

Mentor: Ian R. Porter, DVM, DACVR, Department of Clinical Sciences, irp5@cornell.edu
Co-Mentor: Ursula Krotscheck, DVM, DACVS, Department of Clinical Sciences, uk28@cornell.edu

Abstract:

Acute hip luxation is a common musculoskeletal injury in dogs, with radiographs being the preferred imaging modality for confirming the diagnosis. In large animal and human medicine, ultrasound is often utilized for this purpose. The objectives of this study were to utilize a canine cadaver model to establish ultrasonographic features of hip luxation and evaluate the accuracy and reliability for diagnosing hip luxation with ultrasound. A cadaver model was developed that allowed manual luxation and subsequent ultrasonography of the hip joint while in four directions of luxation. A description of the ultrasonographic features for each direction of luxation was created. Sixteen residency-trained and intern veterinarians, without prior experience in this technique, participated in a blinded study to perform repeated ultrasound exams on cadaver hips randomly assigned as normal or luxated (equally distributed between the 4 directions). A total of 1140 hip ultrasounds were performed with good accuracy (median, 90.8%; range, 61.4-100%), sensitivity (89.5%), and specificity (80.0%) for diagnosing presence of hip luxation. Accuracy for identifying the correct quadrant of luxation was significantly lower (mean, 58.6%; range, 24.6-90.8%; $p<0.001$). Of these, identification of a dorsal versus ventral luxation and the diagnosis of craniodorsal and caudoventral luxation yielded the highest accuracies (statistical significance not reached). Intra-observer accuracy agreement varied widely from none to almost perfect agreement, and inter-observer agreement ranged from slight to moderate agreement. The results support the use of ultrasound for accurately diagnosing the presence of hip luxation, but it should not replace radiography for diagnosing the direction of luxation.

Christian A. Folk, DVM

caf242@cornell.edu

Institution and Location	Degree	Year
Louisiana State University, Baton Rouge, LA	DVM	2018
University of Tennessee, Knoxville, TN	Rot. Internship	2019
Veterinary Specialty Hospital, San Diego, CA	Surg. Internship	2020
Cornell University, Ithaca, New York	Residency	2020-Present

Current Position

2nd Year Resident in Small Animal Surgery

Abstract Title:

Development, Validation, and Use of a Novel 3D-Printed TPLO Saw Guide

Authors Names:

Christian Folk[1], Ursula Krotscheck[1], Ian Porter[1]

[1]Department of Clinical Sciences, Cornell University, Ithaca, New York

Project Mentor(s):

Mentor: Ursula Krotscheck DVM DACVS, Department of Clinical Sciences, uk28@cornell.edu
Co-Mentor: Ian Porter. DVM DACVR, Department of Clinical Sciences, irp5@cornell.edu

Abstract:

Introduction

The objective is to determine if a novel, 3D-printed TPLO saw guide can consistently produce accurate and centered tibial osteotomies regardless of surgeon experience and patient size to prevent postoperative limb malalignment and minimize stress on the tibial tuberosity.

Methods

Multiple, variably sized, novel, 3D-printed, 'jig-less' TPLO saw guides were designed using 3D software (Mimics Research) and printed using a 3D printer. Cadaveric stifles were radiographed, the native tibial plateau angle (TPA) was measured, and the center and size of the radial tibial osteotomy were determined. TPLOs were then randomized to be performed with or without the use of the novel saw guide and then performed by a surgical resident (n=10 per group, 20 per resident). Post-operative stifle radiographs were then performed and compared to the planned pre-operative radiographs to determine the osteotomy accuracy with and without the saw guide.

Results

Preliminary data suggests that the use of the 3D-printed TPLO saw guide produces similarly accurate osteotomies when compared to free-hand osteotomies regardless of the year of the surgical resident.

Discussion / Conclusions

Application of the 3D-printed TPLO guide is helpful for beginners to produce an accurate tibial osteotomy, however, its use becomes negligible with increased experience and exposure to the TPLO procedure.

Brittany A. Zumbo, DVM
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Institution and Location	Degree	Year
Michigan State University, East Lansing, MI	DVM	2018
Cornell University, Ithaca, New York	Internships	2018-2019
Cornell University, Ithaca, New York	Residency	2020-Present

Current Position
2nd Year Resident in Medical Oncology

Abstract Title:
Surgery Followed by Fractionated Radiation Therapy Versus Surgery Alone in the Treatment of Canine Thyroid Carcinoma

Authors Names:
Brittany A. Zumbo[1], Corene Bruhns[1], Kelly R. Hume[1]

[1]Department of Clinical Sciences, Cornell University, Ithaca, New York

Project Mentor(s):
Kelly R. Hume, DVM, DACVIM (Oncology), Department of Clinical Sciences, krh73@cornell.edu

Abstract:
Thyroid carcinomas are one of the most common endocrine tumors in the dog. Due to its locally invasive nature, a combination of surgery and post-operative radiation therapy are sometimes used for treatment. Alternatively, treating with surgical excision alone has been used with varying success. The objective of this retrospective study was to compare clinical outcomes between dogs that received surgery in combination with definitive intent radiation therapy or surgery alone for treatment of thyroid carcinoma at our institution. Records from 29 dogs treated between 2004-2019 were reviewed. Eight dogs received surgery to remove their tumor followed by daily fractionated radiation therapy (total dose > 47 Gy); 3 of these dogs had bilateral tumors. Twenty-one dogs received surgery alone; all had unilateral tumors. Dogs that received radiation therapy had no evidence of gross disease upon starting radiation. Five dogs received adjuvant chemotherapy. Adequate follow-up information was available for 24 dogs. Using Kaplan-Meier analysis, overall median survival (MST) for all dogs was 857 days (95% CI 634-1039 days); MST for dogs that received surgery plus radiation therapy was 1311 days (95% CI 496-2024 days); MST for dogs that received surgery alone was 857 days (95% CI 627-946 days). The survival difference noted between treatment groups did not reach statistical significance (p=0.0525; log-rank test). Patient and tumor characteristics that influenced overall survival were not identified. This study suggests that adjuvant definitive radiation therapy may be indicated in a subset of canine thyroid carcinoma patients.

Molly A. Bechtold, DVM

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Institution and Location	Degree	Year
U.C. Davis, Davis, California	DVM	2003
Dogs and Cats Veterinary Emergency and Referral	Internship	2007
Cornell University, Ithaca, New York	Residency	2019-Present

Current Position

3rd Year Resident in Small Animal Internal Medicine

Abstract Title:

A Pilot Study to Evaluate the Diagnostic Accuracy of Mainstream Versus Sidestream Capnography in Detecting Airway Intubation of Small-Bore Styleted Nasoenteric Feeding Tubes

Authors Names:

Molly Bechtold[1], Meredith Miller[1], Julia Sumner[2], Daniel Fletcher[1], Stephanie Hon[1], Erin Epperly[3]

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Project Mentor(s):

Mentor: Meredith L. Miller, DVM, DACVIM, Department of Clinical Sciences, mlm64@cornell.edu
Co-Mentor: Daniel J. Fletcher, PhD, DVM, DACVECC, Department of Clinical Sciences, djf42@cornell.edu

Abstract:

Introduction

Undetected tracheobronchial placement of nasoenteric feeding tubes can result in pneumothorax, hemothorax, isocalothorax, and death. End tidal carbon dioxide (ETCO2) monitoring is effective in detecting nasoenteric feeding tube misplacement in humans, but this technique has been minimally evaluated in veterinary medicine. Our objectives were to evaluate the accuracy of mainstream vs. sidestream capnorgraphy to detect airway intubation of small bore styleted nasoenteric feeding tubes in variably sized dogs and cats.

Methods

Ten client-owned dogs and ten client-owned cats undergoing elective surgical procedures under general anesthesia were prospectively enrolled in the study. A 6fr or 8fr polyurethane styleted feeding tube was inserted through a fenestrated elbow adaptor connected between the endotracheal tube and anesthesia circuit to the level of the thoracic inlet. Readings through the nasoenteric tube were obtained via both mainstream and sidestream capnography with respiratory rate, ETCO2, and time to ETCO2 waveform recorded.

Results

Mainstream capnography failed to detect an ETCO2 waveform in all dogs. Sidestream capnography detected an ETCO2 > 20mmHg within 1-4 seconds of insertion into the trachea of all dogs and cats.

Conclusion

Sidestream capnography is a readily available, cost-effective method to detect tracheobronchial intubation with polyurethane, small bore, styleted nasoenteric feeding tubes in real time and may be effective in reducing tracheobronchial misplacement and associated complications. An ongoing prospective study is in progress to evaluate the use of this technique in a veterinary teaching hospital in reducing misplacement and complications in the clinical setting.

Amanda B. Craven, DVM

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Institution and Location	Degree	Year
University of Wisconsin-Madison, Madison, WI	DVM	2018
Cornell University, Ithaca, New York	Residency	2019-Present

Current Position
3rd Year Resident in Large Animal Internal Medicine

Abstract Title:
Clinical Findings and Outcome Predictors for Equine Multinodular Pulmonary Fibrosis: 46 Cases (2009-2019).

Authors Names:
Amanda Craven[1], Amy Todd-Donato[1], Tracy Stokol[1], Gillian Perkins[1], Ignacio Corradini[2], Rachel Liepman[3], Ilana Glasberg[4*], Pamela Wilkins[4], Daniela Luethy[5*], David Wong[6], Angelika Schoster[7], Astrid J. Spierenburg[8], Joy E. Tomlinson[9]

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Project Mentor(s):
Mentor: Joy E. Tomlinson DVM, DACVIM, PhD, Baker Institute for Animal Health, jet37@cornell.edu
Co-Mentor: Tracy Stokol, BVSc, PhD, DACVP, Department of Clinical Sciences, ts23@cornell.edu

Abstract:
Background
Prognostic indicators for Equine Multinodular Pulmonary Fibrosis (EMPF), an interstitial fibrosing lung disease, are poorly described.

Hypothesis/Objectives
Describe clinical and diagnostic findings and determine outcome predictors in horses diagnosed with EMPF.
Animals: Forty-six adult horses from academic and private referral institutions diagnosed with EMPF by the attending clinician. Cases were excluded if there was a diagnosis of primary bacterial pneumonia, fungal pneumonia, or neoplasia.

Methods
Retrospective multicenter case series from 2009-2019. Medical records were reviewed. Convenience sample of radiographic and ultrasonographic images from 29 EMPF cases, and bronchoalveolar lavage fluid (BALF) cytology from 6 EMPF and 13 asthma cases were independently reviewed, blinded to diagnosis and outcome. Associations between predictor variables and survival to discharge (short-term) and to 3 months (long-term) were assessed by predictor screening followed by Fisher's exact and Wilcoxon rank sum tests.

Results
Twenty-seven (59%) and 11 (24%) horses survived to discharge and to 3 months, respectively. BALF macrophage atypia was seen in more EMPF than asthmatic horses (67% vs. 8%, $p = 0.017$). Lower maximal rectal temperature and band neutrophil counts, higher BALF lymphocyte:neutrophil ratios, and corticosteroid treatment, were associated with short-term survival. Lower respiratory rate, higher BALF lymphocyte:neutrophil ratios, and higher blood lymphocyte counts were associated with long-term survival. Sonographic and radiographic findings were not associated with survival.

Discussion
BALF macrophage atypia warrants additional testing for EMPF in horses with fever, weight loss, and lower respiratory disease. The prognosis for EMPF horses is poor and corticosteroid treatment does not improve long-term survival.

Shotaro Nakagun, DMV, PhD

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Institution and Location	Degree	Year
Obihiro University of Ag. and Vet. Medicine, Japan	DVM	2016
United Graduate School of Veterinary Sciences, Japan	PhD	2020
Cornell University, Ithaca, New York	Residency	2020-Present

Current Position

2nd Year Resident in Anatomic Pathology

Abstract Title:

Characterizing Clinicopathologic Features of Emerging Skunk Adenovirus 1 in North American Porcupines (*Erethizon Dorsatum*)

Authors Names:

Shotaro Nakagun[1], Elizabeth L. Buckles[1], Cynthia R. Hopf[2], Mason C. Jager[1], Sara E. Childs-Sanfo

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Project Mentor(s):

Mentor: Sara E. Childs-Sanford, DVM, MS, DACZM, Department of Clinical Sciences, sec15@cornell.edu
Co-Mentor: Elizabeth L. Buckles DVM, PhD, DACVP, Department of Biomedical Sciences, elb36@cornell.edu

Abstract:

Skunk adenovirus 1 (SkAdV-1) is an emerging pathogen in eastern North America with multiple known outbreaks. This virus has been identified in a variety of taxonomically unrelated mammals, raising significant concern for its potential wildlife health impacts. However, information on clinical and pathologic presentations of affected animals is scarce.

As clinical SkAdV-1 disease is most commonly observed in North American porcupines, the objectives of this study are to: 1) establish clinical parameters for diagnosis and treatment of SkAdV-1 in porcupines; 2) document gross and microscopic lesions; and 3) assess the feasibility of antemortem PCR diagnosis via ocular swabs versus the current gold-standard of invasive deep nasal swabs. Standardized clinical and postmortem pathologic examinations, RNA in situ hybridization (ISH), and molecular analyses were performed on retrospective and prospective samples. This presentation will focus on the postmortem aspect.

Currently, tissues of 34 out of 55 porcupines have been subjected to ISH analysis based on their postmortem findings. Hybridization was confirmed in nine cases (16.4%), of which seven had rhinotracheitis and pneumonia, and two had hepatitis and peritonitis without respiratory lesions. Novel ocular and middle ear lesions were confirmed in five and three cases, respectively, expanding the known range of SkAdV-1-related lesions. Out of nine cases with SkAdV-1-positive deep nasal swabs, eight also had positive ocular swabs, suggesting that ocular swabs are a promising alternative sample for antemortem diagnosis.

These data will assist clinicians, rehabilitators, pathologists, and biologists in the detection and diagnosis of SkAdV-1 and serve as a foundation for future studies.

Melissa E. Hanson, DVM

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Institution and Location	Degree	Year
Cornell University, Ithaca, New York	DVM	2019
The Animal Medical Center, Sm. Animal Med. and Surgery	Internship	2020
Cornell University, Ithaca, New York	Residency	2020

Current Position

2nd Yyear Resident in Zoological Medicine

Abstract Title:

Metabolic Features of Rapid vs. Gradual Enteral Refeeding in Emaciated Red-Tailed Hawks (*Buteo Jamaicensis*)

Authors Names:

Melissa E. Hanson[1], Sara E. Childs-Sanford[1]

[1]Department of Clinical Sciences, Cornell University, Ithaca, New York

Project Mentor(s):

Mentor: Sara E. Childs-Sanford, DVM, MS, DACZM, Department of Clinical Sciences, sec15@cornell.edu

Abstract:

Emaciated raptors are commonly presented to wildlife hospitals and rehabilitation centers, tasking caretakers with the development of nutritional recovery plans. Despite abundant documentation in mammals, refeeding syndrome has never been reported in avian species. The intent of this study is three-fold: (1) identify normal metabolic parameters for red-tailed hawks (Buteo jamaicensis), (2) identify biomarkers of starvation in emaciated hawks, and (3) compare the effects of two methods of nutritional therapy on metabolic parameters and recovery success to explore the concept of refeeding syndrome in this species.

Twenty-four free-ranging, red-tailed hawks in good body condition were captured. Blood samples were collected for analysis. Upon admission to the Swanson Wildlife Hospital, emaciated red-tailed hawks are currently being enrolled in the refeeding study, with serial blood measurements collected over a one-week time period. Hospitalized hawks are randomly divided into rapid (whole prey) and gradual (commercial recovery formula) refeeding groups, and their outcomes and blood values will be compared upon completion of data collection.

Reference intervals were established using blood values from the sampled healthy hawks for basic biochemical parameters, plasma amino acids, and beta-hydroxybutyrate. Initial data demonstrates that in comparison, emaciated hawks are anemic, hyperuricemic, hypoalbuminemic, and have lower plasma beta-hydroxybutyrate. Research into the optimal refeeding strategy is currently ongoing.

This data will serve to inform the veterinary and wildlife rehabilitation communities about markers of starvation, the presence or absence of refeeding syndrome in an avian species, and the effects of commonly employed nutritional therapy on the metabolic status of red-tailed hawks.

Elizabeth S. Lavin, DVM

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Institution and Location	Degree	Year
Cornell University, Ithaca, New York	DVM	2021
Cornell University, Ithaca, New York	Residency	2021-Present

Current Position
1st Year Resident in Laboratory Animal Medicine

Abstract Title:
Efficacy of Oral Albendazole and Fumagillin in the Treatment of Pseudoloma Neurophilia in Adult Zebrafish (Danio Rerio)

Authors Names:
Elizabeth S. Lavin[1], Erin K. Daugherity[1], Renata Ivanek[2], Michael Kent[3], Rodman Getchell[4]

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[2]Department of Population Medicine and Diagnostic Sciences, Cornell University, Ithaca, New York
[3]Department of Microbiology, Oregon State University, Corvallis, Oregon
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Project Mentor(s):
Mentor: Erin Daugherity, DVM, MS, DACLAM, Department of Biomedical Sciences, ekr2@cornell.edu
Co-Mentor: Rodman Getchell PhD, Department of Microbiology and Immunology, rgg4@cornell.edu
Co-Mentor: Renata Ivanek, DVM, MS, PhD, Department of Population Medicine and Diagnostic Sciences, ri25@cornell.edu

Abstract:
Background/Rationale
An increasingly popular research model, zebrafish (Danio rerio) are used to study developmental biology, toxicology, and human and animal disease.

Pseudoloma neurophilia, the most commonly identified zebrafish pathogen, can disrupt biomedical research. A generally subclinical microsporidian parasite, *P.neurophilia* confounds research by inducing behavioral and physiological changes that manifest as emaciation, scoliosis, aberrant swimming, and reduced fecundity. There is no treatment, and control often requires euthanasia. Two antimicrobials, albendazole and fumagillin, have proven efficacious in treating microsporidians of other fish species, as well as microsporidiosis of humans and honeybees.

Hypothesis and Scientific Design
Adult wild-type zebrafish will be divided into 6 groups: infected control, uninfected control, low-dose fumagillin, high-dose fumagillin, albendazole, and high-dose fumagillin + albendazole. Each group will be administered a gel-based medicated diet containing neither, one, or both antimicrobials for four weeks to be followed by feeding of a non-medicated diet for the remainder of the experiment. At weeks 8, 10, and 16, 1/3 of fish from each group will be euthanized. Half of the carcasses will be submitted for histology to identify the pathogen in situ. The remaining carcasses will be processed via qPCR to assess for quantity of *P.neurophilia* DNA.

Expected Outcomes
We expect that the use of these compounds, alone and in combination, will significantly reduce the load of *P.neurophilia* infection in treated versus untreated fish.

Conclusion
This study presents an exciting and impactful opportunity to control a significant research confounder, improving the quality and reproducibility of biomedical research while advancing animal health and welfare.

Erin K. Pearson, DVM

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Institution and Location	Degree	Year
Cornell University, Ithaca, New York	DVM	2018
Cornell University, Ithaca, New York	Residency	2021-Present

Current Position

1st Year Resident in Large Animal Internal Medicine

Abstract Title:

Treatment of Chronic Equine Hepacivirus Infection with Polyclonal Antibodies in Convalescent Horse Plasma

Authors Names:

Erin K Pearson[1], Joy E Tomlinson[1]

[1]Department of Clinical Sciences, Cornell University, Ithaca, New York

Project Mentor(s):

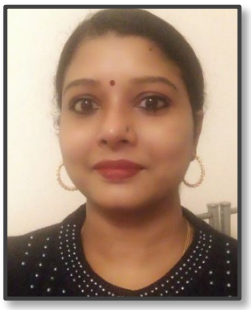
Mentor: Joy E. Tomlinson DVM DACVIM-LA PhD, Department of Clinical Sciences, jet37@cornell.edu

Abstract:

Equine hepacivirus (EqHV), a close relative of hepatitis C virus (HCV), can cause persistent infections and chronic hepatitis. While HCV can be cured with antiviral medications, the expense and low availability of these medications make them impractical for equine use. In chimpanzee and chimeric mouse models, neutralizing antibodies suppressed viremia or cured infection, but some relapses occurred, resulting from escape mutations in the antibody target epitope. EqHV has an apparently lower rate of developing escape mutations, making it possible that antibody therapy could be curative in horses.

Two horses with known chronic EqHV infections of > 1 year duration will be transfused with commercial equine plasma that contains high anti-EqHV antibody. As the isolation of specific neutralizing antibodies for EqHV is impossible given the lack of culture system for neutralization assay, we have elected to use convalescent horse plasma from naturally infected horses. This will likely include both neutralizing and non-neutralizing antibodies, and various immunomodulatory factors that could influence multiple arms of the immune response. Measured outcomes will include serial serum PCR to measure viral load, serial luciferase immunoprecipitation system to measure anti-EqHV antibodies, and clinical examinations, serum biochemistry, and liver biopsies to measure adverse health effects. Data will be primarily descriptive, with repeated measures ANOVA to determine whether serum viral load varies with time after treatment.

We expect viral load to decline after plasma transfusion. This decline might be temporary, followed by rebound, or might progress to viral clearance.



Ranju Manoj, BVSc&AH, MVSc, PhD
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Institution and Location	Degree	Year
Kerala Agricultural University, India	BVSc&AH	2007
Tamil Nadu Vet. and Animal Sciences University, India	MVSc	2011
Tamil Nadu Vet. and Animal Sciences University, India	Research Fellow	2018
University of Bari, Italy	PhD	2021
Cornell University, Ithaca, New York	Residency	2021-Present

Current Position
1st Year Resident in Veterinary Parasitology

Abstract Title:
Can Voltage-Gated Calcium Channel Beta Subunit Gene of *Dipylidium caninum* Be a Diagnostic DNA Marker for Assessing Praziquantel Resistance in Canine and Feline Hosts?

Authors Names:
Ranju Manoj[1], Manigandan Lejeune[1], Dwight Bowman[2]

[1]Department of Population Medicine and Diagnostics, Cornell University, Ithaca, New York
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Project Mentor(s):
Mentor: Manigandan Lejeune PhD, DipACVM, Department of Population Medicine and Diagnostics, ml872@cornell.edu
Co-Mentor: Dwight Bowman PhD DipACVM, Department of Microbiology and Immunology, ddb3@cornell.edu

Abstract:
Background
Dipylidium caninum is a common dog/cat tapeworm with occasional occurrence in humans. The drug of choice is praziquantel (PZQ) and recent reports suggest drug resistance among canine population in North America. Though pharmacodynamics is unknown, the consensus is that PZQ disrupts voltage-gated calcium channel (VGCC), results in paralysis and worm death. Current study is aimed to analyze the use of VGCC beta subunit gene as a diagnostic DNA marker for PZQ resistance.

Hypothesis and Scientific Design
Genetic alteration of VGCC (beta subunit) in *D. caninum* confers resistance and this gene can be a diagnostic marker for rapid assessment of PZQ resistance. *Dipylidium caninum* (n=24) samples will be obtained from infected dogs/cats and retrieved from archived collection at AHDC parasitology section. Initial categorization of worms as 'susceptible' or 'resistant' will be determined based on owner questionnaire that documents D. caninum infection and treatment history for each animal. VGCC beta subunit genes will be PCR amplified using specific primers and Sanger sequenced. Sequence obtained for each worm will be aligned against the reference genome and genetic variations in the target will be correlated with initial assessment for status of PZQ action (resistant or susceptible).

Expected Outcome
We anticipate consistency in genetic variations of VGCC beta subunit sequence associated with resistant D. caninum in comparison to susceptible/reference genome. Utility of PCR based diagnostic test for rapid detection of PZQ resistance helps to avoid unnecessary drug use and guide veterinarians with informed treatment decision to control *D. caninum* infection in pet animals.

Cheyenne J. Cannarozzo, DVM

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Institution and Location	Degree	Year
Cornell University, Ithaca, New York	DVM	2020
Friendship Hospital for Animals	Internship	2021
Cornell University, Ithaca, New York	Residency	2021-Present

Current Position

1st Year Resident in Anesthesiology and Pain Management

Abstract Title:

Determination of the Minimum Effective Concentration of Epidural Ropivacaine With Buprenorphine and Evaluation of Recovery Quality in Dogs Undergoing Ovariohysterectomy

Authors Names:

Cheyenne J. Cannarozzo[1], Luis Campoy[1], Jordyn Boesch[1], Michelle Moyal[1], and Manuel Martin-Flores[1]

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Project Mentor(s):

Mentor: Manuel Martin-Flores, MV DACVAA, Department of Clinical Sciences, mm459@cornell.edu

Abstract:

Systemic opioid analgesics used to treat post-operative pain are associated with deleterious effects including sedation, nausea, vomiting, and inappetence. Lumbosacral epidural anesthesia (LEA) spares the need for systemic opioids and their side effects, improving recovery quality. However, high concentrations of local anesthetic (LA) used in LEA can result in motor blockade that delays hospital discharge.

In this randomized, blinded, controlled trial, 36 dogs undergoing ovariohysterectomy will be assigned to receive either no LEA or LEA with one of five concentrations (0%, 0.05%, 0.1%, 0.15%, 0.2%) of ropivacaine with buprenorphine 4mcg/kg. Post-operatively, Glasgow pain scores, sedation scores, occurrence of hypersalivation and vomiting, and time to urination, ambulation, and return of appetite will be recorded. Systemic hydromorphone will be administered as required by pain scoring. A concentration-response curve will be created to determine the minimum effective concentration (MEC) of ropivacaine that prevents use of systemic rescue analgesia while minimizing motor blockade.

We hypothesize that 1) use of LEA will result in less need for systemic hydromorphone and a better recovery quality than in control dogs and 2) that the magnitude and duration of sensory and motor blockade after LEA are concentration-dependent, with higher LA concentrations resulting in greater magnitude and longer duration of each effect.

We will determine the MEC of epidural ropivacaine with buprenorphine that provides appropriate analgesia with minimal effect on motor function. We expect to show that recovery quality in dogs receiving LEA surpasses that of dogs receiving systemic opioids, resulting in increased comfort and less time in-hospital.

Kelly L Chen, DVM

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Institution and Location	Degree	Year
University of Illinois, Urbana-Champaign	DVM	2020
Friendship Hospital for Animals	Internship	2021
Cornell University, Ithaca, New York	Residency	2021-Present

Current Position

1st Year Resident in Anesthesiology and Pain Management

Abstract Title:

Effect on Duration of Blockade When Dexmedetomidine Is Used as an Adjuvant in Peripheral Nerve Blocks

Authors Names:

Kelly Chen[1], Luis Campoy[1]

[1]**Department of Clinical Sciences, Cornell University, Ithaca, New York**

Project Mentor(s):

Mentor: Luis Campoy LV CertVA Dip. ECVAA MRCVS, Department of Clinical Sciences, lc268@cornell.edu

Abstract:

Peripheral nerve conduction blocks are an increasingly common practice to provide perioperative analgesia. Co-adjuvants such as dexmedetomidine are frequently added to local anesthetics such as bupivacaine to prolong the duration of the analgesic effect following peripheral nerve blockade.

The purpose of this study is to compare the duration of a conduction blockade in an in vitro preparation of a pig saphenous nerve using a Marsh ganglion bath after application of bupivacaine with or without dexmedetomidine and with a negative control (saline). This study will, therefore, provide a clinical recommendation to further support its use.

In this randomized, paired controlled, blinded study, the saphenous nerves from twelve pigs (partaking in an unrelated study) will be harvested immediately following humane euthanasia. Based on previous pilot data collected from in vitro frog nerve preparations, a sample size of eight nerves per group should provide a 95% statistical power (α=0.05) assuming a duration of action of 6±2 hours and 12±4 hours for the bupivacaine and bupivacaine/dexmedetomidine groups, respectively. Each nerve will be randomly assigned to either a saline control, bupivacaine only, or bupivacaine and dexmedetomidine treatment. Compound action potentials will be measured every ten minutes until nerve conduction returns to baseline. A mixed effect test and survival analysis (Manthel-Cox test) will be used to compare treatments and its duration. We hypothesize that dexmedetomidine in combination with bupivacaine will provide significantly increased time to recover to baseline amplitude as compared to bupivacaine only and control treatments.

Shannon N. Larrabee, DVM, MPH

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Institution and Location	Degree	Year
University of Minnesota, St. Paul, MN	DVM	2018
University of Minnesota, St. Paul, MN	MPH	2019
Colorado State University, Fort Collins, CO	Internship	2020
Cornell University, Ithaca, New York	Residency	2020-Present

Current Position

2nd Year Resident in Anesthesia and Analgesia

Abstract Title:

The Effect of Acute Controlled Hemorrhage, Phenylephrine, and Dobutamine on the Regional Distribution of Ventilation-Perfusion Ratio in Anesthetized Pigs.

Authors Names:

Shannon N. Larrabee[1], Manuel Martin Flores[1], Joaquin Araos[1]

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Project Mentor(s):

Mentor: Joaquin Araos MV, PhD DACVAA, Department of Clinical Sciences {Anesthesia}, jda246@cornell.edu
Co-Mentor: Manuel Martin Flores, MV, DACVAA, Department of Clinical Sciences {Anesthesia}, mm459@cornell.edu

Abstract:

Background/Rationale

Regional matching of ventilation (V) and perfusion (Q) is the key for optimal pulmonary gas exchange. While VQ is closely matched globally, regional imbalances are common especially during disease. Therefore, global estimates of VQ matching do not provide regional information. Common clinical scenarios such as acute hemorrhage or vasoactive drug administration can affect global VQ relationships, but its regional effects are unknown. The overarching goal of this study is to develop a computational method to study the three-dimensional (3D) distribution of VQ ratios during infusion of vasopressors and hemorrhage/blood volume replacement.

Hypothesis and Scientific Design

We hypothesized that infusion of vasopressors and hemodynamic disturbances induced by hemorrhage/blood replacement would dramatically increase the discrepancy between global and regional estimates of VQ distribution. Eight anesthetized and mechanically ventilated pigs were instrumented with pulmonary and femoral artery catheters. Physiologic dead space was calculated. These data were used to calculate global indices of VQ matching. An electrical impedance tomography (EIT) belt was placed around the thorax to study regional ventilation. Regional perfusion was studied with EIT after the injection of hypertonic saline. Thereafter, different doses of phenylephrine and dobutamine were infused and data recorded at specific times. Measurements were repeated during hemorrhage and blood replacement. Mathematical models were used to create regional maps of VQ matching using EIT data.

Expected Outcomes

We expect to develop a 3D model of VQ ratio distributions that enhances the clinical understanding of the real time effect of drugs and pathology on regional VQ distribution and gas exchange.

Emily C. Pearson, DVM, MPH

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Institution and Location	Degree	Year
University of Prince Edward Island, PEI, Canada	DVM	2018
Colorado University, Aurora CO	Internship	2019
Cornell University, Ithaca, New York	Residency	2020-Present

Current Position

3rd Year Resident in Laboratory Animal Medicine

Abstract Title:

Evaluation of Transversus Abdominis Plane Block In Pigs Using Liposomal Bupivacaine Versus Bupivacaine HCL

Authors Names:

Emily C Pearson[1], Stephanie Hon[2], Luis Campoy[2]

[1]Department of Biomedical Sciences, Cornell University, Ithaca, New York
[2]Department of Clinical Sciences, Cornell University, Ithaca, New York

Project Mentor(s):

Mentor: Luis Campoy, LV, CertVA, DECVAA, MRCVS, Department of Clinical Sciences, lc268@cornell.edu
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Abstract:

The pig is a common human translational model with increasing use and significance in research. Pigs are also becoming popular companion animals. Analgesic protocols for pigs are often limited by technical challenges of administration, lack of trained overnight staff, and lack of dosage validation. Locoregional anesthesia is a potential solution to these problems, as well as a proposed strategy for overall opioid consumption reduction. The Transversus Abdominis Plane (TAP) block is a locoregional anesthesia technique routinely used in human and veterinary medicine to provide analgesia to the abdominal wall for laparotomies and other abdominal procedures. This study aims to evaluate the quality and duration of liposomal bupivacaine's ability to reduce nociception in pigs undergoing abdominal surgical procedures. We plan to compare a liposome encapsulated, slow-release preparation of a local anesthetic (nocita) with a plain formulation (bupivacaine HCl). A group with a more conventional analgesic approach using systemic opioids (buprenorphine) and current standard of care, will serve as control. Animals will randomly be assigned a group, then undergo a laparotomy receiving a TAP block or systemic buprenorphine. Monitoring of pain scores and abdominal sensitivity will occur at regular intervals post operatively. All animals will receive NSAID medication and if animals are displaying high pain scores, rescure buprenorphine will be administered. We anticipate the nocita group will have decreased nociception for a longer period than the bupivacaine group and the buprenorphine group.