Pain in Animals Workshop 2021: *Exploring best practices and knowledge gaps for measuring chronic pain objectively in dogs and acute pain in cattle*

**October 14-15, 2021**

Virtual Conference

www.paw2021.com

Sponsored by the National Institutes of Health, NINDS

No registration cost, but registration is needed. Completely virtual meeting. Please register [here](#).

The meeting will bring together industry, government, and pain researchers to discuss current status of objectively measuring pain and identifying areas that need more research.

**Subject Overview:** Objective measures of rodent pain models, chronic pain in dogs and acute pain in cattle

**Day 1** will focus on gait analysis (GA) for chronic canine pain (e.g. cancer pain, osteoarthritis) and acute lameness in cattle. The topics will cover the types of GA tools, quality assurance and validation of GA assessments. How to collect and report data will be covered, as well as defining a clinically meaningful change and why ground reaction forces are relevant.

**Day 2** will focus on accelerometry/physical activity monitors (PAMs) and biomarkers. The topics covered will evaluate what is known when using PAMs for assessing OA pain in dogs and acute pain in cattle, the types of equipment, and factors that can influence the PAM data. Discussions will include what is known about PAM use in human pain research along with data management, and how to determine a clinically relevant improvement when evaluating pain via PAM.

As pain can be difficult to interpret based on behavioral signs in animals, the experimental area of whether prognostic biomarkers can be identified and used for assessing pain in animals will also be discussed. Although this area is developing, the research in the potential use of biomarkers will be presented and discussed.
Draft Agenda:

Thursday October 14, 2021
Opening Remarks and Purpose of the Workshop Overview

Establishing Best Practices for Gait Analysis (Ground Reaction Force)
1. Establishing gait analysis standards for evaluating OA in dogs
2. Instrument quality assurance
3. Data collection methodology and statistical analysis
4. Establishing a clinically relevant change and why the GRF is relevant
5. Platform evaluations and dynamic weight bearing in rodents for early proof of concept testing
6. Current knowledge for assessing acute pain in cattle using gait analysis, and rodent gait analysis

Friday October 15, 2021
Review and critique the use of accelerometry for evaluating osteoarthritis in companion animals and in cattle for assessing acute pain.
1. Does pain change activity?
2. Overview of equipment
3. Subject, owner, and environment influences affecting the output of physical activity monitors (PAMs)
4. Data analysis – understanding normal activity and what is being measured
5. What do we know about the impact of acute pain on PAM-measured activity?
6. Applicability of PAM-measured activity in human pain research and therapeutic development
7. Future PAM research priorities

Researching pain biomarkers: Where are we with identifying diagnostic, pharmacodynamic and/or prognostic biomarkers of pain?
2. Identifying inflammatory biomarkers in food producing animals
3. Cell-based and transcriptome biomarkers of pain in livestock
4. miRNA in assessing pain in animals
5. Analysis and validation of transcriptome biomarkers of pain in livestock

Workshop Output: following the presentations and discussion, two summary communications will be written and submitted for publication. A white paper on ‘best practices for GRF data collection and interpretation’, and a narrative review discussing the ‘Current status of use and utility of physical activity monitors in pain conditions’ will be produced.

Organizing Committee: Dorothy Cimino Brown, MS, DVM; Hans Coetzee, BVSc, Cert CHP, PhD, DACVCP, DACAW, DECAWSEL; Mike Conzemius, DVM, PhD; Marie Gill, MS; Duncan Lascelles, BVSc, PhD; DP Mohapatra, PhD; Michael Oshinsky, PhD; Sheilah Robertson, BVMS (Hons), PhD; Michele Sharkey, DVM, MS