UNIVERSITY OF SASKATCHEWAN

UACC Procedures on Pain Recognition and Management

PURPOSE

The purpose of this procedure document is to identify guiding principles for the recognition and management of pain in animals used in research, teaching, testing, and production at the University of Saskatchewan. These guiding principles serve as a minimum requirement for pain management.

BACKGROUND

Many animal species effectively conceal pain and exhibit only subtle changes from normal behaviour, appearance, or physiological responses with mild to moderate pain. Moderate to severe pain usually result in more obvious changes in normal behaviour and physiological parameters. Furthermore, a particular species or individual's response to pain is highly variable so that the recognition and assessment of pain often requires multiple observations and use of several observable and measureable criteria. Given the difficulty in recognizing pain in animal species, we assume any procedure that causes pain in humans is likely to cause pain in animals. Consequently, painful procedures require consideration of adequate pain management to maintain animal well-being and produce valid research outcomes. If anaesthesia or analgesia is withheld, the Principal Investigator (PI) must offer a clear rationale based on scientific reasons in the Animal Use Protocol (AUP) and must gain approval from the Animal Research Ethics Board (AREB) to withhold analgesia.

Research clearly indicates animal species respond effectively to anaesthetics and analgesics. The guidelines set out in this document identify the minimum analgesia recommendations (general and local anaesthesia is not specifically addressed in this document). However, rigorous animal monitoring is necessary to determine whether the analgesic regimen is adequate and to determine the duration of analgesia. Assessment of pain is subjective and requires a familiarity with normal behaviour associated with a species, adequate training to recognize clinical signs of discomfort and pain, and appropriate frequency of monitoring. A number of clinical scoring parameters (based on behaviour, appearance, and measured physiological parameters) can assist in the assessment of pain and should be incorporated into Humane Intervention Point (HIP) Checklists to provide a more objective means to determine whether an intervention with analgesics is necessary.

ROLES AND RESPONSIBILITIES

Animal Users – Refers to students, research trainees, technicians (RTs), course instructors, and principal investigators (PI). Animal users responsible for animal monitoring and pain assessment must have knowledge of the normal behaviour of the species and how to identify signs of

distress and pain. The animal user is responsible for safeguarding animal well-being through appropriate frequency of monitoring, use of HIP checklists and humane endpoints, and documentation of this monitoring and intervention in animal records.

Animal Care Personnel – Refers to Facility Veterinarians (FV), Facility Managers (FM), and animal care staff. The responsibility of animal care personnel is similar to the animal user in terms of monitoring, use of HIP checklists and humane endpoints, and record keeping. Animal care personnel might assist in the training of new animal users and help facilitate the development of HIP checklists. In particular, the FV in consultation with the PI should use professional judgment to determine the need for analgesia and the appropriate type of pain medication and dosage based on severity of pain.

PROCEDURES

PARAMETERS FOR ASSESSMENT OF PAIN (CONSIDER THESE IN HIP CHECKLISTS)

Depending upon species the following parameters may assist in the assessment of pain during clinical observation. These parameters should be incorporated in HIP checklists as appropriate for the species:

1) APPEARANCE
   E.g. Hunched, rough hair coat, porphyrin staining around eyes and nose, recumbent
2) ACTIVITY
   E.g. General decrease in activity with pain; restlessness (pacing), agitation, non-weight bearing
3) WATER AND FOOD INTAKE
   E.g. Water and food intake decreased with pain; reduction in body weight, hydration
4) TEMPERAMENT
   E.g. Increased aggressiveness; withdraw from handling; apathetic
5) VOCALIZATIONS
   E.g. Vocalize while undisturbed or with handling; teeth grinding
6) PHYSIOLOGICAL CHANGES
   E.g. Changes in respiration rate and pattern; changes in heart rate; changes in body temperature and ski color
7) APPEARANCE OF SITE
   E.g. Erythema, swelling, licking/chewing at site
8) SIGNS OF ABNORMALITY RELEVANT TO A SPECIFIC PROCEDURE
   E.g. Serum creatinine (biochemical marker) for renal failure; tumor abscess

GUIDELINES FOR PAIN MANAGEMENT

1. Guiding Principle

The Animal Care and Use Program (ACUP) at the University of Saskatchewan balances two principle goals in the use of animals for advancement of its scholarly activities: safeguarding animal well-being and attainment of valid outcomes with animals used in research, teaching, testing, and production. To achieve this balance our ***guiding principle*** is as follows: When it is not clear whether a procedure or a condition causes pain defer to the provision of pain relief. If a procedure or a condition causes pain in humans and pain relief is required in a human then we assume it causes pain in animals and warrants the use of analgesia.

2. Minimum Guidelines

As a general guideline the degree of pain control is related to the degree of invasiveness (or category of invasiveness) of the procedure. If insufficient knowledge is available of the level of pain resulting from a procedure in a species, analgesia is provided according to the 'guiding principle' of pain management. The AUP must identify a detailed analgesic regimen where the duration of analgesia administration may be based upon a predetermined schedule and/or based on animal user assessment of animal pain.

Procedures that cause more than momentary pain or distress will require the use of appropriate sedation/anaesthesia and/or analgesia and animal users should consult the FV when planning such procedures.

Different analgesic medications are available to provide effective pain relief and the use of a particular analgesic medication will depend on the species and the purpose of the study. Since the effectiveness will vary depending upon species, strain, sex, age, and other parameters, each individual animal requires assessment for its response to an analgesic medication. Choice of an appropriate analgesic medication that will not interfere with experimental/teaching outcomes should be made in consultation with the FV. If analgesia must be withheld due to scientific reasons, the PI must provide a clear justification and must seek approval by the AREB.

The choice of analgesic generally used in the management of pain in laboratory animals either fall into the category of non-steroidal anti-inflammatory drugs or opioid drugs or local analgesic agents. Animal users are encouraged to consider a ***multi-modal use*** of analgesic agents that have different mechanisms of action and thereby provide the best analgesia possible. Animal users should consult the formulary available on the Animal Ethics website or the FV about appropriate multi-modal analgesia.

Animal users should always use ***pre-emptive analgesia***. Analgesia provided before a painful procedure (and continued for a period of 6-36 h post-procedure) will reduce the intensity of the painful stimulus, decrease the amount of anaesthesia required to maintain a surgical plane of anaesthesia, ensure a smoother anaesthetic recovery, and improve the recovery and comfort level of the animal that underwent a painful procedure.

Minimal analgesia requirements for the following procedures are:

a. Vascular catheterization in a non-sedated animal
    i. Local anaesthetic
b. Skin incisions (without incision into muscle), subcutaneous implantations
    i. Systemic NSAID or local anaesthetic for a minimum of 24 h duration
c. Skin incision with simple muscle dissection/incision
    i. Systemic NSAID for a minimum of 48 h
d. Incisions into the abdominal/thoracic cavity through the muscle or into the muscle wall
    i. Systemic opioid or opioid/NSAID combination for a minimum of 72 h
e. Stereotaxic surgery with craniotomy
    i. Systemic opioid or opioid/NSAID combination for a minimum of 72 h
f. Orthopedic/laminectomy surgery
    i. Systemic opioid or opioid/NSAID combination for a considerable duration based upon HIP assessment of the individual animal
g. Disease models that will result in increasing levels of discomfort and pain
    i. Systemic opioid or NSAID provided based upon the HIP assessment of the individual animal.

Animal users should give consideration to the importance of ***nonpharmacological methods of pain management*.** Such methods include:

1. Surgeon skills – a well-trained surgeon will reduce incidence of unintentional tissue trauma, which can be an important source of pain post-operatively.
2. Acclimatisation of both the animal and the animal user to the procedure – acclimatisation reduces anxiety and enhances the effectives of a concurrently administered analgesic agent.
3. Environmental enrichment or enhancement such as use of soft bedding, good nutritional support (e.g. ease of food access, use of softened food) warmer temperatures, decreased human traffic, reductions in noise, fluid therapy to sustain hydration, access to conspecifics for social animals.

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