UNIVERSITY OF TEXAS AT ARLINGTON

INSTITUTIONAL ANIMAL CARE AND USE COMMITTEE

ASSESSMENT OF PAIN AND DISTRESS

It is the goal of the IACUC to limit the pain and distress of experimental animals to the absolute minimum necessary. The following information is used by the Committee in considering painful and stressful procedures, and these guidelines should also be used by those submitting protocols for review. Animal Care Facility (ACF) personnel will also follow these same guidelines. UTA adheres to the concept in U.S. Government Principle IV., "Unless the contrary is established, investigators should consider that procedures that cause pain or distress in human beings may cause pain or distress in other animals."

I. Pain and Distress: Definitions
   A. Pain is an awareness of acute or chronic discomfort, occurring in varying degrees of severity, and resulting from injury, disease, or emotional distress as evidenced by biological and/or behavioral changes.
   B. Acute pain results from a traumatic, surgical, or infectious event that is abrupt in an onset and relatively short in duration. It is generally alleviated by analgesics.
   C. Chronic pain results from a longstanding physical disorder or emotional distress that is usually slow in onset and has a long duration. It is seldom alleviated by analgesics but frequently responds to tranquilizers combined with environmental manipulation and behavioral conditioning.
   D. Distress is a state in which an animal cannot escape from or adapt to internal stresses which results in effects to the animal's well-being. Its acute form may be relieved by tranquilizers. Sustained distress, however, requires environmental change and behavioral conditioning and does not often respond acceptably to drug therapy.

II. Analgesics and Anesthesia: Definitions
   A. Analgesia refers to relief from pain.
   B. Tranquilization is a state of behavioral change in which the patient is relaxed and unconcerned by its surroundings. In this state, the animal is often indifferent to minor pain.
   C. Sedation is a mild degree of central nervous system depression in which the patient is awake but calm.
   D. Narcosis, in man, is defined as a drug-produced state of deep sleep accompanied by analgesia. In veterinary medicine, the narcotized patient is seldom asleep but is sedated and oblivious to moderate pain.
   E. Local anesthesia is the loss of sensation in a limited area of the body.
   F. Regional anesthesia is insensibility in a larger but limited area of the body.
   G. Basal anesthesia is a light level of general anesthesia usually produced by pre-anesthetic agents. It serves as a basis for deeper anesthesia on administration of other agents.
   H. General anesthesia is complete unconsciousness.

I. Surgical anesthesia is unconsciousness accompanied by muscular relaxation to such a degree that surgery can be performed painlessly and without struggling on the part of the patient.

III. Signs and Symptoms: Definitions
   A. Inappetence is lack of appetite.
   B. Piloerection is erection or bristling of hairs.
   C. Ataxia is the loss of full control of bodily movements.
   D. Tonic immobility is a natural state of paralysis in animals.

IV. Signs of Pain- An animal in pain, regardless of species, usually displays one or more of the following signs:
   A. Attraction to the area of pain
   B. Increased skeletal muscle tone
   C. Altered electroencephalogram response (a test of brain activity)
   D. Increased blood pressure and heart rate
   E. Pupillary dilation
   F. Change in the respiratory pattern

V. Signs of Acute Pain
   A. Protection of the painful part
   B. Vocalization (especially on movement or palpation of the painful part)
   C. Licking
   D. Biting
   E. Scratching or shaking of affected area
   F. Restlessness
   G. Pacing
   H. Increased rate of respiration
   I. Isolation

VI. Signs of Chronic Pain
   A. Limping
   B. Licking of area affected
   C. Licking of other areas if the painful part cannot be reached
   D. Reluctance to move
   E. Loss of appetite
   F. Change in behavior
   G. Change in eye brightness

VII. Species Specific Signs - There are species specific signs of pain which should be taken into account when making a practical assessment. Such signs are often associated with what is believed to be a painful condition, although no sign can by itself be regarded as diagnostic of pain and may also occur in conditions in which pain is unlikely to be a

feature. Although a comprehensive description of species specific signs has not been produced, the following notes and comments might be helpful.

A. Rabbits - Rabbits in pain may be apprehensive, dull, inactive, and assume a "hunched" appearance. They sometimes, however, show aggressive behavior, and activity may be increased with excessive scratching and licking. Reactions to handling are exaggerated, and acute pain may result in vocalization. Respiratory rate may be increased, and there may be inappetence.
B. Rodents - Pain in rodents usually results in decreased activity, piloerection and an un-groomed appearance, or there may be excessive licking and scratching. They may adopt an abnormal stance with ataxia, but rats and mice may become unusually aggressive when handled. Porphyrin staining of eyes and nose may occur. Acute pain may cause vocalization. Inappetence or a change in feeding activity may be noted and, if housed with others, a change in the normal group behavior, including isolation, may be apparent.
C. Birds - Birds in pain may show escape reactions with vocalization and excessive movement. There may be an increase in heart and respiratory rates. Prolonged pain will result in inappetence and inactivity with a drooping, miserable appearance. When handled, the escape reaction may be replaced by a state of tonic immobility.
D. Fish - It is difficult to determine the nature of the response to pain in fish. Responses to harmful stress include an increased ventilatory pattern with excessive movement of the fins.
E. Reptiles - Reptiles in pain may exhibit reluctance to move, lameness, difficulty moving, hunching (abdomen tucked up), aggression, protection of painful sites, avoidance behavior, depression or anxiety, slowed reflexes, or failure to eat.
F. Amphibians - It is also difficult to determine the nature of pain response in amphibians. Decrease in avoidance movement (e.g., when approached by a handler) or decrease in appetite can be indicators of pain in these animals.

VIII. Procedures:

A. The PI must perform a good-faith literature search to identify available methods of eliminating or reducing pain and distress in light of scientific objectives.
B. Consultation with the AV is strongly recommended in determining the selection of appropriate anesthetic and analgesic regiments. Information concerning commonly used anesthetic and analgesic drugs along with species specific dosages may be found in the IACUC Anesthesia in Laboratory Animals and Analgesia in Laboratory Animals SOPs.
C. The PI must train protocol personnel on protocol-specific animal procedures, animal monitoring, and indicators of species-specific pain and distress.
D. The PI must train protocol personnel on steps to take when animal pain and/or distress is recognized, whether it is expected or not.
E. The PI must promptly notify the Attending Veterinarian (AV) or designee when:
    1. Pain and/or distress is recognized and not expected or described in the approved IACUC protocol.

2. More animals experience pain and/or distress than those described in the approved IACUC protocol.

F. The absence of observable clinical signs of pain or distress in an animal does not necessarily indicate that it is not in discomfort and cannot be used as a justification for withholding analgesics. Therefore, the analgesic regimen as specified in the approved protocol (as a minimum) must always be completely administered as written.

G. Animals should be closely monitored after painful procedures to assure that effective pain management is occurring. Although daily assessments are performed by ACF Staff, investigators and their staff should also be aware of the typical species-specific criteria of pain and distress for their research subjects (see Species Specific Signs).