



Hunter College Animal Facility Assessing Pain in Laboratory Animals

Rats and Mice

Rats and mice are the two rodent species most widely used in research generally and in pain-related research specifically, so it is important that researchers and IACUCs recognize when these species are in pain. Rats and mice in acute pain may vocalize and become unusually aggressive when handled. Because rodents also vocalize at ultrasonic frequencies inaudible to humans, the absence of audible vocalization does not necessarily signify the absence of acute pain. Inappetence or a change in feeding activity can be noted; for example, they may eat bedding or their offspring. If they are housed with others, the normal group behavior or grooming might change. Rodents in pain may separate from the rest of the animals in the cage and attempt to hide, or they may no longer exhibit nest-building behavior. In rats, porphyrin secretion ("red tears") may appear around the eyes and nose, although this is a general response to stress of any kind.

Birds and Poultry

Birds in pain show escape reactions, vocalization, and excessive movement. Small species struggle less and emit fewer distress calls than large species. Head movements increase in extent and frequency. There may also be an increase in heart and respiratory rates.

Birds with chronic pain may exhibit a passive immobility characterized by a crouched posture with closed or partially closed eyes and head drawn toward the body and may also become inappetent and inactive with a drooping, miserable appearance, holding their wings flat against the body and their neck retracted. There may be reduced perching or birds may remain at the bottom of the cage. When a bird is handled, its escape reaction may be replaced by immobility. Birds with limb pain avoid use of the affected limb and refrain from extension.

Fish

It is difficult to determine the nature of the response to pain in fish or whether their experience is similar to that observed in mammals. Although there have been few species-specific studies, there is evidence that fish exhibit a pronounced initial response to injuries or to contact with nociceptive stimuli or chemical analgesics but their response to chronic stimuli has not been characterized.

Generally, fish react to noxious stimuli (such as puncture with a hypodermic needle) with strong muscular movements, and when exposed to a noxious environment (such as an acidic solution) show abnormal swimming behavior, attempts to jump from the water,

and more rapid opercular movements. Such effects indicate some, perhaps considerable, distress, but it is not possible to describe the distress unequivocally as pain-induced.

Behavioral Signs of Persistent Pain

Sign	Explanation
Guarding	The animal alters its posture to avoid moving or causing contact to a body part, or to avoid the handling of that body area.
Abnormal appearance	Different species show different changes in their external appearance, but obvious lack of grooming, changed posture, and a changed profile of the body can all be observed. In species capable of some degree of facial expression, the normal expression may be altered.
Altered behavior	Behavior may be depressed; animals may remain immobile, or reluctant to stand or move even when disturbed. They may also exhibit restlessness (e.g., lying down and getting up, shifting weight, circling, or pacing) or disturbed sleeping patterns. Large animal species may grunt, grind their teeth, flag their tail, stomp, or curl their lips (especially sheep and goats). Primates in pain often roll their eyes. Animals in pain may also show altered social interactions with others in their group.
Vocalization	An animal may vocalize when approached or handled or when a specific body area is touched or palpated. It may also vocalize when moving to avoid being handled.
Mutilation	Animals may lick, bite, scratch, shake, or rub a painful area.
Sweating	In species that sweat (horses), excessive sweating is often associated with some types of pain (e.g., colic).
Lack of Appetite	Animals in pain frequently stop eating and drinking, or markedly reduce their intake, resulting in rapid weight loss.