

SOP: **LARC-04**

Title: **Abnormalities In Laboratory Rodents**

SOP Last Revision Date:  
18MAY09

## **PURPOSE**

The purpose of this Standard Operating Procedure (SOP) is to outline the animal care requirements associated with the daily husbandry of rodents to recognize the abnormalities that may occur and to ensure consistent and uniform care. This SOP applies to rodents housed at the Laboratory Animal Research Core's animal facilities on the campus of the University of Missouri-Kansas City.

## **POLICY**

It is LARC policy to meet or exceed all federal, state, local regulations and institutional policies/procedures as they apply to the use of animals in research. Personnel must attend any applicable training in animal care and use, occupational health and safety, equipment operation, and Standard Operating Procedures prior to performing activities outlined in this SOP or work under the direct supervision of a trained LARC staff member.

## **REFERENCES**

- A.** Laboratory Animal Research Core Personnel
- B.** Foltz, CJ and M. Ullmann-Cullere. 1999. Guidelines for Assessing the Health and Condition of Mice. Lab Animal Magazine. 28 (4) 28-32.
- C.** Harkness, JE and JE Wagner. 1995. The Biology and Medicine of Rabbits and Rodents. 4<sup>th</sup> Ed. Williams and Wilkins. Philadelphia. PA.
- D.** Suckow, MA, Danneman, P, and Brayton, C. 2000. The Laboratory Mouse. CRC Press. Boca Raton, FL.

## **PROCEDURES**

### **A. Responsibilities**

- a.** Each LARC Technician is to conduct daily assessment/observations of each animal in his/her assigned rooms every day and is to promptly report any illness or injury to the LARC Veterinary Technician (Vet Tech) or LARC Manager. Weekend/Holiday staff holds the responsibility for health checking ALL cages with the LARC.
  
- b.** The veterinary technician is responsible for training LARC Technicians to perform assessment/observation of animals to detect illness or injury and the methods for reporting daily observation results.
  
- c.** The attending LARC Veterinarian provides guidance to investigators and all personnel involved in the care and use of animals to ensure appropriate daily observations to detect illness or injury as well as proper methods and procedures for handling, immobilization, sedation analgesia, anesthesia, and euthanasia. The veterinarian also provides guidance and oversight to surgical programs and oversight of post-surgical care.
  
- d.** In all cases below, if the conditions or abnormalities are severe, submission of animal to diagnostic tests, anesthesia and/or euthanasia are viable options. PLEASE NOTE: Before any diagnostic submission, anesthesia or euthanasia is performed, the Investigator in charge of the protocol must be notified. If the Investigators request is to NOT diagnostic submit, anesthetize or euthanize the animal, the LARC Veterinarian must be notified. Additionally, if the Investigator requests to use anesthesia or submit animal for diagnostic tests, the LARC Veterinarian must be notified as well. In any case, the LARC Veterinarian has final judgment as to action taken that is beyond normal care.

## B. Common Abnormalities

- a. **Fight Wounds** - separate the combatants immediately and place them in separate clean cages. If wounds are moderate, treat with a topical antibiotic ointment.
  
- b. **Dermatitis** – inflammation of the skin. *Ulcerative dermatitis* – severe dermatitis characterized by full thickness ulceration that leaves moist, oozing and red erosions. This is common in C57BL/6 mice due to unknown (idiopathic) causes, or may be secondary to over grooming or scratching. Mild to moderate cases may be treated with an antibiotic-steroid topical ointment such as Panalog® or Animax® ointment.
  
- c. **Alopecia** – loss of hair. Common causes include barbering (excessive grooming by cage mates), scratching, fight wounds, fur mite infestation and fungal infections. Alopecia caused by barbering is not an illness or injury unless the underlying skin is affected.
  
- d. **Excess Weight Loss** – commonly a sign of malocclusion or other oral lesion or inability to access food or water. First confirm access to food and water. Then check alignment of incisor teeth or sores in the mouth immediately. In the absence of malocclusion or other obvious problem, weigh the mouse and schedule weekly weighing. Provide daily nutrient supplement by dissolving powdered diet in water and placing in a container on the cage bottom or providing a gel nutrient. Recommend euthanasia for mice that have lost 10% of body weight since first weight recorded.

- e. **Prolapsed Rectum** – the rectum protrudes from the anus. In mild cases the mouse may continue daily routine without harm to itself; blood supply is retained and the mouse can defecate. Prompt euthanasia is indicated if the prolapsed rectum is large and necrotic.
- f. **Paraphimosis** – the condition in which the prepuce becomes trapped behind the penis and forms a tight band of constricting tissue. The exposed penis becomes edematous, dry and painful. If treated early, before severe edema and pain develop, successful treatment may be possible, although not often attempted. Treatment includes lubricating the penis with surgical lubricant and replacement inside the prepuce by gently manipulation. General anesthesia is usually required. Surgical correction used in some larger species is an option in very valuable mice, but not commonly attempted.
- g. **Abnormal Behavior** –
- Hyperactive* – greater than normal movement or frantic activity behavior is a nonspecific clinical sign. In some strains of mice it is the normal phenotype. In others it may suggest a nervous system abnormality. In such cases, if hyperactivity compromises the mouse's welfare and there is no experimental contradiction, the mouse should be euthanized or be submitted for diagnostic necropsy.
- Lethargy* – lethargy is characterized by sluggishness, stupor, coma, reduced activity, prostration and/or a hunched posture. If severe or persistent, these may indicate serious illness. Live affected mice should be submitted for diagnostic necropsy. In mild cases, supplemental nutrition, SQ or IP fluids and other supportive care may be beneficial, along with weekly weighing.

- h. Abnormal Posture** – Head tilt or torticollis is an abnormal posture in which a mouse consistently holds its head tipped to one side. There are numerous possible causes with varying levels of importance. Continue to observe the animals for ability to eat, drink or hold head up. In moderately severe cases initiate weekly body weights. If multiple cases occur in clusters, submit live mice for diagnostic necropsy.
- i. Abnormal Breathing** – Difficult breathing, rapid breathing and noisy breathing from congestion in the lungs are signs of serious disease. Unless the condition is an experimental endpoint, submission of the live mouse for diagnostic necropsy is recommended.
- j. Not Eating** – Failure to eat when appropriate food is offered (anorexia) occurs very early after an animal is deprived of water. First, check the water source. Malocclusion or other mouth lesions are the next most common cause of anorexia – examine the mouth for these problems. In the absence of water or mouth problems, look for signs of infectious diseases, i.e. signs consistent with a sick mouse. Monitor the mouse several times a day and weigh daily. If its condition deteriorates and there is no experimental contraindication, submit the live mouse for diagnostic necropsy.
- k. Rough Hair Coat** – An unkempt and disheveled appearance indicates a mouse is ill or injured. Examine the mouse more closely to determine the cause.
- l. Malocclusion** – Extension of upper or lower teeth. Trim both upper and lower incisor teeth with scissors. Identify the cage and schedule weekly examination, trimming teeth as needed. Strongly urge euthanasia because affected mice require life-long treatment and the trait is hereditary (passed on to offspring).

- m. Tumor/Mass** – Measure the tumor/mass and indicate its location on the report form sketch, tumors that are > 15% of the mouse's body size (~1.5 cm in diameter), ulcerated or that interfere with eating, drinking, urinating, defecating or walking are indications for euthanasia. Schedule weighing weekly and consult the approved IACUC protocol for details of allowable tumor size.
- n. Eye Problem** – Conjunctivitis is inflammation of the ocular mucous membranes and may be painful and cause squinting, abnormal secretions, crusting or corneal ulcers. In the absence of an experimental contraindication, conjunctivitis should be treated with an ophthalmic antibiotic ointment. Opacity, dilated pupils, constricted pupils, exophthalmia (bulging eye) and enophthalmia (sunken eye) are examples of other abnormalities that may not require treatment but should be reported.
- o. Vaginal/Uterine Prolapse** – Rectal prolapse and a uterine prolapse are not always easy to distinguish; check closely to determine through which opening the organ is protruding. Mice with a prolapse limited to the vagina or vaginal hypertrophy, which may look like vaginal prolapse, are likely to survive and do well, but are not breeding candidates. Uterine prolapse is generally seen postpartum and is ultimately fatal; recommend euthanasia as soon as possible.
- p. Dehydration** – Loss of body water below normal levels. Eyes that appear recessed and facial fur appear fuzzier due to piloerection. Skin picked up over the shoulder blades and released remains bunched. In very mild cases immediate provision of supplemental sources of fluid by water bottle, wet food or gelatin may be of assistance. Alternatively, in mild cases, sterile fluids (physiological saline, lactated Ringer's

Solution, etc.) may be administered SQ or IP at 0.5ml/10 gm body weight twice daily. In severe dehydration cases mice will usually also be hypothermic, cool to the touch and should be euthanized immediately.

- q. **Diarrhea/Loose Stool** – Feces that are just moist is more typical of mouse “diarrhea” than fluid feces. The feces stick to bedding and/or to the side of the cage. Often, hair around the anus is stained or has feces sticking to it. Check hydration (gently pinch skin over the shoulder blades and observe whether it stays bunched after being released), weigh affected mice and cage mates. Immediately notify the LARC Veterinarian, as infectious agents may be involved making early definitive diagnosis important.
  
- r. **Abnormal Locomotion** – Loss of coordination, circling, limping, and weakness may indicate a host of problems, including serious systemic disease. If severe, these signs may interfere with the mouse’s ability to access food and water. Such signs have been seen in cases of poison contamination of feed or bedding; signs appearing in more than one mouse in a cage simultaneously is an important diagnostic feature. If the signs are mild to moderate, assess the ability to eat and drink and initiate weight and body condition scoring weekly. If the signs are severe, submit the live mouse for diagnostic necropsy.
  
- s. **Paresis/Paralysis** - The mouse is weak and unable to support its body weight on the affected limb or limbs, but can move its legs. Monitor cases of paresis closely, and initiate weight weekly. If paresis persists over 2 weeks, or if the mouse’s condition deteriorates, recommend euthanasia or diagnostic necropsy. Paralysis is the loss of voluntary muscle movement. If only one leg is affected initiate weighing weekly. If more than one leg is affected the mouse should be euthanized.

- t. **Hypothermia** – Hypothermia in mice is a common problem after general anesthesia. Mice that are cool to the touch require immediate supplemental heat, preferably by placing the cage on a heating pad with temperature control to prevent overheating or burning. Alternatively a warming light may be used. In severe hypothermia the mouse will be sluggish or possibly non-responsive. Hypothermia may also be seen in terminal cases of a variety of diseases.
  
- u. **Tremors** – Tremors, involuntary shaking, convulsions or seizures should be monitored closely to assess the frequency and severity. If such disturbances are mild and occur infrequently, such as only when being handled, no further action is indicated. If disturbances are spontaneous, frequent and/or severe the mouse should be euthanized.

### **C. Documentation**

- a. All cases of abnormalities are to be documented according to SOP *HU-09 Finding Sick or Dead Animals* and the LARC Vet Tech or LARC Manager (in Vet Tech absence) is to be notified immediately. The Vet Tech will notify LARC Attending Vet and or Investigator upon evaluation of case and corrective action/treatment will be considered on a case-by-case basis under the guidance of this SOP, the LARC Manager, LARC Veterinarian, Investigator, IACUC and/or an *approved* outside source.