1. Purpose

To provide guidance on rodent anesthesia monitoring.

1. Scope

This guideline applies to all personnel anesthetizing and sedating rodents for experimental and or surgical procedures. The Principal Investigator is responsible for ensuring that research personnel are properly trained and provide appropriate anesthesia, monitoring, and analgesia for all animals undergoing anesthesia or surgical procedures.

1. General Guidance
2. Personnel are expected to maintain aseptic technique while providing appropriate anesthetic monitoring during surgery and aseptic procedures. Typically, this requires one person dedicated to the procedure or surgery and a separate person dedicated to anesthesia monitoring.
3. Anesthetic Evaluation

Anesthetic depth must be evaluated prior to initiating the procedure and periodically throughout the procedure. Appropriate anesthetic depth may be determined by testing the animal’s response to peripheral reflex stimulation. This may be performed by applying firm manual pressure to the metatarsals of the hindfeet or the tail to assess for the absence of the pedal-withdrawal reflex or response to peripheral stimulation. Also, the eye blink reflex should be absent.

1. Monitoring
2. Animals cannot be left unattended while anesthetized and should be monitored throughout the anesthetic event, a minimum of every 15 minutes.
3. Respiratory rate and depth should be monitored by observing the chest moving up and down in a slow and regular rhythm.
4. Adequate oxygenation should be monitored by assessing mucous membrane color. Pink mucous membranes indicate adequate tissue perfusion and oxygenation. Tail, foot, tongue or ear color can be monitored for pale or blue membranes, which is indicative of decreased blood volume, decreased perfusion or respiratory distress.
5. Thermoregulation
6. Maintenance of normal body temperature minimizes cardiovascular and respiratory disturbances caused by anesthesia and is of particular importance in small animals, such as rodents, where the high ratio of surface area to body weight may easily lead to hypothermia. Rodents are prone to hypothermia during anesthesia therefore a warming device must be provided to provide gentle heat. The warming device should provide controlled supplemental heat to the animal to help it maintain a normal body temperature. This will reduce hypothermia and decrease anesthetic recovery time.
7. A water-circulating heating pad is preferred and is very effective for this purpose. Electric heating pads designed specifically for use in small animal surgery (i.e., have a self-regulating system via a thermocouple attached to the animal) are also recommended.
8. Heat lamps (without feedback mechanisms) or household electric heating pads are not acceptable methods and must not be used for providing supplemental heat during anesthesia/ surgery.
9. Depending on the type of heat source, an insulating layer between the animal and the heat source such as a towel must be provided. Depending upon the species and procedure, monitoring of body temperature may be indicated.
10. Recovery from Anesthesia
    1. Animals must be provided with heat support and visually monitored until they exhibit a righting reflex and can maintain sternal recumbency. Special attention should be placed on ensuring that the animal is able to maintain an open airway during recovery.