



Institutional Animal Care and Use Committee
Policy, Guidelines,
and
Standard Operating Procedures

Anesthesia and Analgesia

364.1 Purpose

364.1.1 Relief of discomfort, distress, and pain shall be accomplished using anesthesia, analgesia, or tranquilization. In general any procedure that would be expected to cause pain in humans is considered likely to cause pain in animals and should be alleviated using appropriate anesthetics and/or analgesics. Any deviation from this policy requires explicit IACUC approval.

364.1.2 The selection of the most appropriate analgesic or anesthetic shall reflect professional judgment as to which best meets clinical and humane requirements without compromising the scientific aspects of the research protocol. Anesthesia and analgesia used in research projects shall be reviewed and approved by the IACUC prior to use. **NOTE ON AVERTIN USE:** The use of Avertin is strongly discouraged and is not routinely approved by the Emory IACUC. Requests for use of Avertin will be considered by the IACUC on a case by case basis and require a compelling scientific justification for approval. Investigators are strongly encouraged to consult DAR or Yerkes veterinary staff to identify a suitable alternative anesthetic.

364.1.3 The use of paralytic agents is not allowed unless specifically approved by the IACUC.

364.1.4 Preemptive analgesia should be administered when using isoflurane anesthesia during surgery because it enhances intraoperative patient stability and optimizes postoperative care and well-being by reducing postoperative pain.

364.1.5 Local anesthetic/analgesic drugs should be used during major surgery and Intra-operative use can augment the pain relief of general anesthetics, and reduce the need for frequent redosing of anesthetics.

364.1.6 Controlled drugs used must be purchased, stored, disposed, and used in accordance with all applicable regulations of the Federal Drug Enforcement Administration, State of Georgia, Georgia Board of Pharmacy, and Emory University. See Emory Policy 7.25 “Research Use of Controlled Substances” (<https://policies.emory.edu/7.25>) for more information.

364.1.7 Formal monitoring of animals following anesthesia is required to ensure the animal does not experience any difficulties during recovery (see **Section 364.3** below).

364.1.8 Analgesics and anesthetics used in animals should be of pharmaceutical grade, unless a specific exemption has been approved by the IACUC.

364.1.9 Expired analgesics and anesthetics must not be used in animals and must be separated from unexpired drugs (ideally kept in a sealed packet or container) and must be clearly marked “Expired Not for use in animals” until appropriate disposal can be effected.

364.2 Definitions

364.2.1 General anesthesia – state of unconsciousness characterized by the absence of pain sensation and controlled, reversible central nervous system depression by the administration of an anesthetic drug

364.2.2 Surgical anesthesia – stage of general anesthesia that provides adequate unconsciousness, muscle relaxation, and analgesia to perform surgery

364.2.3 Analgesia – freedom from or absence from pain, usually without loss of consciousness

364.2.4 Local Analgesia– A loss of sensation in a restricted body area creating a local area of analgesia

364.2.5 Preemptive analgesia– The administration of preoperative and intraoperative analgesia

364.2.6 Tranquilization – relaxation and relief from anxiety by the administration of a drug

364.2.7 Paralytic agents – Neuromuscular-blocking drugs causes paralysis of the affected skeletal muscles

364.3 Use of Anesthesia, Analgesia and Post-procedural Recovery and Monitoring

364.3.1 Administration of anesthetics and analgesics and monitoring of animals recovering from anesthesia must be performed according to an appropriate approved Emory IACUC protocol. These procedures may only be performed by trained individuals. This training may be accomplished by working with a supervisor who has the requisite training and experience, and/or by working with a veterinarian in the conduct of these procedures, and/or having vet staff or a training coordinator provide supervisory oversight of the individual being trained.

364.3.2 Monitoring of **all** animals following anesthesia is required to ensure the animals do not experience difficulties during recovery and so that intervention/supportive measures can be introduced as soon as possible if needed. The individual administering the anesthetic has the primary responsibility for insuring that appropriate monitoring is conducted. This shall be accomplished either by personally conducting the monitoring or by arranging to have the monitoring accomplished by another appropriately trained individual. The timing of post anesthetic monitoring will be determined based on relevant factors that might influence the course of recovery (e.g. anesthetic agent used, dose and frequency of administration, animal's clinical condition and history with prior anesthetic episodes, age, etc.). Monitoring should be performed a minimum of every 15 minutes until fully recovered. Individuals shall consult with the veterinary staff or training coordinator, if in doubt regarding the appropriate schedule for monitoring and any deviation from the 15-minute minimum monitoring schedule must be specifically approved by the IACUC.

N.B. For **surgical procedures in rodents** anesthesia, monitoring and analgesia administration must be performed and documented as described in the separate policy on **Aseptic Survival Surgery in Rodents** located at: (<http://www.iacuc.emory.edu/policies/index.html>).

364.3.3 Any adverse observations or clinical problems must be reported immediately to the veterinary staff. Animals processed in groups may be monitored in groups; however, any indication of problems

364.3.4 Upon completion of the procedure requiring anesthesia, the animal shall be returned to a recovery cage or its home cage. The animal shall be checked at appropriate intervals to insure that continued recovery is progressing normally.

364.3.4.1 For additional information on recovery and monitoring of anesthetized nonhuman primates refer to Yerkes SOP # 5.1.

364.3.4.2 For additional information on recovery of other Animal Welfare Act covered species (including sheep, guinea pigs, voles, rabbits, cats, dogs, pigs) see the DAR Policy under Veterinary Care and Services on the Emory DAR Website(http://www.dar.emory.edu/vetcare/post_care.php) and Yerkes SOP #5.1.

364.3.4.3 For additional information on recovery of species not covered by the Animal Welfare Act (including mice and rats). Please see the Emory IACUC Rodent Surgical Policy under the Policies Tab on the Emory IACUC web site: (<http://www.iacuc.emory.edu/policies/index.html>).

364.3.4.4 For additional information on other species, including birds and frogs, see the DAR Policy under Veterinary Care and Services on the Emory DAR Website. (http://www.dar.emory.edu/vetcare/post_care.php).

364.4 Specific Anesthetic and Analgesia Considerations

There are a number of anesthetics and analgesics suitable for different species and applications. For detailed information regarding appropriate anesthetic and analgesic selection, dosage, duration, and frequency of administration, please refer to the relevant sections of the Emory DARs website:

364.4.1 For detailed information on Anesthetic and Analgesic Management of nonhuman primates including dosages, see Yerkes SOP# 5.1

364.4.2 For detailed information on Anesthetic Management of Rodents and Rabbits see the Veterinary Care and Services section of the DAR website under Veterinary information or at: http://www.dar.emory.edu/vetcare/anesthetic_manag.php and Yerkes SOP # 5.1.

364.4.3 For detailed information on Analgesic Drugs for Rodents and Rabbits see the Veterinary Care and Services section of the DAR website under Veterinary information or at: http://www.dar.emory.edu/vetcare/analgesic_drugs.php and Yerkes SOP # 5.1.

364.4.4 If additional information is required, or for any species not specifically covered, please consult an Emory DAR veterinarian or for procedures performed at Yerkes please consult the Yerkes veterinary staff for additional information.

364.5 Use of Pharmaceutical Grade Reagents

Analgesics and anesthetics used in animals should be of pharmaceutical grade, as defined by IACUC Policy for Non-Pharmaceutical Grade Drugs, unless a specific exemption has been approved by the IACUC.

364.6 Gas Anesthesia

364.6.1 Inhalational anesthetic vaporizers are required to function properly for the administration and use of general inhalational agents on animals at Emory University.

364.6.2 The IACUC requires that vaporizers be fully serviced every 3 years by a qualified technician.

364.6.3 In addition, the IACUC requires preventative maintenance of anesthesia machines be performed annually by users.

364.6.4 Scavenging of waste gasses by appropriate use of a Charcoal Filter Canister or other scavenging method is required for gas anesthesia. Charcoal Filter Canister maintenance is required before every use and should be documented.

364.6.5 Servicing and annual maintenance documentation (Anesthetic Vaporizer Preventative Maintenance Checklist) should be maintained and be available for IACUC inspection.

364.6.6 For the checklist and more information on gas anesthesia maintenance see the IACUC Policy on **Gas Anesthesia Vaporizer Maintenance** on the IACUC website under the Policies Tab on the Emory IACUC web site: (<http://www.iacuc.emory.edu/policies/index.html>).

364.7 Document Properties

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