Policy 364
Anesthesia and Analgesia

Responsible Official: Research Administration
Administering Division/Department: IACUC / Research Compliance and Regulatory Affairs
Effective Date: 06/18/2014
Last Revision Date: 10/05/2022

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 the Division of Animal Resources (DAR) and/or Emory Primate Center (EPC) 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 (pre-operative) analgesia should be administered because it enhances intraoperative animal stability and optimizes postoperative care and well-being by reducing pain associated with the procedure.

364.1.5 Local anesthetic/analgesic drugs should be used during surgery. Intraoperative use is complementary to the pain relief provided by other peri-operative analgesics.

Multimodal analgesic use is important to consider and utilize for major surgeries and procedures that are considered to cause moderate to severe pain. Investigators are strongly encouraged to consult with DAR or EPC veterinarians about appropriate analgesic plans for experimental procedures and surgeries.

364.1.6 Controlled and dangerous drugs (as defined by GA. Code 16-13-71) must be purchased, stored, used and disposed 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 during and following anesthesia is required to ensure the animal does not experience any difficulties during anesthesia or anesthetic recovery (see Section 364.3 below).

364.1.8 Analgesics and anesthetics used in animals must 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 under any circumstances. This includes both terminal and survival procedures as well as the use of expired agents for the purpose of euthanasia. Expired agents 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 occur.
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

364.2.5 Preemptive analgesia – the administration of preoperative and intraoperative analgesia

Multimodal analgesia- the use of more than one pharmacological class of analgesic medication targeting different receptors along the pain pathway with the goal of improving analgesia, decreasing dosages, and decreasing the risk of overall side effects.

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

364.2.7 Paralytic agents – neuromuscular-blocking drugs causing 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 during and following anesthesia is required to ensure the animals do not experience difficulties during anesthesia and anesthetic 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 ensuring 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.). Animals, except for nonhuman primates, should be monitored a minimum of every 15 minutes until fully recovered (EPC SOP#5.1 for monitoring of nonhuman primates). Individuals shall consult with the veterinary staff or training coordinator, if in doubt regarding the appropriate schedule for monitoring animals. Any deviation from the minimum monitoring schedule must be specifically approved by the IACUC.

NOTE: For surgical procedures in rodents, birds, and amphibians: anesthesia, monitoring and analgesia administration must be performed and documented as described in the separate policy on Aseptic Survival Surgery in Rodents, Birds, and Amphibians located at: (https://rcra.emory.edu/_includes/documents/sections/iacuc/forms/303_aseptic_survival_surgery_in_rodents.pdf).

364.3.3 Any adverse event 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 requires specific animal identification and immediate reporting to veterinary staff

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 monitored as indicated above (Section 364.3.2) to ensure that continued recovery is progressing normally.

364.3.4.1 For additional information on recovery and monitoring of anesthetized nonhuman primates refer to EPC 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), please consult with DAR veterinary staff and EPC SOP #5.1.

364.3.4.3 For additional information on recovery of species not covered by the Animal Welfare Act (including mice, rats, birds and frogs), please see the Emory IACUC Aseptic Survival Surgery in Rodents, Birds, and Amphibians located at: (https://rcra.emory.edu/_includes/documents/sections/iacuc/forms/303_aseptic_survival_surgery_in_rodents.pdf)

364.4 Specific Anesthetic and Analgesia Considerations

There are several anesthetics and analgesics suitable for different species and applications. For detailed information regarding appropriate anesthetic and analgesic selection, dosage, duration, and frequency of administration, refer to standard procedures in eIACUC or consult with DAR veterinary staff.

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

364.4.2 The physiology and pharmacology of anesthetic agents used in neonatal mice differs greatly from adults and anesthetic considerations are warranted. Neonatal mice are poikilothermic for up to 7 days after birth and animals in this age range can be anesthetized for a procedure by inducing hypothermia. During recovery, neonatal animals then require active re-warming and monitoring. For further information on the implementation of this method or methods for older preweaning mice and neonatal animals of other species, please consult with DAR veterinarians.

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

364.5 Gas Anesthesia

364.5.1 Inhalation anesthetic vaporizers are required to function properly for the administration and use of general inhalant anesthetic agents on animals at Emory University. Anesthetic vaporizers are specific to each inhalant anesthetic agent and are not interchangeable.

364.5.2 The IACUC requires that vaporizers be fully serviced every 3 years by a professional service.

364.5.3 In addition, the IACUC requires preventative maintenance of anesthesia machines be performed annually by trained laboratory personnel.

364.5.4 Scavenging of waste gases 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.

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

364.5.6 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: (https://rcra.emory.edu/_includes/documents/sections/iacuc/forms/368-gas-anesthesia-vaporizer-maintenance.pdf).

Contact Information

<table>
<thead>
<tr>
<th>Subject</th>
<th>Contact</th>
<th>Phone</th>
<th>Email</th>
</tr>
</thead>
</table>

Page 3 of 4
Revision History

- 09/04/2019; 10/05/2022