



University of Michigan Policy On Analgesia in Animals Undergoing Surgery

Purpose:

Assessment of pain and distress in animals is difficult and can be subjective. As such and according to the *U.S. Government Principles for the Utilization and Care of Vertebrate Animals Used in Testing, Research, and Training*, **unless the contrary is established, it should be considered that procedures that cause pain or distress in humans may also cause similar effects in animals.** This policy has been created to provide guidance on the use of analgesics in various surgical procedures

Guidelines:

1. Animal welfare regulations require that experimental procedures involving animals avoid or minimize discomfort, distress, and pain to the animals. If procedures involve more than momentary or slight pain and discomfort to animals, as is often the case in surgery, regulations require the appropriate use of analgesics, unless withholding of such agents is scientifically justified in writing and approved by the Institutional Animal Care & Use Committee (IACUC).
2. The [ULAM Anesthesia & Analgesia Guidelines](#) specified for each species should be consulted prior to submission of the protocol to determine the species-specific recommendations on analgesic use. The above website also offers species-specific behaviors and circumstances indicative of pain and suggesting the need for analgesics. Any questions regarding behavioral signs indicative of pain in a particular species, the choice of agents, dose range, etc. should be directed to the ULAM Veterinary Staff.
3. Investigators must follow the recommendations made in this document when performing surgical procedures, unless alternate analgesic plans are appropriately justified and documented in the IACUC protocol (*see section 6 below*). Surgical procedures are divided into three categories for the purpose of this document: Type I, II and III. For each of these categories, the *minimum* analgesic requirements are included in the table in this document.
4. Exemptions to this policy are allowable for scientific reasons if appropriately justified and approved by the IACUC in the animal use protocol. If the IACUC approves the withholding of analgesics, the procedure will automatically be elevated to Humane Use Category 7, 8, or 9, meaning it will include procedures that expose animals to pain or distress without administration of appropriate analgesic medications. The procedure(s) will also be included as such in an annual report to the USDA, for species covered by the Animal Welfare Act and Regulations.
5. Exemptions to this policy are allowable in situations where analgesics are causing adverse effects in animals or for procedures where data can be provided that demonstrates a particular surgical procedure in a specific species does not warrant the length of analgesia required in its surgical classification.
 - a. If analgesics are causing adverse effects in animals, changes must be applied under the direction of a veterinarian and documented in an official veterinary recommendation for short-term changes and subsequently reviewed and approved by the IACUC for long-term application.



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- b. If a particular procedure does not warrant the length of analgesia required in the surgical classification category an exemption may be granted based on appropriate justification and evidence provided by published reports or appropriately designed local pilot studies. All exemptions must be reviewed and approved by the IACUC.
6. Finally, **the recommendations herein should be considered the minimum acceptable for procedures listed. Veterinary staff may recommend increased duration or changes in types of drugs or combinations of drugs based on professional judgment, published literature and observation of animals recovering from surgical procedures.**

References:

1. *U.S. Government Principles for the Care and Use of Animals Used in Testing, Research, and Training* (1983)
2. *Guide for the Care and Use of Laboratory Animals* (NRC, 2011)
3. *Animal Welfare Regulations* (9 CFR, chapter I, subchapter A)



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Analgesic Timelines According to Surgery Classifications

CLASSIFICATION	Type I Surgery	Type II Surgery	Type III Surgery
	<p><i>Surgical procedures that require use of preemptive analgesia, such as a single dose of a systemic analgesic or the local anesthetic bupivacaine. Though some anesthetic agents have analgesic properties, the duration of that analgesia is insufficient to treat post-operative pain.</i></p>	<p><i>Surgical procedures that require use of preemptive analgesia and a minimum of approximately 24 hours of postoperative analgesia. Systemic analgesia should be used and can be combined with local anesthesia.</i></p>	<p><i>Surgical procedures that require use of preemptive analgesia and a minimum of approximately 48 hours of postoperative analgesia. Multimodal analgesia is recommended.</i></p>
PROCEDURE	<p>Skin incision without deeper tissue manipulation</p> <p>Examples:</p> <ul style="list-style-type: none"> • Skin biopsy • Tracheal injection 	<p>Skin incision and deeper tissue manipulation</p> <p>Examples:</p> <ul style="list-style-type: none"> • Subcutaneous implantation with creation of a pocket such as for a pellet, pump, or tissue • Muscle incision • Muscle biopsy • Vessel cannulation • Vessel incision • Vessel biopsy • Castration • Vasectomy • Oral soft tissue manipulation • Craniotomy with minor soft tissue manipulation and small bone defect or hole • Laparotomy with minor flank incisions • Laparoscopic surgeries 	<p>Any surgical procedure not included as Type I or Type II</p> <p>Examples:</p> <ul style="list-style-type: none"> • Thoracotomy • Laparotomy with midline or major surgical incision • Craniotomy with extensive soft tissue manipulation and bone defects or incisions • Direct manipulation of a joint, nerve, or bone (including teeth) • Ophthalmic surgery

For all surgery types: Additional analgesia may be needed if pain persists after the required analgesia is provided.



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Analgesic terms:

- **Preemptive analgesia:** For the purpose of this guideline is analgesia administered before or immediately after an animal is anesthetized, but prior to initiation of a painful stimulus, such as skin incision
- **Systemic analgesic:** A drug that provides pain relief to the entire body
- **Local anesthetic:** A drug that blocks sensation from a specific area of the body, such as lidocaine or bupivacaine
- **NSAID:** Non-steroidal anti-inflammatory drug such as carprofen, meloxicam, flunixin, or ketoprofen
- **Opiate:** Opioid drug such as buprenorphine, fentanyl, or morphine
- **Multimodal analgesia:** A combination of systemic analgesics, like a NSAID and an opiate, or a combination of a systemic analgesic/s and a local anesthetic