



Title: Guidelines for Surgical Procedures

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Version #	1
Implementation Date	11/12/2016
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Standard Operating Procedure

1. Purpose

To describe the requirements for performing surgery.

2. Scope

Pertains to all Principal Investigators (PI) performing surgery per an IACUC approved animal care and use protocol (AUP).

3. Responsibilities

Principal Investigators must ensure all personnel performing or assisting with surgery are trained in this SOP. Only licensed veterinarians are authorized to perform anesthesia and surgery.

4. Procedure

Major surgeries must be conducted in IACUC approved surgery suites which meet federal standards. Minor surgeries may be conducted in the treatment area of the facility.

Acclimation period:

- Newly received animals should be given a period for physiologic, psychological, and nutritional stabilization before their use.

Designated surgery area:

- The surgery area must be easily sanitized. The surgery suite should not be used for other purposes during the time of surgery and traffic in this area should be minimized.
- Prior to and between surgeries, clean and disinfect the surface upon which surgery will be performed. Commonly used disinfectants are quaternary ammonium compounds, household bleach diluted 1 part to 32 parts water, chlorine dioxide-based sterilant, chlorhexidine, or other antimicrobial agent. Disinfectants must be prepared and used according to the manufacturer's recommendations.



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Use of sterile instruments:

- Surgical instruments must be sterilized. Several techniques (steam, dry heat, ethylene oxide, or chemical agents) can be used to sterilize instruments and other materials that will come in contact with the animal's tissues. **Steam or dry heat are the preferred methods to sterilize surgical instruments** (see SOP AV 60-103 Autoclave Use and Quality Assurance).
- Chemicals used to sterilize surgical instruments must be classified as a sterilant and not a disinfectant. Chemical sterilants typically require a contact time of 6-24 hours, depending on the chemical used. Chemical sterilants must be prepared and used according to the manufacturer's recommendations. **All instruments sterilized by chemicals must be rinsed in sterile water** before use in tissues.
- When performing surgeries on multiple animals, a newly sterilized instrument pack must be used for each animal.

Aseptic technique:

- Preparation of animals -
 - While under anesthesia (as approved in a protocol) and prior to taking the animals to the surgery suite, remove all hair from at least a centimeter on either side of the surgical site. Hair can be removed by clipping with an appropriate sized clipper, shaving with a razor, or plucking. Then remove loose hair with a dry gauze or careful vacuuming. Place lubricating ophthalmic ointment in the anesthetized animal's eyes to prevent drying of the cornea.
- Clean and aseptically prepare the surgical site -
 - Use an effective antiseptic surgical scrub (e.g., chlorhexidine). Carefully scrub the area with a new clean surgical sponge or sterile cotton swab. Scrub in a gradually enlarging circular pattern from the center of the proposed incision to the periphery. The sponge or swab should not be brought back from the contaminated periphery to the clean central area. Repeat with a chlorhexidine solution (or sterile water) soaked sponge or sterile cotton swab. Repeat this process a minimum of three times to minimize the presence of micro-organisms.
- Preparation of the surgeon -
 - Surgeons must wash their hands with a surgical scrub, wear a cap and mask, sterile gloves, and sterile gown. A new pair of sterile surgical gloves must be used for each animal.
- During surgery -
 - The surgical field must be kept sterile throughout the procedure. In most cases, sterile drapes are required for maintenance of the sterile field. Sterile

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instruments must be prevented from contacting non-sterile surfaces.
Instruments must be placed on a sterile surface when not in use.

Monitoring and care of animal's well-being:

- Monitor the animal carefully during the surgical procedure. Anesthetized animals must not be left unattended during the procedure. Surgeons must pay close attention to the animal's heart rate, respiratory rate, and body temperature. Assess the animal's depth of anesthesia by toe/tail pinch prior to making an incision. Evaluating the animal's response to surgery (increased respiratory rate, movement) will also help determine the anesthetic depth.
- Maintain body temperature -
 - To prevent hypothermia, do not wet the animal any more than necessary. Care should be taken to prevent contamination of the sterile surgical field during subsequent handling and positioning of the animal. Place the animal on a clean absorbent surface and maintain body temperature using a circulating water blanket, warm water bottle, forced warm air, or equivalent external heat source, taking care to not cause thermal burns to the animal's skin.

Postoperative care:

- Recovering animals should not be placed onto loose bedding material until they are fully awake, as suffocation can result. A towel may be placed between the bedding and the animal until it awakens from anesthesia. Prevent hypothermia by placing recovering animals in a warm cage. If necessary, the cage may be supplied with supplemental heat as required (e.g., circulating hot water pad, forced warm air). Be cautious with supplemental heat sources; hyperthermia can be as detrimental as hypothermia.
- Observe animal -
 - Animals must be in an area where they can be frequently observed until they are sternal and clearly awake. To prevent injury, it is best to separate non-ambulatory from ambulatory cage-mates.
- Maintain hydration -
 - Dehydration can be ameliorated by the administration of appropriate fluid therapy. If blood loss occurred during the surgical procedure, or if the animal is slow to recover from anesthesia, provide additional fluids.
- Daily post-op checks -
 - Post-surgical animals must be checked at least daily for a minimum of 7 days, until wounds have healed, and/or sutures/staples have been removed, unless the protocol has been approved for shorter duration for minor procedures. Animals must be given analgesics as specified in approved animal care and use



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protocols (AUPs) and if needed thereafter, as prescribed by a clinical veterinarian.

- Antibiotics -
 - In general, intra- or post-operative antibiotics are unnecessary when aseptic technique is maintained. If routine post-operative antibiotics are thought to be needed, their use needs to be included in the approved AUP.
- The clinical veterinarian must be notified if post-surgical complications occur.

Records:

- Post-surgical records must be kept in the room where the animals are housed the duration of post-operative care.
- All daily observations and treatments must be recorded in the animal’s medical record.

Training:

- Principal Investigators are required to ensure all staff conducting or assisting with surgeries are appropriately trained and that training has been documented.

5. References

1. Guidelines for Rodent Survival Surgery. UC Davis Safety Services, 2016. (<http://safetyservices.ucdavis.edu/article/guidelines-rodent-survival-surgery>).
2. Institute of Laboratory Animal Resources: Guide for the Care and use of Laboratory Animals, National Academy Press, Eighth Edition (http://www.nap.edu/catalog.php?record_id=12910).
3. Animal Welfare Act and Animal Welfare Regulations. United States Department of Agriculture, 2013 (https://www.aphis.usda.gov/animal_welfare/downloads/Animal%20Care%20Blue%20Book%20-%202013%20-%20FINAL.pdf).
4. National Institutes of Health: Public Health Service Policy on Humane Care and Use of Laboratory Animals (<http://grants.nih.gov/grants/olaw/references/phspol.htm>).
5. The Federation of Animal Science Societies: Guide for the Care and Use of Agricultural Animals in Research and Teaching, 3rd Edition, 2010 (http://www.fass.org/docs/agguide3rd/Ag_Guide_3rd_ed.pdf).

6. Definitions

1. AV – Attending Veterinarian – responsible for the health and well-being of all laboratory animals used at the institution



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2. AVMA – American Veterinary Medical Association – a not-for-profit organization for advancing the science and practice of veterinary medicine to improve animal and human health
3. SOP – Standard Operating Procedure – established or prescribed methods to be followed routinely for the performance of designated operations or in designated situations
4. IACUC – Institutional Animal Care and Use Committee – responsible for assessment and oversight of the institution’s animal care program components and facilities
5. Chair – Chairperson of the IACUC
6. PI – Principal Investigator – a Central Oregon Community College employee having the background and training in scientific and administrative oversight necessary to conduct and manage the proposed study
7. AUP – Animal Care and Use Protocol – protocol created by the principal investigator of the proposed research, testing, or educational study
8. Protocol – Animal Care and Use Protocol – protocol created by the principal investigator of the proposed research, testing, or educational study
9. COCC – Central Oregon Community College
10. Guide – the *Guide for the Care and use of Laboratory Animals*
11. AWA – Animal Welfare Act – requires that minimum standards of care and treatment be provided for certain animals bred for commercial sale, used in research, transported commercially, or exhibited to the public
12. PHS – Public Health Service – establishes guidelines for the proper care of animals to be used in research
13. Clinical veterinarian – the Attending Veterinarian or designee

Revision	Author	Revisions Made	Effective Date	Approval
1	Cindy Elston	<ul style="list-style-type: none"> • New SOP 	11/12/16	Cindy Elston (AV)
		<ul style="list-style-type: none"> • 		