

**Repair of Incisional
Dehiscence in Mice and Rats
IACUC Standard Procedure
Effective Date: June 2019**



The following policies must be followed for all repair procedures:

- UCSF IACUC [Guidelines for Rodent Anesthesia](#)
- UCSF IACUC [Guidelines for Rodent Surgery](#)
- Analgesia should be provided at the time of repair per the [LARC Veterinarians' Anesthesia and Analgesia Recommendations for UCSF Laboratory Animals](#) (January 2018)

The protocol must identify:

- Anesthesia and analgesia used for the repair
- Closure method(s)

Objectives:

- Aid researchers in determining the appropriate treatment for incision dehiscence.
- Provide guidance to determine the severity of dehiscence and decision making strategies for appropriate wound management.

Surgical wound dehiscence is a complication that requires immediate intervention. Treatments for dehiscence include surgical repair or monitoring with treatment. Each of these methods has advantages in various situations. Craniotomy incisions are best treated with surgical closure with sutures, minimizing exposure of the craniotomy site (David M. Young, MD, personal communication, 2019). In humans, dehiscence has been studied within the context of episiotomy procedures (Dudley et al 2013), for which primary closure of the wound was most effective. However, skin healing is a conserved process across mammalian species (Sandy-Hodgetts et al 2013; Takeo et al 2015) and these findings suggest that wound dehiscence is best repaired using a surgical method.

Description of procedure:

- 1) Perform a physical examination of animal to determine:
 - a) Origin of wound (suture or clip failure or implant failure versus trauma such as abrasion or scratching)
 - i) Wound closure failure- determine level of contamination, presence of necrotic tissue, discharge, or desiccation.
 - ii) Trauma- determine if lesions are self-inflicted, such as over grooming, or abrasion from cage structures (for implanted animals)
 - (1) Remove any objects that may aggravate wound from cage, or trim nails

- b) Depth of wound/incision
 - i) Superficial (epidermis only)
 - ii) Partial thickness (epidermis + dermis)
 - iii) Full thickness (epidermis + dermis + subcutaneous fat)
 - iv) Deep (epidermis + dermis + subcutaneous fat + exposing muscle/bone/connective tissue)
 - c) Considerations
 - i) There must be adequate healthy skin surrounding the wound
 - (1) Surgical repair requires additional skin removal; larger incisions may leave a defect too large to close.
 - ii) Repairing incisions close to limbs or the head may impact mobility/movement, or the animal's ability to perform normal functions (walking, grooming, blinking.)
 - iii) Animals that are hunched or not moving well may not survive a second surgical procedure.
 - iv) Large or infected wounds are not likely to heal successfully.
 - (1) Excessive tension on the incision leads to poor blood supply and tissue necrosis.
 - (2) Severely contaminated wounds do not heal as well as clean wounds.
- 2) Determine if the wound should be surgically repaired or monitored and treated
- a) Monitor- Appropriate for superficial or partial thickness wounds
 - i) Allow wound to heal on its own. Remove necrotic tissue and contamination by cleansing the wound with sterile saline or dilute chlorhexidine.
 - ii) Aid healing and prevent secondary infection with topical dilute chlorhexidine solution and antibiotic ointment.
 - iii) Provide analgesia per protocol or LARC veterinary staff recommendations.
 - b) Surgical Dehiscence Repair- Appropriate for full thickness and deep wounds
 - i) Perform procedure as described in IACUC standard procedure "Repair of Incisional Dehiscence or Implant Failure in Mice and Rats"
 - ii) Analgesia is required as described in the original surgery, or per LARC veterinary staff recommendations.
 - iii) Monitor animal for at least three days post-surgery.
 - iv) Consult LARC veterinary staff if complications occur or wound does not heal.
 - v) Second dehiscence cannot be repaired and the animal must be euthanized unless approved by a LARC veterinarian.

- c) Euthanasia- Appropriate for deep wounds that are grossly infected, causing severe pain, impair mobility, or cases where surgical repair would impair normal mobility.
- 3) Repair Procedure:
- a) All dehisced incisions are urgent and require immediate attention.
 - b) Repair must be performed as soon as the dehiscence is noticed.
 - c) Anesthetize and prep the animal following the UCSF Rodent Anesthesia and Survival Surgery Guidelines.
 - d) Gently debride the wound using a sterile swab and flush with sterile saline. Debriding involves the removal of dead or infected tissue.
 - e) Instill local anesthetic in the incision.
 - f) Freshen the skin margins with sharp scissors. Freshening the margins involves minimally trimming skin margins until a small amount of bleeding occurs.
 - g) Close the incision using wound clips or monofilament suture
 - h) Surgical glue may not be used as the sole method of closure.
 - i) Recover the animal following the UCSF Rodent Anesthesia guidelines and provide analgesia as indicated in the approved protocol.
 - j) Monitor repaired incision daily until healed.
- 4) LARC veterinarians may recommend treatment or veterinary care not described in this document, in consideration of the animal's health, the research model, and the approved protocol.
- a) Departures from these procedures may occur when reviewed and approved by a LARC veterinarian.
 - b) If the incision appears grossly infected (marked swelling, redness or purulent discharge) or if a second dehiscence occurs, the animal must be euthanized.

Agents: This procedure requires anesthetics and analgesics. All agents administered to animals should be listed in the "Agents" section of RIO.

Adverse Effects to be considered: Infection, dehiscence, skin ulceration