Purpose Bred Mice and Rats in Research, Testing and Teaching

Section 5 (part 2): Suitable Anesthetics and Federally Mandated Surgical Guidelines
Suitable Anesthetics and Federally Mandated Surgical Guidelines

When using injectables, keep in mind:

- Animals must be weighed and appropriately dosed. Some drugs are reversible in the event of an overdose, others are not.
- Some drugs have a cumulative effect during multiple dosing
- Alpha-chloralose and urethane are unacceptable unless justified and approved by the IACUC
- Avertin (tribromoethanol) is not available as a pharmaceutical grade anesthetic. Its use must also be justified and approved by the IACUC
- Non-pharmaceutical agents must be justified, approved, and sterilized; remember that non-pharmaceuticals may introduce impurities which can impact your research

Regarding inhalants, remember:

- Cardiovascular and respiratory depression are minimized; inhalants allow for greater control of anesthetic depth and quicker recovery
- A calibrated vaporizer provides an accurate drug delivery concentration
- Rodents anesthetized without a vaporizer must be more closely monitored because the unregulated anesthetic concentration can easily reach fatal levels.
- Gas scavenging, exhaust or collection of excess anesthetic vapor, is mandated by OSHA (Occupational Health and Safety Association)
- Anesthetized rodents must be continuously monitored; check heart and respiratory rate, blood pressure, color, and reflexes.
Suitable Anesthetics and Federally Mandated Surgical Guidelines

IMPORTANT FACTS:

For combination anesthetics, recommendations for both injectables and inhalants apply.

Regardless of the anesthetic used, animals must be monitored until they are ambulatory; anesthetized animals must NEVER be left unattended.

Most anesthetics cause hypothermia: hypothermia slows recovery from anesthesia. Always use approved veterinary heating devices which are designed to safely monitor and control an animal’s body temperature during anesthesia.
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“What are the current surgical guidelines?”

Surgical Guidelines
All surgical participants must demonstrate both species - and procedure-specific training and experience. Survival procedures require particular attention:

• Surgery must be performed in an IACUC approved, dedicated area (uncluttered and amenable to sanitization)
• The surgeon must wear sterile gloves, mask, cap, and scrubs (or a clean lab coat) Note: it should be intuitive, but is worth stating that touching non-sterile items with sterile gloves or instruments contaminates them making them no longer sterile.
• Surgical instruments and supplies must be sterilized before use.
  – Acceptable sterilization methods include
    • Autoclaving (steam under pressure)
    • Ethylene Oxide Gas
    • Chemical Sterilants such as Glutaraldehyde
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“What are the current surgical guidelines?”

• Hot bead sterilizers can only be used between animals to re-sterilize the tips of surgical instruments. Sterile saline or sterile water are acceptable for cooling. An un-opened sterile packet of surgical instruments is required for each subsequent group of 4 rodents.

• The surgical site must be suitably prepared
  – Fur removal (clipping, plucking, depilatory cream)
  – Skin preparation (Betadine or Chlorahexidine, remove scrub with sterile saline if necessary.)

• The use of alcohol alone for sterilization is NOT adequate. Also, alcohol evaporates quickly, contributing to hypothermia in small animals.

• Animals must be observed post-operatively; they can not be returned to their “home cages” until they exhibit spontaneous and voluntary movement
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“What are the current surgical guidelines?”

Remember: successful surgical procedures require skillfully refined techniques. It is important to understand that:

• An animal’s physiological balance—particularly temperature, ventilation, and perfusion—must be monitored
• Analgesics must be properly administered; animals experiencing more than momentary pain (comparable to a simple needle injection) must be treated with an appropriate analgesic; exceptions must be IACUC approved.
• Pain relieving drugs are most effective when given prior to painful procedures (pre-emptive treatment).