

**University of Colorado at Boulder  
Office of Research Integrity  
Institutional Animal Care and Use Committee  
SOP # 26**

**Title: Tribromoethanol (formerly Avertin®) Anesthesia in Mice**

**PURPOSE**

The purpose of this Standard Operating Procedure is to provide guidelines on the use of Tribromoethanol (formerly Avertin®) as anesthesia in mice, and highlight the advantages and disadvantages of its continued use.

**BACKGROUND**

Tribromoethanol is a popular injectable anesthetic agent used in mice. It was once manufactured specifically for use as an anesthetic by Winthrop Laboratories under the trade name Avertin®, but this product is no longer available. Investigators who wish to use Tribromoethanol as an anesthetic must make their own solutions.

**USES**

- Tribromoethanol is appropriate for short term procedures in mice, especially surgical procedures. It's best used in situations where it will be given only on a single occasion.
- Tribromoethanol is a non-pharmaceutical grade compound and therefore in order to use it on an IACUC protocol it must be scientifically justified, including why other available pharmaceutical grade compounds that are available cannot be used on the study. Historical use of Tribromoethanol alone is not a sufficient justification.

**ADVANTAGES**

Tribromoethanol induces anesthesia rapidly and provides good surgical analgesia for approximately 20 minutes. Since it is given by injection, one is spared the occupational health risks and technical difficulties associated with volatile anesthetics. If used appropriately, Tribromoethanol has a good margin of safety.

**DISADVANTAGES OF USING TRIBROMOETHANOL**

- Tribromoethanol is an irritant, especially at high doses, high concentrations, or with repeated use. Adhesions are sometimes seen in the abdominal cavity after IP injections.
- Tribromoethanol degrades in the presence of heat or light to produce toxic byproducts. Degraded solutions can be both nephrotoxic and hepatotoxic. Administration of degraded Tribromoethanol solutions has been associated with death, often 24 hours after surgery.
- Tribromoethanol can cause intestinal ileus (stopping of the gut motility and subsequent death of the animal) several weeks after injection. This is more common with Tribromoethanol stored in the presence of light or heat, stored at higher than recommended doses, or given at higher than recommended concentrations.
- The effects of Tribromoethanol are also somewhat unpredictable in mice younger than 16 days, or in animals with altered carbohydrate metabolism, such as various mouse strains used for diabetes or obesity models (db/db mice or ob/ob mice).

**CAUTIONS**

- Do not administer non-sterile solutions, outdated solutions, more concentrated solutions than recommended or higher doses than recommended by a Veterinarian. Store the solution under refrigeration and in the dark. Containers should be wrapped in foil.
- Although some authors report that refrigerated solutions may be kept for months, most authors recommend preparing a new solution every 2 weeks. The CU Boulder's IACUC requires replacing refrigerated Tribromoethanol at least every 14 days (after mixing).

**REFERENCES:** Duke University & Medical Center, Animal Care and Use Program *Guidelines for Avertin Anesthesia in Mice* <http://vetmed.duhs.duke.edu/GuidelinesforAvertin.html>