The University of Pennsylvania Institutional Animal Care and Use Committee (IACUC) has developed the following policy to describe the necessary information research investigators need to provide to obtain IACUC approval to use non-pharmaceutical grade sodium pentobarbital. This document also provides guidance on acceptable methods of preparation and use.

Sodium pentobarbital has a long history of effective use in laboratory animals. In recent years, the medication has fallen out of favor with human healthcare use and, consequently, most pharmaceutical companies have ceased producing or selling pentobarbital as an injectable pharmaceutical grade product. While most researchers are able to convert to alternative medications, for certain applications and certain studies, scientific necessity requires continued use of this barbiturate.

The NIH has stated “The exorbitant cost of this product has placed it logistically into the **unavailable** category. Regulatory guidance on this matter specifically allows for use of non-pharmaceutical-grade compounds due to non-availability and with IACUC approval.” Therefore, the IACUC will consider and may approve requests to use a non-pharmaceutical grade of pentobarbital under the following circumstances:

The preparation and use of this anesthetic **must** be:
- Scientifically necessary,
- Appropriately justified,
- Prepared from a reagent or analytical-grade powder; properly prepared by a pharmacist or other knowledgeable individual (e.g., chemist, veterinarian, researcher), with assurance of appropriate storage and handling, and
- Approved by the IACUC. In making its decision, the IACUC must consider the side effects, stability, storage requirements, and other considerations associated with the preparation of this agent (the PI must provide this information for IACUC consideration).

Please note that even non-pharmaceutical grade pentobarbital is an **DEA schedule II** controlled substance, and therefore must be obtained, stored, dispensed, administered, and properly disposed of in accordance with the University’s [Management of Controlled Substances Policy](#).

### STERILE PREPARATION OF NON-PHARMACEUTICAL GRADE SODIUM PENTOBARBITAL

1) The drug must be prepared to USP/NF standards for sterility; at a minimum, preparation of the drug should be within a **clean** laminar flow hood, while minimizing contamination of the product. See recipe below.

2) Combine the measured amount of powder and sterile diluent necessary to achieve the desired concentration and mix thoroughly.

3) All solutions intended for parenteral use must be sterile and balanced. The following guidelines should be used:
IACUC POLICY
USE OF NON-PHARMACEUTICAL GRADE SODIUM PENTOBARBITAL

- Filtering – Filtration should be through a 0.22 µm or finer filter.
- pH testing – The pH should be between 6.8-7.2.
- Culture (optional) – For further confirmation of sterility, the final solution can be cultured for bacterial growth.

4) If the resultant sodium pentobarbital is NOT in the specified pH range or if particulates are visible in the final solution, do NOT inject it into an animal.

5) The final product should be steriley transferred to a sterile, sealed container within the laminar flow hood.

6) The final product must have a label with the following information, at minimum:
   - Compound name
   - Compound concentration
   - Date of reconstitution

RECIPE FOR SODIUM PENTOBARBITAL STOCK SOLUTION

1) Ingredients:
   - 6 grams sodium pentobarbital
   - 10 mL ethanol (95%) USP
   - 40 mL propylene glycol USP
   - 0.9% sterile saline USP

2) Steps:
   - Dissolve the pentobarbital powder completely in alcohol.
   - Add 25 mL of 0.9% sterile saline and mix thoroughly.
   - Add 40 mL of propylene glycol, again mixing thoroughly.
   - Bring up to the final volume (100 mL) with 0.9% sterile saline.

3) The final concentration of the pentobarbital stock solution is 60 mg/mL.

SPECIAL NOTES FOR THE USE OF PREPARED SODIUM PENTOBARBITAL

1) Both stock and diluted working solutions must be protected from light and maintained for no longer than 30 days.

2) Do not administer non-sterile solutions, expired solutions, more concentrated solutions, or higher doses than those recommended above.

3) Expired stock or working solutions of pentobarbital must be labeled “EXPIRED – DO NOT USE IN ANIMALS” and stored separately from in-date stock.