



**Sterilizing Surgical Materials Used on Animals – Standard
Operating Procedures**

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1. Overview

1.1 Purpose

To define the methods and documentation required for sterilizing surgical instruments and materials. Specific sterilization methods should be selected on the basis of the physical characteristics of the materials to be sterilized and sterilization indicators should be used to validate that materials have been properly sterilized.

2. Procedure

Any survival surgical procedure performed on animals, including rodents, requires the use of sterile surgical instruments, material, and supplies. The use of sterile supplies and instruments for non-survival surgery is recommended, but not required. Sterilization is defined as the killing of all living microbial organisms including bacterial spores.

2.1 Acceptable Methods for Full Sterilization

Steam Autoclave: autoclave must be monitored and serviced to ensure proper function – temperature, pressure, and time.

Gas Sterilization: for use on materials damaged by heat and steam such as plastics and cannulas. Proper safety precautions must be used.

Chemical Sterilization: only chemicals approved for sterilization (such as glutaraldehydes or formaldehyde solutions) can be used. Those chemicals defined as disinfectants (alcohol and iodophores) are not adequate. It is essential to thoroughly clean all organic material from the instruments for a chemical sterilant to be effective. The items must be in contact with the chemical for the required amount of time as indicated for the agent for **sterilization to occur**. Freshly prepared solutions must be used, and the preparation and expiration date of the chemical must be labeled on the container. Because these chemicals are irritating and toxic, the instruments must be rinsed thoroughly with sterile saline before contacting the animal. These chemicals can also be corrosive to stainless steel instruments.

2.2 Acceptable Methods for Re-sterilization Between Animals When Using Tip Aseptic Technique

Hot Bead Sterilization: For multiple surgeries done continuously or alternatively in one session, instruments must first be sterilized completely by one of the methods listed in Section 2.1. Hot bead sterilization may then be used before the second, third, and fourth procedures after which the instrument set must again be completely sterilized. The bead sterilizer must be activated 15 to 20 minutes prior to use to ensure it has reached reach operating temperature of approximately 240 C to 270 C. It is essential to thoroughly clean all organic material from the instruments before inserting



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into the bead sterilizer. Tips should remain in the sterilizer for 15 to 20 seconds. Ensure the tips of the instruments are cool before they contact the animal.

2.3 Methods NOT Acceptable for Sterilization

Disinfectants (such as alcohol and iodophores) do not kill bacterial spores and cannot be used for sterilization. Standard ultraviolet light is not effective unless sterilization is performed in a hospital grade medical UV sterilizer. These devices provide proper UV wavelength and time to ensure destruction of RNA and DNA of microbial organisms, as well as protection of operators.

2.4 Monitoring Sterility

Indicators of sterility must be included **inside** the pack or pouch containing the items being sterilized. These are commercially available strips which change colors to indicate that the internal area of the pack has reached temperatures of sterilization, or the gas has penetrated the pack. In addition, sterilization indicator tape on the outside of the pack may also be used to indicate the pack was sterilized. The date of sterilization should be written on the outside of the pack or pouch.

The sterilizer should also be biologically monitored on a quarterly basis. This involves placing a tube containing bacterial spores within a pack. The tubes are removed after the sterilization process and incubated to look for inadequate sterilization. These monitors can be obtained from ULAR.

2.5 Record Keeping

A log must be maintained showing the dates the instruments were autoclaved. The actual **internal** pack sterilization monitor, showing adequate sterilization, must be attached to this log or included in the surgery record. These logs should be available for inspection by the IACUC, regulatory agencies and AAALAC.

Records of results of autoclave spore testing should also be maintained.

2.6 Shelf Life of Sterile Materials

Packs of sterile instruments or materials stored for more than a week should be double-wrapped in packaging which is impermeable to water. **The date of sterilization should be clearly marked on the outer wrapper.** Expiration dates vary with packaging materials, but a general guideline is two months from the date of sterilization. Using commercially available plastic dust covers or storing in closed cabinetry will extend the shelf life to 6-12 months.

3. Responsibilities

3.1 Drexel University IACUC Responsibilities

The Drexel University IACUC and the IACUC Office are responsible for maintaining this guidance document, training, and monitoring. All exceptions to this procedure must be approved by the IACUC. For inquiries regarding these procedures, please contact the Director of Animal Welfare, a part of the Office for Research & Innovation (ORI), or the Attending Veterinarian.



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3.2 Principal Investigator Responsibilities

The Investigator is responsible for ensuring that each individual sterilizing materials for surgical procedures follows this procedure.

4. Revisions

Edition 001/Effective Date: 07/14/2004 – Original Document

Edition 001/Review Date: 05/11/2017

Edition 002/Revision 4/10/2024 and Effective Date: 4/24/2024 – Revised Document

- Updated formatting to new template.
- Changed title to “Sterilizing Procedures Surgical Materials Used in Surgical Procedures on Animals”
- Section 1.1 - Updated purpose to focus on sterilization and not only autoclaving
- Section 2.1 - Inserted more information about chemical sterilization usage
- Section 2.2 - Inserted more information about hot bead sterilization usage
- Section 2.3 - Added Methods NOT Acceptable for Sterilization
- Section 2.5 - Inserted “or in the surgery record”
- Section 3.1 - Added Drexel IACUC Responsibilities