NEW GUIDELINES: UCSF LABORATORY ANIMAL RESOURCE CENTER

GUIDELINES FOR ASEPTIC SURGERY (NON-RODENTS)

Introduction

Animal surgical procedures must be conducted in accordance with the requirements of:

• The Guide for the Care and Use of Laboratory Animals [The Guide] (Institute of Laboratory Animal Resources, National Research Council, 1996)

• Animal Welfare Regulations (AWR, CFR 1985), and

• Public Health Service Policy on Humane Care and Use of Laboratory Animals (PHS Policy, 1996).

The “Guide” classifies surgical procedures under the category of Veterinary Medical Care. It specifically states that: “appropriate attention to pre-surgical planning, personnel training, aseptic and surgical technique, animal well being, and animal physiologic status during all phases of a protocol will enhance the outcome of surgery”.

It further states that: “Aseptic technique is used to reduce microbial contamination to the lowest possible practical level. No procedure, piece of equipment, or germicide alone can achieve that objective. Aseptic technique requires the input and cooperation of everyone who enters the operating suite. The contribution and importance of each practice varies with the procedure.

Aseptic technique includes:

• Preparation of the patient; such as hair removal and disinfection of the operating sites;

• Preparation of the surgeon such as the provision of decontaminated surgical attire, surgical scrub, and sterile surgical gloves;

• Sterilization of instruments, supplies, and implanted materials; and

• The use of operative techniques to reduce the likelihood of infection”.

The purpose of the following guidelines is to assist the investigators in complying with these requirements. In general, unless an exception is specifically justified as an essential component of the research protocol and approved by the IACUC, the investigators should follow these guidelines.

(Continued on page 2, see Aseptic)
(Aseptic, continued)

A) Principles of Surgical Techniques

1. All items used in any surgical procedure must be sterilized.
2. Persons who have scrubbed should touch only sterile items. Persons who have not scrubbed should touch only non-sterile items.
3. If the sterility of any item is in doubt it should be considered non-sterile.
   - If a non-scrubbed person touches a sterile table re-drape the table.
   - If a scrubbed person touches a non-sterile table that person should re-gown or cover the contamination.
   - Any sterile table or sterile item left unguarded or uncovered should be considered non-sterile.
   - If the autoclave tape is only partially changed in color the item should be considered non-sterile.
4. When preparing for surgery, personnel should:
   - First put on a cap and then a mask.
   - Scrub from fingers to 2-3 inches above elbow.
   - Open gown and glove packs and put on gown and gloves.
5. Persons who have not scrubbed should avoid reaching over sterile fields and those who have scrubbed should avoid leaning over non-sterile areas.
   - The scrubbed person should set basins to be filled at the end of the table.
   - The circulator should stand at a distance from the sterile field when adjusting the light.
   - The surgeon should turn away from the field to have his/her brow mopped.
   - The scrubbed person should drape the sterile tables nearest him/her first.
6. Tables are considered sterile only at tabletop level or above.
   - Linen or sutures falling below table level are considered non-sterile and discarded.
   - When draping the table the part of the sheet that drops below the table surface should not be brought up to table level again.
7. Gowns are considered sterile only from waist to shoulder level and in front or on the sleeves.
8. While scrubbing, keep hands in sight above waist level, and away from the face.
9. When standing on stools, the area of the gown below the waist must not brush against the sterile table.
10. Arms should never be folded; perspiration in the axillary region may lead to contamination.
11. Articles dropped below waist level must be discarded.
12. Scrubbed persons should keep well within the sterile area. A wide margin of safety should be allowed when passing non-sterile areas.

13. Persons who have not scrubbed should avoid sterile areas.
   - If a person who has not scrubbed must pass a sterile area he/she should face the area when passing to make certain it has not been touched.
14. Moisture allows transport of bacteria to the sterile area causing contamination.
15. Sterile packages should be laid only on dry areas.
   - If a sterile package becomes damp or wet, it should be re-sterilized or discarded.
   - If a solution soaks through a sterile drape to a non-sterile area, the wet area should be covered with another sterile drape.
16. When bacteria cannot be eliminated from a field, they should be kept to an irreducible minimum. Patient skin cannot be sterilized and is a source of potential contamination from both the patient and members of the operating team. To minimize contamination potential:
   - The patient is shaved and scrubbed in the prep area and is given a final sterile scrub in the operating room.
   - When draping, all skin should be covered except the site of incision.
   - All surgeons and assistants must scrub their hands and arms.
   - All surgeons and assistants must gown and glove without touching the outside of the gown and gloves.
   - Hand towels should not touch scrub suits while drying hands after scrubbing.
   - In some cases the knife blade used for the skin incision should be considered contaminated and should not be used deeper than the skin.
   - If a glove is contaminated during the procedure it must be changed at once. If an instrument punctures the glove, the instrument must also be handed off.

Note: All drugs, medical supplies, and sterilized items used during surgery must be current. No outdated material can be used.

B) Cleaning Instruments

1. Prior to sterilization, all instruments must be cleaned to remove debris, blood, oil, etc. The two common methods of cleaning include:

   Manual cleaning
   1. Rinse the instruments in tap water as soon as surgery is over. This prevents blood from drying in serration and box locks.
2. Open all box locks and disassemble instruments.

3. Scrub each instrument with a soft brush in warm water with an instrument detergent with a pH near 7.0-8.5. Wear gloves and be mindful of sharp edges on instruments.

4. Inspect each instrument for proper function and cleanliness; particularly box locks, grooved ends, and other areas not readily exposed.

5. Rinse the instruments with water (distilled if available) to ensure removal of detergent. Distilled water is used to prevent mineral deposits on the instrument surfaces. If distilled water is not available and tap water is used, hand-dry the instruments to remove mineral deposits from the water.

6. Instrument “milk” can be used to lubricate instruments.

**Ultrasonic cleaning**

Ultrasonic cleaning is a more effective cleaning method than manual cleaning. It can penetrate areas that a hand brush cannot reach. Cleaning is accomplished by the use of high frequency sound waves converted in the solution into mechanical vibrations, which pull soil out of instruments. The ultrasonic method typically removes about 90% of soil. However, it is important to recognize that it does not sterilize, or eliminate the need for initial removal of obvious blood and soil. Ultrasonic cleaning is most effective when it follows a preliminary manual cleaning to remove accessible debris from the instruments. When using an ultrasonic cleaner, always:

1. Follow manufacturer’s instructions carefully.

2. Use the detergent solution recommended by the manufacturer.

3. Strictly adhere to the cleaning times and temperatures recommended by the manufacturer.

4. Use distilled water/or de-mineralized water.

5. Rinse instruments with box locks open and disassembled.

6. Do not overload cleaner.

7. Inspect instruments carefully on a regular basis; ultrasonic cleaning can accelerate flaking of chrome plated instruments and loosen small screws in instruments.

**C) Sterilizing Instruments**

As described above, the use of sterilized instruments is a critical requirement of sterile survival surgery techniques. All instruments used in these surgeries must be sterile.

Specific sterilization methods should be selected on the basis of physical characteristics of materials to be sterilized. At UCSF, autoclaving is the only method recommended for use by the investigators. The use of the gas sterilization method is only approved through the UCSF Medical Center’s central sterilization facility. Sterilization indicators should be used to identify materials that have undergone proper sterilization.

The use of liquid chemical sterilizing agents must be conducted in approved facilities with adequate ventilation systems and should be used with adequate contact times. Instruments should be rinsed with sterile water or saline before use. Alcohol is neither a sterilizing agent nor a high-level disinfectant.

**Note:** *If the sterilization date has expired then instruments and supplies must either be discarded, or re-sterilized with the new expiration date clearly posted.*

1. All articles to be sterilized must be clean.

2. All articles to be sterilized should be packaged in materials (such as paper, muslin, cloth, etc.) that protect them from contamination. The material must be porous enough to allow the penetration of the sterilizing agent (e.g. steam).

3. Double envelope wrap method where two wrappers are used, can be used to wrap the items being sterilized. Place items in the center of the wrap and fold the wrap from the bottom, doubling back a small corner. Fold the right and then left edges over again, leaving corners doubled back. Bring down the last edge (top) over the other edge. Repeat with second wrapper.

4. Secure the wraps with a pressure-sensitive tape (preferably a sterilizing tape).

5. Date (must include the expiration date) and label the sterilized items.

6. The efficacy of the sterilizing process should be measured at regular intervals with a biological indicator (refer to UCSF Biological Safety Manual for procedures).

7. Store sterilized items in a clean, dust-proof and low-humidity area. Closed storage cabinets prevent contamination more effectively.

8. If an open shelf is used, the lowest shelf should be 8 to 10 inches from the floor, at least 18 inches from the ceiling and two inches from outside wall.

9. Any sterilized package that is dropped or torn or has come in contact with moisture is considered contaminated and must be repackaged and re-sterilized.

10. Shelf life depends on the packaging material used, the number of layers of the wrap, the integrity of the seal, and the handling of the items received.

11. Average shelf-lives most commonly used are:

   - Cloth-double wrapped - 1 month
   - Paper/plastic peel packages - 6 months to 1 year
   - Dust covers - airtight plastic to cover linen 6 months

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Rodent Housing Space

As you are aware, due to increased research activity, we are experiencing shortages of rodent housing space. A brand new facility is being planned for the Parnassus Campus (detailed information will be provided in future editions), and other options are being reviewed to increase housing capacity. In the meantime the Animal Users Advisory Committee is charged with the review and approval of requests for new or additional rodent housing. If you require rodent housing please submit a written request to the Animal Users Advisory Committee at Box 0942. In your request please include a description of the need and a justification for the increased capacity.