

Best Practices for Preparation of Surgical Instrumentation

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BACKGROUND

Surgical instruments must be thoroughly cleaned, properly assembled, carefully inspected and tested, correctly packaged and effectively sterilized to ensure patient safety and positive patient outcomes.

The outcome of a surgical procedure can be affected if the instruments are not present or functioning as intended. An Operating Room's efficiency is adversely affected when there are issues associated with surgical instruments:

Room turnover time can be delayed if an instrument

- a) or component is missing
- b) does not function as intended (e.g. scissors do not cut)
- c) is not clean
- d) is damaged/broken (e.g. tips do not approximate on finger forceps).

All of the above scenarios would require the circulating nurse to leave the OR room to obtain replacements (which may not be readily available!). Sometimes, there are no back-up instruments and a substitute instrument is used. The substitute may alter the surgery outcome or add time to the case. This may cause the patient to be exposed to anesthesia for a longer period of time than necessary. Problems of this nature are unacceptable to the surgeon, the surgical team and the patient. Moreover, in a majority of the instances, these problems are preventable!

To reduce instances of surgical instrument problems, this Inservice will describe the best practices for preparation of surgical instruments.

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WHERE IT STARTS

Before any device or surgical instrument is **ordered**, from a manufacturer, obtain the written instructions for processing. This information should include detailed information on disassembly, cleaning (including equipment and detergents to be used), testing, packaging and sterilization methodologies.

Verify that your facility has the recommended equipment to clean and sterilize the instruments and the recommended chemicals for cleaning/disinfection. If not, you should not purchase the devices or get approval to purchase the needed equipment. For example, the manufacturer of an endoscopic forceps recommends ultrasonic cleaning but your facility does not have an ultrasonic cleaner. You would be modifying the device manufacturer's instructions for cleaning if you did not use an ultrasonic cleaner! The manufacturer tested and validated the cleaning process using ultrasonics. Non-compliance could result in an unclean instrument and may adversely affect the performance and longevity of the device.

DECONTAMINATION

The detergents used in cleaning are important to remove visible and invisible soil (microorganisms) and to prepare the device for disinfection or sterilization. The recommended detergents should be used **and** the end user should carefully follow the detergent manufacturer's instructions for measuring the detergents as well as the recommended water temperature. This is especially critical with enzymatic detergents which can be inactivated in temperatures above 140°F. The effectiveness of the cleaning process can be adversely affected when detergents are not used properly.

Proper cleaning implements are also essential – especially when cleaning small lumens (channels). It is important to clean all surfaces of the instrument/device. To do this, some disassembly may be required. Follow the device manufacturer's instructions for disassembly and take care to keep all components together to avoid loss. **You should always use the correct size brush (correct length and diameter – especially for cleaning lumens). Reusable cleaning brushes should be cleaned and disinfected or**

sterilized (if recommended) at least each shift. The condition of the brush bristles should be checked regularly. Any brushes with bent, missing or distorted bristles should not be used.

Many devices require manual cleaning (delicate items), some are not immersible (power equipment). If cleaning by hand, always wash the device below the water level to prevent aerosolization of bacteria. If using a mechanical washer, do not overload the washer. Make sure all items have direct exposure to the water/detergent. Do not place bowls/basins over instruments to keep a set together.

Rinsing off debris and detergents is the final step in cleaning. It is preferable to rinse under running water to permit the detergent residues and debris to flow down the drain. Some instrument manufacturers recommend a final rinse with distilled water.

PREPARATION/PACKAGING

Most instrument manufacturers recommend a water soluble lubricant (often called instrument milk) be applied after cleaning and before sterilization. This process should be performed in the prep and packaging area (clean area) to avoid contamination of the lubricant solution. If a mechanical washer is used, many offer a lubrication cycle. Always follow the lubricant manufacturer's instructions for dilution (e.g. mix with sterile distilled water rather than tap water), use life (can be anywhere from 24 hours to 14 days) and compatibility with steam, ethylene oxide gas (ETO) and low temperature gas plasma processes. It is recommended to note the date the lubricant needs to be changed on the lid of the container of instrument milk. The lubricant should be allowed to air dry; do not rinse off, or use towels to dry or the lubricant will be removed.

Harsh chemicals such as saline and bleach should be avoided to prevent damage and corrosion to instruments. Only use the chemicals recommended by the device manufacturer.

Inspection of instruments should be performed using a lighted magnifying lamp to help identify quality issues. Examine the instruments for:

- 1) Cleanliness – especially in the joint (box lock), serrations and ratchets.
- 2) Completeness – for multi-part devices, verify that all parts are present.
- 3) Functionality – inspect/test the instrument for:
 - a) stiffness in the joint
 - b) sharpness
 - c) tips of finger forceps approximate
 - d) ratchets hold
 - e) jaws of needle holder hold a suture needle
 - f) condition of instrument marking tape or “dipped” covering
 - g) integrity of insulation.

The inspection process for cleanliness must occur each time. When processing Orthopedic loaner sets, make sure to lift up each instrument; look underneath for bone fragments that can accumulate during surgery. Any instruments that are not clean should be returned to the Decontamination Area. Cleaning is not to be performed in the prep/.packaging area. When an instrument is stiff in the joint ~~is~~ this is an indication of debris in the joint; over time the joint will fail (cracked box lock). A scissors that does not cut, does not belong in an OR. Every scissors should be tested each time before placing on a set. Use of a piece of Theraband (latex or non-latex type product) to test for sharpness. Cut through the Theraband with $\frac{3}{4}$ of the scissors blade . Make sure you use the correct thickness of latex product; the thicker product is for longer instruments; the thinner product is for smaller blades (e.g. tenotomy scissors). The tips should cut without snagging. To test if the ratchets will hold, close the instrument on the first ratchet and then gently tap on the the edge of the table. If the ratchet opens, the instrument should be sent for repair. Instrument marking tape or instruments that have been “dipped” into a chemical for color coding need to be inspected to make sure the tape or dipping is in good condition. These products can flake off in the surgical field and

enter the patient's incision. If either of these methods is used to identify sets, they must be routinely replaced.

The integrity of insulation on insulated (e.g. laparoscopic) instruments is essential to prevent patient injury. All insulated instruments should be visually inspected for breaks in the integrity of the insulation. This is best visualized using a lighted magnifying glass. However, this is just the first inspection because some defects cannot be detected visually, Therefore it is recommended to perform insulation testing using a device specifically designed for this purpose. There are several on the market. Evaluate the performance, ease of use, cost and capability of the tester. Some units can also test cables and cords which is also desirable.

The insulation should be tested each time the instruments are processed to avoid possible injury to the patient and/or surgical team. Results of the insulation testing should be documented in a log form and the records saved with the sterilization records. For example, The date the set was tested, who tested it, how many instruments were tested, how many passed, how many failed, the action taken for the instruments that failed.

Any instrument that does not meet the performance criteria should be placed in a designated location for repair. A quality repair service is recommended to keep instruments working properly. It is also recommended to include preventive maintenance of all sharps.

Refer to the instrument manufacturer's- instructions for use to determine if the instrument can be sterilized assembled. For example, laparoscopic forceps with inserts may need to be sterilized disassembled, Failure to do so could adversely affect the sterility of the device.

Instruments should be packaged based upon the use of the device, the anticipated handling and the recommended sterilization process.

TRAY ASSEMBLY

When assembling sets always follow the count sheet or "recipe card" to make sure the correct instrument is placed on the set and the correct quantity. Today, some facilities using instrument tracking forms or count

sheet programs. Regardless of the method, to prevent errors, enter the count on the count sheet or in the computer AFTER the instrument has been placed on the set. Do not enter the counts after the set is assembled—errors can be made.

Instruments should not be substituted without the approval of the OR. Missing instruments should be documented and the OR consulted to see if the set can be completed without the missing instrument(s).

Use tip protectors to protect sharp or delicate instruments. All instruments with finger rings should be placed on a stringer—the stringer should be wide enough to permit the jaws of the instruments to remain open to make contact with the sterilant. Do not use any type of packaging material inside the set (wrapped or container). If instruments must be separated (e.f. forceps) use an autoclaveable bag that has been validated for use inside a wrapped set or rigid container.

When labeling sets, it is important to label the set correctly. When a set is labeled incorrectly, it delays the OR and the set will have to be completely reprocessed—a waste of time and money. For wrapped sets, write the name of the tray on the autoclave tape FIRST. Then after the set is wrapped, apply the tape. For rigid containers, check the name on the container first to make sure it matches with the tray.

When labeling packages always use a permanent marker that is non-toxic. Other devices are not recommended for use.

STERILIZATION

Today, most surgical instruments can be steam sterilized using standard pre-vacuum steam cycles at 270°F for 4 minutes or 275°F for 3 minutes at 28-30 psig. However, it is the device manufacturer that determines how the device is sterilized. Some devices require extended exposure times (e.g. metal implants) while others may require a lower temperature (250°F). To avoid possible damage to the instrument, always

follow the device manufacturer's written instructions for the sterilization process (steam, ETO, low temperature gas plasma, etc.), temperature, exposure time, etc. It is not recommended to use an alternate method of sterilization without the device manufacturer's approval.

SUMMARY:

Surgical Instrument represent a major financial asset to the healthcare facility. Careful attention to care, handling (especially avoiding abuse of instruments) and sterilization is essential to avoid costly replacements, enhance patient and surgeon satisfaction, reduce costs (delays in the OR) and enhance patient safety.

Develop a process for instrument preparation that includes all of the above steps and make sure it is followed at all times.

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POST TEST QUESTIONS: Best Practices for Preparation of Surgical Instrumentation

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1. _____ The very first thing to do when purchasing a new instrument is to:
 - A) sterilize the instrument
 - B) wash the instrument
 - C) read the manufacturer's instructions for processing
 - D) place it in storage until needed

2. When labeling a wrapped set:
 - A) label the set after it is wrapped.
 - B) write the name of the set on the autoclave tape before assembling the set.**
 - C) use a magic marker.
 - D) use an ink pen.

3. _____ Some enzymatic cleaners can be inactivated in temperatures that exceed:
 - A) 100 ° F.
 - B) 120 ° F.
 - C) 130 ° F.
 - D) 140 ° F.

4. _____ When manually cleaning, it is recommended to wash items below the water to prevent
 - A) splashing
 - B) aerosolization of microbes
 - C) problems with rinsing
 - D) build-up of detergent

5.____ Unless otherwise directed by the manufacturer, power equipment would best be cleaned:

- A) in an ultrasonic cleaner
- B) in a mechanical washer/decontaminator
- C) manually
- D) in a washer/sterilizer

6._____ The final step in the cleaning process is:

- A) Scrubbing
- B) Rinsing
- C) Inspection
- D) Disinfection

7._____ Instrument lubricant would best be applied:

- A) in the decontamination area after cleaning
- B) in the decontamination area after disinfection
- C) in the prep/packaging area before assembly
- D) in the prep/packaging area after assembly

8._____ Which of the following chemicals can destroy and corrode surgical instruments?

- A) phenols and alcohol
- B) alcohol and QUATS
- C) enzymatic detergents and chlorine bleach
- D) chlorine bleach and saline

9____ If an instrument is found to be “stiff” the instrument should be

- A) sprayed with mineral oil
- B) sprayed with instrument lubricant
- C) re-cleaned
- D) placed on the set

10_____ Scissors should be tested for sharpness

- A) Each time processed
- B) Weekly
- C) Every other week
- D) Monthly

Directions for Payment and Results

This in-service = \$15

Re-do's = \$15 each

No refunds (all sales are FINAL), prices subject to change.

Payment is accepted in the form of a Credit Card, Facility Check, or Money Order only.
Sorry, no personal checks.

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Upon passing this in-service, your certificate will be mailed to you within 7-10 business days.

Please fill out the form below and submit it with your payment and the quiz to:

Sterile Processing University, 59 Allerton Road, Lebanon, NJ 08833.

Name: _____

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If you have any questions, please email heidi@spdceus.com

Thank you!