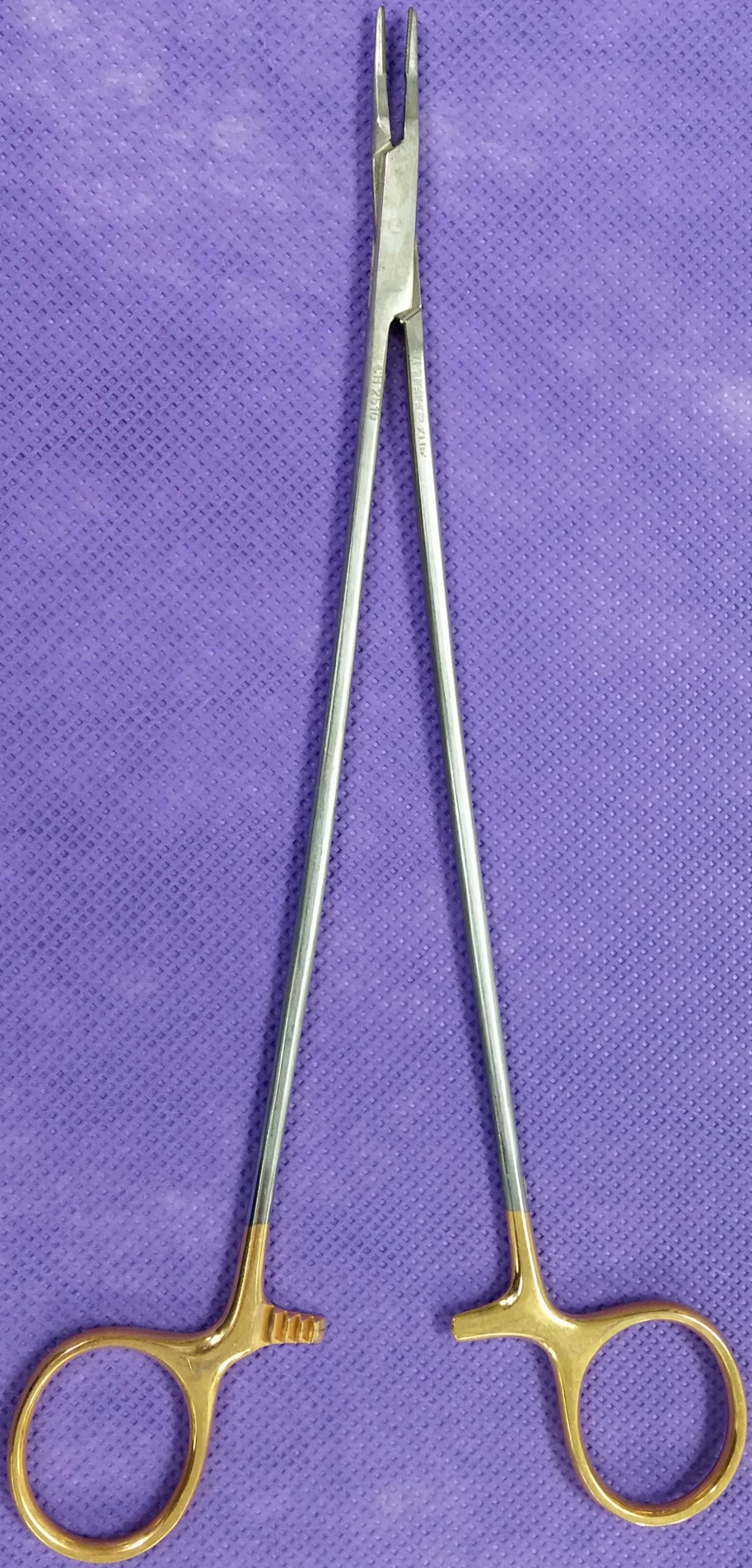

CIS SELF-STUDY LESSON PLAN

Lesson No. CIS 284 (Instrument Continuing Education - ICE)

Sponsored by:

AESCULAP ACADEMY®

The Importance of Instrument/ Equipment Lubrication

BY DON WILLIAMS, CRCST, CIS, CHL

Certified Instrument Specialist (CIS) lessons provide members with ongoing education in the complex and ever-changing area of surgical instrument care and handling. These lessons are designed for CIS technicians, but can be of value to any CRCST technician who works with surgical instrumentation.

Earn Continuing Education Credits:

Online: Visit www.iahcsmm.org for online grading.

By mail: For written grading of individual lessons, send completed quiz and $15 to:
Purdue University - Online Learning
Young Hall, Room 527
155 S. Grant Street
West Lafayette, IN 47907

Subscription Series: Purdue Extended Campus offers an annual mail-in or online self-study lesson subscription for $75 (six specific lessons worth 2 points each toward CIS recertification of 6 hours). Call 800.830.0269 for details.

Scoring: Each online quiz with a passing score is worth 2 contact hours toward your CIS recertification (6 hours) or CRCST recertification (12 hours).

More information: IAHCSMM provides online grading service for any of the Lesson Plan varieties. **Purdue University provides grading services ONLY for CRCST and CIS lessons.** Direct any questions about online grading to IAHCSMM at 312.440.0078. Questions about written grading are answered by Purdue University at 800.830.0269.

LEARNING OBJECTIVES

1. Discuss the importance of instrument and equipment lubrication
2. Review the types of instrument lubricants available
3. Discuss the possible consequences of improper lubrication and understand the role lubrication plays in the life cycle of instrumentation

Proper lubrication of surgical instrumentation and equipment is critical for effective operation and it helps prolong the lifespan of the devices; however, there are several factors healthcare organizations and Sterile Processing (SP) professionals need to consider to ensure they are selecting the appropriate type of lubricant and using it properly. Inappropriate use of lubricant can damage instruments and lead to inadequate sterilization of surgical instruments that can jeopardize patient safety.

Objective 1: Discuss the importance of instrument and equipment lubrication

Lubrication is a key factor in the care and maintenance of surgical instruments, and one of the easiest, most effective ways to keep instruments in good working condition. It is important that lubrication be viewed as an essential proactive step in the instrument care process, not as an optional practice. Proper lubrication of instruments/equipment prior to sterilization provides protection against wear from metal-upon-metal friction of moving joints. Moving parts such as ratchets, joints, box locks, and screws should be lubricated on a regular basis and in strict accordance with the instrument manufacturer's instructions for use (IFU).

Instrument lubricant (also called instrument milk due to its milky white color and texture) must be compatible with the processing method being used. The lubricant manufacturer should provide evidence to support material compatibility and biocompatibility (e.g., lack of cytotoxicity) of the lubricant for its intended use.

If carefully selected and properly used, lubricants can lengthen the life of surgical instruments by:

1. Reducing friction and wear;
2. Preventing staining and rusting during sterilization and storage; and
3. Reducing the downtime and costs associated with friction, stress and corrosion, and maintenance and repair.

Objective 2: Review the types of instrument lubricants available

There are several types of healthcare device lubricants. Before selecting a lubricant, it is important to determine that the product is compatible with not only the device to be lubricated but also the sterilization method to be used. Instrument lubricants are developed for specific uses, with the packaging of the lubricant designed to support the intended method of application.

Lubricants created for healthcare include the following types:

Bulk lubricants – These are typically delivered in containers of liquid ranging from one gallon to 55 gallons. Bulk lubricants come in concentrated form and are designed for use with mechanical cleaning equipment. The concentrated product's dilution will be automatically performed during the mechanical cleaning equipment cycle; therefore, it is important to periodically have the lubricant titration (dilution rate) verified.

Lubricant sprays – These come in both prediluted and concentrated forms. The prediluted lubricants are usually delivered in 16-ounce spray bottles. The concentrated lubricant most frequently comes in one-quart or one-gallon containers and must be diluted prior to use. When diluting the concentrate, it is important to carefully measure the correct type and amount of water before placing the diluted lubricant into the labeled spray container. Mixing the lubricant incorrectly can cause the instruments to become stiff and sticky from lubricant buildup, and over-dilution can render the lubricant ineffective. This type of lubricant is designed to be sprayed into the identified areas of the device. Instruments should be manipulated after lubrication and the lubricant should then be allowed to air dry on the instrument before packaging the device for sterilization.

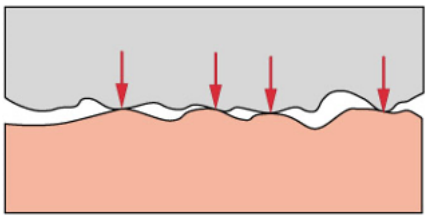

Figure 1

Aerosol lubricants – These are used for dental drills and some power instrument attachments that require pressurized application. Aerosol lubricants are typically mineral oil-based and must only be used on items specified in the IFU. It is important to carefully follow the instructions for post-application use. The IFU will instruct on how to remove the excess spray, so the item can be sterilized.

Silicone spray – This type of lubricant is used for some power equipment and stopcock "O" rings. It is important to only use silicone spray if specifically stated to do so in the IFU. Instructions for proper application must also be carefully followed.

Objective 3: Discuss the possible consequences of improper lubrication and understand the role lubrication plays in the life cycle of instrumentation

Most instrument manufacturers recommend using a water-based lubricant for surgical instruments. Mineral oil- or silicone-based lubricants should never be used on general surgical instruments because they may adversely affect the instruments' functionality. These oils can also coat microorganisms and organic soils on instrument surfaces and prevent the penetration of sterilants, thereby preventing proper sterilization.

Although the instrument surface may appear to be smooth, there are microscopic ridges, called asperity, on the metal that—as the instrument is used—can cause friction and corrosion

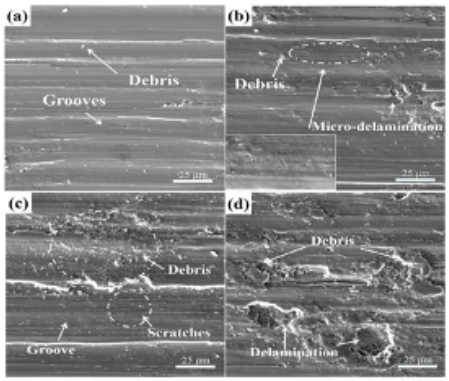

Figure 2

(See Figure 1). Improperly lubricating instrument can negatively impact the instrument's functionality and may lead to pitting, wear, friction, corrosion, or even fractures. Insufficient lubrication and/or foreign bodies can lead to corrosion of the metallic friction surfaces/instrument components that move relative to one another. This can especially be seen in ends/joints and sliding rails (e.g., with punches). This creates micro-abrasion, which can make the surface of the instrument extremely rough and destroy the passive layer (See Figure 2). In these sensitized areas, humidity or organic deposits can easily accumulate and lead to corrosion.

Not only can the presence of organic material shield microorganisms during sterilization, but many oil-based lubricants can also shield pathogen-containing soil or debris. Studies have shown that both vegetative and spore forms of bacteria in oils are capable of resisting heating conditions that would be lethal in water solutions.

When using lubricants, it is important to use only those that are formulated specifically for surgical instruments (again, check the IFU; if any doubts remain, contact the manufacturer prior to use). It is also important to check "stiff" instruments before applying instrument spray. If the hinge, crevices or box lock area, for example, are soiled

and not moving properly, lubricants will not remedy the situation. The instrument must be recleaned prior to applying the lubricant. A buildup of lubricant can also cause instrument stiffness; it is difficult to see but can be detected through touch (adding more lubricant will only worsen the condition). The instrument must be recleaned, with care being taken to remove all buildup prior to re-lubrication.

Proper lubrication and care are vital factors for long-term value retention of motorized systems; therefore the manufacturer's instructions should always be carefully followed. Motors and powered surgical handpieces may be engineered to be sealed or not sealed. In the latter case, a care spray may need to be applied after each reprocessing.

Compressed air motors must be lubricated using a special care spray or oil (refer to the manufacturer's IFU/specifications). This excludes maintenance-free compressed air motors, which will be labeled accordingly. As a rule, all movable external parts, such as pushbuttons or tool couplings, should be properly lubricated, unless expressly stated by the manufacturer. It is important to only use lubricants approved by the manufacturer.

Most ready-to-use water-based lubricants applied by SP professionals are pre-mixed and critical water (distilled, deionized, or reverse osmosis) is typically required for dilution. Again, proper dilution is critical; if a lubricant is over-diluted, it will become ineffective. If a lubricant is too concentrated or too heavily applied, it will result in slippery instruments that are difficult to handle, and also buildup on the instrument that can lead to stickiness or stiffness.

There are a few different application options for water-based lubricants. They can be applied by spray, submerged into a lubricant bath, or applied as part of an automated wash cycle in a washer-disinfector. Care must be taken to ensure the appropriate water-based lubrication for the application at hand is being used. A pre-diluted, water-based lubricant is typically good for spray and bath applications as it helps ensure the lubricant is neither overly diluted nor overly concentrated. For a washer-disinfector, it is appropriate to use a concentrated lubricant formula—with care being taken to dilute precisely as stated in the lubricant manufacturer's IFU.

An approved spray (or milk bath, as a last resort) can be used when manual lubrication is required. The instrument milk bath should be located in the preparation and packaging area, not in the decontamination area where it could become contaminated. The instruments should be opened and dipped in the lubricant solution, not allowed to soak. The instruments should be placed in the lubricant solution for the length of time specified by the lubricant manufacturer and then allowed to air dry after manipulating the instrument. The lubricant should not be wiped or rinsed off. The container should then be washed and thoroughly rinsed and disinfected before it is reused. *Note: Using the "bath" method of lubrication is discouraged, unless there is no other means of instrument lubrication.*

It is important that SP professionals never assume that all instruments should be lubricated. Verification is needed to determine which instruments require lubrication. Some implant manufacturers do not recommend lubrication of implantable items. Also, some manufacturers of ophthalmic and microsurgical instruments do not recommend lubrication for their devices, or they have specific recommendations for lubrication that must be carefully followed.

Conclusion

Proper care and handling of surgical instruments and equipment helps extend their useful life and promote positive outcomes. Taking a proactive approach to care and maintenance can save a facility thousands of dollars per month in repair/replacement costs, ensure effective sterilization and positive patient outcomes, and improve end-user satisfaction. Proper lubrication of surgical instruments and equipment (as approved by the manufacturer) is an essential step in the care and maintenance process. C

RESOURCES

1. *Central Service Technical Manual,* Eighth Edition. P. 149. IAHCSMM. 2016.
2. *Causes & Risk Management for Corrosion & Pitting Corrosion*. Art of Innovative Instrument Making. http://aiimgmbh.de/causes-risk-management-for-corrosion-pitting-corrosion.
3. ANSI/AAMI ST79, *Comprehensive guide to steam sterilization and sterility assurance in health care facilities*. Association for the Advancement of Medical Instrumention.
4. AORN Guideline for Care and Cleaning of Surgical Instruments. 2020. Association of periOperative Registered Nurses.

CIS Self-Study Lesson Plan Quiz - The Importance of Instrument/ Equipment Lubrication

Lesson No. CIS 284 (Instrument Continuing Education - ICE) • Lesson expires March 2024

1. All lubricants are suitable for sterilization.
a. True
b. False

2. Guidelines for lubricating most surgical instruments recommend the use of:
a. Water-based lubricant
b. Mineral oil-based lubricant
c. Silicone oil
d. Both A and C

3. Asperity is a word that describes:
a. The smooth edge of a surface
b. The rough edge of a surface
c. The sharp edge of a surface
d. The dull edge of a surface

4. Lubricants containing mineral oil or silicone oil can encapsulate microorganisms and prevent adequate sterilization.
a. True
b. False

5. Improper dilution and application of water-based lubricants can:
a. Interfere with the sterilization process
b. Affect surgical outcomes
c. Damage instruments
d. All the above

6. Lubricant manufacturers should provide evidence to support:
a. Metal compatibility
b. Water compatibility
c. Material compatibility
d. Organic compatibility

7. Lubrication is an important step in the care and maintenance of surgical instruments, but it is a step that can be viewed as optional when limited time is a factor.
a. True
b. False

8. Incorrect mixing of lubricants can:
a. Cause instruments to become stiff
b. Cause instruments to become sticky
c. Render the lubricant ineffective
d. All the above

9. Most ready-to-use, water-based lubricants are pre-mixed with which type of water?
a. Critical water
b. Utility water
c. Mineral water
d. None of the above

10. For many ophthalmic instruments, manufacturers typically recommend:
a. That lubricants be applied prior to mechanical cleaning
b. That lubricants be silicone-based
c. That lubricants be avoided
d. That lubricants be applied and then quickly removed from the instruments

11. The "bath" method of lubrication:
a. Is recommended for full sets that require lubrication
b. Should only be used as a last resort and should not be performed in the decontamination area where contamination can occur
c. Is recommended for power accessories
d. Is typically used for ophthalmic instruments

12. Some manufacturers recommend not lubricating which type of instruments?
a. Implants
b. Neurological power equipment
c. Multi-part instruments
d. All the above

13. This type of lubricant should only be used on "O" rings and some power equipment:
a. Mineral oil-based lubricant
b. Approved vegetable oil
c. Silicone oil
d. None of the above

14. When an instrument becomes stiff, it could mean:
a. The blades are micro-abraded
b. The hinge pin is too loose
c. An oil-based lubricant was used
d. The box lock area is soiled

15. Proper lubrication of instruments:
a. Reduces instrument costs and increase instruments' useful life
b. Reduces cleaning time
c. Speeds up the sterilization process
d. All the above

Request for paper/pencil scoring (please print or type information below)

❍ I have enclosed the scoring fee of $15. (please make checks payable to Purdue University. We regret that no refunds can be given)

❍ Check here if you have a change of address

❍ Check here if you wish to have your results emailed to you

Detach quiz, fold, and return to:
Purdue University - Online Learning
Young Hall, Room 527
155 S. Grant Street
West Lafayette, IN 47907
800.830.0269

Name

Mailing Address (be sure to include apartment numbers or post office boxes)

City State/Province Zip Code/Postal Code

( )Daytime telephone IAHCSMM Membership Number

Email Address

If your name has changed in the last 12 months, please provide your former name
Purdue University is an equal access/equal opportunity institution