



# Instrument Cleaning

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Get clinical answers to frequently asked questions about Instrument Cleaning.

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## Should the scrub person wipe instruments with sterile water during the surgical procedure?

During the procedure, the scrub person should remove gross soil from instruments by wiping the surfaces with a sterile surgical sponge moistened with sterile water. Saline should not be used to wipe instrument surfaces. Blood, organic material, debris, and saline are highly corrosive to instrument surfaces and can cause corrosion, rusting, and pitting when allowed to dry on surgical instruments. These materials can be difficult to remove from all surfaces during the cleaning and decontamination process, reducing the efficacy of the subsequent sterilization process.

Periodically during the procedure, the scrub person should use sterile water to irrigate instruments with lumens. Irrigating instrument lumens periodically throughout a procedure removes gross soil and may reduce the risk of biofilm formation. Biofilm can form on many surfaces but is particularly problematic when it forms in lumens because it is difficult to see and remove.

### Resources:

- ♦ Guideline for cleaning and care of surgical instruments and powered equipment. In: *Guidelines for Perioperative Practice*. Denver, CO: AORN, Inc.
- ♦ AAMI TIR12: 2010 Designing, Testing, and Labeling Reusable Medical Devices for Reprocessing in Health Care Facilities: a Guide for Medical Device Manufacturers. Arlington, VA: Association for the Advancement of Medical Instrumentation; 2010.
- ♦ ANSI/AAMI ST79: Comprehensive Guide to Steam Sterilization and Sterility Assurance In Health Care Facilities. Arlington, VA: Association for the Advancement of Medical Instrumentation; 2013.

- Spry CC, Brooks Tighe SM. Care and handling of surgical instruments. In: Brooks Tighe S, ed. *Instrumentation for the Operating Room: a Photographic Manual*. 8th ed. St Louis, MO: Elsevier/Mosby; 2012:1-2.
- Root CW, Kaiser N, Antonucci C. What, how and why: enzymatic instrument cleaning products in healthcare environments. *Healthc Purchasing News*. 2008;32(11):50.

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### **If an instrument is opened onto the sterile field, but not used, is it necessary to clean it in the same manner as instruments that have been used?**

All instruments opened onto the sterile field in the operating or procedure room should be cleaned and decontaminated whether or not they have been used. Airborne microorganisms may come in contact with instruments that have not been used. Scrubbed persons may touch and contaminate instruments without being aware of it. Instruments that were used may come in contact with unused items. Contamination of unused instruments on the sterile field can occur without the occurrence being noticed.

#### **Resources:**

- Guideline for cleaning and care of surgical instruments and powered equipment. In: *Guidelines for Perioperative Practice*. Denver, CO: AORN, Inc.
  - ANSI/AAMI ST79: Comprehensive Guide to Steam Sterilization and Sterility Assurance In Health Care Facilities. Arlington, VA: Association for the Advancement of Medical Instrumentation; 2013.
- Spry CC. Care and handling of basic surgical instruments. *AORN J*. 2007;86(Suppl 1):S77-S81.
- Spry CC, Brooks Tighe SM. Care and handling of surgical instruments. In: Brooks Tighe S, ed. *Instrumentation for the Operating Room: a Photographic Manual*. 8th ed. St Louis, MO: Elsevier/Mosby; 2012:1-2.

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## **Does AORN have specific recommendations about the quality of water that should be used to clean and decontaminate surgical instruments?**

AORN recommends that the final rinse should be performed with treated (eg, distilled, reverse osmosis, filtered) water of a quality that will not stain or cause damage to instruments or contribute to recontamination of the instrument. Untreated water can contain contaminants, including endotoxins, which can be deposited on instruments during the final rinse. Rinsing with treated water can prevent deposits of impurities or contaminants on instruments. Endotoxins are heat stable and may not be destroyed by subsequent steam sterilization. Tissue contaminated with endotoxins can cause severe inflammation. Treated water can prevent spotting, stains, deposits, and corrosion on the surfaces of instruments.

### **Resources:**

- Guideline for cleaning and care of surgical instruments and powered equipment. In: *Guidelines for Perioperative Practice*. Denver, CO: AORN, Inc.
- ANSI/AAMI ST79: Comprehensive Guide to Steam Sterilization and Sterility Assurance In Health Care Facilities. Arlington, VA: Association for the Advancement of Medical Instrumentation; 2013.
- Alfa MJ, Olson N, Al-Fadhaly A. Cleaning efficacy of medical device washers in North American healthcare facilities. *J Hosp Infect*. 2010;74(2):168-177.
- AAMI TIR34:2007: Water for the Reprocessing of Medical Devices. Arlington, VA: Association for the Advancement of Medical Instrumentation; 2007.
- Proper Maintenance of Instruments. 8th ed. Morfelden-Walldorf, Germany: Arbeitskreis Instrumenten- Aufbereitung [Instrument Working Group]; 2004.

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## **Does AORN have specific recommendations about the processes that should be used to clean ophthalmic instruments?**

Special precautions should be taken when processing intraocular ophthalmic instruments. Toxic anterior segment syndrome (TASS) is a complication of ophthalmic surgery involving a severe, noninfectious inflammation of the anterior segment of the eye, that requires thorough cleaning and rinsing of intraocular instruments and strict adherence to the manufacturer's written IFU and to professional guidelines. Most instances of TASS appear to be related to errors in instrument processing. Adequate time, an adequate number of personnel, and sufficient instrument inventory should be provided to permit

thorough instrument cleaning and sterilization in order to prevent TASS. For information on specific processes for cleaning ophthalmic instruments, the reader should refer to the AORN Guideline for cleaning and care of surgical instruments and powered equipment.

## Resources:

- ♦ Guideline for care and cleaning of surgical instruments and powered equipment. In: *Guidelines for Perioperative Practice*. Denver, CO: AORN, Inc.
- ♦ American Society of Cataract and Refractive Surgery, American Society of Ophthalmic Registered Nurses. Recommended practices for cleaning and sterilizing intraocular surgical instruments. *J Cataract Refract Surg*. 2007;33(6):1095-1100.
- ♦ Shunmugam M, Hugkulstone CE, Wong R, Williamson TH. Consecutive toxic anterior segment syndrome in combined phaco-vitrectomy. *Int Ophthalmol*. 2013;33(3):289-290.
- ♦ Tamashiro NS, Souza RQ, Goncalves CR, et al. Cytotoxicity of cannulas for ophthalmic surgery after cleaning and sterilization: evaluation of the use of enzymatic detergent to remove residual ophthalmic viscosurgical device material. *J Cataract Refract Surg*. 2013;39(6):937-941.
- ♦ Ozcelik ND, Eltutar K, Bilgin B. Toxic anterior segment syndrome after uncomplicated cataract surgery. *Eur J Ophthalmol*. 2010;20(1):106-114.
- ♦ Cutler Peck CM, Brubaker J, Clouser S, Danford C, Edelhauser HE, Mamalis N. Toxic anterior segment syndrome: common causes. *J Cataract Refract Surg*. 2010;36(7):1073-1080.
- ♦ Mamalis N. Toxic anterior segment syndrome update. *J Cataract Refract Surg*. 2010;36(7):1067-1068.
- ♦ Bodnar Z, Clouser S, Mamalis N. Toxic anterior segment syndrome: update on the most common causes. *J Cataract Refract Surg*. 2012;38(11):1902-1910.
- ♦ Mamalis N, Edelhauser HF, Dawson DG, Chew J, LeBoyer RM, Werner L. Toxic anterior segment syndrome. *J Cataract Refract Surg*. 2006;32(2):324-333.
- ♦ McCormick PJ, Kaiser JJ, Schoene MJ, et al. Ophthalmic viscoelastic devices as a cleaning challenge. *Biomed Instrum Technol*. 2013;47(4):347-355.
- ♦ Maier P, Birnbaum F, Bohringer D, Reinhard T. Toxic anterior segment syndrome following penetrating keratoplasty. *Arch Ophthalmol*. 2008;126(12):1677-1681.
- ♦ Mathys KC, Cohen KL, Bagnell CR. Identification of unknown intraocular material after cataract surgery: evaluation of a potential cause of toxic anterior segment syndrome. *J Cataract Refract Surg*. 2008;34(3):465-469.

- ◆ ANSI/AAMI ST79: Comprehensive Guide to Steam Sterilization and Sterility Assurance In Health Care Facilities. Arlington, VA: Association for the Advancement of Medical Instrumentation; 2013.

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## **Does AORN have specific recommendations about the processes that should be used for cleaning and care of laryngoscope handles and blades?**

Laryngoscope blades are considered semicritical items (ie, items that contact mucus membranes or nonintact skin). They should be cleaned and high-level disinfected or sterilized after each use according to the manufacturer's written IFU.

The laryngoscope handle by itself is considered a noncritical device that contacts only intact skin and requires only low-level disinfection; however, the laryngoscope consists of two parts that are handled concurrently. When the laryngoscope blade is folded closed, the tip of the blade is in contact with the handle. Laryngoscope handles have a knurled surface that can accumulate bioburden. For this reason, laryngoscope handles should be cleaned and low-level disinfected after each use and may be high-level disinfected or sterilized according to the manufacturer's written IFU.

Cleaned and disinfected laryngoscope blades and handles should be packaged and stored in a manner that prevents contamination. Laryngoscope blades should be stored in individual packages.

### **Resources:**

- ◆ Guideline for Disinfection and Sterilization in Healthcare Facilities, 2008. Atlanta, GA: Centers for Disease Control and Prevention; 2008.
- ◆ Tablan OC, Anderson LJ, Besser R, et al. Guidelines for preventing health-care-associated pneumonia, 2003: recommendations of CDC and the Healthcare Infection Control Practices Advisory Committee. *MMWR Recomm Rep.* 2004;53(RR-3):1-36.
- ◆ Guideline for cleaning and care of surgical instruments and powered equipment. In: *Guidelines for Perioperative Practice*. Denver, CO: AORN, Inc.
- ◆ Negri de Sousa AC, Levy CE, Freitas MI. Laryngoscope blades and handles as sources of cross-infection: an integrative review. *J Hosp Infect.* 2013;83(4):269-275.

- ♦ Williams D, Dingley J, Jones C, Berry N. Contamination of laryngoscope handles. *J Hosp Infect.* 2010;74(2):123-128.
- ♦ Standards FAQs details: laryngoscopes – blades and handles – how to clean, disinfect and store these devices. The Joint Commission. Accessed October 27, 2014.

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### **Does AORN have specific recommendations about the processes that should be used for cleaning and sterilizing instruments potentially contaminated with prions?**

Special precautions should be taken to minimize the risk of transmission of prion diseases from contaminated instruments. A multidisciplinary team should establish, document, and implement evidence-based policies and procedures to minimize the risk of prion disease transmission. Special precautions that may minimize the risk of transmission of prion diseases from contaminated instruments include:

- ♦ Using single-use surgical drapes, gowns, and supplies whenever possible and discarding them after use,
- ♦ Using single-use instruments, or if single-use instruments are not available,
- ♦ Limiting the use of reusable instruments to those that are easy to clean and able to tolerate exposure to an extended steam sterilization cycle;
- ♦ Keeping the number of instruments used to a minimum;
- ♦ Decontaminating instruments in a mechanical washer as soon as possible after use;
- ♦ Using cleaning chemicals that have evidence of prionocidal activity and that are compatible with the instruments to be cleaned;

Note: Some cleaning formulas have demonstrated an ability to remove and inactivate prions; however, it has also been shown that some cleaning agents may increase the resistance of prions to subsequent steam sterilization.

Use one of the following three methods to steam sterilize instruments after decontamination:

- ♦ Prevacuum sterilizer: 273o F (134o C) for 18 minutes,

- ♦ Gravity displacement sterilizer: 270o F (132o C) for 60 minutes, or
- ♦ Immerse in 1 N NaOH (sodium hydroxide [lye]) for 60 minutes, then remove,
- ♦ rinse in water, and sterilize using one of the cycles noted above; and

Cleaning environmental surfaces and then spot decontaminating with a 1:5 or 1:10 dilution of sodium hypochlorite (bleach) or sodium hydroxide for a contact time of 15minutes.

For information on specific processes for cleaning instruments potentially contaminated with prions, the reader should refer to the AORN “Guideline for cleaning and care of surgical instruments and powered equipment.”

### Resources:

- ♦ Guideline for cleaning and care of surgical instruments and powered equipment. In: *Guidelines for Perioperative Practice*. Denver, CO: AORN, Inc.
- ♦ McDonnell G. Prion disease transmission: can we apply standard precautions to prevent or reduce risks? *J Perioper Pract*. 2008;18(7):98-304.
- ♦ Rutala WA, Weber DJ. Guideline for disinfection and sterilization of prion-contaminated medical instruments. *Infect Control Hosp Epidemiol*. 2010;31(2):107- 117.
- ♦ McDonnell G, Dehen C, Perrin A, et al. Cleaning, disinfection and sterilization of surface prion contamination. *J Hosp Infect*. 2013;85(4):268-273.
- ♦ Fichet G, Comoy E, Duval C, et al. Novel methods for disinfection of prion-contaminated medical devices. *Lancet*. 2004;364(9433):521-526.
- ♦ Lehmann S, Pastore M, Rogez-Kreuz C, et al. New hospital disinfection processes for both conventional and prion infectious agents compatible with thermosensitive medical equipment. *J Hosp Infect*. 2009;72(4):342-350.

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