



OHIO STATE DENTAL BOARD

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Infection Control Manual

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Infection Control Manual

© Ohio State Dental Board
77 South High Street • 18th Floor
Columbus, Ohio 43215-6135
Phone 614.466.2580 • Fax 614.752.8995
www.state.oh.us/den

The Ohio State Dental Board's (Board) Infection Control Manual is intended to provide a guideline for licensees to follow to maintain compliance with the provisions set forth in Ohio Revised Code and Ohio Administrative Code Chapters 4715 regarding infection control in the dental office. The manual is meant to enhance and clarify the Board's laws and rules in this regard, and it is subject to revision at the Board's discretion without notice to the public. References to various resource materials are indicated throughout the document.

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Introduction

The Ohio State Dental Board (Board) is responsible for protection of the public by enforcing the provision of the Dental Practice Act, specifically, Ohio Revised Code and Ohio Administrative Code Chapters 4715.

Ohio Revised Code Chapter 4715.03 (C) mandates that the Board adopt rules to ensure infection control standards are being maintained in the dental office. The section states in pertinent part:

The board shall adopt rules in accordance with Chapter 119 of the Revised Code establishing universal blood and body fluid precautions that shall be used by each person licensed under this chapter who performs exposure prone invasive procedures. The rules shall define and establish requirements for universal blood and body fluid precautions that include the following:

- (1) Appropriate use of hand washing;
- (2) Disinfection and sterilization of equipment;
- (3) Handling and disposal of needles and other sharp instruments;
- (4) Wearing and disposal of gloves and other protective garments and devices.

The Ohio Administrative Code, Section 4715-20, sets forth the rules established by the Board to implement the Revised Code provisions noted above. These rules are referenced throughout the manual as indicated therein, with supporting material and specific information to assist our licensees in maintaining compliance with the law and rules in this area.

OAC 4715-20-01 Patient and Personnel Protection

Immunization

- (A) Immunization – All dentists and dental health care workers must show evidence of immunity to or immunization against the hepatitis B virus when such immunization does not threaten their health and well-being. Such immunization must begin prior to patient contact. Medical documentation must be maintained in the dental facility for each dentist and dental health care worker providing care in that facility. This medical documentation must be made available immediately upon request by an authorized agent of the state dental board.

Hepatitis B Virus and Documentation

1. This applies to all dental health care workers, i.e., dentists and persons utilized by the dentist, who assists in the dental practice and who may be exposed to body fluids such as blood and saliva.
2. The first shot is required prior to patient contact. not simply offered to affected employees within ten (10) days as required by the Occupational Safety & Health Administration (OSHA).
3. The most common vaccination schedule is given intramuscularly three (3) times over a six (6) month period.
4. To ensure complete protection against the Hepatitis B Virus (HBV), a screening for antibody levels is recommended by the Centers for Disease Control (CDC) at one (1) to two (2) months after the final inoculation.
5. Currently, HBV boosters are not recommended by the CDC or required by OSHA.
6. Those who have had Hepatitis B must show immunity with the appropriate titer testing documentation.

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7. Appropriate documentation must be kept in each office in which you work.

Note: Dentists cannot administer the Hepatitis B inoculations.

Acceptable Documentation for those dental health care workers who need to demonstrate the HBV vaccine inoculation - Medical Record

Medical documentation for the dental health care worker indicating the dates of each inoculation in the series will be considered acceptable by the Ohio State Dental Board (Board) if signed by any of the following entities but not limited to:

1. Licensed Physician;
2. Licensed Nurse;
3. Ohio Department of Health or local Health Department employee; or
4. Documentation from a College or University Health Service, etc.

Unacceptable Documentation - Medical Record

Attestation forms or forms completed and signed by the dental health care worker are not considered acceptable medical documentation.

Acceptable Documentation for those dental health care workers who need to demonstrate HBV immunity- Blood Titer Testing

Dental health care workers who are unable to provide acceptable medical documentation may obtain a blood titer indicating immunity to the Hepatitis B virus. Acceptable titer results are as follows:

1. Reactive; or
2. Positive; or
3. > 9.9

Note: Blood titer test results that read < 2.1 - 9.9 are considered borderline and the dental health care worker is encouraged by the Board to consult their physician.

Unacceptable Documentation - Blood Titer

Blood titer testing which indicates a non-reactive or negative result is unacceptable as they indicate that the dental health care worker is not immune to the Hepatitis B virus. Dental health care workers receiving this type of result should contact their physician to schedule an inoculation series.

Note: These types of results are only significant if you cannot provide medical documentation of the series.

Waiver

- (C) Waiver – The board may waive the requirements set forth in paragraph (A) of this rule if the board determines that such waiver is justified. Any board-approved waiver must be renewed annually.

Any person who is medically unable to receive the HBV inoculations must apply and be approved for a one-year waiver from the Board. A “Hepatitis B Waiver Request” is available on the Board’s website, www.dental.ohio.gov. These waivers are based on medical documentation from your physician.

Note: Pregnancy is not a contraindication for otherwise eligible individuals. "The HBV series can be administered to pregnant women who are at risk...and work in health care or public safety field." - American College of Obstetrics and Gynecologists.

Barrier Techniques

Gloves

- (B)(1) Gloves – All dentists and dental health care workers must wear disposable gloves whenever placing their fingers into the mouth of a patient, or when handling blood/saliva-contaminated items, instruments and equipment. Hands must be washed and regloved before examining and/or performing procedures on another patient. Disposable gloves shall not be washed and/or reused for any purpose. Overgloving between patients is not permitted.

Gloves are not to be reused, as repeated use is likely to produce defects in the gloves, which diminishes the gloves ability to be an effective barrier.

Gloves that become ripped, torn or in some other way compromised must be removed as soon as feasible.

Overgloving or placing one (1) glove over another disposable glove between patients when the first glove is contaminated is prohibited. Finger cots are also prohibited.

At all times when wearing gloves as a barrier, the dental health care worker must be aware of surface contact (i.e. pens, charts, eye protection, handles, etc.).

Hand Hygiene

Hands harbor resident and transient microorganisms. Transient organisms pose the greatest risk of cross-infection. Therefore, dental health care workers should always wash their hands prior to putting on a new pair of gloves and/or removal of gloves.

Note: Alcohol-based hand rubs can be used to replace hand washing in accordance with Table 2 (Appendix A) of the CDC “Guidelines for Infection Control in Dental Health Care Settings – 2003” (Guidelines).

The CDC recommends these hand rubs contain 60%-95% ethanol or isopropanol.

Face Protection

(B)(2) Face protection – Chin length face shields, or masks and eyewear with protective side shields must be worn by dentists and dental health care workers when spattering of blood or other body fluids is likely.

Face Shields

Chin length face shields should provide protection at both the top and the sides. These shields should be disinfected between patients. Dental health care workers need not wear masks when wearing appropriate face shields.

Masks and Eye Protection

Dental health care workers must wear masks when spatter of blood or body fluids is likely (i.e. when using hand pieces, prophylaxis angles, etc.).

Some masks are single use only and dental health care workers must dispose of them properly when used.

Masks that are damp (inside or out) have lost their effectiveness as a barrier and should be removed as soon as feasible.

All eye protection must have side shields, either solid or slide-on type for prescription lenses.

All eye protection must be disinfected between patients to avoid possible contamination or infection.

Note: The Board does not have regulations that address protective clothing (i.e. gowning) OSHA has bloodborne pathogen standards for protective clothing and equipment to prevent contamination of street clothing and skin from exposures to blood and body fluids.

OAC 4715-20-02 Sterilization and disinfection

Sterilization - the process by which all forms of microorganisms, including viruses, bacteria, fungi and spores, are destroyed.

Disinfection - generally a less lethal process than sterilization and is intended to kill disease-producing microorganisms, but not bacterial endospores.

Universal sterilization - an instrument processing method in which all reusable instruments and handpieces are sterilized between patients. This provides the highest level of patient protection.

Heat Sterilization

Heat Sterilizers

(A)(1) Sterilization must be accomplished by an FDA-approved device or method, for example, autoclave, dry heat, or unsaturated chemical vapor.

The use of sterilizers in medicine and dentistry is regulated by the Food and Drug Administration (FDA). FDA regulations require that equipment manufacturer's support claims of sterilization with appropriate studies. Equipment that has not been manufactured for the sole purpose of medical or dental sterilization does not fall within this regulatory content, and therefore cannot be used. Consequently, toaster ovens, microwave units and kitchen ovens cannot be used as sterilizing devices. Such equipment is not subjected to regulatory testing and thus unreliable and unsuitable for sterilization purposes.

Handpieces and other items

(A)(2) All high speed and surgical handpieces, low speed contra angles, prophylaxis angles, and nose cones must be subjected to heat sterilization. Sterilization must be accomplished by an FDA-approved device or method.

Instrument Sterilization

- (A)(3) All instruments and all items that are able to withstand repeated exposure to heat must be heat sterilized between patients. The following instruments and items (but not limited to) must be heat sterilized between patients:
- (a) All hand and orthodontic instruments;
 - (b) All burs and bur changers, including contaminated laboratory burs and diamond abrasives;
 - (c) All endodontic instruments;
 - (d) Air-water syringe tips;
 - (e) High-volume evacuator tips;
 - (f) Surgical instruments;
 - (g) Ultrasonic periodontal scalers and tips; and
 - (h) Electro-surgery tips;
 - (i) Metal impression trays; and
 - (j) Intra-oral radiographic equipment that can withstand heat sterilization.

Packaged and/or unpackaged instruments should be sterilized in accordance to CDC Guidelines.

The purpose of cleaning the instruments prior to sterilization is to reduce the amount of blood, saliva, microbes and other materials that can insulate microorganisms from the sterilizing agent. Cleaning also removes materials that may damage the instrument.

Biological Spore Testing

- (A)(4) All heat sterilizing devices must be tested for proper function on a weekly basis by means of a biological monitoring system that indicates microorganism kill. The biological monitoring system used must include a control to verify proper microbial incubation. In the event of a positive biological spore test, the dentist must take immediate remedial action to ensure that heat sterilization is being accomplished. Immediate remedial action is defined as following manufacturer guidelines and performing a second biological spore test. In the event a second positive biological spore test occurs, the device must be removed from service until repaired. Proof of such repair must be maintained with the testing documentation.

All heat sterilizing devices in the office that may be readily used must be tested every seven (7) days (one calendar week), unless the dental office/practice is closed for one (1) or more complete calendar weeks. The closure of the office/practice (i.e. vacation, etc.) should be documented accordingly.

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Testing must be done in a consistent manner (i.e. every Monday unless the office/practice is closed for a holiday/vacation, in which case the testing must be performed on the next available working day in which the office/practice is open for business).

Vacation schedules or absences of dental healthcare workers responsible for weekly testing do not negate the requirement that the heat sterilizer be tested at the designated weekly date.

Biological Spore Testing - Independent Entity

Biological spore testing through an independent entity must be performed in the following manner:

1. A biological indicator is placed in the pack, pouch, bag or cassette of instruments or in the sterilizer with unpackaged instruments.
2. The test must then be mailed the same day or the day after to the independent testing agency.
3. Multiple sterilizers must be clearly identified including type (i.e., steam, dry heat, chemical vapor).
4. The test must include a "control".
5. Forms from the independent entity must be completed in their entirety.

Biological Spore Testing - In-Office Testing

Sterilizers may be tested via in-office testing mechanisms utilizing manufacturers recommendations. Accurate records of sterilization monitoring must be maintained to include the following:

1. Ensure that test capsules are clearly identified if multiple sterilizers are being tested;
2. Each office must use a "control" with the same lot number when two (2) or more offices are using the same incubator;
3. The "control" must be from the same lot number as the test capsule;
4. Capsules **must** be incubated within two (2) hours or refrigerated;
5. You must use an incubator that is recommended for the capsule by the manufacturer.

| |
|--|
| <p>NOTE: Controls verify that the test capsules have not been compromised and that the incubator is working properly.</p> |
|--|

Unapproved Testing Sources

Physical monitoring - Observation of gauges and indicators on the sterilization equipment (cycle monitors) such as time, temperature, pressure, etc.

Chemical indicators* - Applied to the outside of instrument packages prior to heat sterilization, rapid-change temperature-sensitive process indicators (i.e. autoclave tape, indicator markings on

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pouches and bags, paper strips, labels, and steam-pattern cards) change color or form after a pre-determined temperature has been reached.

Multi-parameter, slow-change indicators* - respond to a combination of steam and temperature or to a combination of steam, temperature, and time.

* These testing indicators display color or form change long before appropriate sterilization conditions have been met.

Some causes of sterilization failure include, but are not limited to the following:

1. Improper packaging;
2. Overloading the sterilizer;
3. Incorrect operation of the unit;
4. Timing errors;
5. Mistaking the control for the test strip; and
6. Not placing the test strip in the sterilizer unit.

Note: It is unacceptable for the dental health care worker to use a test, which is not sent to an independent entity or is not incubated in-office.

Documentation

(A)(5) Documentation must be maintained either in the form of a log reflecting dates and person(s) conducting the testing, or copies of reports from an independent testing entity may be used. The documentation shall be maintained for a period of at least two years, and shall be maintained in the dental facility and be made immediately available upon request by an authorized agent of the state dental board.

Reports from an independent entity must be maintained in the dental office where the testing was performed, not at corporate headquarters.

In-office monitoring documentation must include the following information:

1. Date in;
2. Date out (within 48 hours);
3. Results of the test capsule (-, neg);
4. Results of the "control" capsule (+, pos); and
5. The initials of the dental health care worker who performed the sterilization test.

All documentation must be kept for a period of at least two (2) years.

Chemical Sterilization

(B)(1) Instruments and items that cannot withstand heat sterilization must be subjected to a chemical sterilization process between patients, which is defined as use of a sterilant cleared by the FDA in a 510(k) in accordance with the manufacturer's instructions.

The majority of chemical sterilants on the FDA-approved list are glutaraldehydes. However, some approved chemical sterilants may be a mixture of hydrogen peroxide and/or peracetic acid. In order for these products to be utilized as chemical sterilants, they must be used at full strength and must not be diluted with water. Once diluted, these chemical sterilants may only be used as disinfectants.

Since chemical sterilants cannot be biologically spore tested for microorganism kill, there should be very few items sterilized in this manner. Some items that may be chemically sterilized include, but are not limited to the following:

1. Glass mixing slabs;
2. Metal or plastic spatulas;
3. Glass Dappen dishes;
4. Plastic/glass items not meant to be disposed of that cannot withstand heat;
5. Mirrors for intra-oral photography;
6. Some cheek retractors; and
7. Handles for brush tips.

Your dental supply representative may tell you that certain items such as burs, endo items, metal impression trays, and instruments need only be chemically sterilized. However, this information is inaccurate, since the Dental Practice Act, states in pertinent part:

All instruments and all items that are able to withstand repeated exposure to heat must be heat sterilized between patients.

Note: Based on manufacturers recommendations, anesthetic carpules should not be placed in chemical sterilization. Chemical sterilization solutions may seep into the anesthetic causing harm to the patient.

To determine if the chemical sterilant being utilized in the dental office is an FDA-approved sterilant, access the following website:

<http://www.fda.gov/cdrh>

Surface Disinfection

Surface Disinfection - Disinfectants and Cleansers

(C)(1) Environmental surfaces that are contaminated by blood or saliva must be properly cleaned prior to disinfection. Disinfection must be accomplished with an appropriate disinfectant that is registered with the environmental protection agency and used in accordance with the manufacturer's instructions. The disinfection process must be followed between each patient.

Surface Cleaning

Surfaces must be cleaned properly prior to disinfection. Cleaning is the physical removal of debris that reduces the number of microorganisms present and removes organic matter that can interfere with disinfection. For a product to be used as a cleaner prior to disinfection of surfaces, the cleanser must be labeled: "cleaner-disinfectant".

Surface Disinfectants

Disinfectants are chemical agents that destroy or inactivate most species of microorganisms to number that pose no threat of disease transmission. There are four (4) types of products appropriate for surface disinfection:

1. Products registered with the Environmental Protection Agency (EPA) as sterilants;
2. Products registered with the EPA as tuberculocides;
3. Products registered with the EPA which are effective against HIV-I and HBV; or
4. Products registered with the EPA that are effective against *Mycobacterium* ssp, HIV-1 and HBV.

Products listed as "disinfectants" **only** cannot be used as "cleansers". "One-step" cleanser/disinfectants indicate that the product may be used as both a "cleanser" and a "disinfectant". "One-step" does not mean that the product cleanses and disinfects in only one step.

It is a violation of Federal Law to use a product in a manner inconsistent with the manufacturer's label.

Appropriate Disinfectants

To determine if the surface disinfectant being utilized in the dental office is an EPA-approved disinfectant, access the following website:

<http://www.epa.gov/oppad001/chemregindex.htm>

Note: Items including, but not limited to, 4x4 sponges should not be placed in containers and saturated with liquid disinfectants. The efficacy of these products when combined for long periods of time with items such as sponges is not yet determined. However, you can spray liquid disinfectants onto items such as 4x4 sponges and *immediately* use them to wipe environmental surfaces.

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Cleaner/Disinfectants

Always read the disinfectant's label and directions for use, paying special attention to the agent's antimicrobial activity, its pre-cleaning ability, and the contact time required for disinfection. If a disinfectant can be used as a pre-cleaner, it should be indicated under uses/instructions/directions on the label. If a disinfectant does not include a cleaning agent it may be worded as "cleaning is necessary prior to the use of this disinfectant..."

Although separate cleansers and disinfectants certainly may be used, experts agree that chemical agents that can do both are the most efficient approach to surface asepsis in dental practices.

Surface Disinfection - Surface Covers

(C)(2) Impervious backed paper, aluminum foil or plastic wrap must be used to cover surfaces or items that may be contaminated by blood or saliva and that are difficult or impossible to disinfect. The cover must be removed, discarded and then replaced between patients.

Surface Covers

Surface covers cannot be disinfected and therefore, if used, must be changed between patients. Disinfection is not required between patients when surface covers are used. The covers prevent contamination of those surfaces that are difficult or impossible to protect. Surface covers also reduce the handling of chemical disinfectants and require less time to use. When using surface covers, precleaning and disinfection at the beginning and end of the day is adequate.

Note: If the area under the surface cover is touched, then the area must be re-cleaned and disinfected to prevent contamination.

Single Use Items

(D)(1) All single use or disposable items, labeled as such, used in patient treatment must be discarded and not reused. Single use items include but are not limited to:

- (a) Disposable needles and syringes;
- (b) Local anesthetic carpules;
- (c) Saliva ejectors, high volume evacuator tips, and air water syringe tips;
- (d) Prophylaxis angles, cups, and brushes;
- (e) Polishing discs, cups, points;
- (f) Fluoride trays; and
- (g) Disposable impression trays;

In addition, other disposable items including, but not limited to, gloves, masks, orthodontic wires, bands and brackets, matrix bands, "Enhance" type polishing items and bite sticks for the Panorex machine can successfully make it through a heat sterilization cycle. However, these items are disposable and **must** be properly disposed of as single use items.

Dental Laboratory Items

- (E)(1) All items that have been placed in the mouth, or are otherwise contaminated with blood or saliva, must be thoroughly rinsed, placed in, and transported to the dental laboratory in an appropriate case containment device that is properly sealed and labeled.

The item must be properly labeled with a biohazard label, if the item is not disinfected prior to being sent to the dental laboratory. Communication between the dental office and the dental laboratory is very important.

OAC 4715-20-03 Disposal of Wastes and Sharps

All sharp items and contaminated wastes must be disposed of according to the requirements established by local and state environmental agencies.

Wastes

Generally, blood and /or saliva-tinged items are not considered regulated waste. Therefore, disposable items such as gloves and patient bibs may be placed in a regular trash receptacle, as they are not subject to infectious waste regulations.

Regulated waste items are sharps, extracted teeth and tissue and saturated patient care items, i.e., items that drip when held vertically, release fluid when compressed, have dried on fluids that could flake off in transit, and/or items that the dentist determines should be handled as infectious waste.

Should you have questions regarding regulated waste, contact the following:

1. Ohio EPA district offices;
2. Ohio EPA website: www.epa.state.oh.us/dsiwm;
3. Local health department; or
4. Local refuse/trash collector.

Office policies for defining, collecting, storing, decontaminating, and disposing of infectious waste should be determined in accordance with state and local regulations.

Sharps

Sharp items, such as needles, scalpel blades, endodontic files and orthodontic wires, or other sharp items should be placed in an appropriate "sharps" container. An appropriate "sharps" container is defined pursuant to Ohio Administrative Code Section 3745-27-34(B)(1), which states:

Infectious wastes "sharps" containers shall be rigid, puncture-resistant, leak resistant, and closed tightly to prevent loss of contents. "Sharps: containers shall be only those containers specifically designed and manufactured for the management and/or disposal of "sharps." "Sharps" containers shall be labeled "sharps" and, if not treated in accordance with rule 3745-27-32 of the Administrative Code, shall be conspicuously labeled with the international biohazard symbol.

Containers used for sharp items should not be emptied and should be disposed of as soon as the contents reach the fill/full line.

Infection Control Internet Resources

Advisory Committee on Immunization Practices

<http://www.cdc.gov/nip/ACIP/default.htm>

American Dental Association

<http://www.ada.org>

American Institute of Architects Academy of Architecture for Health

<http://www.aahaia.org>

American Society of Heating, Refrigeration, Air-Conditioning Engineers

<http://www.ashrae.org>

Association for Professionals in Infection Control and Epidemiology, Inc.

<http://apic.org/resc/guidlist.cfm>

CDC, Division of Healthcare Quality Promotion

<http://www.cdc.gov/ncidod/hip>

CDC, Division of Oral Health, Infection Control

<http://www.cdc.gov/OralHealth/infectioncontrol/index.htm>

CDC, Morbidity and Mortality Weekly Report

<http://www.cdc.gov/mmwr>

CDC, NIOSH

<http://www.cdc.gov/niosh/homepage.html>

CDC Recommends, Prevention Guidelines System

<http://www.phppo.cdc.gov/cdcREcommends/AdvSearchV.asp>

EPA, Antimicrobial Chemicals

<http://epa.gov/oppad001/chemregindex.htm>

FDA

<http://www.fda.gov>

INFECTION CONTROL INTERNET RESOURCES

Immunization Action Coalition

<http://www.immunize.org/acip>

Infectious Diseases Society of America

<http://www.idsociety.org/PG/tox.htm>

OSHA, Dentistry, Bloodborne Pathogens

<http://www.osha.gov/SLTC/dentistry/index.html>

<http://www.osha.gov/SLTC/bloodbornepathogens/index.html>

Organization for Safety and Asepsis Procedures

<http://www.osap.org>

Society for Healthcare Epidemiology of America, Inc., Position Papers

<http://www.shea-online.org/PositionPapers.html>



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Appendix A

Department of Health and Human Services Centers for Disease Control “Guidelines for Infection Control in Dental Health-Care Settings – 2003”

Hand Hygiene Methods and Indications

TABLE 2. Hand-hygiene methods and indications

| Method | Agent | Purpose | Duration (minimum) | Indication* |
|---------------------|---|--|---|---|
| Routine handwash | Water and nonantimicrobial soap (e.g., plain soap)† | Remove soil and transient microorganisms | 15 seconds§ | Before and after treating each patient (e.g., before glove placement and after glove removal). After barehanded touching of inanimate objects likely to be contaminated by blood or saliva. Before leaving the dental operator or the dental laboratory. When visibly soiled.¶ Before regloving after removing gloves that are torn, cut, or punctured. |
| Antiseptic handwash | Water and antimicrobial soap (e.g., chlorhexidine, iodine and iodophors, chloroxylenol [PCMX], triclosan) | Remove or destroy transient microorganisms and reduce resident flora | 15 seconds§ | |
| Antiseptic hand rub | Alcohol-based hand rub¶ | Remove or destroy transient microorganisms and reduce resident flora | Rub hands until the agent is dry¶ | |
| Surgical antisepsis | Water and antimicrobial soap (e.g., chlorhexidine, iodine and iodophors, chloroxylenol [PCMX], triclosan) Water and non-antimicrobial soap (e.g., plain soap)† followed by an alcohol-based surgical hand-scrub product with persistent activity | Remove or destroy transient microorganisms and reduce resident flora (persistent effect) | 2–6 minutes Follow manufacturer instructions for surgical hand-scrub product with persistent activity¶** | Before donning sterile surgeon’s gloves for surgical procedures†† |

* (7,9,11,13,113,120–123,125,126,136–138).

† Pathogenic organisms have been found on or around bar soap during and after use (139). Use of liquid soap with hands-free dispensing controls is preferable.

§ Time reported as effective in removing most transient flora from the skin. For most procedures, a vigorous rubbing together of all surfaces of premoistened lathered hands and fingers for >15 seconds, followed by rinsing under a stream of cool or tepid water is recommended (9,120,123,140,141). Hands should always be dried thoroughly before donning gloves.

¶ Alcohol-based hand rubs should contain 60%–95% ethanol or isopropanol and should not be used in the presence of visible soil or organic material. If using an alcohol-based hand rub, apply adequate amount to palm of one hand and rub hands together, covering all surfaces of the hands and fingers, until hands are dry. Follow manufacturer’s recommendations regarding the volume of product to use. If hands feel dry after rubbing them together for 10–15 seconds, an insufficient volume of product likely was applied. The drying effect of alcohol can be reduced or eliminated by adding 1%–3% glycerol or other skin-conditioning agents (123).

** After application of alcohol-based surgical hand-scrub product with persistent activity as recommended, allow hands and forearms to dry thoroughly and immediately don sterile surgeon’s gloves (144,145). Follow manufacturer instructions (122,123,137,146).

†† Before beginning surgical hand scrub, remove all arm jewelry and any hand jewelry that may make donning gloves more difficult, cause gloves to tear more readily (142,143), or interfere with glove usage (e.g., ability to wear the correct-sized glove or altered glove integrity).