

DECONTAMINATION

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Decontamination



Receiving Case Cart

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OBJECTIVES

Following training, the employee will be able to:

1. Define the mission of the Decontamination Area.
2. Name the items that are considered Personal Protective Equipment.
3. Discuss the importance of hand washing.
4. Identify when hands should be washed.
5. List the accepted containers to transport soiled supplies and instrumentation.
6. Describe the purpose of detergents and disinfectants.
7. Describe in brief the purpose of:
 - * washer/sterilizer
 - * washer/sanitizer
 - * cart washer
 - * ultrasonic washer
 - * pasteurmatic washer
 - * scope washer
 - * tube dryer
8. Discuss the importance of Universal Precautions.
9. List types of safety hazards that may exist in the Decontamination Area.

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DECONTAMINATION

1. INTRODUCTION

a. One of the primary concerns of a medical facility is infection control. The medical center staff must follow all precautionary steps to minimize the spread of pathogens from one patient to another. The supplies, instrumentation, and equipment they use must be clean and/or sterile. Important aspects of infection control are the processes by which instruments and equipment are collected, processed, and handled.

b. Decontamination is the process of cleaning and disinfecting medical supplies and equipment. The decontamination area of your medical center is where this process should take place. It is designed to isolate soiled items during processing. Personnel, who work in this area, are trained in the various methods of processing medical supplies and equipment for sterilization. The decontamination process plays a vital role in interrupting the transmission of infectious disease.

2. DESCRIPTION OF THE DECONTAMINATION AREA

a. The decontamination area of SPD is a restricted area specifically designed to meet the medical center's needs for the reprocessing of supplies and equipment. The area should be physically separated. Supplies and equipment should be transported to the decontamination area in impervious bags, covered/closed carts, cart lifts, dumbwaiters, and automated transport systems. The area should have adequate lighting to allow for inspection of articles during processing. Ventilation should be under negative pressure allowing air to be pulled from areas outside of decontamination. Correct ventilation is essential to reduce cross-contamination into surrounding areas.

b. The decontamination area is designed for and constructed with finished surfaces. These surfaces must withstand daily cleaning with a disinfectant to reduce the bioburden or microorganism count in the area. Personal protective equipment (PPE) is essential to an SPD technician's safety. Protective attire must be donned before entering the decontamination area. Ideally, an area should be available immediately outside the decontamination area for this purpose. It is the technician's responsibility to understand the policies and procedures regarding protective attire in their work area or job assignment. Work flow should originate from outside the decontamination area and travel inside through a dedicated entry way and/or dumbwaiter/lift system. Articles are then processed and passed through to the clean side for further preparation and redistribution.

3. PERSONAL PROTECTIVE EQUIPMENT (PPE)

a. Since the introduction of Universal Precautions, all used equipment and supplies are considered contaminated and treated as such. It is the medical center's responsibility to provide healthcare workers with PPE and training to promote personal safety. The type of PPE used in SPD includes surgical scrub suits, surgical hair covers, impervious gown and shoe covers, face mask and goggles or face shield, and designated decontamination gloves (not exam gloves). Additional protective items include plastic aprons and ear protection. Eye protection must be worn when working with liquids because splashing may occur. Ear protection may be necessary when some decontamination equipment is in use.



PPE Attire

b. Personal protective equipment must be worn at all times in the decontamination area and must be removed whenever the technician leaves the area. After removing protective wear, the technicians must wash their hands. A fresh set of protective wear must be donned before reentering the decontamination room. Regular laundering and/or disinfection of all reusable personal protective equipment is required to reduce cross-contamination. The items should be stored in an area away from contaminated equipment. A shower is highly recommended at the completion of duties in decontamination.

4. MECHANICAL EQUIPMENT PROCESSING

a. There is a wide variety of processing equipment available for use in the decontamination area. The type of equipment used will depend on the items to be processed. Each piece of equipment is designed to process a selected group of instrumentation and/or equipment. The various types include: washer/sterilizer, washer/sanitizer, utensil washer, ultrasonic cleaner, tube washer, pasteurizer, scope washer, cart washer, hand operated steam cleaning device, and tube dryer.

b. Washer/Sterilizer

(1) This unit is designed to clean and sterilize. This is a gravity type unit that can be programmed to wash, sterilize (steam under pressure), or a combination of the two. Generally the phases of the wash/sterilize cycle are wash, rinse, sterilize, and exhaust. Types of items that can be processed through a washer/sterilizer include: metalware, respiratory tubing, surgical instruments, and glassware. Only items specifically designed to be washed/sterilized should be put through the washer/sterilizer.



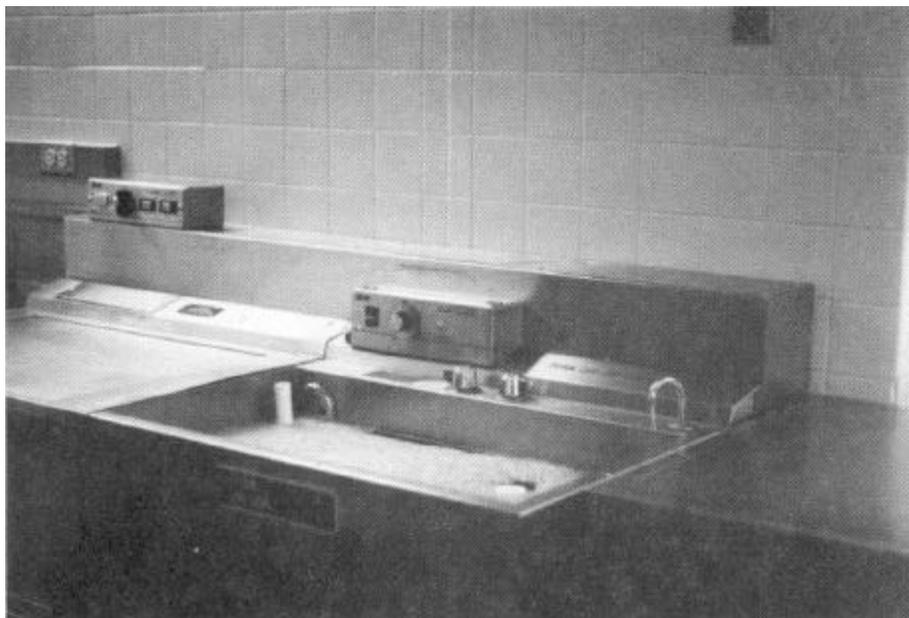
Washer/sterilizer

(2) During the cycling process technicians should periodically check monitoring displays or chart to ensure that the machine is functioning properly. A machine that does not perform up to standard will not properly process the load.

c. **Washer/Sanitizer.** This unit is designed to wash and sanitize. For the sanitizing process, hot water or steam at atmospheric pressure is used to sanitize the load. Sanitization is less effective in killing microorganisms than a washer/sterilizer.

d. **Utensil Washer.** This unit is designed to clean metalware, instrumentation, and glassware. In general, the cycle includes a wash and a rinse. Depending on the type of machine, other options could be prerinse and special rinses, such as deionized or distilled water. Only items designed for this unit should be processed through it. The items should be inspected following the cycle to ensure that they are clean.

e. **Ultrasonic Cleaner.** The unit is designed to clean surgical instrumentation utilizing ultrasonic energy in a heated water-detergent solution. Instruments which appear clean after hand scrubbing may still retain particles and other soil in the box locks, serrations, or any other difficult to clean surface of an instrument. Understanding some of the technology involved with the operation of the ultrasonic is helpful. This unit converts sound waves into vibrations that remove residual soil from instruments. Microscopic bubbles are formed on the instruments and minute vacuum areas are created as the bubbles implode. This action draws out minute particles of debris from the instruments. The process is called cavitation. Rubber and plastic items should not be used in the ultrasonic due to their tendency to absorb sound waves and defeat the process.



Ultrasonic Cleaner)

f. **Pasteurmatic Washer.** This unit is used to clean and disinfect plastic/rubber tubing and similar items. Pasteurization occurs using hot water at 170 degrees F (76.7 degrees C) for 30 minutes. This process is not effective against spore-forming bacteria.

g. **Scope Washer.** The scope washer is a machine used to automatically clean and disinfect flexible endoscopes. Depending on the unit, there may be several options which include wash only, disinfect only, or a combination. The scope requires a few preparatory steps which include manual brushing of the channels, leak testing to assure that the scope has not been perforated during use, manual cleaning of the outside of the scope. Once these steps have been accomplished, the scope is placed in the washer and an adapter is attached to the appropriate channels of the scope. In general, a detergent solution is forced through the channels of the scope followed by a water rinse. A disinfectant is then injected into the channels and the scope is bathed in a disinfectant solution for a predetermined time. This is followed by a water rinse and drying cycle. Once the scope is removed from the washer, alcohol and air may be pulled through the channels to aid drying. Before operating the unit, the technician should review the manufacturer's operating instructions.



Scope Washer

h. **Cart Washer.** This unit is used to clean items such as carts, wheel chairs, litters/stretchers, and metal pan ware. In general, the cart washer cycle consists of

a water/detergent phase followed by a water rinse. Cart washers can also be equipped with drying vents or a separate drying chamber.

i. **Steam Cleaning Device.** This is a hand held device (commonly called a steam gun) utilized for sanitizing items such as wheelchairs, litters, and carts. Steam cleaning devices can come equipped with detergent dispensers and water rinse options. Technicians should use caution when using this device. Splashing or burns may occur if personal protective equipment is not used.

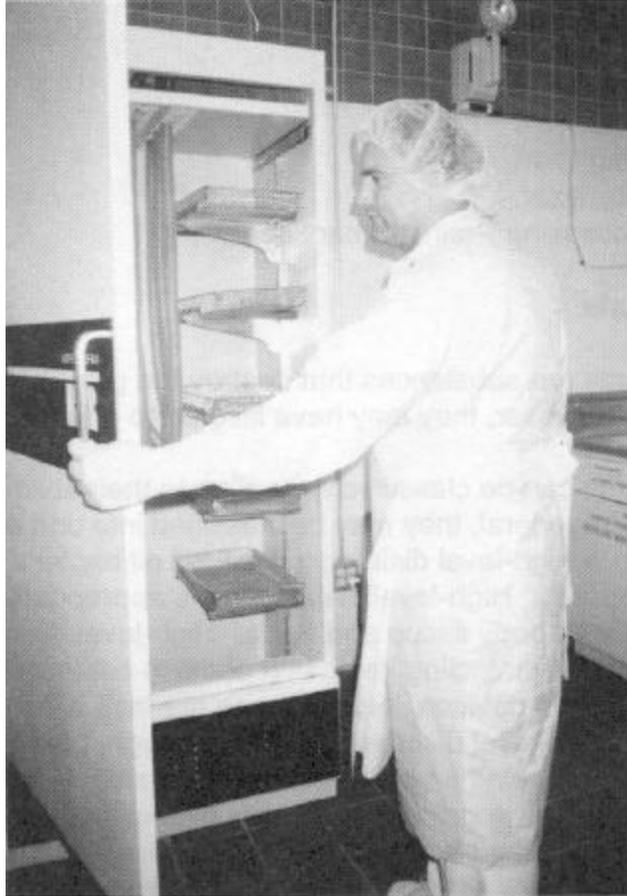


Cart Washer

j. **Tube Dryer.** This unit is used to dry plastic/rubber goods following cleaning and disinfection. The unit draws in air and heats it. The hot air is then circulated into the cabinet. This facilitates drying the load. Following the cycle, the technician should check the items to ensure they are completely dry. Items that are not dried correctly may interfere with further thermal or EtO sterilization.

5. DETERGENTS AND DISINFECTANTS

a. Detergents and disinfectants are the chemical agents used with manual and mechanical processing of instruments and equipment. Proper use of these agents helps reduce the number of microorganisms to a level that makes items safer to handle.



Tube Dryer

b. Detergents

(1) Detergents are used to aid in the removal of soil such as blood, pus, bone fragments, and urine from the surface of instruments or equipment. Soil gives the microorganism a place to live and colonize (grow in numbers). Instrumentation and equipment not properly cleaned will continue to afford sustenance to the contaminant and may impede the disinfection and/or sterilization process.

(2) Detergents are utilized in both manual and mechanical processes of decontamination. They are normally chosen according to a pH level. A level of 7.0 is neutral. Any pH level below 7.0 is acidic. For example, blood, vinegar, and lemon juice are highly acidic. Acidic detergents can lead to rust and corrosion of instruments. Any pH level above 7.0 is alkaline. Most detergents and soaps are alkaline compounds.

(3) Detergents are used with:

- (a) Ultrasonic.
- (b) Pasteurmatic Washer.
- (c) Cart Washer.
- (d) Washer/Sanitizer.
- (e) Washer/Sterilizer.
- (f) Manual Processing/Preinstrument soak.

c. **Disinfectants**

(1) Disinfectants are substances that destroy the growth of pathogenic microorganisms. However, they may have little or no effect on bacterial spores.

(2) Disinfectants can be classified according to their ability to kill microorganisms. In general, they may be classified into one of three levels: high, medium, and low. A high-level disinfectant will kill all bacteria, viruses, and fungi, but not bacterial spores. High-level disinfection is appropriate for items that have come into contact with body tissue and fluids. High-level disinfection is also an appropriate means of disinfecting items that come in contact with mucous membranes (respiratory devices, laryngoscope blades). If the object remains in contact with some high-level disinfectants long enough, bacterial spores can be killed. For example, soaking an instrument in glutaraldehyde for a minimum of 10 hours will kill bacterial spores. Some other examples of chemical disinfectants include chlorine dioxide, hydrogen peroxide, and peracetic acid-based formulation. Medium-level disinfectants kill most pathogenic microorganisms and some viruses. They do not kill bacterial spores. Medium-level disinfection is appropriate for use on I.V. pumps, feeding pumps, etc. They are effective in killing such organisms as mycobacterium tuberculosis fungi, hepatitis B virus, medium and small size viruses. Examples of solutions include chlorine compounds, alcohols (70 percent to 90 percent ethanol or isopropyl), and some phenolic and iodophor compounds. Low-level disinfectants kill some types of bacteria. They generally have little effect on viruses and do not kill spores. Low-level disinfectants are only appropriate for use in cleaning environmental surfaces, such as table tops, floors, and walls. A disinfectant or detergent should always be used for what it was intended. If used properly, the solution will be able to perform effectively. SPD technicians must be familiar with the manufacturer's instructions for use of the chemicals.

6. SYSTEMS FOR COLLECTION AND TRANSPORT OF SOILED INSTRUMENTS AND SMALL EQUIPMENT

a. **Solid Containers.** Solid containers provide an excellent barrier to cross-contamination, as well as protection for the SPD technician. The container should be light weight, durable, and made of material that can be properly decontaminated. The container should come with a lid that fits snugly over its opening. If the container does

not have a lid, then it should be lined with a plastic bag. The bag must be sealed at the time of soiled pickup.

b. **Carts.** Carts used for soiled collection and transport should be enclosed. The cart should be easy to maneuver and decontaminate. Carts require regular maintenance; of particular importance are the wheels. Wheels must have routine lubrication to keep them moving freely and to avoid freeze up, which may occur due to repeated decontamination processing. A combination of a cart and a container is often used for soiled pickup.

c. **Automated Transport Systems.** Types of systems available include monorails and robotic transport. The principle of operation for the two systems is similar. The robotic transport is the newer of the two systems. Components consist of an enclosed cart, guide track, programmable robot, and dedicated elevator(s). The technician can program the robot to retrieve a cart from a designated area. The robot travels to a designated area, automatically loads the waiting cart, and automatically returns it to the SPD decontamination area.

d. **Dedicated Lifts/Dumbwaiters.** These provide a system for delivery of contaminated supplies to SPD. They reduce handling and provide a direct link between the user area and SPD. They should be disinfected on a regular basis, and care must also be taken that cross-contamination does not occur.

7. SOILED SUPPLY COLLECTION PROCEDURES

a. One of SPD's primary functions is the collection of contaminated supplies and equipment. All contaminated supplies and equipment should be collected in covered conveyances or containers, such as waterproof plastic bags, tote-boxes with lids, or closed or covered carts. Collection containers for holding soiled reusable supplies should be made of material that can be properly decontaminated or disposed of. Personnel involved in collecting contaminated supplies and equipment should wear protective clothing. Care must also be taken to protect the environment when transporting contaminated items to SPD. All nursing units and clinic areas should have a dedicated soiled utility or "dirty" room. Enclosed carts or containers should be provided in these rooms and all ward procedure trays and reusable equipment placed in them. It is the user's responsibility to dispose of sharps appropriately and to remove or dispose of gross soil from items being returned to SPD.

b. Technicians are required to wear appropriate protective attire when collecting and transporting soiled items. Gloves must be changed after direct handling of contaminated items and between container drop-off sites. This procedure will help reduce the chance of cross-contamination between soiled pickup points and public conveyance (i.e., elevator buttons, door handles, telephones).

c. When transporting large equipment such as emergency carts, warming blankets, etc., a plastic bag should be placed over the item(s).

8. SOILED SUPPLY SORTING PROCEDURES

Every item that is returned to SPD Decontamination requires cleaning/decontaminating as the first step in reprocessing. Items must be sorted as they are removed from the transport container according to the process or processes to be used. Items should be inspected for condition and missing parts and origins noted so that the user can be contacted to account for condition or locate missing parts. Items are sorted into the following categories:

- a. Equipment, electrical.
- b. Equipment, nonelectrical.
- c. Rubber and/or plastic supplies.
- d. Metalware.
- e. Glassware.
- f. Surgical power equipment.
- g. Surgical instruments.
- h. Endoscopic equipment.
- i. Electronic devices.

9. CLEANING AND DISINFECTING PROCEDURES

a. The single most important procedure for good infection control and prevention of cross-contamination is the removal of all visible soil and proper application of a disinfectant. Follow specific equipment cleaning procedures provided by the manufacturer to assure the correct cleaning procedure (microbial harbors).

(1) **Equipment, Electrical.** Manually wipe down equipment starting at the top and working down. Use a brush to reach all nooks and crannies. Hand wash and inspect electrical cords, coil, and secure with a binder. Wash casters and wheels last. Apply good aseptic technique when cleaning small equipment. Be sure to wipe the work surface (counter top) with disinfectant solution before turning the item over to be cleaned. Always rinse cloth in disinfectant solution between pieces of equipment. Examples of electrical equipment are infusion pumps, feeding pumps, K-pad motors, air compressor, portable suction machines, hypothermia units.

(2) **Equipment, Nonelectrical.** Use the same procedure listed above to manually clean nonelectrical equipment. If equipment can be mechanically cleaned, it should be inspected and precleaned, removing all gross soil, tape, or residual adhesive before

cleaning in a cart washer. Examples of nonelectrical equipment are IV poles, wheelchairs, litters, K-pads, hypothermia blankets, seizure pads, foot cradles, commodes, isolation carts.



Ward Equipment

(3) **Rubber and/or Plastic Supplies.** Damage can easily occur to rubber and/or plastic supplies by using inappropriate chemicals or elevated temperatures. Manufacturers' instructions should be followed. Inspect each piece for tears, holes, or deterioration. These items can be cleaned or disinfected manually and/or mechanically. To manually wash items, use small brushes to clean inside tubes and rinse thoroughly. Items can then be dried by compressed air, tube drier, or air dried. When processing items mechanically in a washer/sterilizer, washer/sanitizer, or pasteurization machine, place items in the appropriate basket with insert before starting cycle. The baskets are needed to correctly position the items to facilitate washing and rinsing. Heavily soiled items may require precleaning prior to mechanical processing. Supplies should be thoroughly dried before any further processing takes place. Examples of rubber and/or plastic supplies include nasal airways, oral airways, reusable ventilator tubing, reusable resuscitators, pulmonary tubing.

(5) **Metalware.** Inspect each item upon receipt for gross soil and, if present, the item may need to be manually soaked and washed. Metalware can be processed through a cart washer, a washer/sterilizer, or a washer/sanitizer. It is important for the technician to use proper loading techniques. Appropriate baskets with inserts must be used to assure that the items are in the correct position during the processing cycle. In general,

metalware with open depressions should be positioned open end down to facilitate drainage. Basket inserts also keep items from excessive movement in the chamber, which can cause damage to the items, chamber, or spray arms. If an item, such as a basin or instrument container, turns right side up and fills with water, the technician should be careful when handling -- burns may occur, protective gloves may be needed. Examples of metalware are bedpans, basins, medicine cups, instrument containers.

(6) **Glassware.** Care must be taken when handling glassware. Broken glass can cause a serious wound to staff or patient. These items can be cleaned or disinfected mechanically. The technician should first inspect each item for cracks and chips. Disassemble component parts. To preclean items, use appropriate brush and detergent. Scrubbing must be done under the surface of the solution --eye protection is mandatory. **Note: Syringes should be soaked in enzyme solution first and then processed in an ultrasonic.** Items can then be processed through a washer/sterilizer or washer/sanitizer using appropriate baskets. Following the machine cycle, the items must be inspected for damage. A glass container may right itself during the cycle and fill with water. The technician must be careful when handling the container to avoid getting burned. Protective gloves may be needed. Examples of glassware are syringes, medicine cups, elik evacuator, straight and Y connectors, graduates.

(7) **Surgical Power Equipment.** Surgical power equipment must be inspected prior to processing. Although it is the user's responsibility to remove cutting blades or drill bits prior to returning equipment to SPD, sometimes this equipment is returned to the decontamination area with these items in place. This is especially hazardous if the unit is battery operated and the power source is in place. Serious injury can occur if power equipment is not handled properly. Manufacturers' recommendations should be followed regarding disassembly and cleaning. Examples of surgical power equipment are drills, saws, reamers, mini drivers.

(a) **Battery Powered Equipment.** Power source should be removed. The hand piece should be wiped down with appropriate cleaning solution, followed by wiping down with a water-dampened cloth.

(b) **Electrically Powered Equipment.** Inspect electrical cords for cracking or fraying. Wipe down with appropriate cleaning solution, follow by wiping down with a water-dampened cloth.

(c) **Compressed Air/Nitrogen Powered Equipment.** Remove the hose and inspect it for damage. Wash the hose in a mild detergent. Saline or a disinfectant solution must not be used. Wipe off the hand piece with a mild detergent, followed by wiping down with a water-dampened cloth. Care must be taken not to get the cleaning solution or water inside the hand piece. The equipment should be sent into the preparation area for further processing.

(11) Surgical instruments

a. There is a wide variety of instrumentation available ranging in complexity and quality. Instruments, as well as all patient care equipment, are a costly investment; proper handling will extend the useful life of the investment. The types of instruments that will pass through SPD's decontamination area depends on the services offered at a medical center or clinic.

b. General principals of instrument decontamination, manual and mechanical, will be examined. Instruments range in type, size, complexity, and quality. SPD technicians must be familiar with the various instrument types and their special needs.

c. The instruments used during a procedure should be rinsed in water and any gross soil removed. Instruments should be placed in covered containers or impervious bags and returned to the decontamination area using an enclosed cart.

d. Once in the decontamination area, inspect the instruments for tissue or bone remaining in the teeth or grooves. Remove this debris by holding the instrument under the surface of the solution and scrub the area with an instrument brush. Since splashing is likely, technicians must wear eye protection and mask.

e. During the initial cleaning and throughout the subsequent steps, instruments should be handled in such a manner as to avoid damage to the instrument and to prevent injury to the technician. Reprocessable sharps that have been used must not be processed in a manner that requires employees to each by hand into the containers where these sharps have been placed. Instruments should be handled in small groups to avoid tangling and damage. Needles should be separated and processed separately. The technician should watch for scalpel blades still attached to knife handles -- these should be removed and disposed of in sharps containers. All scalpel blades, disposable needles, saw blades, and drill points used during a surgical procedure should be disposed of by the operating room staff, but may be inadvertently overlooked. Many instruments contain sharp edges and parts, and extreme care should be taken by the technician while handling any sharp item.

f. During the cleaning process, always remember to open all instruments. For example, scissors should be opened, instruments with box locks should not be in a locked position, and multipiece retractors, staplers, etc., should be disassembled prior to cleaning. This allows for all areas to be exposed to the cleaning process.

Attention to all cannulated items or items with lumens, such as suction tubes, needles, and some orthopedic instruments is vital. These areas may harbor blood and body tissue. Brushes are available from manufacturers in many sizes allowing access to the cannulated areas and should be used faithfully to assure any and all debris is removed.



Cleaning Process

g. Only nonabrasive cleansers should be used for instrument cleaning, as the abrasive cleaners can damage the surface of the instrument, resulting in corrosion and rust. Instruments should be exposed to detergents that maintain a pH between 6.0 and 8.0. A neutral pH of 7.0 is ideal since a pH level too high (alkaline) or too low (acidic) will damage the surface of the instrument. Once this process is complete, rinse the instruments and process in the ultrasonic.

h. The **ultrasonic** will penetrate into the box locks, joints, and screw areas of the instrumentation. The cleaning solution used in the ultrasonic should be changed frequently. Instruments should be placed loosely in the ultrasonic in metal baskets. Never use plastic or rubber in the ultrasonic because they will absorb the sound waves and the process of cavitation will not take place. Instruments should then be rinsed and processed through the washer/sterilizer. Items that cannot be processed through the washer/sterilizer should be rinsed and placed in the drying chamber of the ultrasonic. If a drying chamber is not included on existing equipment, the instruments should be air dried or patted dry with an absorbent material so that no water is left standing on the instruments.

i. **Washer/sterilizers** are the next step in the cleaning process. Stainless steel instruments should not be processed close to instruments made of metals, such as nonanodized aluminums, brass, copper, or chrome plating. A reaction known as electrolysis may occur, resulting in one metal plating onto another. This reaction can

result in permanent damage and staining. Ideally, demineralized or deionized water should be used in the washer/sterilizer to prevent mineral buildup and chemical reactions associated with regular tap water. A drying cycle should be set to assure the instruments will dry completely and not emerge into the prep room wet after the cycle.

j. **Microsurgical and delicate eye instruments** should not be processed through a washer/sterilizer because the turbulent action of steam mixed with water may damage them. Once these delicate instruments are processed through the ultrasonic, rinsed, and dried, they should be processed on a sterilize cycle only to assure a decreased bioburden is achieved to allow safe assembly by the preparation room instrument technician.

k. **Endoscopic Equipment.** There are two types of endoscopic equipment, rigid and flexible. The use of this type of equipment has increased and their use is expected to expand. The popularity of endoscopes is due to the fact that they cause far less trauma to the patient. However, the equipment is very delicate and extremely expensive, and special attention must be given to the decontamination process. Discussed are general principles of processing scopes and should not be applied to specific equipment. Before processing a scope manually or with the use of a scope washer, consult the manufacturer's instructions.

l. **Rigid endoscopes** are used primarily in the operating room but are also used in a clinical setting. Following use, the user wipes down the scope and places it in a covered container. The container is then transported to SPD's decontamination area. To manually process a rigid endoscope, first check the scope for damage, such as clouded lenses, bent instrument shaft, and burrs on the tip of the instrument shaft. Remove the fiber optic light cable from the scope. Wipe down scope, light cables, and adapters using appropriate cleaning solution. Thoroughly rinse items by wiping down with a water-dampened cloth. Careful attention should be paid to the lenses -- they should be wiped with an alcohol-dampened swab/applicator. The scope should then be dried thoroughly. Before processing any scope, the technician should consult all manufacturer's instructions. Examples of rigid scopes include arthroscopes, cystoscopes, bronchoscopes, laryngoscopes.

m. **Flexible endoscopes** can be used by a variety of services within the medical center, such as GI, Procto Clinic, Respiratory, Surgery, and ENT Clinic. Scopes should be wiped down and flushed with a cleaning solution immediately after use. The scope should then be placed in a covered container and transported to the SPD decontamination area. Since several different services use endoscopes, it is advisable to keep a check sheet in the decontamination area and record the location, serial number of each scope, date, and time in and out. Before processing any scope, the technician should consult all manufacturers' instructions. Flexible scopes can be cleaned and disinfected manually or through a scope washer.

n. **Manual processing** of flexible endoscopes requires the following equipment: leakage tester, large basin of appropriate cleaning solution, appropriate cleaning supplies, and brushes. To manually clean scopes, remove caps and/or valves on scope. Using an enzyme solution, brush the channel(s) and flush until completely clean. Hook up scope to leak tester to check integrity of the channel(s). This should be followed by inspection of the outer casing of the scope. If no damage is detected, the scope is ready to be processed in a cleaning or disinfecting solution, followed by rinsing and drying. Scopes that are terminally sterilized in EtO do not need to be processed in a disinfecting solution, such as glutaraldehyde.

o. **Automated cleaning/disinfecting** of flexible endoscopes requires the technician to have a thorough knowledge of how the scope washer operates. Before placing the scope in the scope washer, follow the steps outlined for manual cleaning. Once the manual cleaning is complete, the scope is ready to be processed in the scope washer. Follow the manufacturer's instructions for specific scopes and scope washers. Each different type of scope has a specific adapter. Selection of the correct adapter is critical. The adapters are fastened to the open channels of the scope so that there is access to the cleaning and disinfecting solution. After disinfecting, the scope is passed through to the preparation area for further processing. Examples of flexible endoscopes are sigmoidoscopes, colonoscopes, bronchoscopes, intubation scopes, cystoscopes.

p. **Electronic Devices.** A variety of electrical cords, cables, and leads come to the decontamination area for processing. These items are delicate and should be handled carefully. The manufacturer's instructions should be thoroughly reviewed before processing this type item. General cleaning procedures are as follows: Inspect the outer case of the device for cracks, tears, or deterioration. Prepare a detergent solution, dampen cloth and wipe down casing. Do not immerse the device in the detergent solution or use disinfectant unless the manufacturer's instructions indicate to do so. Following cleaning, the device should be wiped off with a water-dampened cloth. The device should air dry and then be sent to the preparation room. Examples of electronic devices are bovie's, pacemaker cords, defibrillator paddles, EMG needles, EKG leads, rectal probes.

10. INFECTION CONTROL PRACTICES

a. **Universal Precautions** should be strictly followed in the decontamination area. It is the technician's responsibility to be familiar with these policies and procedures for their own protection. Important factors to remember are hand washing, sharps safety, spills, soiled laundry, infectious waste, and environmental cleaning.

b. **Hand Washing.** Hand washing is the single most important step in preventing cross-transmission of infectious agents; it allows protection of the patient and the SPD technician. Hand washing is indicated in the following situations:

- (1) Immediately after unanticipated contact with blood or body fluids.
- (2) Immediately after gloves are removed.
- (3) For personal hygiene, i.e., arrival at the work site, use of the lavatory, before and after eating, and before returning to the job site.

c. **Sharps Safety.** Sharps are defined as: needles, scalpel blades, and other sharp objects that can penetrate the skin. Safe use must include:

- (1) Technicians must inspect procedure trays carefully for sharps that have not been disposed of at point of use.
- (2) Disposal in a puncture-resistant container immediately.
- (3) Always use a forceps to remove a scalpel blade from a reusable handle.
- (4) Never attempt to pick up broken glassware with your hands. Check procedures for proper disposal in your facility.
- (5) Never put your hands in a sharps container to retrieve items that were accidentally disposed.
- (6) Sharps must never be placed in uniform pockets or used for box openers, removing tape, etc.

d. **Spills.** After a disinfectant is used to clean where infectious material has been spilled or sprayed, the affected area must be allowed to air dry. In the case where a large volume of potentially hazardous material has been spilled, your supervisor and Environmental Management Service should be contacted and appropriate steps taken to reduce further contact to co-workers (wet floor signs, etc.).

e. **Soiled Laundry.** Soiled laundry, such as towels, reusable drapes, cleaning rags, etc., shall be handled as little as possible to prevent further contamination or exposure. It shall be placed in the appropriate moisture resistant laundry bag. SPD technicians, who come in contact with contaminated laundry, should wear appropriate personal protective clothing.

f. **Infectious Waste.** All body fluids and disposable items visibly contaminated with body fluids should be discarded as infectious waste. Infectious waste is any substance deemed to be potentially harmful to personnel or the environment by way of cross-contamination. Impervious containers with a secure fitting lid should be provided in the decontamination area. The container should be emptied and disinfected regularly by Environmental Management Service.

g. **Environmental Cleaning.** Environmental Management Service is responsible for cleaning the floors and walls of the decontamination area. SPD technicians are responsible for cleaning all work surfaces and sinks at the end of each shift and as needed.

11. SAFETY

a. As with Universal Precautions, the SPD Policy and Procedures Manual covers safety related guidelines for technicians to follow. It is the technician's responsibility to know and observe safety rules.

b. **Material Safety Data Sheets (MSDS).** These are documents prepared by the manufacturers of chemical products and provided to the user so they understand the safe use of the products. SPD must have a copy of the MSDS for each chemical that is used. These copies must be assembled in the Policy and Procedures Manual and referenced where they are located. The MSDS usually consist of 8 to 10 sections of information regarding health hazards, emergency procedures, precautionary measures, and first aid techniques. SPD technicians must review the MSDS before handling any potentially hazardous chemicals.

c. **Eye Wash Stations.** These are used for emergency eye flush in the case of a chemical splash in the eye. Technicians must be knowledgeable in how and when to use this equipment.

d. **Physical Hazards.** SPD staff should follow all safety procedures in the performance of their job duties. Proper body mechanics should be used when lifting or bending is required. Any injuries, unsafe conditions, or practices should be reported immediately to supervisory personnel. Some of the areas of potential safety hazards in the decontamination area are:

- (1) Open drawers.
- (2) Sharps and needle sticks.
- (3) Carelessly stacked washer/sterilizer baskets.
- (4) Automatic cart washer doors.
- (5) Lifting heavy objects.
- (6) Slippery wet floors.
- (7) Automatic loaders/unloaders and doors of washer sterilizers.
- (8) Hot items.
- (9) Improper use of chemicals.
- (10) Operating equipment noise.

DECONTAMINATION TERMS

Atmosphere Pressure
Bioburden
Box Lock
Cannulated
Cart Lift
Cart Washer
Cross-Contamination
Decontamination
Deionize
Detergent
Distilled
Dumbwaiter
Electrolytic Deposition
Endoscopes
Hemostat
Infectious Waste
Instrumentation
Manual
MSDS (Material Safety Data Sheet)
Microsurgery
Negative Pressure
Pitting
PPE
Pasteurmatic
Processing
Scopewasher
Serrations
Sharps
Steam Gun
Tube Drier
Utensil Washer
Universal Precautions
Washer/Sterilizer
Washer/Sanitizer

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DECONTAMINATION

1. Personal protective equipment for the decontamination area consists of _____, _____, _____, _____, _____, _____, _____, and _____.
2. Detergents are used to aid in the removal of _____ from the surface of the surgical instrument or a piece of equipment.
3. A chemical disinfectant is a substance that is used to kill _____.
4. Manufacturers of chemical products are responsible to provide _____ _____ to facilities that purchase their product.
5. Proper _____ should be used when _____ or _____ is required.
6. The decontamination of SPD is a physically _____ area specifically designed to meet the medical center's needs.
7. The decontamination area should be under _____ air pressure.
8. _____ should originate from outside of the decontamination unit and travel inside through a dedicated entry way.
9. Negative air pressure is essential to reduce _____ into surrounding areas.
10. Work surfaces should be cleaned _____ with a low level disinfectant.
11. All equipment and supplies returned from patient care areas are considered _____.
12. The appropriate _____ should be worn when transporting contaminated equipment.
13. Ideally all nursing units and clinic areas should have a _____ utility room.
14. When transporting large equipment, a _____ should be used to cover it.
15. Immediately after all supplies have been delivered to decontamination, _____ should be removed.
16. Cleaning is preliminary to _____ and _____.
17. The removal of _____ is most important to the sterilization process.

18. Once disinfected, items must not be allowed to become _____ before sterilization.
19. Most washing detergents contain _____ agents that cause foam.
20. When cleaning equipment follow specific _____ to assure correct cleaning.
21. Apply good _____ technique when cleaning all equipment surfaces.
22. All cannulated items must be soaked and flushed followed by cleaning the _____ with a brush.
23. Types of mechanical processing equipment that would be found in a decontamination area are _____, _____, _____, _____, _____, _____, _____, and _____.
24. An _____ cart should be used when making soiled instrument pickups.
25. Soiled supplies can be returned on dedicated _____ or _____.

TRUE OR FALSE

26. Shoe covers that are worn in the decontamination area do not have to be water resistant.
27. A tube dryer is capable of killing pathogenic microorganisms.
28. A cart washer is used to clean and sanitize carts, wheelchairs, and litters.
29. The Center for Disease Control published guidelines for Universal Body Substance Precautions to help medical centers develop local plans to protect healthcare workers.
30. Eye protection is an option, not a requirement when processing instruments and supplies when splashing is likely.
31. Employees should wash their hands when leaving the decontamination area and before returning.
32. Disposable sharps, such as needles and scalpel blades, should be carefully disposed of in a puncture resistant container.
33. The decontamination area of SPD should be under positive air pressure.

34. Decontamination process begins with the removal of gross contamination.
35. It is important to wear eye protection when splashing may occur.
36. Wearing gloves is only necessary when transporting visibly soiled equipment.
37. Gloves should only be changed when torn or punctured.
38. Plastic bags are the only way to transport soiled supplies.
39. Tote bins provide excellent barriers to cross-contamination.
40. It is acceptable to use equipment between patients if no visible soiling is present.
41. Always rinse cloth in disinfectant solution between pieces of equipment.
42. Universal Precautions guidelines were developed to help medical centers develop local plans to protect healthcare workers.
43. The purpose of the decontamination unit is to clean and sterilize medical instrumentation and equipment.
44. Types of eye protection include face shield and goggles.
45. Wearing gloves is only necessary when transporting visibly soiled equipment.
46. Surgical gloves can be work in the decontamination area.
47. A detergent should have a pH between 2.0 and 5.0.
48. The SPD Section must have a copy of the MSDS for each chemical that is used in the section.
49. An ultrasonic cleaner is used to clean and disinfect surgical instrumentation.
50. Only nonabrasive cleaners should be used for instrument cleaning as the abrasive cleaners can damage the surface of the instrument, resulting in corrosion and rust.

MATCHING

51. _____ Decontaminating equipment that uses sound waves to remove minute particles of soil from instrumentation. A. ultrasonic cleaner
52. _____ Items such as bed pans, emesis basins, and instrument trays must be properly positioned in the chamber of a washer/sterilizer, washer/sanitizer, or utensil washer. B. hand washing
53. _____ Soiled equipment can be automatically transported to the decontamination area. C. basket & insert
54. _____ Single most important step in preventing cross-transmission of infectious agents. D. disinfectants
55. _____ Disposable needles, scalpel blades, and chipped glass syringes should be disposed of. E. lifts/dumwaiter

MULTIPLE CHOICE

56. Equipment capable of killing microorganisms, including bacterial spores:
- a. washer/sterilizer
 - b. ultrasonic cleaner
 - c. medium-level disinfectant
 - d. none of the above
57. An example of personal protective equipment:
- a. impervious gown
 - b. water resistant shoe covers
 - c. surgeon's gloves
 - d. a. and b.

58. Rubber and/or plastic items should never be processed through the following piece of equipment:

- a. scope washer
- b. washer/sterilizer
- c. washer/sanitizer
- d. ultrasonic cleaner
- e. a. and b.

59. The following equipment should be hand cleaned and not sent through the various mechanical processing units:

- a. electronic cords
- b. EKG leads
- c. infusion pump
- d. feeding pump
- e. all of the above

60. Detergent solution must be used with the following equipment:

- a. tube dryer
- b. pasteurmatic washer
- c. utensil washer
- d. b. and c.