

Environmental Sanitation and Terminal Cleaning

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ENVIRONMENTAL SANITATION AND TERMINAL CLEANING

AORN INDEPENDENT STUDY ACTIVITY
AORN VIDEO WITH STUDY GUIDE



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GOAL

The goal of this module is to provide guidance for environmental cleaning in the surgical setting in order to minimize exposure to infectious organisms.

OBJECTIVES

After viewing the videotape and completing the study guide, participants will be able to

- describe the importance of cleaning the OR suite;
- demonstrate the principle of “confine and contain;”
- differentiate between preliminary, interim, and terminal cleaning; and
- list the areas within the OR that must be cleaned.

GUIDE FOR STUDY

This study guide is intended to be used in conjunction with the accompanying video. We suggest that you take the following steps to complete this activity.

1. Read the overview and objectives for this educational activity, and compare them with your own learning objectives.
2. View the video.
3. Read the study guide, paying particular attention to those areas that reflect the objectives.
4. Consult a dictionary for definitions of unfamiliar words.

OVERVIEW

Every hospital patient owes a debt of gratitude to a Hungarian physician named Ignaz Semmelweis. In the 1840s, he was the first person to demonstrate the importance of hand hygiene for preventing infection in hospitals. Despite remarkable improvements in controlling the transmission of infection since that time, nearly two million patients still acquire a nosocomial (ie, health care associated) infection each year in US hospitals.¹

Estimates for the costs associated with these infections are more than \$6 billion per year.² The real cost is to patients who suffer the consequences of prolonged hospital stays and additional therapeutic interventions. Approximately 90,000 patients die each year as a result of nosocomial infections.

Infection occurs when disease-causing microorganisms, called pathogens, penetrate the body’s natural defenses, proliferate, and cause tissue damage and disease. Three factors need to be present for infection to occur: a susceptible host, such as a surgical patient; an infectious agent; and a means of transmission.

Contamination in the surgical setting comes from a variety of sources, but hand contact with contaminated surfaces is one primary way in which microorganisms are transferred from the environment to the patient. Hand hygiene is the most important method for controlling the transmission of infection. A clean surgical environment also is fundamental to reducing the incidence of nosocomial infections.

PATHOGENS COMMON TO THE OR ENVIRONMENT

The operating room may look spotless and pathogen-free, but infectious microorganisms are everywhere. These pathogenic microorganisms can cause disease if they are present in large numbers, have a high degree of infectivity, and are of sufficient virulence. Pathogenic microorganisms are classified as bacteria, viruses, fungi, parasites, or prions.

The majority of surgical site infections (SSIs) are caused by bacteria, although fungal infections also can cause serious complications.³ Bacteria can reside harmlessly as part of the body’s normal flora, such as the bacteria *Staphylococcus aureus*. Thirty to 70% of people carry staphylococci on their skin.⁴ *Staphylococcus aureus* is a common cause of hospital infections and can spread to the heart, bones, lung, and bloodstream and can result in patient death.⁵

The bacterial species most commonly found in SSIs include

- Staphylococci,
- Enterococci,
- Pseudomonae, and
- Streptococci.

The nine most common pathogens in the OR environment include the following:

- Staphylococci (*S. aureus*, *S. epidermis*)
- Escherichia coli
- Streptococci (*S. pyogenes*)
- Mycobacterium tuberculosis
- Pseudomonas (*P. aeruginosa*)
- Serratia marcescens
- Clostridium
- Fungi
- Hepatitis viruses (hepatitis A, hepatitis B [HBV], and hepatitis C [HCV])

More than 70% of the bacteria that cause hospital-acquired infections are resistant to at least one of the drugs most commonly used to treat them.⁵ Treating resistant pathogens often requires the use of more expensive drugs and results in longer hospital stays. These antibiotic-resistant bacteria are becoming a major public health concern. Multidrug-resistant organisms, (MDROs) include

- Methicillin-resistant *Staphylococcus aureus* (MRSA),
- Vancomycin-resistant *Enterococcus* (VRE),
- Vancomycin-resistant *S. aureus* (VRSA), and
- Multidrug-resistant *Mycobacterium tuberculosis* (MDR-TB).

According to The Centers for Disease Control and Prevention (CDC), patients have a higher risk for getting a drug-resistant infection in a health care facility and are considered susceptible hosts if they have been treated with antimicrobials previously, are elderly, are undergoing invasive procedures, and have underlying diseases or conditions.⁶

The possibility of infection is one of the most crucial concerns for patients undergoing surgical procedures. Surgical team members must follow strict practices for controlling the OR environment to prevent postoperative infections, and use aseptic principles to maintain a sterile field and to prevent its contamination during surgery.

ENVIRONMENTAL SANITATION CONTROLS

Prevention is the key to infection control. Environmental sanitation in surgical settings is one preventive method because it can eliminate or reduce the likelihood of a patient’s exposure to potentially infectious microorganisms. The basic work control practices include

- prompt clean up of blood and body fluids with an appropriate germicidal disinfectant;
- proper handling and disposal of blood, body fluids, and contaminated patient care items;
- safe handling of used linen and waste; and
- proper disposal of sharps.

The environmental sanitation and terminal cleaning practices in this study guide are based on the CDC's *Guidelines for Environmental Infection Control in Health Care Facilities*

(http://www.cdc.gov/ncidod/dhqp/gl_environmentinfection.html) and AORN recommended practices. Health care facilities should use these practices to develop environmental cleaning policies and procedures. The policies and procedures should clearly establish authority, responsibility, and accountability for environmental cleaning and serve as operational guidelines. In addition, these practices should become an important component in orientation and in continuous quality improvement activities.

Three categories of cleaning are required in the OR:

- Preliminary cleaning prepares the OR before the start of the day.
- Interim cleaning is performed at the end of one surgical procedure and before the start of another surgical procedure in the same room.
- Terminal cleaning is the thorough cleaning and disinfection of the perioperative environment at the end of the day's schedule.

AORN's five Recommended Practices for Environmental Cleaning in the Surgical Practice Setting include the following stipulations:

1. Patients should be provided a safe, clean environment.
2. During surgical procedures, contamination should be confined and contained within the immediate vicinity of the surgical field to the degree possible.
3. After each surgical procedure, a safe, clean environment should be reestablished.
4. Surgical procedure rooms and scrub/utility areas should be terminally cleaned daily.
5. All areas and equipment in the surgical practice setting should be cleaned according to an established schedule.

These five core practices are guidelines that can be applied to any surgical practice setting. Used consistently, they help prevent infection by reducing the possibility of cross-contamination.

Environmental Cleaning--Recommended Practice I: Patients should be provided a safe, clean environment.⁷

Each health care facility establishes its own environmental routine to meet its specific needs. In most facilities, the environmental services personnel and the perioperative personnel work together as a team to ensure a clean perioperative environment.

The surgical team members usually prepare the room before the first procedure of the day and perform interim cleaning duties following each case. The environmental services team is responsible for terminal cleaning duties.

Although environmental cleaning is a team effort, the ultimate responsibility for ensuring a clean surgical environment rests with perioperative nurses.

Universal/Standard Precautions

Universal precautions (sometimes referred to as standard precautions) are a set of precautions designed to prevent transmission of bloodborne pathogens. All patients are considered potentially infectious for human immunodeficiency virus (HIV), HBV, and other bloodborne pathogens, regardless of the procedure being performed.⁸ Complying with universal/standard precautions reduces the risk of cross-infection, reduces health care acquired infections, and protects health care practitioners.

Precautions include hand washing; using personal protective equipment (PPE), which includes gloves, masks, eye protection, face shields, and gowns appropriately; implementing safe sharps practices; and cleaning and disinfection of environmental surfaces.

Basing sanitation programs on universal precautions helps reduce the risk of transmitting pathogens from known and unknown sources of infection. Universal/standard precautions also eliminate the need for special cleaning procedures for patients likely to disperse pathogens to other patients or personnel, during what are often referred to as "dirty cases"⁹ (contaminated cases).

The ultimate goal of environmental cleaning procedures is to protect both patients and personnel from exposure to infectious pathogens. The four elements required to accomplish this are

- the use of personal protective equipment (PPE);
- approved germicidal disinfectants;
- appropriate cleaning equipment;
- supplies; and
- segregating waste products.

Personal Protective Equipment

Personnel responsible for handling waste should wear PPE, such as gloves and masks, which prevent contact with blood or other potentially infectious materials. Hand washing guidelines should also be followed, especially immediately after removing PPE.

Disinfectants

The choice of a specific cleaning or disinfecting agent is guided by product label claims, instructions, and government regulations. A facility-approved Environmental Protection Agency (EPA) registered disinfectant should be used to clean floors, furniture, and equipment in the OR. To be labeled as an EPA-approved disinfectant, each product must pass a test showing it is effective against three organisms: *Salmonella choleraesuis*, *Staphylococcus aureus*, and *Pseudomonas aeruginosa*.¹⁰ Products that pass these tests are also considered to be effective against HIV, HBV, HCV, and herpes.

The benchmark of potency is that the product is effective against *Mycobacterium tuberculosis*. The CDC designates any EPA-registered hospital disinfectant with a tuberculocidal claim as an intermediate-level disinfectant. Any EPA-registered hospital disinfectant without a tuberculocidal claim is designated as a low-level disinfectant.

Low- to intermediate-level environmental surface germicides are used in most hospitals. Product labels specify indications for use of the product and provide information on the range of its microbial activity. Material safety data sheets (MSDS) provide precautions and other information regarding disinfectants.

Appropriate Cleaning Equipment and Supplies

One element of environmental sanitation is using the appropriate cleaning equipment and supplies. For example, the cloths that are used to wipe surfaces within the surgical suite should be soft, absorbent, and of a material that doesn't generate its own lint. Low-lint or lint-free cloths meet this requirement. Squeeze-bottles should be used for dispensing disinfectants, not spray bottles.

A wet vacuum is the preferred method for floor cleaning in the OR, especially for procedures that generate large amounts of fluid and debris.¹¹ The advantage to using a wet vacuum is that it can first be used dry to pick up large amounts of debris and then wet. If the facility doesn't have access to wet vacuum cleaning equipment, a wet-mop system may be used instead.

The two options to the wet-mop system include:

1. Using one mop and changing the germicidal agent after the mop head is dipped into the solution, or changing mop heads. It is important to dip the mop into the disinfectant solution only once, to prevent contaminating the solution.
2. Using two mops - one mop to apply the solution and a second mop to take up the solution. Mop heads are changed after each case and disposed of according to hospital policy.

Other supplies used for environmental sanitation include mechanical floor scrubbers, plastic liners, gloves, laundry bags, disposable suction tubing, suction containers, utility carts, and covered carts for linens and trash disposal.¹²

Segregating Waste Products

There are two kinds of waste products that enter a facility's waste stream: infectious and noninfectious. It is estimated that only 15% to 20% of a facility's waste is infectious.

Infectious waste is sometimes referred to as hazardous (or biohazardous) waste, regulated waste, medical waste, or red-bag waste. Infectious waste includes, but is not limited to, sharps used in patient care, sharps

containers, pathological wastes, blood products, bloody gauze or dressings, syringes, and suction canisters. Disposal of infectious waste is governed by local, state, and federal regulations. Some states allow incineration of infectious waste; others require disposal in a permitted landfill.

Noninfectious waste is general waste, such as regular trash, dry, non-patient contact packaging, unused supplies, clean plastics, Styrofoam, and paper products. Approximately 80% to 85% of a facility's waste is noninfectious.

Waste is segregated at the point of generation to decrease the volume of infectious waste and decrease medical waste disposal fees. Color-coded and labeled bags are used to sort infectious waste from noninfectious waste. Red-bag waste, or biohazardous waste boxes, includes only potentially infectious medical waste products. Recycling containers allow for materials to be sorted early in the waste process.

Preliminary Cleaning

Proper preparation of the procedure room is essential to an effective surgical outcome.¹³ Preliminary cleaning is completed by the circulator and the scrub nurse, with help from environmental services, before the first scheduled surgical procedure of the day.

The room is visually inspected first, and then clutter is reduced by removing any furniture, equipment, or supplies that are not needed for the procedure. Furniture is arranged away from the traffic pattern.

One of the main environmental hazards found in the OR is dust.¹⁴ Horizontal surfaces must be damp-dusted with a hospital-approved disinfectant solution, using a clean, lint-free cloth. Surfaces are damp-dusted, using friction, starting with higher surfaces and working down to the lower levels. Furniture, surgical lights, flat surfaces, and all portable or mounted equipment are damp-dusted.

Damp-dusting is effective in reducing microbial contamination by as much as 90% to 99%.¹³ Some nurses

have questioned whether flat surfaces need to be damp-dusted before the day's first procedure, because the OR was terminally cleaned during the night shift. Damp dusting is an important infection control method. No matter how effective terminal cleaning practices are or how efficient the air ventilation or filtration system is, dust will deposit on horizontal surfaces overnight and must be removed.¹⁵

The sterilizers and countertops in the adjacent sub-sterile areas are also damp-dusted. If needed, damp-mop the floor. If additional equipment is needed for the procedure, it must be damp-dusted before being brought into the room.

Environmental Cleaning--Recommended Practice II: During surgical procedures, contamination should be confined and contained within the immediate vicinity of the surgical field to the degree possible.⁷

Confine and contain is a principle that promotes prompt cleanup of items contaminated with blood, tissue, or body fluids by keeping contamination confined to a small, defined area around the patient. It is important to minimize the possibility of tracking contaminated material into other areas or allowing materials to dry and become aerosolized. Prompt cleanup and decontamination of potentially infectious materials helps maintain a safe, clean surgical environment.

There are 10 basic steps for confining and containing contamination:

1. Use gloves, gowns, protective eyewear, and instruments when handling contaminated items.
2. Wipe up small spills (ie, less than 10 mL) or organic debris with a low-lint cloth and approved disinfectant.
3. Wipe up larger spills using special absorbing agent.
4. Do not use spray bottles to apply disinfectant to spills because they might contaminate the sterile field.
5. Discard the contaminated cleaning cloth into an impervious container.

6. Use color-coded or labeled, leak-proof containers for specimens, blood, or other potentially infectious tissue. Place the original container in a second container if it leaks or otherwise becomes contaminated.
7. Discard soiled sponges into a plastic-lined kick bucket or similar receptacle.
8. Count sponges by placing them in a sponge counter, clear plastic bag, or other impermeable receptacle.
9. Pick up surgical instruments that fall on the floor, and submerge them in a pan of germicidal detergent to prevent debris from drying.¹⁶
10. Remove and dispose of soiled shoe covers, if used, before leaving the procedure room.

Environmental Cleaning--Recommended Practice III:

After each surgical procedure, a safe, clean environment should be reestablished.⁷

Interim cleaning of the OR/procedure room is performed at the end of each case after a patient leaves the OR. The goal is to prepare the environment for the next patient. Interim cleaning breaks the cycle of contamination from patient to environment and from environment to OR personnel and subsequent patients.¹⁷ The circulating nurse and scrub person usually are responsible for cleanup between procedures. Environmental services personnel also should be involved in room turnover activities.

The key to interim cleaning is to contain potential contamination (from wet linens, soiled sponges, sharps, and biohazardous waste) in impervious containers. Disposable items should be processed according to local, state, and federal regulations and AORN's "Recommended Practices for Environmental Responsibility in the Surgical Practice Setting." Reusable items should be processed according to written policies and procedures.

The following is a checklist for interim cleaning.

- Scrub equipment and furniture are considered contaminated following a procedure.
- Bag soiled linen and used, disposable items in fluid-impervious bags before removing them from

the room.

- Discard soiled sponges, other bloodied waste, and contaminated items into appropriate biohazard waste receptacles.
- Discard unused sponges, nonwoven drapes, and other nonbloody disposable waste into the regular trash receptacle or separate for recycling.
- Discard blades, needles, and other sharps in a puncture-resistant, biohazard-labeled container. **Never** discard blades, needles, and other sharps into any other receptacle.
- Follow policies for processing and transporting instruments to the cleaning location in closed carts.
- Place single-use devices in appropriate containers for reprocessing.
- Dispose of fluid in impervious containers, and seal for transport or dispose of containers according to environmental regulations. Carefully handle all containers with blood, body fluids, disinfectant solutions, and other hazardous waste products.
- Add an isolyser (if used in the facility) to solidify contaminated fluids in containers. Dispose of suction system contents according to regulations.
- Dispose of red bags in specially marked containers.
- Remove linens and noncontaminated trash from room.
- Seal and discard sharps containers, if full.
- Wipe down all horizontal surfaces, including the anesthesia machine, using a lint-free cloth moistened with an approved disinfectant.
- Wipe down unnecessary furniture and equipment; remove it from room.
- Clean OR bed thoroughly, including all surfaces of the mattress, pads, and screw connections.
- Wipe the outside of lights and the inside of light reflectors; spot wipe arms as needed.
- Inspect and disinfect kick buckets, hampers, and similar receptacles.
- Clean the floor, using a wet vacuum or mop. If using a mop, follow these procedures:
 - a. Use a new or freshly laundered mop head.
 - b. Use new disinfectant solution for each OR suite after each case, or use a separate mop head for each room and dip in the disinfectant solution only once, or change mop heads.

- c. Mop 3 to 4 feet around the OR bed; extend outward if necessary to clean any visibly soiled areas. Let floor dry.
 - d. Dispose of mop head in an appropriate receptacle.
 - e. Move the OR bed to check for items that may be under the table.
- Visually check walls, and clean if splashed with blood or other debris.
 - Reposition furniture.
 - Clean transport vehicles by wiping the vehicle, nondisposable straps, and attachments.
 - Remove gowns and then gloves, and place them in proper receptacles before leaving the OR.¹⁸

Prepare the room for the next case by first washing hands and then replacing the liners and bags in the trash and linen receptacles, reassembling the suction canisters, and preparing the OR bed.¹⁹

Environmental Responsibility—Recommended Practice VI: Recycling programs should be an integral part of health care facilities' policies and procedures.⁸

United States health care organizations generate millions of tons of waste each year. This waste has a negative effect on the environment and on hospital budgets. Infectious waste alone can consume as much as 20 percent of a hospital's annual budget for environmental services.²⁰

Disposing of infectious waste is regulated, and strict waste management rules must be followed. Approximately 85 percent of waste generated in hospitals, however, is noninfectious. A large amount of that noninfectious waste is generated in the OR.²¹ This waste can be classified as general refuse and is similar to the kind of waste that is collected in nonmedical industries.

Health care personnel can work together to conserve resources in their facility with the same conservation efforts they practice at home: reduce, reuse, and recycle. AORN provides the "Recommended Practices for Environmental Responsibility" to guide perioperative personnel in reducing the environmental effects of their practice settings.

Many hospitals have implemented policies requiring their purchasing departments to reduce waste by purchasing reusable, durable goods or using reusable containers instead of disposable packaging.²¹ Hospitals, like many other businesses, are also involved in recycling paper, cardboard, and plastics. Some of the recyclables in perioperative settings²² include

- high density polyethylene containers for dialysis solutions, food stuffs, and cleaning solutions,
- polypropylene (eg, sterile irrigation fluid bottles, blue wrap),
- polystyrene (eg, food service, supply packaging),
- aluminum and metal cans,
- glass,
- paper,
- cardboard, and
- batteries.

The benefits of a recycling program can go further than being good for the environment and making economic sense for the hospital. A recycling program can provide humanitarian benefits when unused surgical supplies and medical equipment are donated to nonprofit health care organizations for use overseas. Perioperative personnel can help these humanitarian efforts by collecting medical supplies and equipment such as

- bandages,
- dressings,
- sutures, and
- old or obsolete equipment and instruments.

Charitable Organizations

The following nonprofit, volunteer organizations need medical supplies and equipment. Each web page explains the organization's mission and its needs for donated equipment:

- Global Aid Network (www.gainusa.org)
- Healing the Children (www.healingthechildren.org)
- Peaceworks (www.peaceworks.org)
- Global Health Ministries (www.ghm.org)
- World Medical Missions (www.samaritanspurse.org)

Environmental Cleaning—Recommended Practice IV: Surgical procedure rooms and scrub/utility areas should be terminally cleaned daily.⁷

Terminal cleaning is the thorough cleaning and disinfection of the perioperative environment and is performed at the end of the day's schedule. Terminal cleaning is performed in all surgical procedure rooms, scrub areas, and utility areas.

Operating rooms in which procedures may be preformed, regardless of whether they have been used, should be terminally cleaned once during each 24-hour period during the regular work week. Each facility should define its work week. Large facilities may schedule Sunday through Saturday; ambulatory surgery centers may schedule Monday through Friday. If the facility provides 24-hour services, a protocol should be established so that all designated areas are cleaned once during each 24-hour period.²³

This terminal cleaning is required even if the room was not used during the 24-hour surgery period. Monitoring traffic in and out of the ORs that are not in use is difficult. Personnel who enter unused operating rooms for supplies and equipment may carry microorganisms into the room on their shoes or clothing.²⁴ Opening and closing OR doors also stirs up accumulated dust and lint particles, which then settles on furniture and equipment.

In addition to the areas that are cleaned during interim cleaning, terminal cleaning requires a good physical cleaning. In addition to an approved disinfectant, friction is probably the most important ingredient for cleaning.²⁴

The areas to be cleaned should include

- surgical lights and their external tracks,
- fixed and ceiling-mounted equipment,
- furniture and equipment, including wheels and casters (this includes step stools, foot pedals, telephones, and light switches),
- cabinet handles and push plates,
- horizontal surfaces (eg, counter tops, open shelving, sterilizers),
- air-handling vent covers,

- substerile areas,
- scrub sinks,
- kick buckets,
- scrub and utility areas, and
- halls and floors.

All furniture is thoroughly scrubbed with the approved disinfectant. All removable parts are disassembled and cleaned with the disinfectant. Casters and wheels should be cleaned and any debris removed. Spot clean walls as needed.

Floor Cleaning Best Practices

To clean the floor, remove furniture and flood the floor, half the room at a time with a detergent-disinfectant solution. This solution may be dispensed from a pump sprayer or automatic spraying device attached to a central vacuuming system or with a watering can. The water is left to sit for at least five minutes and then vacuumed.

If a wet-mop system is used, the mop head should be dipped into the solution only once when it is clean, unless the disinfectant solution is changed after each use. Re-dipping the mop head into the solution can potentially contaminate the solution.

A two-mop system may also be used. One mop applies the solution and a second mop takes up the solution. Because bucket solutions can become contaminated during cleaning, the cleaning solution must be changed frequently. If the contaminated solution continues to be used, microorganisms will be transferred to each subsequent surface to be cleaned. The mop head should be changed after each case and properly disposed of.

Whether a wet vacuum or wet-mop system is used, the cleaning items must be disassembled and decontaminated after use. Mop heads and cloths should be laundered and allowed to dry before reuse. Mop handles should be wiped down or discarded. A wet vacuum must be disassembled and disinfected and allowed to dry before reassembly.

The furniture is replaced when the floor is dry and clean linen is placed on the OR bed.

Environmental Cleaning--Recommended Practice V: All areas and equipment in the surgical practice setting should be cleaned according to an established schedule.⁷

In addition to the preliminary, interim, and terminal cleaning, a schedule is set for weekly and/or monthly cleaning by environmental services staff members with assistance from surgical services staff members. A checklist of cleaning activities should be developed and implemented, such as:

- Return ventilation and heating system grills
- Recessed ceiling tracks
- Storerooms
- Closets, cabinets, and shelves
- Sterilizers, warming cabinets, and refrigerators
- Ice machines
- Solution dispensers (refillable soap dispensers are not recommended)
- Kick buckets (washed and sterilized)
- Cleaning equipment (disassembled, cleaned with disinfectant and dried before storage)
- Offices, lounges, lavatories, and locker rooms

Ceilings, walls, vents, cupboards and drawers should be cleaned on a periodic basis.

All cleaning equipment should be disassembled, cleaned with an approved disinfectant, and dried before storage. Cleaning in this manner prevents growth of microorganisms during storage and prevents subsequent contamination of the surgical setting.

SUMMARY

Prevention is the key to infection control. Environmental cleaning in surgical settings decreases contamination risks and helps prevent nosocomial infection in patients.

Although environmental cleaning is a team effort, the ultimate responsibility for ensuring a clean surgical environment rests with perioperative nurses. There are three categories of cleaning in the OR: preliminary cleaning, interim cleaning, and terminal cleaning. All cleaning procedures should be completed consistently. Patients should be provided a safe, clean environment in the surgical setting; contamination should be confined and contained during surgical procedures; a safe, clean environment should be reestablished after each procedure; procedure rooms and scrub areas should be terminally cleaned daily; and all areas should be cleaned according to an established schedule. The goal of environmental cleaning procedures is to protect both patients and personnel from exposure to potentially infectious pathogens.

GLOSSARY

Cleaning - A form of decontamination that renders environmental surfaces safe to handle. The process by which any type of soil, including organic material, is removed. Cleaning is accomplished with detergent, water, and scrubbing action.

Confine and contain - A principle that promotes prompt cleanup of items contaminated with blood, tissue, or body fluids, and keeps contamination in a defined area.

Contaminated - The presence of potentially infectious pathogenic microorganisms on animate or inanimate objects; unsterile.

Cross-contamination - The presence of potentially infectious pathogenic microorganisms that are transferred from patient to patient, from inanimate objects to patient, or vice versa.

Decontamination - The process by which contaminants are removed, either by hand or mechanical means, using specific solutions capable of rendering blood and debris harmless and removing them from the surface of an object or instrument.

Disinfection - A chemical or physical process of destroying all pathogenic microorganisms, except spores, on inanimate objects or surfaces.

Exogenous - From a source other than the patient (eg, personnel, equipment, the environment, instruments, supplies).

Facility-approved agent - A microorganism-killing agent that has been registered with the EPA. The EPA classifies agents as sporicides, general disinfectants, hospital disinfectants, detergents, sanitizers, or able to kill other specific organisms.

Infectious waste - Medical waste that is contaminated with blood, body fluids, or contaminated sharps that is capable of producing infectious diseases.

Interim cleaning - Cleaning that is performed at the end of one surgical procedure and before the start of another surgical procedure in the same room.

Intermediate-level disinfection - A process that kills *Mycobacterium tuberculosis*, vegetative bacteria, most viruses, and most fungi, but does not necessarily kill bacterial spores.

Low-level disinfection - A process that kills most bacteria and some viruses and fungi, but cannot be relied on to kill resistant microorganisms such as *Mycobacterium tuberculosis* or bacterial spores.

Organic debris - Blood, tissue, and body fluids.

Personal Protective Equipment (PPE) - Specialized equipment or clothing designed to protect personnel from direct exposure to blood, tissue, or body fluids (eg, gowns, gloves, eye protection, masks).

Reusable - Any product or piece of equipment intended by the manufacturer for multiple uses.

Regulated medical waste - Sharps (both used and unused); pathological waste; human blood; cultures and stocks of infectious agents; discarded materials including carcasses, body parts, fluids, blood, or bedding originating from animals known to be contaminated with infectious materials.

Segregation - Separation of infectious waste from other types of medical waste at the point at which material becomes waste.

Terminal cleaning - Thorough cleaning and disinfection of the perioperative environment at the end of each day's schedule.

Universal precautions - A set of precautions designed to prevent transmission of bloodborne pathogens. All patients are considered potentially infectious for HIV, HBV, and other bloodborne pathogens.

Waste stream - Flow of discarded materials and fluids that eventually return to the land, water system, and air.

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NOTES

POSTTEST

1. Nearly two million patients acquire a nosocomial infection each year.
 - a. True
 - b. False
2. The primary way in which microorganisms are transferred from the environment to the patient is through
 - a. airborne transmission of dust particles.
 - b. transmission of microorganisms through a person with a clinical disease.
 - c. hand contact with contaminated surfaces.
 - d. allowing contaminated material to dry and become aerosolized.
3. The key to infection control is
 - a. terminal cleaning.
 - b. prevention.
 - c. confine and contain.
 - d. Environmental Protection Agency (EPA)-regulated disinfectant use.
4. Environmental services team members usually prepare the room before the first procedure of the day.
 - a. True
 - b. False
5. One aspect of universal/standard precautions is
 - a. segregating waste products in the operating room.
 - b. considering all patients to be potentially infectious.
 - c. assuring interim cleaning is completed before each new case.
 - d. selecting the appropriate EPA-regulated disinfectant.
6. The preferred method for cleaning floors in the OR is a
 - a. wet-mop system with one mop.
 - b. wet-mop system with two mops.
 - c. wet-vacuum.
 - d. combination of wet-mop with wet-vacuum.
7. When damp-dusting during preliminary cleaning, it's best to start with flat surfaces such as tables and furniture.
 - a. True
 - b. False
8. The principle of confine and contain means to
 - a. use gloves and other protective equipment to confine and contain contaminated items.
 - b. count sponges by confining and containing them in a sponge counter, clear plastic bag, or other impermeable receptacle.
 - c. contain contaminated cleaning cloths in an impervious container.
 - d. confine contamination to a small defined area around the patient.
9. Interim cleaning of the OR/procedure room is performed at the end of each day in order to prepare the environment for the next patient.
 - a. True
 - b. False
10. The key to interim cleaning is to contain potential contamination from
 - a. wet linens.
 - b. soiled sponges.
 - c. biohazardous waste.
 - d. all of the above.
11. Operating rooms should be terminally cleaned daily, unless there were no procedures performed within 24 hours.
 - a. True
 - b. False

12. Probably the most important ingredient for cleaning is
 - a. using strong mechanical friction.
 - b. use of a low-level disinfectant.
 - c. use of an intermediate-level disinfectant.
 - d. attention to universal/standard precautions.
13. During terminal cleaning, casters and wheels on equipment or furniture should be cleaned and any debris removed.
 - a. True
 - b. False
14. The best practice for terminal cleaning of the procedure room floor is to mop 3 to 4 feet around the OR bed, and extend cleaning outward if necessary to clean any visibly soiled areas.
 - a. True
 - b. False
15. Whether a wet-vacuum or wet-mop system is used, the cleaning items must be disassembled and decontaminated after use.
 - a. True (correct)
 - b. False
16. The majority of waste generated in hospitals is regulated waste and must be disposed of following state, local, and federal regulations.
 - a. True
 - b. False
17. The Centers for Disease Control and Prevention (CDC) and AORN present guidelines for cleaning ceilings on a weekly basis.
 - a. true
 - b. false
18. Which of the following is not a requirement of interim cleaning?
 - a. Clean sterilizers and warming cabinets.
 - b. Clean transport vehicles.
 - c. Dispose of red bags in specially marked containers.
 - d. Wipe outside of lights and inside of light reflectors.
19. _____ is effective in reducing microbial contamination by as much as 90%?
 - a. Prompt cleanup of items contaminated with blood
 - b. Removing soiled shoe covers before leaving procedure room
 - c. Damp-dusting
 - d. Wearing gloves, mask, and face-shield
20. Special cleaning procedures should be used for patients likely to disperse microbes of risk to other patients.
 - a. True
 - b. False

- 1. A
- 2. C
- 3. B
- 4. B
- 5. B
- 6. C
- 7. A
- 8. D
- 9. B
- 10. D
- 11. B
- 12. A
- 13. A
- 14. B
- 15. A
- 16. B
- 17. B
- 18. A
- 19. C
- 20. B

Answer sheet for Environmental Sanitation
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