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AST Guidelines for Best Practices for Laundering Scrub Attire

Introduction

The following Guidelines for Best Practices were researched and authored by the AST Education and Professional Standards Committee, and are AST approved.

AST developed the Guidelines to support healthcare delivery organizations (HDO) reinforce best practices in laundering scrub attire as related to the role and duties of the Certified Surgical Technologist (CST®), the credential conferred by the National Board of Surgical Technology and Surgical Assisting. The purpose of the Guidelines is to provide information OR supervisors, risk management, and surgical team members can use in the development and implementation of policies and procedures for laundering scrub attire in the surgery department. The Guidelines are presented with the understanding that it is the responsibility of the HDO to develop, approve, and establish policies and procedures for the surgery department regarding laundering scrub attire practices per HDO protocols.

Rationale

Laundering scrub attire is a controversial subject, particularly regarding home laundering. Before further discussion Table 1 is a summary of literature reviews and studies.

Table 1

Study	Description of Study	Results	Conclusion
Experimental; Twomey, et al, 2010[1]	80 surgical scrubs prior to use & after use collected from HDOs across the U.S. 10 sets of scrubs in ea. category: single-use; home-laundered; facility-laundered; 3rd-party laundered.	* No statistical difference in bacterial contamination among facility-laundered, 3rd-party laundered, or single-use scrubs prior to use. * Bioburden found on home-laundered scrubs prior to use was significantly greater than on any of the other scrubs that had been worn for a day in the OR.	Study indicates that home-laundering is not effective as facility- or 3rd-party laundering. An OR person wearing home-laundered scrubs who is beginning a shift is wearing scrubs that have the same number of bacteria as the scrubs of an OR person finishing a shift.
Experimental; Nordstrom, et. al, 2012[2]	29 unwashed OR scrub swatches from unwashed OR scrubs that were facility-laundered, home-laundered, new cloth, & new single-use.	* 23 of the swatches were positive for some type of gram-positive cocci. * 44% of the home-laundered scrubs were positive for coliform bacteria.	Home-laundered scrubs had a significantly higher total bacterial count than facility-laundered scrubs, new scrubs or single-use scrubs.
Experimental; Neely & Maley, 2000[3]	Determine the survival of 22 gram-positive bacteria on common HDO materials: 100% cotton, 100% cotton terry, 60%/40% polyester blend, 100% polyester, 100% polypropylene.	* All staphylococci survived for at least 1 day on all fabrics & plastics; viability was longest on polyester & polyethylene plastic. * Enterococci lived longer than staphylococci on all the fabrics & plastics.	Data indicates staphylococci & enterococci can survive long periods of time on materials commonly worn by patients & HCP. Since scrub suits are blends of material, it can be assumed these fabrics could be vectors for the spread of staphylococcal & enterococcal organisms.
Experimental; Heinzel, et. al, 2010[4]	A new in situ method was used to show that conventional washing detergents have a full virucidal efficiency at	* The washing process with tap water insufficiently removed virus particles from	The washing process must be carefully monitored as to temperature & quality of water

	40° C (104°F) against non-enveloped viruses.	contaminated swatches & caused transfer of the viruses to the washing fluid. * Using laundry detergent the virus particles were removed from the swatches.	including use of the proper quantity of detergent to be effective.
Experimental; Gerba & Kennedy, 2007[5]	Enteric viruses (adenovirus, HAV, rotavirus) were applied to cotton cloth swatches to determine if the viruses could survive the wash cycle, rinse cycle, and 28-min. permanent press drying cycle as commonly practiced in households in the U.S.	* Washing with detergent alone was not effective in removing or inactivating enteric viruses; significant concentration of rotavirus and HAV were confirmed on the swatches. * Viruses were transferred from contaminated cloths to uncontaminated cloths. One item of heavily contaminated clothing can contaminate the entire laundry load. * Use of sodium hypochlorite (bleach) had a significant impact on virus reduction.	* Use of sodium hypochlorite is necessary to significantly reduce the number of viruses. * Washing in warm or hot water does result in a greater reduction of viruses. However, it is estimated that only 5% of all home laundering in the U.S. currently is done with hot water.
Descriptive pilot study; Kiehl, et. al, 1997[6]	2-year study to determine the effect of wearing home-laundered scrubs in labor & delivery on the perinatal infection rate. 68 participating employees laundered their scrub attire in home automatic washing machines & automatic dryers on the hot setting.	The perinatal infection rate prior to the start of the study was 1.7% & at the end of the study 1.0%	Conclusion of authors reporting results of the study was home-laundering of scrub clothing is safe. However, the decrease in the perinatal infection cannot be attributed directly to home-laundering; the employees participating in the

			study may been more cognizant of improving other infection-control practices prompted by the study, such as better hand hygiene.
Literature review; Belkin, 2001[7]	Literature review of studies and guidelines (CDC, NIOSH).	n/a	Based upon the available studies & guidelines, Belkin concludes that the requirement to have soiled scrubs facility-laundered is "indefensible and simply predicated on the "that's the way we've always done it" syndrome".[7]
Literature review; Fijan & Turk, 2012[8] **(AORN 96)**	Literature review of laundering of HDO textiles.	n/a	Evidence is inconclusive and varied. Many factors not taken into consideration or controlled when studies were performed.
Literature review; Vera, et. al, 2016[9]	Literature review of laundering methods of reusable surgical scrubs.	n/a	Evidence shows that hospital uniforms become contaminated during patient care activities. But the evidence for laundering scrub attire is limited, and most of the research focuses on laundering linens that have been artificially inoculated with microbes. Therefore, the evidence for home laundering versus HDO- or commercial-facility laundering is

			insufficient to draw any conclusions.
Literature review; Ban, et. al, 2016[10]	American College of Surgeons (ACS) 2016 update of surgical site infection guidelines based upon literature reviews.	n/a	Even though The Joint Commission & AORN only support facility-laundered scrub attire, ACS indicates "there is limited evidence to support recommendations on surgical attire". The authors further state the opinion that "multiple studies have shown no increase in SSI with home laundering of scrubs."

The studies don't directly link the presence of microorganisms on scrub attire/fabrics to causing *surgical site infections* (SSI) or even increasing the risk of SSIs. Additionally, it is recognized there is a lack of definitive research involving home laundering that includes addressing all the controls in a study, e.g., water temperature; dryer temperature; length of time scrub attire is washed and dried; type of detergent that is used; if sodium hypochlorite) bleach is used; ratio of detergent and other chemicals to water[11]; size of load(s); mixture of clothing or only scrub attire laundered; level of contaminants on the scrub attire and level of debris/dirt on other clothes; and quality of water. Other limitations of studies include they only examined in-vitro situations that do not reflect what actually occurs and studies that do not involve the surgery environment, therefore, the results and conclusions may not be applicable.[11] However, most of the evidence in studies establish that home-laundering is ineffective for removing microorganisms from scrub attire and thus, the **possibility exists** that patients, healthcare personnel (HCP), and the community is at-risk for developing life-threatening infections when scrub attire is home laundered. Additionally, biofilms can form inside washing machines and the biofilm containing the microbes introduced into the washing machine by used scrub attire are more resistant to chemicals and temperatures.[12]

SSIs account for 20% of all HAIs.[10] 77% of mortality in patients that acquired a SSI is attributed to the infection itself.[14,15] The incidence of SSI is 2% to 5% for inpatient surgery.[14] Estimates of annual incidence varies, ranging from 160,000 – 300,000 cases in the U.S.[14,15] SSI is the costliest of HAIs in the U.S. with an annual estimated cost at $3.5 to $10 billion.[14] The average extended length of stay due to a SSI is 9.7 days and increases the cost of the hospitalization by more than $20,000 per admission.[14] More than 90,000 readmissions annually are attributable to SSIs costing an additional $700 million annually.[14] Up to 60% of SSIs are estimated to be preventable based upon the use of evidence-based measures.[14] The number of studies confirming the inadequacy of home laundering support the preventability of SSIs by strengthening the evidence-based measure that scrub attire should only be facility laundered.

One of the most important duties that HCP have towards patients is to protect them from acquiring a healthcare-associated infection (HAI) that can be life-threatening; this is particularly important to surgery personnel whose professional lives revolve around the principles of asepsis.[15] If the **possibility exists** that microorganisms could be transferred to family members, community members, patients, and other HCP, as well as place the person wearing the scrub attire at risk due to the ineffectiveness of home-laundering, then HCP have the ethical and moral duty to take the proper steps in preventing that possibility from occurring. Patients place their trust in HCP to provide the safest care possible daily and supporting home-laundering violates that trust.

Evidence-based Research and Key Terms

The research of articles, letters, nonrandomized trials, and randomized prospective studies is conducted using the Cochrane Database of Systematic Reviews and MEDLINE®, the U.S. National Library of Medicine® database of indexed citations and abstracts to medical and healthcare journal articles.

The key terms used for the research of the Guidelines include: cardiac surgery surgical site infections; family protection; hygiene; home laundered scrubs; home laundering scrub attire; isolation precautions; infection control; laundry; hospital textiles; reusable surgical textiles; surgical site infections. Key terms used in the Guidelines are italicized and included in the glossary.

Guideline I

Scrub attire should be laundered in an accredited HDO or commercial laundry facility to reduce the risk of cross-contamination at home, community, and perioperative environment. The facility or commercially laundered scrub attire should be donned by all surgery personnel prior to entering a semi-restricted or restricted area of the surgery department.

1. *Home laundering scrub attire* is not recommended. AST concludes there is enough evidence to support home laundering does not sufficiently reduce the number of microbes to a safe level on used scrub attire creating the possibility of transferring pathogens in the following ways:
    - pathogens are transferred from the used scrub attire to clothes contained in the washer or dryer load that are worn daily by family members,
    - pathogens are transferred to the inner surfaces of the home washing machine or dryer that can survive and contaminate subsequent *laundry* loads,
    - hands of family members can be contaminated when transferring wet laundered clothes to the dryer,
    - surgical patients are exposed to cross-contamination when surgical personnel wear home-laundered scrub attire that is still contaminated.[1-5]

    A. Two articles reported multiple cases of *Gordonia bronchialis* SSIs following cardiac surgery that involved surgery personnel wearing home-laundered scrub attire.

        1) Wright, et. al[12] reported three cases of *G. bronchialis* postoperative sternal wound infections following open heart surgery. A nurse anesthetist had reported dermatitis on her forearm. Cultures of the home-laundered scrub attire, axilla, hands and purse were taken of the nurse anesthetists and her roommate who was a RN at the same facility. The cultures were positive for four strains of *G. bronchialis*; one strain was found on the nurse anesthetist,

her RN roommate and two of the patients. A second strain was also found on the nurse anesthetists and one of the patients. When informed of the culture results, the nurse anesthetist discontinued home laundering scrub attire and decontaminated her home, but unfortunately got rid of the front-loading washing machine before it could be cultured. Subsequently, the nurse anesthetist and RN tested negative for *G. bronchialis*. The three patients were readmitted to the HDO three weeks to eight months postoperatively with deep sternal wound infections caused by *G. bronchialis*. The patients required debridement, skin grafts and intense intravenous and oral antibiotic therapy. The conclusion of the authors is that the home washing machine was the likely source of the bacterial reservoir. The authors recommended that scrub attire should be hospital-laundered to reduce the risk to patients of acquiring an SSI. This is the first report that comes closest to establishing a link between home-laundered scrub attire causing cross-contamination and surgical patients experiencing a catastrophic, costly SSI.

2) A year after the Wright report, Nguyen, et. al[13] reported an outbreak of sternal SSIs among cardiac patients in a Florida community hospital that performs approximately 400 open heart procedures per year; the outbreak was reported to the Florida Department of Health and the CDC. More than eight pathogens were identified; however, four of the patients were positive for *G. bronchialis*. *Staphylococcus aureus* was identified from hand cultures of a RN, perfusionist and surgeon. *Escherichia coli* was identified from the hand culture of a nurse anesthetist. Three of the case-patients were identified as having SSIs caused by *G. bronchialis*. The conclusion of the authors based upon the on-site investigation suggested that the cause of the environmental contamination that lead to the outbreak was multifactorial, including wearing home-laundered scrub attire and fleece jackets in the cardiovascular ORs (CVOR) that could have been contaminated with *G. bronchialis* and/or any of the other eight pathogens; suboptimal CVOR pressure and humidity control; wearing non-OR attire in the CVOR; inadequate cleaning/disinfection of the CVOR; and failure to implement correct *infection control* precautions during remodeling of two CVORs. Following the investigation, the hospital improved general infection control practices by emphasizing proper practices regarding hand *hygiene*, facility-laundered scrub attire, and cleaning/disinfection of the CVORs.

B. Home laundering creates the possibility of causing harm by not protecting the HCW performing home laundering, family members, HCP, patients, and the community from exposure to life-threatening bloodborne pathogens or OPIM. The National Institute for Occupational Safety and Health (NIOSH) has published two important reports that focus on the threats of disease transmission from pathogens carried on workers clothing into the home. The *Report to Congress on Workers' Home Contamination Study Conducted Under the Workers' Family Protection Act* states that "infectious agents are included as hazardous substances to the extent that pathogens can be transported on a worker's person or clothing" and "home laundering of contaminated clothing exposes the launderer" and others in the

household to potential pathogens.[16] Additionally, the report included "the possibility appears to exist for bloodborne diseases such as HIV or HBV to be transported home on a worker's clothing soiled with body fluids from an infected person."[16] The report provided the following measures for preventing home contamination:

- Change clothes before going home and leaving the work clothing at work to be laundered by the employer;
- Store street clothes in a separate area to prevent their contamination; reusable scrub attire that has been worn should not be placed in an employer-provided personal locker for later donning.
- Do not remove contaminated items from the workplace;
- If laundering at home cannot be avoided, launder the contaminated clothing separate from family laundry;
- Employer informs workers of the risks to family members of home laundering and preventative measures;
- Educate physicians and other HCP to inquire about potential work-related causes of disease; and
- Develop surveillance programs to track health effects possibly related to home contamination.[16]

The second report, *Protecting Workers' Families – A Research Agenda*, supports the information in the first report further emphasizing that pathogens can be transferred into the home on worker's clothes, and HCP should not bring items used at the work setting into the home.[17] The standard ANSI/AAMI ST65: 2008/(R)2013 *Processing of reusable surgical textiles for use in health care facilities* states "after each use, all surgical textiles (e.g., gowns, drapes, wrappers, towels), including patient-care textiles should be considered contaminated and sources of infection."[18]

2. Home laundering cannot be properly monitored and therefore, cannot meet the rigorous standards that apply to accredited HDO or commercial laundry facilities. Using an HDO or commercial laundry facility that is Healthcare Laundry Accreditation Council (HLAC) accredited is recommended.
    A. Typical home washers have few settings for water temperature, and most individuals use cold or warm setting for washing and rinsing to prevent the fading of colored fabrics, such as scrub attire. Warm water setting is a combination of cold water and the hot water from the home water heater that is typically at a temperature of 482.2° C (900° F) to 593° C (1100° F). In comparison, HDO or commercial laundry facilities typically launder scrub attire at 871.1° C (1600° F) that will eliminate microbes such as *E. coli* and *S. aureus*. Additionally, detergents may be used to eliminate bacteria, but the amount and type of detergent used at home cannot be monitored, and there is no guarantee of the effectiveness of the detergents against the strains of bacteria encountered in HDOs.

    This underscores the crucial factor that home laundering cannot be monitored for adherence to consistent standards and safety, and left up to the discretion of surgery personnel as to how they complete the laundering process. A person may only use cold water and/or skip drying to prevent the scrub attire from fading or shrinking. Few, if any, home laundering situations or appliances have the

capability of duplicating commercial processes. Therefore, home laundering is not appropriate since laundry conditions cannot be effectively controlled.

B. The processes of accredited HDO or commercial laundry facilities are strictly monitored and records of the loads are maintained. The laundry facility adheres to guidelines for water and dryer temperatures; detergent concentration; use of oxidizing agents in specific, monitored amounts; water change cycles; and avoidance of overloading the washing machines and dryers. The accredited facility must meet industry standards established by HLAC through its *Accreditation Standards for Processing Reusable Textiles for use in Healthcare Facilities*.[19]
    1) Healthcare textiles must be handled, collected and transported in accordance with OSHA regulations and federal guidelines to minimize the potential exposure of patients, HCP, and laundry personnel to bloodborne pathogens or other potentially infectious material (OPIM).
    2) Ventilation standards must be met including negative pressure in the area where soiled textiles are handled and positive pressure on the clean side. The laundry facility must have 6 to 10 air exchanges per hour with the air vented to the outside of the HDO.
    3) Surfaces within the laundry facility must be kept clean and disinfected, and immediately disinfected if they become contaminated by blood or OPIM.[20]
    4) The laundry facility must have an OSHA Exposure Plan in place, and the facility provides the proper PPE that is worn by laundry workers. This includes handwashing facilities and emergency eyewash equipment located in the area(s) where soiled or contaminated textiles are handled, and liquid antiseptic hand dispensers are available in the clean textile area to promote hand hygiene among the employees.[20] Employees should perform hand washing before eating, after using the restroom, after removing gloves, and when the hands become contaminated with blood, body fluids, or OPIM.
    5) The laundry facility must provide safety training and continuing education (CE) to be completed by employees including but not limited to laundry processes, handling chemicals, use of PPE, and hand washing. The laundry facility must document the training and CE.[20]
    6) The laundry facility must keep the safety data sheets (SDS) on file for each chemical used in the facility and the employees must have easy access to the SDSs.
    7) Accredited laundry facilities use specific laundering formulas that facilitate killing microbes.[21] Different formulas are used for different types of fabric. The following is a synopsis of the multiple steps, which include all or some of the following depending on the type of fabric[21]; the most important point being home laundering cannot duplicate this process for killing microbes on textiles.

- Flushing or dilution: Use of high water levels and low temperatures to remove gross soil without “setting” stains;
- Break: Use of alkali salts to enhance soil removal and assist with microbial kill;
- Washing: Use of hot water and detergents with mechanical washing action;
- Bleaching: Use of an oxidizing agent, usually sodium hypochlorite (chlorine bleach), in defined concentrations to facilitate decontamination. Bleaching is an

important step in providing aseptically clean *reusable surgical textiles* that render them suitable for use.[18] The CDC recommends using chlorine bleach in concentrations of 50 to 150 parts-per-million (ppm) to effectively reduce the levels of microbial contamination on textiles during the laundering process.[18] Chlorine bleach has been shown to be effective in reducing bioburden on reusable textiles.[18]

- Rinsing: Use of copious amounts of water to remove suspended soil and laundry chemicals;
- Finishing: Addition of laundry sour to neutralize remaining alkalinity. Softeners, optical brighteners and antistatic agents also may be used on some fabrics.

3. Visibly soiled, wet, and/or contaminated scrub attire should be changed before subsequent procedures. Additionally, scrub attire worn during a contaminated and/or dirty procedure should be changed before subsequent procedures.[10] Clean, laundered attire should be donned to reduce the potential for cross-contamination and to protect the individual from exposure to bloodborne pathogens or OPIM.
    A. All soiled healthcare textiles must be handled per CDC Standard Precautions. Additionally, OSHA requires HDOs to launder healthcare textiles that are visibly soiled and contaminated with blood or OPIM, and must not be home-laundered.[22]
    B. Soiled reusable textiles must be collected at the point of generation such as in the OR to minimize the microbial contamination of the air and personnel handling the textiles.[18,19] The soiled textiles should be handles as little as possible; soiled textiles must not be sorted or rinsed at the point of collection, or in patient care areas.[18,22] The collection bags or containers used in the OR must be able to contain wet and/or soiled, contaminated textiles during collection and transportation.[18] The bags or containers must not tear, be leak-proof, and able to be securely closed. At the discretion of the surgery department, red-colored bags or bags labeled with the biohazardous symbol can be used, but are not required by OSHA if only soiled healthcare textiles are transported to the laundry and Standard Precautions is implemented when handling the bags.[18,19,21,22] The soiled textiles should be immediately contained and transported to the laundry facility where the sorting process takes place on the dirty side of the facility by appropriately attired personnel who are trained in handling potentially infectious soiled textiles.[18]
4. If scrub attire is worn outside the OR within the HDO, they should be covered with a clean lab coat.[10,23] The lab coat should be long-sleeved and full-length (knee length). Upon donning it should be completely fastened upon leaving the surgical department to protect the integrity of the scrub suit. Covering scrub attire eliminates the need for changing into another pair of scrub attire upon reentry into the surgical department and aid in decreasing costs.[24-27] The lab coat must be removed prior to entering the semirestricted or restricted areas of the surgery department.
    A. Scrub attire, even if covered with a lab coat, should never be worn outside the HDO.[10] If this were to occur, the individual must change the scrub attire before entering the semirestricted or restricted areas of the surgery department.

5. Facility laundered scrub attire dispensing machines may be used as a method for clean storage; decrease costs; and avert home laundering. The dispensing machines should be maintained in working order and disinfected according to manufacturer's instructions.

   Another alternative is the use of disposable (single use) scrub attire. However, there is a lack of information/studies verifying the efficacy of the use of disposable scrub attire including comfortability and cost comparison of disposable scrub attire vs. facility laundered reusable scrub attire.[16] Facilities that are considering this option should consider the following comparison of expenses: cost of disposable vs. reusable textiles; waste-management costs associated with disposables; staff expenses for collecting, sorting, cleaning and packaging reusables; energy costs to operate an on-site laundry facility or costs of contracting with a commercial facility.[21]
6. If HCP are required to home launder scrub attire, the employer should provide information to the employees regarding infection control and cleaning guidelines based on the processes performed in the facility laundry.[21] When home laundering is performed by a healthcare worker (HCW), Al-benna[28] recommends scrub attire should be:
   - laundered as the last load,
   - totally submerged in the water of the washing machine,
   - washed with the addition of bleach to the detergent,
   - washed at the maximum temperature indicated on the attire's washing and drying instructions label/tag,
   - tumbled dry at the highest temperature possible immediately after washing,
   - steam ironed to further reduce the level of microorganisms,
   - stored and transported from home in a manner that ensures cleanliness.

   Additionally, the individual should wash his/her hands after transferring the wet scrub attire from the washing machine to the dryer, and the lid or door of the washer should be disinfected prior to removing and transferring clean laundry to the dryer.[28]

Guideline II

Clean, freshly laundered scrub attire should be protected from contamination when transported from the HDO laundry or commercial laundry facility to the storage area.

1. HLAC standards for transporting scrub attire should be followed.[19]
   A. The laundry facility is responsible for either using fluid-resistant material to wrap the scrub attire in bundles or place bundled, but unwrapped scrub attire into fluid-resistant covered carts for transportation to the designated location, usually locker-rooms, where surgery personnel change into scrub attire. If the textiles are transported unwrapped, it must be lined with a hygienically clean barrier prior to placing the clean textiles inside.[19]
      1) During packaging the clean textiles should be handled as little as possible to prevent soiling or contamination.
      2) Clean and soiled textiles must not be stored in the same container.
      3) If a cart is soiled, it must be cleaned by either steam cleaning, cleaning with a detergent or water, or use of an Environmental Protection Agency (EPA) registered disinfectant. The EPA-registered disinfectant must be used according to the instructions on the label. The reusable cover must also be washed and dried.

4) If a cart is used to transport soiled textiles, it must be cleaned before next use, no matter if it is used to transport clean or soiled textiles. Reusable textile covers and liners must also be washed and dried before using again.
5) If clean and soiled textiles are transported by vehicle, the clean and soiled textiles must always be kept separate by either a physical barrier or sufficient space. The interior of the storage space of the vehicle must be cleaned on a regular basis per facility policy or when visibly soiled.
6) The vehicle must have a waterless antibacterial hand cleaner available for hand hygiene for the workers. The vehicle must also have PPE and spill kits for cleaning and disinfecting spills per employer's policies and procedures. The workers must wear gloves when handling visibly soiled textiles and upon removal of the gloves, perform a hand wash as soon as possible.

B. The scrub attire can be stored on shelves in the locker-room/changing-room.[19]
   1) The shelves must be two inches from the wall; the top of any item on the top shelf must be eighteen inches below the ceiling; and the bottom shelf must be of solid, nonporous construction situated eight inches from the floor. There must be a written schedule in place for cleaning the shelves and floors in the storage area.
   2) Clean textiles are required to be stored at a temperature of 68° F (20° C) to 78° F (25.6° C) in an area that is kept clean.

Guideline III
The surgery department should review the policies and procedures (P&P) regarding handling and laundering soiled scrub attire on an annual basis.

1. The surgery department should include members of the surgical team and administration when reviewing the P&Ps, including CSTs, RNs, risk management, and infection control officer.
   A. The surgery department should document when the P&Ps were reviewed, revision completed, and who participated in the review process.
2. CSTs should be familiar with the P&Ps for handling and laundering scrub attire. The orientation of new employees should include reviewing the P&Ps.

Guideline IV
CSTs should complete continuing education to remain current in their knowledge of handling and laundering soiled scrub attire. [29]

1. The continuing education should be based upon the concepts of adult learning, referred to as andragogy. Adults learn best when the information is relevant to their work experience; the information is practical, rather than academic; and the learner is actively involved in the learning process.[30]
2. It is recommended surgery departments use various methods of instruction to facilitate the learning process of CSTs.
   A. If the education is primarily lecture, methods to engage learners include presentation of case studies for discussion, and audience discussion providing suggestions for reinforcing handling and laundering soiled scrub attire.

   B. Other proven educational methods including interactive training videos, and computerized training modules and teleconferences.
   C. The continuing education should be delivered over short periods of time such as in modules, and not in a one-time lengthy educational session.
3. Continuing education programs should be periodically evaluated for effectiveness including receiving feedback from surgery department personnel.
4. The surgery department should maintain education records for a minimum of three years that include dates of education; names and job titles of employees that completed the continuing education; synopsis of each continuing education session provided; names, credentials and experience of instructors.

Competency Statements

Competency Statements	Measurable Criteria
1. CSTs have the knowledge and skills in the prevention of bacterial contamination.	1. Educational standards as established by the *Core Curriculum for Surgical Technology*.[31]
2. CSTs have the knowledge and skills to protect themselves, HCP, the patient, and general public from microbial and environmental hazards.	2. The didactic subject of the handling and laundering of soiled scrub attire is included in a CAAHEP accredited surgical technology program.
3. As practitioners, CSTs perform the skills related to proper personal protection including donning and disposal of scrub attire in accordance with CDC and OSHA regulations, and the implementation of such regulations in the work place.	3. Students demonstrate knowledge of the handling of soiled scrub attire in the lab/mock OR and during clinical rotation.
4. CST's are knowledgeable of updated regulations, protocols and practices related to HDO policies and procedures.	4. CSTs complete continuing education to remain current in their knowledge of PPE standards, and handling and laundering soiled scrub attire.[29]

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Glossary

Hygiene: Practices that maintain health and prevent disease through cleanliness of self and surroundings.

Home laundering scrub attire: Practice whereas HCP transport their soiled, contaminated scrub attire home for washing and drying, and transport back to the HDO of employment.

Infection control: Measures that aim to ensure the protection of those who might be vulnerable to acquiring an infection both in the general community and while receiving health care; the basic principle of infection control is hygiene.

Laundry: Dirty, soiled, and/or contaminated home or work-place textiles.

Reusable surgical textiles: Drapes, gowns, scrub attire, towels, and wrappers that can be cleaned, disinfected, and if necessary sterilized, multiple times for reuse; also referred to as non-disposables.

Surgical site infection: A surgical site infection (SSI) is an infection that occurs after surgery in the part of the body where the surgery took place. SSIs can sometimes be superficial infections involving the skin only. Other SSIs are more serious and can involve tissues under the skin, organs, or implanted material.

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