

Infection Control Today - 03/2002: Follow Standard Precautions When Handling Soiled Linens

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CLEANING AND DISINFECTING

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Follow Standard Precautions When Handling Soiled Linens

By Kelly M. Pyrek

How infectious is hospital linen? In the 1970s the Centers for Disease Control and Prevention (CDC) stated, "Although soiled linen has been identified as a source of large numbers of pathogenic organisms, the risk of actual disease transmission appears negligible."¹⁻² When in doubt, healthcare workers (HCWs) have been encouraged to adopt a hygienic and common-sense approach to the handling, processing, and storage of both soiled and clean linen to avoid the risk of nosocomial infections.

"If soiled linens are handled properly, they pose no risk to HCWs or laundry personnel," says public health nurse Ruth LeTexier, RN, BSN. "The linens are laundered at high temperatures with proper detergents, and what especially kills the germs is the heat of the dryers." LeTexier says that HCWs should be wary of contact transmission-allowing soiled and potentially contaminated linens come in contact with skin or clean uniforms/scrubs that are not protected by personal protective equipment (PPE), such as gowns and gloves.



At the heart of proper linen handling within a hospital setting is heeding Standard Precautions (formerly known as Universal Precautions/Body Substance Isolation) to eliminate the opportunity for the transmission of disease. While more than 5 billion pounds of soiled linen are generated annually in healthcare settings in the US³, there are few reports in current literature of HCWs infected by organisms carried in contaminated linen. The HCWs who might have been infected from soiled linen are most likely those who break from stringent infection control best practices.

"Vigilance against occupational exposure to bloodborne pathogens is especially critical both in the handling of linens and the performance of medical procedures," LeTexier adds. "The most basic guideline is to handle soiled linens as little as possible, with minimum agitation, and transport it in an impervious bag or container."

The application of Standard Precautions to proper linen processing means handling any patient linen soiled with blood, body fluids, secretions, or excretions in the same manner regardless of source.⁴ OSHA's Bloodborne Pathogen standard applies to HCWs' handling of soiled linens, and spells out the requirements for the identification, bagging, and processing of both soiled linens as well as the PPE worn by HCWs to avoid occupational exposure.

When it comes to safeguarding the health of hospital personnel who handle soiled and potentially contaminated linen, a team effort works best.⁵ This team often comprises the laundry manager, the infection control practitioner (ICP), nurses, technicians, and laundry department personnel. The laundry manager partners with the ICP to develop sound infection control guidelines as they relate to laundry service, as well as to create open communication between the laundry department and the end users--the nursing staff. This is especially important to combat the improper use/abuse of linen, such as double-gowning, placing linen products over disposable items, placing unacceptable linen in the soiled linen hamper rather than the hamper marked "discard linen," as well as unauthorized employee access to OR linens.⁶

Infectious disease experts agree that soiled linen should be handled as little as possible and with a minimum of agitation to prevent gross microbial contamination of the air and hospital personnel handling the linen. All soiled linen should be bagged at the location where it was used, and the collection bag must be of sufficient quality to contain the wet/soiled linens and prevent leakage during handling and transportation. OSHA mandates that linens must be placed and transported in labeled or color-coded bags or containers. Double-bagging has been shown to be unnecessary unless the HCW believes the body fluid-soaked linens cannot be hygienically contained in the primary bag. Studies have demonstrated that the exteriors of single bags do not harbor significant levels of bacteria.⁷

Standard Precautions requires that personnel who handle soiled linens utilize PPE, particularly gloves. Guidelines from the National Association of Institutional Linen Management (NAILM) emphasize that *reusable* gloves, as opposed to disposable gloves, should be used because the latter are too thin to endure the pressure on the glove material that sorting linens requires, and do not adequately protect the worker from gross contamination or tearing. The NAILM guidelines also state that masks are usually not needed because the aerosols are too large to penetrate lung tissue; likewise for protective eyewear, since the splashing of blood and/or body fluids is believed to be unlikely. What *is* necessary, however, is vigilant handwashing, and the laundry department must have a sink specifically designated for the washing of hands within the soiled linen area. Less important is the kind of soap used for handwashing; rather it is the proper friction and duration that protects workers against the transmission of disease from contaminated linens.

Many factors come into play when striving for linen that is free from microorganisms, including the use of detergents, enzymes, and chlorine bleach, as well as the mechanical action of rinsing, the temperature of the water, and the drying process. According to Raymond B. Otero, PhD, author of the NAILM's Healthcare Textile Infection Control Guidelines, "There are no microbiological standards for textiles to determine what level of contamination is acceptable. This is due to the viability of microbial survival based on the degree of soiling, laundry processing, and the ability of microorganisms to attach to fibers. So routine culturing of linens is not recommended."⁸

To address linen-sorting issues, the NAILM's Educational Affairs Committee compiled a list of the advantages and disadvantages. The advantages of pre-sorting include less chemical usage for a longer textile life, less damage to textiles and laundry equipment by removal of foreign objects/sharps, and possible identification of textile abuser by user areas. The disadvantages of pre-sorting include the potential increase of sharps injuries, increased cost of providing PPE to laundry workers, and employees' fear of infection.

According to the CDC's Guidelines for Laundry in Healthcare Facilities, "hot water provides an effective means of destroying microorganisms, and a temperature of at least 160°F for a minimum of 25 minutes is commonly recommended for hot-water washing. Chlorine bleach provides an extra margin of safety. A total available chlorine residual of 50-150ppm is usually achieved during the bleach cycle. The last action performed during the washing process is the addition of a mild acid to neutralize any alkalinity in the water supply, soap, or detergent. The rapid shift in pH from approximately 12 to 5 also may tend to inactivate some microorganisms. Recent studies have shown that a satisfactory reduction of microbial contamination can be achieved at lower water temperatures of 22-50° C when the cycling of the washer, the wash formula, and the amount of chlorine bleach are carefully monitored and controlled. Instead of the microbial action of hot water, low-temperature laundry cycles rely heavily on the presence of bleach to reduce levels of microbial contamination. Regardless of whether hot or cold water is used for washing, the temperatures reached in drying... provide additional significant microbial action."⁹⁻¹¹

The CDC's guidelines also state, "Clean linen should be transported and stored by methods that will ensure its cleanliness." According to the NAILM, the carts or hampers that deliver laundered linens must be cleaned prior to accepting processed linens. A clean liner within the cart is acceptable, and the linens should be covered. The guidelines state: "Carts that are going to be used to store linens on patient-care areas (hallways) must have covers on them during transportation and storage time. The covers shall protect the linens at all time during storage. They cannot be removed or adjusted in a manner that will expose linens to common traffic. Open carts that are going to be used just to dispense linens on patient- care areas need not be covered for this purpose. They cannot be used to store linens on the floors."

According to the NAILM guidelines, if linens are sent to an off-site laundering facility, the same vehicle should not be used to transport soiled and clean linens simultaneously. The guidelines state: "There is no infection control reason for this not to occur if the following measures are taken: the soiled linen is bagged in such a manner as to prevent soak-through; the soiled linen is placed and anchored in the vehicle so that it does not induce spillage; personnel know their responsibilities in bagging and placement of linens in the transporting truck; and Standard Precautions are followed by all staff members with this responsibility. Organisms do not jump from one area to another. If clean linen is protected properly--which does not take insurmountable measures--then there is absolutely no reason why

commercial trucks need to make special trips to pick up separate loads. Cleaning of trucks is no different than cleaning isolation rooms in hospitals. Spot clean with a disinfectant. If the temperature is too cold (less than 32° F), then plain soap and water for spot cleaning is sufficient. There is absolutely no need to spray or aerosol the trucks with a chemical prior to reuse."

The NAILM guidelines also address the physical plant of the laundry department: "The laundry facilities shall be designed, equipped, and ventilated to reduce the dissemination of microorganisms onto finished textiles. The ventilation shall include adequate intake, filtration, air exchange rate (5-10 per hour) and exhaust in accordance with local, state, and federal regulations. The soiled linen area shall be separated physically from the clean linen area." According to the NAILM guidelines, rooms that are used to store clean linen must:

- Have temperatures ranging from 68° to 78° F
- Be properly ventilated to prevent the accumulation of dust and lint
- Be free from drains or hot water pipes
- Have shelves used for storing linen that are approximately 1-2 inches from the wall for accessible cleaning; the bottom shelf must be 6-8 inches from the floor and the top shelf must be 12-18 inches below the ceiling
- Store only clean linens
- Have a door that remains closed at all times
- Have positive pressure

Hospitals are also required to have policies and procedures addressing all areas of their laundry departments, and they must be accessible by HCWs, licensure and regulatory agencies, compliance officers from OSHA, infection control/quality assurance committees from healthcare, and personnel working in the laundry area.¹²

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