



Infection Prevention and Healthcare Laundry:

A Compendium



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Navigating the Intersection Where Healthcare Laundry and Infection Prevention Meet

By John Scherberger BS, FAHE, CHESP

Remember learning intersection safety in Driver's Ed? We were warned that intersections could be dangerous because they're where vehicles, pedestrians, runners and cyclists are converging in the same space. We were told that about 20 percent of all crashes happen at intersections. We learned that – whether it's one without a signal, one with signals, or one with a roundabout – it is important to understand how to navigate an intersection safely and under many different conditions.

Similarly, in the hospital, the infection preventionist (IP) must understand how to navigate the intersection where healthcare laundry and infection prevention come together. The good news is, outbreaks of infectious diseases associated with laundered healthcare textiles (HCTs) are extremely rare. Yet, like with driving, this is an intersection with potential for risk for the inexperienced, where unforeseen accidents can happen if unaware, and where certain "laws" apply – but you must know them.

Of course, in Driver's Ed, the goal of understanding how to navigate intersections is all about crossing to one's own personal safety. For the IP, the goal of navigating the intersection of healthcare laundry and infection prevention is to ensure hygienically safe healthcare textiles (HCTs) for every patient in the hospital. This is especially true for those IPs who are part of a multidisciplinary team approach to infection prevention strategy.

That's a big responsibility for an already complex job. Here are some points to know about this intersection to help steer in the safest direction:



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Maintaining hygienically safe and clean HCTs is as important to quality patient outcomes as practicing proper hand hygiene.

The healthcare textile is the one common factor of every patient experience in their hospital or long-term facility encounter. Every patient's skin will touch a sheet, towel, bed pad, washcloth, bedspread or blanket. Not every patient will have physical contact with a physician, nurse or other clinician.

Unfortunately, many healthcare professionals fail to maintain the hygienic integrity of HCTs. HCTs are dropped to the floor and picked up and used rather than being placed in a soiled/contaminated linen hamper. Many staff clutch hygienically safe and clean HCTs to their uniform while transporting them, thus contaminating them. Many staff embrace HCTs in uncovered arms and consequently transfer skin cells and their own microbiome to the HCTs, thus contaminating them. And those are just three opportunities for contamination by the staff; there are countless other examples that can be provided but three alone should give one pause.

Regrettably, for patients, many hospitals have taken the ill-conceived step of not changing a patient's bedding daily due to cost-cutting measures. They have failed to view hygienically safe and clean HCTs as one of the multidisciplinary and multimodal interventions and tools needed to work toward quality patient outcomes. And, given unforeseen events, some hospitals may not change the bedding for three or more days. In 2012, the latest year for which data are available, the average length of stay for an acute care hospital admission was 4.5 days. That means the bedding was changed only once. This may be a potentially great cost cutter, but at what cost to the patient and possible exacerbation of co-morbidities, or exposure to healthcare associated infections (HAIs)? When a patient's sheets are not changed daily, the environment of the bedding is a great place for microbiota to propagate.

Healthcare laundries accredited by the Healthcare Laundry Accreditation Council (HLAC) are in the business of ensuring that HCTs are processed and delivered to their healthcare partners in a hygienically safe and clean manner. But, as the aforementioned examples point out, the hygienic integrity of the laundry can be compromised once it's at the hospital.

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We go to great lengths to foster proper hand hygiene. We need to do the same to maintain hygienically safe and clean HCTs.

Ensuring hygienically safe HCTs is not exclusive to the launderer — it's everyone's job.

There are more than 600 standards to ensure that accredited laundries are producing hygienically safe linens. But as already put forth, an article of linen can become contaminated at the healthcare facility whether or not it was processed properly to these standards at the healthcare laundry.

This makes the job of maintaining hygienically safe HCTs everyone's — the nurse, the environmental services (EVS) technician, the IP and the launderer (and transporter).

Linens that touch the patient: In the hospital, the job of those who are responsible for making sure that only hygienically safe HCTs ever touch the patient begins when the linen cart is unloaded at the dock and continues to the linen room, linen closet, patient room and then finally to when they're used by the patient. Matters of importance include functional separation,

environmental cleaning of surfaces, cart disinfection, transport protection, hand hygiene, airflow quality, and lint control.

Linens that are used: All HCTs that are used are considered contaminated and must be treated as such. For example, staff should handle contaminated laundry as little as possible with minimal agitation (e.g., bedding should be rolled into itself, not shaken). This process will also provide the staff the opportunity to view the linens and avoid trapping sharps and patient items such as hearing aids, glasses and dentures. Bedding and especially bed pads containing feces should be taken to the nearest toilet and the feces carefully deposited into the commode; feces should never be rolled into linens and placed in soiled linen bins. Contaminated laundry bags should not be held close to the body or squeezed when transporting to avoid punctures from improperly discarded syringes.

Regarding sorting, soiled textiles should be sorted by classification and/or type of goods, i.e., soiled loads must be segregated into proper hampers and fluid-proof bags. Also, soiled linen bags should only contain soiled linens, meaning there should be in place both foreign objects (food, pharmaceuticals, adhesives, etc.) and sharps policies. Last -- but not least-- to the sorting process is following Universal Precautions by all personnel who handle used HCTs (avoiding contact with patients' bodily fluids through use of appropriate PPE).

It's important to know that Occupational Safety & Health Administration (OSHA) regulations do not recommend the disposal of contaminated reusable textiles that have been contaminated by blood and/or other potentially infectious material (OPIM). On the contrary, OSHA allows for these contaminated textiles to be sent to the laundry for processing; and, in fact, discourages the disposal of reusable textiles, recommending instead their processing in a healthcare laundry.

Linens at the laundry: The job of the healthcare laundry is to follow standards like HLAC's and OSHA's, which cover the complete textile processing cycle: from handling and transporting to laundering and finishing to customer use. HLAC Accreditation Standards have been developed based on federal regulations and guidelines as well as best industry practices.

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The use of reusable HCTs is a circular process of proper procedures: laundering, transportation to the healthcare facility, storage and distribution within the hospital, placement (but not storage) of the HCTs in a patient or treatment room, removal and placement into a soiled linen bin after use, transportation to the soiled linen depot at the hospital, and loading and transportation back to the healthcare laundry. As a process, it's just like nursing and all of healthcare and it requires attention to detail for proper outcomes – it's everyone's job.

It's not an “either/or” decision when choosing a laundry as an infection prevention partner.

Because laundering of HCTs is a process with distinct stages that requires adherence to standards every step of the way, choosing a laundry as an infection prevention partner is not an either/or decision, even though choices are available. This is true whether your facility has its own on-premise laundry or you contract with an outside vendor, or whether yours is a hospital or another kind of healthcare facility.

Selecting the right laundry service has been an often-overlooked decision for a hospital. There has been a tendency to focus solely on the lowest-priced provider. Fortunately, the healthcare industry is beginning to realize the importance of having proper textile care as part of infection prevention strategy. This is due to the realization that HAIs affect not only the lives and safety of patients but a facility's reputation and financial health.

Among leading healthcare facilities, HLAC accreditation is considered a requirement to be considered a healthcare laundry vendor. Here's why:

The HLAC accreditation process covers the entire laundry process, end-to-end. It begins with a day-long inspection whereupon an independent inspector, trained on HLAC standards, ensures that a laundry has quality control, quality assurance and quality monitoring processes in place to provide hygienically safe linen not just once, but every time. The inspection aligns with the specifics of the HLAC Accreditation Standards document, “Accreditation Standards for Processing Reusable Textiles for Use in Healthcare Facilities, 2016 Edition.”

It's not an “either/or” decision when choosing a laundry as an infection prevention partner.

HLAC standards cover the complete textile processing cycle, from handling and transporting soiled healthcare textiles, to in-plant processing and delivery back to the customer. The standards also cover many basic considerations, such as facility layout, personnel training, and customer service.

The standards include strict adherence to federal government regulations and guidelines. Special attention has been given to laundry processes directly related to patient safety and OSHA required practices, including bloodborne pathogen exposure control standards. Part III of the Standards addresses the surgical pack assembly room and its activities. This section is based on the American National Standards Institute (ANSI)/Association for Advancement of Medical Instrumentation (AAMI) reference regarding reusable surgical textiles processing.

It's worth noting here that an earlier-referenced report highlighting evidence-based strategies observes that proper laundering and handling are important in achieving and maintaining the hygienically safe quality of healthcare fabrics and textiles delivered to the point of care. This study is comprehensive – it is based on findings and recommendations from peer-reviewed studies, as well as current standards and guidelines to inhibit serious contamination during the processing of HCTs, many of which are applicable to HLAC's standards.

Clearly, when healthcare laundry and infection control intersect, you want to have the confidence that the former is in its safest state. This makes the case for specifying in any request for proposal that your textile laundry service company be accredited by HLAC. It's not an either/or decision.

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At a traffic intersection, what happens when just one driver irresponsibly, recklessly or ignorantly flouts the rules of the road? The outcome is an accident or worse →→ serious injury or death.

The same misfortune can happen with HCTs, even though outbreaks of infectious diseases associated with laundered healthcare textiles are rare. If everyone isn't doing what is required of them at the intersection of healthcare laundry and infection processing, someone is going to be adversely affected.

The percentage of hospitalized patients who are severely immunocompromised has increased in the past decade. Hospitals and long-term care facilities are caring for more patients who are extremely susceptible to infection by environmental pathogens. More hospitals are performing technically and medically complex, life-saving interventions, but if hospitals fail to do all they can for infection prevention they run the risk of losing these patients to contaminants.

HCTs should not and cannot be viewed with a lesser concern than other healthcare interventions. They must be viewed as a very important intervention to attain quality patient outcomes. The intersection of healthcare laundry and infection prevention can be safely navigated, and everyone approaching this intersection has a responsibility to, as we say, "First, do no harm."

John Scherberger is the past board president of the Healthcare Laundry Accreditation Council (HLAC). The Healthcare Laundry Accreditation Council (HLAC) is a nonprofit organization formed for the purpose of inspecting and accrediting laundries processing healthcare textiles for hospitals, nursing homes and other healthcare facilities.





Diligence in Environmental Infection Prevention Is Important to Maintaining the Quality of Laundered Healthcare Textiles Prior to Use

By Lynne M. Schulster, PhD, M(ASCP), CMIP(AHE)

Maintaining both the quality and cleanliness of processed healthcare textiles (HCTs) prior to their use is a shared responsibility. It calls for a collaborative effort between laundry operators and the healthcare professionals in the recipient healthcare facilities. This maintenance phase is the last part of the overall laundry process of preparing reusable fabric items for use in the next clinical setting, and infection prevention is central to its success. Thus, it is useful to understand how efficiently contemporary laundry procedures reduce contamination; a perspective on the outbreaks that have been attributed to laundered HCTs; and an awareness of when and where, and how HCTs can become contaminated prior to use.

Microbial Inactivation/Removal Properties of the Laundry Phase

A review article published in 2015 summarized the published evidence supporting the notion that contemporary laundering procedures excel at both soil/organic matter removal and microbial contamination removal and inactivation.¹ According to the Centers for Disease Control and Prevention (CDC) “hygienically clean laundry carries negligible risk to healthcare personnel and patients, provided that the clean textiles are not inadvertently contaminated before use.”² The laundry process is primarily a soil removal process, but the combination of detergent use, agitation of the textiles during the wash, duration of the wash, use of laundry additives with antimicrobial properties, rinsing, and hot air drying together can achieve significant microbial reductions (i.e., > 8 log₁₀).³ Antimicrobial chemicals for laundry use include but are not limited to quaternary ammonium compounds, chlorine compounds, hydrogen peroxide and other oxygenated formulations (some of which include peracetic acid), and ozone producing systems.¹ Many of these chemicals are registered by the Environmental Protection Agency (EPA) as either



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laundry sanitizers or laundry disinfectants, and many are designed specifically for use with cooler wash water temperatures⁴

Infectious Disease Epidemiology and Laundered HCTs

Laundered HCTs are hygienically clean but they are not sterile (the exception being surgical textiles which are sterilized prior to use), and they will accumulate microorganisms from patients, the environment, and anything that touches them while they are in use.⁵ Nevertheless, four decades of experience using laundered, reusable HCTs strongly supports the notion that current industrial laundry processes are effective in interrupting potential patient-to-patient transmission of infectious diseases.¹ The significance of this assessment increases when one notes the annual volume of laundered HCTs produced for U.S. hospitals is estimated to be 4.34 billion pounds; this volume of clean HCTs increases potentially by several billion pounds when the clean HCT demands of non-hospital venues are taken into account.^{1, 6-7}

Immunocompetent patients in general are not adversely affected from contact with hygienically clean, reusable HCTs despite anticipated accumulation of microbes from various sources (e.g., patient skin squames, microbial transfer from hands and other surfaces, microbes settling out from the air). A literature search, however, identified 13 outbreaks around the world attributed to laundered HCTs that were ultimately determined to be contaminated prior to use.¹ Box 1 summarizes the main points describing these outbreaks; the earliest of these events was in the late 1970s and the latest outbreak occurred in Hong Kong in 2015.^{1, 8}

Of these 13 outbreaks, seven occurred in the period 2004 — 2015 (53.8 percent). Five of these outbreaks were clusters of *Bacillus cereus* bloodstream infections (5/7, 71.4 percent) and two outbreaks involved invasive systemic infections due to fungi of the family Mucoraceae (2/7, 28.6 percent). The fact that more than half of the reported disease outbreaks attributed to laundered HCTs have occurred in the most recent 12 years in a more than 40-year period begs the question, what has changed in healthcare delivery in recent years? Four things come to mind: 1) significant advances in medical technology and treatment options are now available to treat diseases and conditions deemed incurable or untreatable only a decade or so ago; 2)

Outbreaks Attributed to Laundered Healthcare Textiles (HCTs)

13 outbreaks in 44 years worldwide attributed to laundered, clean HCTs

United Kingdom: **4** | United States: **3** | Singapore: **1**
Netherlands: **1** | Hong Kong: **1**

> 356 Patients affected

Pathogens identified

- *Acinetobacter* spp.
- *Aspergillus flavus*
- *Bacillus cereus* (7/13, 53.8% of the outbreaks)
- *Streptococcus pyogenes*
- Mucorales (*Rhizopus delemar*, *Rhizopus microspores*, *Lichtheimia* spp.) (2/13, 15.4% of the outbreaks)
- *Clostridium difficile*

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the proportion of hospitalized patients with either severely compromised immune systems or medical conditions necessitating very lengthy hospital stays has steadily increased; 3) many of these severely immunocompromised patients require care in a protective environment; and 4) routine care for immunocompetent patients continues to move from acute-care hospitals to other healthcare venues (e.g., ambulatory care centers).² In short, more hospitalized patients are at increased risk of acquiring a healthcare-associated opportunistic infection, including infections due to exposure to environmental pathogens.

The outbreak of infection due to *Rhizopus delemar*, an environmental fungus that was linked to contaminated HCTs in a New Orleans children's hospital in 2009 provides insight into the epidemiology of this infection and the risk factors at work here.⁹ Five case-patients with different clinical conditions in three different critical care areas of the hospital were identified, each with an extended length of stay. All five patients died. An epidemiologic investigation to identify possible exposure risk factors found HCTs as the only item in common with the care for these patients. Applying the chain of infection to the analysis of the outbreak information provides some clarity. In its original presentation, the five links in the chain are: 1) presence of a pathogen; 2) an infectious dose of that pathogen; 3) a mode of transmission; 4) a susceptible host; and 5) a portal of entry.¹⁰

"Laundry A" provided laundered HCTs to all departments in this hospital, but only five patients were clinically susceptible to this opportunistic pathogen and became infected. All the other patients in the hospital during this period were presumably immunocompetent to prevent this pathogen from initiating infection. A medical chart review revealed that all five patients had significant clinical risk factors (i.e., immunocompromised, acidosis, hyperglycemic) for opportunistic *Rhizopus* infection.^{9,11} All of the case patients developed cutaneous lesions on their skin at some location (e.g., face, neck, upper back, etc.), which suggests the mode of transmission was cutaneous via direct contact and the lesions became the portal of entry. In this outbreak, each of the case-patients had extensive exposure to laundered HCTs that were inadvertently contaminated with *R. delemar*.⁹ In the investigation of this outbreak, *R. delemar* was isolated from laundered HCTs, hospital areas where the HCTs were stored, and in clean HCTs and clean linen delivery carts at Laundry A.⁹ Sterilization of HCTs used by at-risk patients helped to stop this outbreak.



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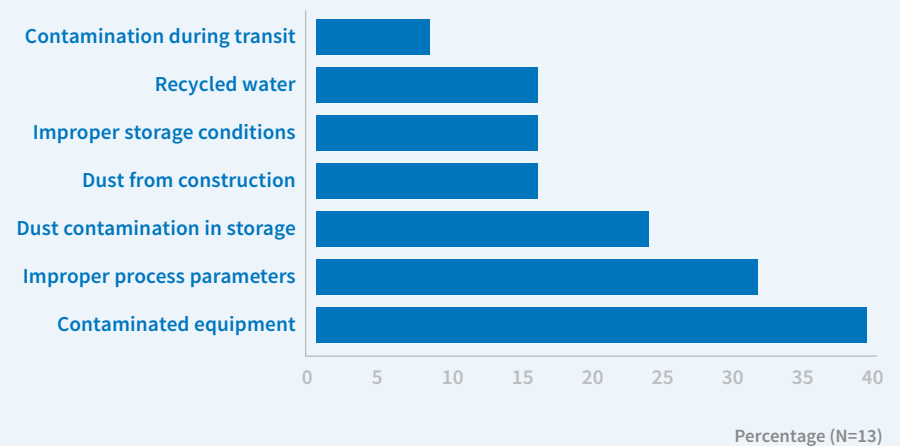
Inadvertent Environmental Contamination Compromises HCT Quality and Cleanliness

Referring to Box 1, the majority of pathogens implicated in the outbreak investigations of infections associated with laundered HCTs are environmental microbes that are present in both indoor and outdoor environments. In each of the investigations efforts were made to identify the root cause leading to the inadvertent environmental contamination of the HCTs. A summary of these root causes is presented in Box 2.

Three of these root causes are associated with laundry equipment maintenance and operation issues, which suggests that routine facility and equipment maintenance and process inspection should be priorities. Improper wash process parameter settings can affect all aspects of the wash cycle and reduce the overall level of microbial inactivation of the wash process. Three other root causes are related to improper HCT storage settings and control of dust from construction or other sources. It is well known that dust can serve as a carrier of organic matter contamination, bacteria, and fungal spores. Dust and lint control measures such as regular blow-downs and keeping a regular surface cleaning schedule are necessary to minimize the deposition of dust on clean HCTs as they move toward the packaging/bundling stage of the overall process. Once these packages/bundles are in either a holding stage or in storage, the storage units and/or carts should be designed to minimize any additional contact with dust. Strategies to help with dust control in the healthcare facility storage rooms include: 1) regular cleaning and disinfection of surfaces; 2) setting the area’s ventilation at positive pressure relative to adjoining spaces; 3) installing self-closing doors; and 4) storage rooms should not be near the loading dock. Additionally, HCT storage rooms should not be designed as pass-through areas, thereby keeping personnel traffic in the room to a minimum. Climate control in these rooms should be engineered to prevent departures from recommended settings for temperature and humidity. Box 3 summarizes some of the ambient environment concerns and ventilation parametric support for environmental control.

Regarding inadvertent environmental contamination of laundered HCTs, one possible means of contamination control would be to apply an antimicrobial treatment to the HCTs. To date, however, we have not seen published reports describing the use of such treatments on a large scale.

Outbreaks Associated with Laundered HCTs: Frequently Reported Root Causes



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Furthermore, selection of the appropriate antimicrobial for this purpose requires some consideration re: how the chemical is applied, what are the target microbes (e.g., fungi, bacteria, viruses, etc.), and whether or not the chemical is safe for patients.¹ The other method of contamination control involves steps that are taken to eliminate environments within the textiles themselves that can promote microbial growth on the fabrics. For example, fungi require three things to grow and proliferate: 1) a food source [e.g., cellulose]; 2) moisture; and 3) favorable environmental conditions [e.g., temperature and relative humidity].¹⁶ Some fabrics such as cotton contain large amounts of cellulose. Some degree of moisture can be present in laundry bundles if they are wrapped before the fabrics have fully dried out. And when these bundles are stored in settings with warm environments with fluctuations in temperature and humidity, fungi within these bundles can increase in numbers sufficient to pose a potential risk of infection to highly susceptible patients.

The importance of climate and dust control for laundry facilities and storage areas is undeniable. In the outbreak of *Rhizopus* spp. infections in a Hong Kong hospital in 2015, the investigators noted excessive levels of dust throughout Laundry A and a dew point of 84 degrees F in the facility, all suggesting poor environmental control. HCTs were warm and moist to the touch in the packing area. HCT storage areas in the hospital, laundered HCTs, and environmental surfaces in Laundry A tested positive for zygomycetes while surfaces and HCTs in a control laundry were negative.⁸

Effective control of inadvertent environmental contamination of HCTs requires commitment and diligence from all laundry operators and healthcare professionals who manage the production and use of hygienically clean HCTs. Staying on top of these responsibilities can be made easier through the use of checklists such as those provided by the Healthcare Laundry Accreditation Council (HLAC).¹⁷ Process control in the laundry facility, taking steps to ensure thoroughly dry HCTs, controlling ambient storage conditions, and dust prevention are significant responsibilities, but taking action on all of these will help laundry and healthcare professionals navigate safely through one of the most challenging intersections where healthcare laundry and infection prevention meet.

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Climate Control via Ventilation: Key Engineering Specifications

Why is this important

Fungi grow rapidly at RH > 80%

Keeping the ventilation parameters consistent helps to minimize microbial growth

- Trapped excess moisture due to packaging may create opportunities for growth when RH fluctuates
- May cause pockets of high humidity within the HCT bundle that may be RH > 80%
- This increase can be as much as 20% over ambient humidity

Higher temperatures encourage fungal growth

Clean HCT Storage

- Temperature: 72-78°
- Air changes/hour (ACVH): 2
- Relative humidity (RH): NR*
- Airflow direction: Positive

Surgical Pack Room Storage:

- Temperature: < 72-78°
- Air changes/hour (ACVH): 2
- Relative humidity (RH): < 70%
- Airflow direction: Positive

Hold/Staging at the Laundry

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*NR: No requirement specified

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How Infection Preventionists Can Affect a Hospital's Bottom-Line with Effective Linen Strategy

By Gregory Gicewicz and Janice Carter Larson

In matters concerning healthcare textiles (HCTs), the focus of most infection preventionists (IPs) has logically been related to the implementation of infection prevention strategy. But is that enough anymore? The fact is, in this age of dwindling resources and funding, developing an effective linen strategy can give IPs plenty of opportunities to demonstrate positive, measurable bottom-line value and thereby increase their influence over relevant policy and decision making.

Success depends on the choices one makes in administering this strategy and this begins with having an understanding of the end-to-end linen and laundry value proposition, regardless of whether a hospital has an on-premise laundry or outsources its laundry service. Quite simply, the more IPs understand where the value lies, the more influence they'll have, and the greater the bottom-line impact.

Here are some key considerations where the knowledgeable IP can make a difference.

Linen Vendor Choice

If a hospital outsources its linen processing, choosing the best vendor is a critical financial decision. It can be a temptation to choose the linen vendor solely on the offered price-per-clean pound of delivered laundry. But this approach is beset with risks.

Today, leading hospitals are requiring in their RFPs that commercial laundries and cooperatives have accreditation from the Healthcare Laundry Accreditation Council (HLAC). That is, healthcare customers and potential customers want formal acknowledgement from the laundry verifying that its processes are based on the highest professionally recognized standards. This same HLAC accreditation is also available to on-premise laundries.



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The potential risks to a hospital of using a laundry not following the highest standards of infection prevention can far outweigh any perceived savings in linen cost per pound. While documented cases of HCTs contributing to healthcare-associated infections (HAIs) and deaths are rare, reports of microorganisms on HCTs as a source of infections is possible, and can threaten not only patients and staff, but also a facility's reputation and finances.

Linen Choices

Hospitals that provide superior patient experience generate 50 percent higher financial performance than an average provider. With this fact in mind, when it comes to linen strategy, healthcare could learn a thing or two from the hospitality industry, where guests have come to expect premium linens from leading hotels. In fact, luxurious bedding and linens are among the most important amenities a hotel can offer, according to a recent guest satisfaction survey. There's no denying that plush, hotel-style linens are expensive; but if they help to make for a positive patient experience, it may be worth it.

Here are some other linen-related choices that, with proper understanding, can impact the bottom line:

Synthetic, cotton or blended textile: Synthetic healthcare textiles are usually more expensive to purchase. Or are they? Synthetic HCTs will usually last for more processing turns and therefore may actually have a lower cost per use. For example, a \$4.50 sheet that lasts 100 turns cost 4.5 cents per use. A less expensive, \$3.50 sheet that wears out after 50 turns, costs 7 cents per use, or 56 percent more.

In addition, most synthetic HCTs will require less dry time/temperature or ironing temperature. Cotton scrubs will typically take about 15 minutes to dry in a tumbler. Newer synthetic scrubs can dry in under 5 minutes. Therefore, there will be an additional net savings in utility costs and production costs.

Linen weights: Most laundry vendors charge by the pound. Therefore, lighter HCTs that provide the same function can provide better overall value. Does the hospital spread blanket need to

weigh 3.75 pounds or would a 3-pound blanket work just as well? Will a 1.5-pound bath blanket perform the same for a hospital as a 1.75-pound bath blanket?

Are extra-large bath towels necessary? The heavier, plusher HCT may positively impact patient satisfaction and that is a good thing. But heavier items can also add up in laundry processing costs. Be cautious of the tradeoffs and choose strategically.

What does price per pound actually mean? Many laundry vendors will quote an attractive laundry price per pound but hide the real price behind lots of hidden fees.

It is important to understand the true cost per pound once the hidden fees are factored in. Then do an "apples-to-apples comparison." Some typical add-on fees to beware of include scrub surcharges, baby item surcharges, loss/damage charges, specialty-item fees, fuel surcharges, minimum delivery fees, stocking fees, and par level fees.

Low temperature chemicals: Laundry chemical vendors have come out with many chemicals that clean at lower temperatures. This will save money on heat used by the laundry. They will also save on linen life, regardless of choice, as linens will last longer.

A low-temperature laundry bleach that activates at 140 degrees Fahrenheit vs. normal hydrogen peroxide, which activates at greater than 180 degrees Fahrenheit, will save significant money in natural gas costs. Furthermore, linens processed by this laundry will last longer since excessive heat shortens linen life. And it should be noted that low temperature chemicals can impact linen costs, yet be as effective in producing hygienically clean textiles.

Disposable vs. reusable: No doubt, IPs often hear among healthcare facilities managers' arguments in favor of disposable products over reusable HCT products, like infection prevention wipers and mops, sheets, towels, incontinence pads, gowns, mammograms capes, surgical gowns and drapes, etc.

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There exists a common belief that disposables are preferable – that they’re less expensive. The truth is, in a typical lifecycle they can be just the opposite – they’re costlier than reusables quite simply because they’re only used once. Also, they’re costlier because of frequency of purchase, their disposal as a biohazard waste, the harm they cause the environment, and the many dangers their use can pose in the healthcare environment, including even the spread of superbugs. Lastly, one cannot control the efficacy or sanitary nature of the disposable; on the other hand, the quality of HCTs is virtually assured when hospitals work in partnership with HLAC-accredited laundries.

Linen Care

Hospital linen-care practices have a large impact on linen and laundry costs, and the IP nurse can play a significant role in raising awareness of this. Did you know that less than 50 percent of hospital linens reach their useful life? The rest are either damaged by preventable abuses, such as tape and adhesives on linen, ink, cutting or tearing, and using linens intended for patient care on environmental cleaning. Many are also lost due to theft, both deliberate and inadvertent.

Operating room (OR) scrubs that are taken out of the hospital setting and not returned must be replaced. Even if the scrubs are returned laundered, the recommendation that surgical attire not be home laundered is supported by clinical evidence. Impacting how and where scrubs are used, and helping to enforce the OR scrub policy, can help save a hospital money.

IPs can also influence policies that prevent non-linen items from ending up in the laundry. Non-linen items thrown into a laundry hamper are expensive problems for the laundry and ultimately the hospital. Garbage, food, papers, and plastics that must be separated during soiled linen sorting are annoying, time consuming and expensive, but relatively harmless. Pharmaceuticals, vials, needles, and other sharps are not only expensive but dangerous for laundry workers and routinely cause workplace injuries, the cost of which is eventually passed on to the end user.

Linen Management

IPs can play a key role in linen management by being an active member of their hospital’s linen committee or linen task force and by serving as an advocate for good linen practices

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by clinical staff. Educating clinicians on the necessity of keeping linen covered (both clean and soiled), for example, and bringing only that which is required into patient rooms, and following a “needs based” approach to bed make up can underscore their importance to clinical outcomes.

Adhering to good linen practices at the department level may be viewed as somewhat of an inconvenience to nursing, but not doing so may have serious consequences to patients. Linen stored unprotected runs the risk of contamination, potentially invisible to the naked eye. Extraneous linen in patient rooms may be handled by visitors with questionable hand hygiene. Changing linen items based on a rote schedule rather than a clinical need contradicts the philosophy of patient-centered care.

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Although reusable, healthcare linen needs to be managed statistically, just like other consumable medical supplies. The consistent use of linen management software will facilitate data driven decisions about department par levels quantities rather than those made on nursing perceptions of usage. Enlisting IP support for reasonable par levels based on actual usage can eliminate dead stock and the infamous “smorgasbord” effect, i.e., staff using more linen than is necessary for patient care based on over-abundant shelf quantities.

By adhering to best practices in linen management and making it part of overall linen strategy, the hospital can lower the quantity of linen used per adjusted patient day; this can result in a huge financial savings for the hospital. The hospital that consumes, for example 12 pounds of linen per adjusted patient day through best linen in management practices, versus the hospital that consumes 18 pounds of linen per adjusted patient day, will end up saving thousands of dollars over the year even though the price per pound processed they pay is the same. Here’s another way to look at the same scenario:

⊕ HOSPITAL A:

- Is charged 50 cents per pound by the laundry (fixed)
- 125,000 adjusted patient days per year (fixed)
- 18 pounds per adjusted patient day
- = 2.25 million pounds per year, which comes to
- \$1.125 million per year spent on linen/laundry

⊕ HOSPITAL B:

- Is charged 50 cents per pound by the laundry (fixed)
- 125,000 adjusted patient days per year (fixed)
- 12 pounds per adjusted patient day
- = 1.5 million pounds per year, which comes to
- \$750,000 per spent on linen/laundry
- or 33 percent savings over HOSPITAL A

Trusted Partnership with Healthcare Laundry

IPs looking for a reliable partner to develop or enhance their linen strategy need look no further than to their healthcare laundry professional. This is especially true if the laundry is HLAC-accredited.

A good practice is for the hospital-based infection prevention team members to treat their healthcare laundry professionals as part of their extended team, where there’s an ongoing sharing of updates in infection control and prevention efforts and in the regulatory and licensing arenas. Important to this team-style relationship is for the IP to visit the healthcare laundry to become acquainted with the personnel responsible for administering the laundry. In fact, the laundry should be open to at least yearly visits from their IPs. These visits are more productive when they’re treated collaboratively.

Critical here is open communication, cooperation and collaboration between the healthcare IP and the laundry profession, “a sharing of knowledge and operational details.” With such collaboration, “a bond can be established that allows both entities to address ongoing issues with desired outcomes.” And, clearly, with an effective healthcare linen strategy, this can also include desired outcomes like measurable, bottom-line value.

Gregory Gicewicz is past-president of HLAC and owner/operator of the healthcare laundry Sterile Surgical Systems in Tumwater, Wash.

Janice Carter Larson, CLLM, is vice president of clinical resources and consulting for Encompass Group LLC. She currently sits on the Association of Linen Management (ALM) board of directors.



Aligning the IP's Linen/Laundry Message with the C-Suite Mindset: Key Messages for a Key Messenger

By Gregory Gicewicz, John Scherberger and Lynne Schulster, PhD

An effective healthcare laundry solution, like having hospital textiles processed by a laundry accredited by the Healthcare Laundry Accreditation Council (HLAC)*, aligns perfectly with the objectives of most healthcare C-suites. The trick is communicating this alignment in the language of the C-suite.

The observant, well-informed and articulate infection preventionist (IP), and possibly the facility's environmental services (EVS) director, can be the most important messengers in this critical communication. In all likelihood, these are the individuals who have recognized that healthcare textiles (HCTs) are the one common factor of virtually every patient's experience in a hospital, long-term facility or other healthcare venue.

The "take-home" messages from the first three articles in this series on healthcare laundry can be helpful for framing the C-suite discussion points. The first of these articles made the case for selecting an HLAC-accredited laundry.¹ HLAC emphasizes the routine monitoring of the laundry process, proper maintenance of the equipment, safety for the workforce, and best practice in all aspects of the production. HLAC encourages communication between the client facility and the senior laundry management and supervisors. Furthermore, monitoring of the laundry process is done in real time, so processing problems can be detected quickly and steps taken to prevent the affected load of HCTs from leaving the plant.

The second article in the series addressed the potential problem of clean HCTs becoming contaminated prior to use in a clinical setting.² The point to be emphasized to C-suite members is that the multidisciplinary team members of the healthcare facility will work in cooperation with the laundry to help prevent such contamination from occurring, thereby maintaining



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HCT cleanliness quality during transportation and storage. IPs can also decide if sterilization of HCTs directed to severely at-risk patient care is appropriate and add this to facility policies and procedures.³

The business case for partnering with an HLAC-accredited laundry was presented in the third article, showing how an effective linen strategy can affect a healthcare facility's bottom line.⁴ Advances in laundry processes, laundry chemistries, built environmental designs and environmental stewardship all contribute to reduced costs without compromising the organization's quality of care.

From our experience gained from interacting with C-suite members, we have observed that the hospital C-suite's key focus areas typically revolve around the following:

- ✓ Ensuring patient safety
- ✓ Promoting patient satisfaction
- ✓ Maintaining financial health and stability
- ✓ Compliance
- ✓ Strategic planning and innovation
- ✓ Environmental stewardship.

With that in mind, we offer some key messages on these areas.

Ensuring Patient Safety

All hospitals must deal with the reality of healthcare-associated infections (HAIs), a situation that has reached epidemic proportions.⁵

The No. 1 goal in their HAI prevention campaign is the reduction of harm and loss of life. Be that as it may, commenting on HAIs, one hospital CEO noted: "A patient acquiring an infection as a consequence of participating in necessary healthcare is a failure of the system and/or the individuals within it."⁶

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In this regard, it's important to make the point that patients have the most contact with HCTs during their care compared to contact with any other surfaces in the hospital, and this can have an impact on the quality of patient care.

HLAC accreditation standards are patient-safety focused, and reusable HCTs laundered in an HLAC-accredited laundry meet the definition of "hygienically clean" in accordance with both the recommendations from the Centers for Disease Control and Prevention (CDC) and the standards from the Association for the Advancement of Medical Instrumentation (AAMI).⁷⁻⁸

HLAC standards are nationally recognized and have been developed based on federal regulations, guidelines and industry best practices. And as discussed in the second article of this series, the laundry process is a robust antimicrobial process that prevents patient-to-patient transmission of pathogens from clean HCTs.²

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Promoting Patient Satisfaction

This aspect of healthcare laundry may be something members of the C-suite may not have considered in the past. Given the frequency of patient skin contact with HCTs, a comfortable, aesthetically pleasing hygienically clean HCT — be it a patient gown, a bath towel, a bedspread, a fitted sheet, or an incontinence pad — will have a considerable impact on a patient's satisfaction.

While higher-end HCTs may be more expensive at initial purchase, their positive impact on patient satisfaction can make this extra cost worthwhile. Furthermore, HCTs consist of a wide variety of fibers and fiber blends (e.g., cotton/polyester, nylon and other specialty fibers/fabrics). Today's leading healthcare laundries can custom-tailor their laundering processes to reprocess these modern fabrics and textile items to fabric manufacturer instructions, thereby ensuring textile performance and aesthetic/sensory qualities.

Maintaining Financial Health and Stability

Where the COO is singularly focused on reducing the overall cost of "doing the hospital laundry," the IP can help her or him – and the entire C-suite for that matter – to distinguish the connection between effective laundry strategy and reduced costs without compromising the organization's quality of care.

This includes the decisions made about:

Linen choice — the different costs involved in the processing of synthetic, cotton or blended textiles

Low temperature chemicals — whose use saves money on heat used by the laundry and also saves on linen life

Disposable vs. reusable — disposables are costlier, they're a biohazard waste, they can pose dangers to the healthcare environments

Linen care — hospital linen-care practices have a large impact on linen and laundry costs, and the IP nurse can play a significant role in raising awareness of this

Linen management — healthcare linen needs to be managed statistically, just like other consumable medical supplies. The consistent use of linen management software will facilitate data driven decisions about department par levels quantities rather than those made on nursing perceptions of usage.

Compliance

The C-suite of any hospital is concerned with compliance. An HLAC-accredited laundry will ensure that all laundry operations are in compliance with federal, state, funding, and city regulations, certifications, and licensing requirements. These include but are not limited to:

- Adhering to the OSHA Bloodborne Pathogen standard and other relevant OSHA standards for hazard identification and worker safety
- Complying with state/city water discharge laws
- Validating the wash process and results on a regular schedule
- Ensuring all laundry equipment is in good working order and operated only by licensed technicians where appropriate
- Ensuring the integrity and protection of all clean HCTs from plant to hospital
- Maintaining regular plant cleaning schedule.

Another point to mention about a laundry being HLAC-accredited is the fact that the laundry is familiar with necessary measures to comply with an inspection process and will be ready for inspections from either the hospital personnel or third party survey teams.

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Strategic Planning and Innovation

The modern healthcare laundry industry abounds with strategic innovations that can align with a hospital's strategic innovations. IPs can provide C-suite members with some examples of these innovations to heighten awareness of laundry contractors' efforts to enhance their attention to infection prevention measures and effective linen management strategies. Such innovations can include:

- UV-treated rinse water as a means of enhancing infection prevention
- Using ATP monitoring devices to measure a laundry's environmental cleaning processes
- Antimicrobial HCT including scrubs, flat goods, cubicle curtains, patient gowns, and EVS cleaning goods
- Air sampling of laundries to detect microorganisms and measure environmental cleaning
- Bacteriostatic laundry softeners
- Technologies using radio frequency identification (RFID) and bar code tracking can help to determine remaining use life for key HCTs
- Linen management software systems to track key metrics such as utilization by department, pounds per adjusted patient day, clean/soil ratios, linen losses, performance versus national standards, and fill rates
- RFID tracking systems to track locations, inventory, last processing dates and losses of key high expense items such as scrubs, cubicle curtains, OR textiles, lab coats and patient lifter slings.

Environmental Stewardship

Most HLAC-accredited healthcare laundries are trend-setting leaders when it comes to "Green" practices and sustainability. These directly align with a hospital's objective of environmental stewardship. Key areas where HLAC-accredited healthcare laundries lead in environmental stewardship include:

Pushing reusable textiles — Whether it is in the operating room, on the patient's bed, or on the patient's body, reusable HCTs are better for the environment, more comfortable, and support local jobs versus single-use disposable HCTs that fill up landfills and pollute our planet.

Water savings — A home washer consumes more than three gallons of water per pound of linen processed. A modern HLAC-accredited healthcare laundry consumes less than 0.8 gallons of water per pound of linen processed.

Plastic recycling — Most HLAC accredited healthcare laundries have programs to recycle used plastics from cart covers and linen bags rather than dispose of them into landfills.

Synthetic textiles — Many HLAC accredited healthcare laundries have switched to using synthetic HCTs in increasing numbers. These textile items dry much faster, thereby consuming fewer BTUs during processing. Furthermore, they typically last for more processing turns before having to be replaced.

High-efficiency continuous batch washers — Many HLAC-accredited healthcare laundries utilize ultra-high efficiency continuous batch washers. These environmentally friendly washers efficiently reuse water, heat, and chemistry thus greatly reducing the laundry's environmental footprint.

We know that HAIs are a primary concern for virtually all hospital C-suites, with pay-for-performance mandates and the crackdown on reimbursements for related complications. This has cleared the path for the IP to begin making what *ICT* editor Kelly M. Pyrek has called a "solid business case for infection prevention and control at his or her healthcare institution." In her article, "Making the Business Case for Infection Prevention," Pyrek called constructing a

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solid business case “one of the most critical skills an IP can have” and she provided key aspects necessary for making the case. Pyrek elaborated on the topic earlier this year in the first of her “IP/Stakeholder Series: The C-Suite,” in which she shared insights from industry professionals on how to foster communication and collaboration between IPs and key stakeholders.¹⁰

Is there room for the aforementioned laundry/linen messages in a business case for infection prevention, or for that matter in any other opportunity to communicate with the C-suite? We think so. And we strongly believe HLAC accreditation is an effective solution to have in hand in these communications.

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John Scherberger is past president of HLAC.

Lynne Schulster, PhD, recently retired from CDC after 20 years of serving as the Division of Healthcare Quality Promotion's subject matter expert on environmental infection control.

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*HLAC (Healthcare Laundry Accreditation Council) is a nonprofit organization formed for the purpose of inspecting and accrediting laundries processing healthcare textiles for hospitals, nursing homes and other healthcare facilities.

Healthcare Laundry Accreditation Council (HLAC)

The Healthcare Laundry Accreditation Council (HLAC) is a nonprofit organization that inspects and accredits laundries that process reusable textiles for hospitals, nursing homes and other healthcare facilities. HLAC-accredited laundries work in tandem with Infection Preventionists to ensure hygienically clean healthcare textiles for every patient in the healthcare facility.

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