

Promoting Energy Efficiency and



“Green” Practices in the Laundry Process

Designing and implementing Green laundry solutions by Mark Whitaker

Sustainability and the “Greening” of hospitals have been hot-button topics for many years, with experts (and customers) continually reminding us to examine our environmental and carbon footprint. For most hospitals, the reality is that “going Green” should be both about doing what’s right for the environment and the community as well as creating an opportunity to save money over the long term. And it’s worth noting that for many patients, their healthcare experience will usually include heavy exposure to the hospital’s textiles through patient gowns, robes and bedding, so customer satisfaction also has to be considered as part of the equation. Fortunately, there are opportunities for hospitals to greatly impact these areas through the decisions they make with regard to linen selection and laundry processing.

Green Opportunities: Linen and Laundry

Ask anyone in charge of laundry, be it household or industrial, and they will tell you that it is a never-ending task. From bed linen to patient gowns, textiles are everywhere within a healthcare facility, making them a great place to implement meaningful change. In fact, studies show that a hospital with more than 300 beds typically uses 16 pounds of textiles per patient day, so it’s probably not surprising to find out that laundry is one of the top services accounting for most of a hospital’s energy use.

As you would expect, designing and implementing Green laundry practices for a healthcare facility can be a challenge, especially since some of the best practices from other industries do not transfer easily. For example, some of the most ecological and cost-saving Green measures are in the category of “zero” solutions, which can be basically described as the elimination of a product, a process or a section of a process. A good example of this is in the hospitality industry, where some hotels offer guests the choice of reusing towels and bed sheets for several days. By eliminating daily washings, the hotel is not only able to reduce the consumption of water and detergents, but also overall laundry costs. There is also the additional benefit of extending the useful life of its textiles and laundry machines (if done in house), which also increases profit margins.

But while some hospitals are adopting a similar policy of changing bed linens every other day unless it is necessary to do it more frequently, the reality is that in a healthcare setting, patient laundry most likely has to be done every day for sanitary reasons. And of course, no one would advocate hospital staff forgoing the use of proper barrier gown protection to increase hospital sustainability at the risk of increasing safety and infection control issues.

With zero solutions being less of an option, the most practical and implemental Green healthcare linen and laundry efforts are likely to be focused on the second, but equally effective category of efficiency solutions. Efficiency usually refers to a reduction in the usage for a given service (production, heating, etc.). This reduction in energy consumption is not necessarily associated with technical changes. It can also result from better organization and management or improved economic efficiency (e.g. overall gains of productivity). As mentioned earlier, hospitals can greatly influence these areas through their linen selection and how they process their laundry. For those looking for a place to start, here’s a closer look at how some changes in these areas can contribute to your Green—and monetary—bottom line.

Linen Selection: Using Energy-efficient Textiles

Energy-efficient textiles (EETs) are making strong inroads across the healthcare textile market as linens, apparel, interior furnishings and medical textiles. With healthcare facilities searching for energy conservation and cost savings answers, many linen companies are now coming out with more EETs that are based on texturized polyester fibers that feel more like cotton. In general, EETs are 100 percent synthetic products that replace a poly/cotton blended product in the laundry. These products are in the efficiency solutions category and promote savings through product performance, energy conservation and reduced operating costs.

While the word “polyester” conjures up images of the 1970s and leisure suits for many, the reality is that the fiber has been used for decades within the healthcare industry as a way to increase the strength and durability of linens while reducing drying time. It was traditionally offered in blended fabric sheeting with cotton, as the pure polyester fiber wasn’t suited for processing in large laundries or ironing, and it didn’t absorb or wick moisture. The good news is that today’s 100 percent polyester sheets are as comfortable as cotton, have superior soil release, wash well, stay bright white, last longer, stain less and save energy through faster drying.

Textile performance is defined in terms of what a textile can do; that is, the manner in which or the efficiency with which the product reacts or fulfills its intended purpose. Performance can be identified as “performance attributes” that specify the five major needs or requirements that textiles must meet in a laundry and hospital environment:

- ▶ **Maintenance:** The ability of the textile to remain in the same state of cleanliness, size, physical integrity and to be the same color as when purchased, following use and/or care procedures.
- ▶ **Durability:** The ability of the textile to retain its physical integrity for a reasonable period of time.
- ▶ **Comfort:** The ability to provide the user with freedom from pain and/or discomfort.
- ▶ **Aesthetic appeal:** The degree of pleasantness of the textile to the sensory mechanisms of the ultimate consumer.
- ▶ **Health/safety/protection:** The characteristics of textiles that make them potentially hazardous to humans and/or the environment.

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How do the EET products of today measure up against these criteria? The answer is “very well.”

Innovative EET products, such as Medline's PerforMAX textile line, are now manufactured with patent-pending yarns that are specially altered to wick away liquids, which makes the fabric feel as if it absorbs moisture, as well as very soft. The result is faster drying times, hot water savings and a reduction in rag-outs (product taken out of circulation) due to better stain resistance. In terms of energy conservation, the fabric readily provides savings through decreased drying times and reducing the need for multiple washes. The durability and strength of the fabric, as well as its ability to keep its fresh white color longer, substantially reduces replacement, keeping product in circulation for longer periods and reducing costs. Polyester fabric doesn't require any conditioning in the dryer, which saves on energy cost and leave less lint in dryers, meaning less maintenance is needed.

So how does a healthcare facility measure the impact of a change to energy-efficient textiles? One resource Medline is offering on its Web site (www.medline.com/textiles) is a calculator to help facilities understand how the choices they make affect their carbon footprint. A carbon footprint is a representation of the effect an organization has on the climate measured by the total amount of greenhouse gases it produces (CO₂). Users enter the amount of linens they process annually in pounds (the national average is 16 pounds per patient day) and the tool shows the potential annual gas emissions that could be saved by using PerforMAX sheets, scrubs and underpads.

As you would expect with every technological improvement, EET innovation comes with a caveat. While sustainability and cost savings from reduced energy usage are inherent in the design and use of energy-efficient textiles, it can take some time to realize those benefits due to transition issues. For example, if a wash load contains both cotton blended and pure polyester items, the drying time does not speed up as much as if the load contained only energy efficient textiles.

Green Practices in the Laundry

Of course, there's more to Greening up the linen and laundry process than just the product selection. For laundry managers looking to be not only being environmentally friendly but also

cost-effective, the energy, water and chemical consumption used in the cleaning process, as well as the electricity and steam for pressing, are great targets for reduction and reuse.

Hospitals are often one of the most intensive consumers of water resources in their given communities, so it's become increasingly important for them to place resource conservation and sustainability at the top of their list of priorities. There are some very high-tech solutions, such as water reclamation

systems that capture and reuse the hot water and steam used in the washing and drying process. The basic concept is to process the "used" water through a filtration system and recycle back into the wash process instead of routing waste water out of the facility and on to the public sewage treatment facility.

Recycling of laundry wastewater is a relatively new phenomenon in the industry, and while the lack of readily available information leads some to question whether recycled

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What Makes it Green?

As one of the largest healthcare organizations in the United States, Kaiser Permanente's environmental purchasing policy has become a model for other organizations. Kaiser Permanente's general utilization and selection strategy for contracting staff and individual/department purchases says a product is environmentally preferable if:

- ▶ It requires the company to use less of it;
- ▶ It helps conserve resources like energy or water;
- ▶ It eliminates waste;
- ▶ It allows the company to reduce the toxicity of a product;
- ▶ It is recyclable;
- ▶ It allows the company to reduce total cost of ownership with comparable functionality and effectiveness.

Source: Kaiser Permanente's Environmental Purchasing Policy

Case Study: Portland Hospital Service Corporation

As the above shows, when it comes to linen selection and laundry processing, hospitals have many choices on how best to invest time and resources. Implementing changes in linen products and laundry operations can be challenging, but several healthcare and industrial laundry companies have made changes like those discussed above and are finding favorable results.

There are many forms that a laundry/hospital partnership can take. Some hospitals have onsite laundries where the linens are processed, while others rent their textiles from a local commercial laundry. Portland Hospital Service Corporation (PHSC) was formed in 1970 and is one of the longest running cooperative healthcare laundries in the country. As a cooperative laundry, PHSC is owned by Legacy Health System, Kaiser Permanente and Sister of Providence. PHSC provides laundry service for all of the hospitals in these three systems, but is

not completely limited to the facilities within its owner organizations. Today, PHSC services 13 hospitals and 60 medical and dental clinics. The laundry currently processes about 23 millions pounds annually.

As a cooperative laundry, a key component of PHSC's mission has always been to provide an efficient and cost-effective laundry service. The laundry is held to the same standards as any other business group within the health system. So, not only must they manage and control the total cost of healthcare linen for their members, but they must also maintain the highest standards of product quality. This means the linens chosen must be in the best interest of patient care and they must be clean from an infection prevention perspective.

One example of how PHSC addresses the areas of cost control, product quality and infection prevention is in the pre-sort of their laundry.

It is well understood in the industry that laundry must be processed using the right combination of chemicals, relatively high temperatures and mechanical action. Yet, it is not economically feasible to wash all linen with the same formula, which by necessity would mean using the heavy soil process for all items. Doing this would unnecessarily increase your utility costs and decrease linen life by exposing it to harsher chemicals and prolonged mechanical action. Instead, PHSC sorts its linen into soil classifications ranging from light to heavy.

However, even with their best efforts, PHSC was still faced with the challenges of increasing energy costs and products that were by their very nature not delivering in the area of product quality.

PHSC was very interested in looking at alternative "Green" linen products that would help them conserve resources, lower their energy use and, if possible, offer better quality. This initiative was welcomed by its member hospitals, which had all individually developed their own

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sustainability initiatives and were having measurable success with their own energy management programs.

For PHSC, the largest single issue was with its poly/cotton blended flat sheets (55 percent cotton/45 percent poly and 70 percent cotton/30 percent poly). The sheets they were using were shrinking and had to be rewashed or thrown out because of stains at a rate that the laundry considered excessive. Because flat sheets alone represented more than 25 percent of the total pounds that PHSC was laundering, any improvements in this area could bring big changes to energy use, total costs and customer satisfaction.

In particular, the problems they were facing with the poly/cotton blended flat sheets included:

- ▶ **Shrinking:** Cotton tends to shrink. At PHSC, as at most laundries, they were running their sheets through an ironer. Over time, the heat of the iron was higher than the heat set temperature on the sheets and the sheets were shrinking. When a sheet shrinks, it will no longer fit to the top of the pillow and won't stay tucked in, making it frustrating for the nurse and patient.
- ▶ **Staining:** Hospital sheets can have any of a multitude of different stains, from blood and human waste to CHG. Cotton will naturally draw fluid into the fiber (this is why 100 percent cotton bath towels feel so good). However, when it comes time to get the stain out, it is more difficult with cotton because the stain has penetrated to the inside of the fiber. The laundry was spending a lot to get the stains out and to replace stained sheets that couldn't be salvaged. And, given the volume, it was inevitable that a sheet with a stain would find its way to a customer now and again, leading to calls and quality complaints.
- ▶ **Yellowing:** Cotton fibers are more fragile, and when exposed to chlorine bleach the fibers become

damaged and discolored, giving them a grey or yellow appearance.

- ▶ **Tearing:** The tensile strength of cotton is not as strong as polyester and wears out faster, so it is more likely to tear and over time will naturally become thinner and even more prone to snags and rips.

In her search for a Green linen sheet solution, Deborah Lark, executive director of Portland Hospital Services Corporation, considered whether the product could be cleaned with fewer or even no chemicals, whether the product would last longer, whether the product was safe for patients and employees to handle and whether the product had been designed for use in a commercial healthcare laundry.

In early 2006, she switched to PerforMAX 100 percent polyester sheets from cotton-rich bed linens. Lark says that the change has been "very positive and well-liked by healthcare workers." And, just as importantly, it has served the laundry and its owners well because the products are "highly energy efficient and help us to increase production." Small changes had to be made in the laundry in order to process the sheets properly, but the time spent was well worth it for the very big energy and resource reductions that they have enjoyed since the move to PerforMAX synthetic sheets.

Staining, yellowing and tearing have virtually disappeared, meaning far fewer rag-outs. Lark appreciates the lower costs associated with having to purchase 71 percent fewer replacement sheets on an annual basis, and also feels good about delivering a product to her customers that can be used up to four times longer than the previous product. Lark realizes that no change would be successful without the support and approval of her member customers, and she is delighted that her first foray into Greening her operations and product mix has been so well received. †

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water is "bacteria laden" and may pose infection control risks for the patient population, there are facilities using recycled water safely. For an example, a large centralized healthcare laundry located in Marietta, Ga. has been recycling their laundry wastewater for more than five years, with more than 110 million gallons recycled to date. They maintain a practice of monitoring bacterial growth on final processed linen as a routine component of their infection control, and since the installation of the laundry water recycling system there has

been no documented increase in microbial growth on final processed linen.

There are also some very simple and important practices that a hospital can review and implement that will save money and resources. Take for example, the wash load itself. One of the most important Green practices a laundry facility can implement is ensuring the use of the correct detergent for the classification of soiled linens being washed. Using the correct detergent for a specific grouping will require a lower water temperature,

shorter washing cycles and cleaner fabrics. Sorting linens based on the classifications of light, medium and heavy soil will also help optimize chemical use.



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To match detergents to soil classifications, you must sort before washing. From an infection control perspective, sorting before washing also protects both the machinery and the linen from the effects of objects in the linen and reduces the potential for recontamination of clean linen in post sorting. There is an argument that the alternative of sorting after washing minimizes the direct exposure of laundry personnel to infective materials in the soiled linen and reduces the airborne microbial contamination in the laundry. The use of protective apparel and appropriate ventilation, however, can minimize these exposures.

And when it comes to wash load, size does matter. When the machine is underloaded, overall energy costs, chemical costs, linen wear are all increased. If the washer is overloaded, there will not be enough water or chemicals in the machine to handle soil removal, greatly increasing the chances that the textiles will not get cleaned and will need to be rewashed. Why the emphases on reducing rewash? In addition to the costs of time and detergent, it is a fact that much of the energy utilized at a laundry operation is used to heat the water for a rewash process. More importantly to the infection control professional, a poor wash caused by an improperly sized load could lead to a potentially poorly performing barrier linen item, as residual soap left in the fabric can decrease barrier effectiveness and lead to moisture passing through the fabric.

In terms of cost savings, using the correct wash load size also helps to reduce the number of overall loads, because

you are eliminating underloading. It sounds basic, but if by ensuring a full load every time you increase loads by 5 percent across the board, you may be able to save as much as 5 percent of the water and the energy associated with heating that water. Even the elimination of one hot water pre-flush or rinse in a high-volume wash classification could save thousands of gallons of water a week.

Making the Change

It is a reality that any product change can be difficult for clinicians to accept. Further complicating the matter, infection control requirements and regulatory requirements can create barriers to the adoption of energy conservation programs and protocols. Because of this, it is important to invite a variety of hospital personnel to participate in making product recommendations and help implement Green strategies, says Tom Badrick, sustainability coordinator at Legacy Health Systems in Portland, Ore.

“Being Green means a product has a bigger foot in the door, but being Green does not and should not trump other issues,” says Bardick. “It still has to above all be in the best interest of patient care, so it is vital to include nurses, infection preventionists and purchasing team members early in the process so all perspectives are brought to the table. In the end, a team effort where everyone is vested is always more effective than trying to implement a change on your own no matter how good the cause.”

And while hospitals have a desire to be Green and have as little environmental impact as possible, going Green is quickly becoming a business reality. According to the Environmental Protection Agency’s Energy Star program, hospitals spend \$8.3 billion on energy each year and offer \$2.5 billion in potential savings. It might be, however, that the best benefit is that the money saved on energy costs enables healthcare facilities to redirect those dollars to other areas, including improving patient care.

“The phrase ‘first, do no harm’ is growing in popularity, as is the idea of creating less waste—it’s no longer good enough to just recycle it,” says Bardick. “In general, our nurses are very supportive of Green projects and initiatives, and that’s a growing trend everywhere I’ve been.” †

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