Gowns Worth Wearing A Hundred Times Over

COVID-19 PANDEMIC LEADS TO HEIGHTENED INTEREST IN REUSABLE BARRIER GOWN PROGRAMS

BY NICK FORTUNA

**PROPONENTS OF REUSABLE BARRIER GOWNS** in hospitals saw their argument bolstered dramatically by the COVID-19 pandemic this spring, when news stories and photos emerged that shocked and outraged a nation.

Faced with an unprecedented shortage of personal protective equipment (PPE), nurses and doctors were forced to reuse disposable masks and gowns for entire shifts or longer, with some turning to trash bags and raincoats when supplies ran out.

Single-use barrier gowns offer convenience because medical professionals can simply throw them away and be done with them, but as the COVID-19 pandemic proved, convenience often comes at a cost. With PPE alarmingly scarce at the height of the crisis this spring, end users became acutely aware of the value of reusable isolation gowns and an increased interest arose from hospitals, medical centers and laundries.

Jason Hartsell, director of operations for Indianapolis-based United Hospital Services, said the ability to reuse a gown 75 to 100 times sounds especially good to hospital administrators preparing for a second wave of COVID-19 infections.

"I feel that the COVID-19 pandemic has really shown both hospitals and laundries how having a robust, reusable isolation gown program can be a huge benefit," said Hartsell, whose company processes more than 49 million pounds of laundry each year, including 4.9 million isolation gowns in 2019. "Most of the PPE that caregivers were having to wear was disposable, and acquiring these products started to put huge strains on supply chains."

Graham Skinner, vice president of large laundry sales for Greenville, N.C.-based UNX Industries, which provides chemicals for the laundry, housekeeping and ware wash sectors, said reusable gowns offer other benefits as well. They cost more at the time of purchase, but their cost per use is much lower than that of disposable gowns, providing significant savings over time.

In addition, hospitals can avoid the waste-disposal costs associated with single-use gowns while giving their medical professionals a higher degree of protection, said Skinner, who spent more than three decades supervising laundry operations before joining UNX Industries. There’s also the environmental benefit since fewer gowns need to be manufactured and sent to landfills.

"It’s a constant grind, keeping that process of buying more and restocking going," Skinner said of single-use gowns. "During the pandemic, hospitals that were using disposable isolation gowns suddenly had a problem because they were running out and the supply dried up. If you had a reusable program, then you could pretty much carry on as usual because you had a sustainable supply and you just had to reprocess them."

**SORTING AND WASHING**

Sorting reusable gowns is an easy task, but there are several important points to remember, Hartsell said. First, tied strings, including the ones around the neck, shouldn’t be untied during the soiled sort, especially if sorters are wearing needle-proof or needle-resistant gloves that limit dexterity and make it difficult to undo a knot.

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Another common issue is caregivers leaving exam gloves inside the sleeves of an isolation gown as they doff the gown. Hartsell said medical professionals often develop this habit while using disposable gowns and continue it after switching to reusable.

"If you see a lot of tied strings and gloves left in the sleeve, give feedback to the hospitals so they can retrain their staff on using a reusable gown," he said. "During the COVID-19 pandemic, there was a huge rush of hospitals starting to use reusables, so they may have started using the product without providing the necessary training on their proper use."

Most chemical vendors will have experience determining a proper wash formula for isolation gowns, so laundries should lean on them in establishing one, Hartsell said. Similarly, improper temperatures during washing and drying can greatly reduce the lifespan of gowns, so it’s vital to obtain care instructions from manufacturers and to adhere to them strictly, Skinner said.

During washing and drying, it’s also important to pay attention to load weights. Isolation gowns generally must be under-loaded in both the washer and dryer. Since they are designed to be fluid resistant, they typically will be carrying a lower soil factor than most laundry products. If operators are overloading pockets in a tunnel washer, they may see isolation gowns "float" from one pocket to the next, Hartsell said.

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The service life of reusable barrier gowns can be extended by chemical applications that restore their fluid resistance by forming a fluid-repellent barrier. Gowns sometimes will be treated with one of these products at a prescribed dose the first time they are washed and at maintenance doses each time thereafter.

Skinner said these rejuvenation products may extend the life of gowns by 25 percent to 50 percent and may provide enhanced safety for the end user. "You do get a marked improvement in the properties of the gown when you’re using some of these rejuvenation products, if you use them according to the manufacturer’s recommendations," he said.

**DRYING**

Most isolation gowns have a knit cuff, and that can make drying them the most difficult part of the process. The cuff may dry more slowly than the body of the gown, resulting in gowns having damp cuffs when they come out of the dryer. In that case, the dryer may be overloaded, hindering airflow, or more drying time may be needed, Hartsell said. Increasing the drying temperature probably isn’t the best solution because it risks damaging the fluid-resistant properties of the body of the gown.

"Properly maintaining your dryers will benefit you immensely," Hartsell said. "For example, if you have failing door seals, you may notice isolation gowns being forced between the dryer and the door. If you have melted plastic built up inside your dryer drum, you run the risk of damaging the isolation gowns. If there are any sharp spots on your drum, the isolation gowns could be completely shredded."

Operators should bring any damaged gowns to the attention of maintenance personnel immediately so they can isolate the faulty dryer, take it offline and repair it. Operators also should take special notice of any loads that come out hot or damp, which may indicate a problem with the dryers, such as lint buildup or overloading, Hartsell said.

**THE FOUR LEVELS OF BARRIER GOWNS**

The Food and Drug Administration has issued the following guidance for using the four levels of barrier gowns:

* **Level 1:** Minimal risk; to be used during basic care or standard isolation, as a cover gown for visitors or in a standard medical unit
* **Level 2:** Low risk; to be used while drawing blood, suturing, in the intensive care unit or in a pathology lab
* **Level 3:** Moderate risk; to be used during an arterial blood draw, inserting an intravenous line, in the emergency room or for trauma cases
* **Level 4:** High risk; to be used during long, fluid-intense procedures, surgery, when pathogen resistance is needed or when non-airborne infectious diseases are suspected

Kristy Warren, director of clinical resources for Encompass Group LLC, said laundries that are considering reusable gown programs should get input from clinicians early on, taking into account the types of patients they will be caring for and the procedures they will be performing.

"I think it’s important to have the clinicians involved in the decisions of gown selection," said Warren, a former nursing supervisor. "It all depends on the level of exposure, the type and length of exposure and the invasiveness of the medical procedure. It comes down to what patient-care activities are anticipated and the level of protection needed."

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**TRACKING USAGE**

Standards put forth by the Association for the Advancement of Medical Instrumentation (AAMI) require that surgical gowns be tracked to ensure they aren’t kept in circulation too long. Laundries have several options, including one that requires the smallest of investments but also is the most labor intensive.

In the quality-control grid system, a laundry worker uses a sharpie to mark each gown’s grid after it has been washed and inspected. The grid typically appears on a label on the tail of the gown, and when all the spaces have been marked, the gown should be ragged out.

Barcodes and RFID tags offer greater efficiency but at a higher cost, Skinner said. Barcodes are quicker than the grid system, but workers must locate the barcode on each gown and present it to a barcode reader, which still requires considerable time. RFID tags allow for quicker processing since workers can simply pass the gowns over a scanner without taking the time to locate each tag.

Hartsell said his company used grids before switching over to RFID tags, and the technological upgrade offers several advantages. It gives a laundry the ability to know the age of its inventory, where that inventory is located, and the average time between uses for its gowns. The company also gains the ability to charge clients for losses.

"The quality control grid is the easiest method to begin using, since your only investment is a marker," Hartsell said. "It is messy and sometimes time consuming for the operator to mark the grid perfectly. This will often mean a grid could be difficult to read, and you may prematurely remove gowns from service. Using RFID is more expensive, but it gives you an accurate number of cycles for a gown. It also opens you up to much more information and options."

**TESTING**

As reusable gowns age, it’s important to test them periodically to ensure they are remaining water-resistant. Skinner said that when he was supervising laundry facilities, operators would process several thousand gowns a day, and managers would randomly select a dozen for testing. The gowns would undergo a hydrostatic head test using a small machine called a Suter tester to measure their precise level of water resistance.

A section of the gown is secured to the testing machine and is stretched over a tube of water. Increasing levels of air pressure are used to eventually force that water through the cloth barrier. The machine measures the pounds per square inch (psi) that the fabric can withstand before water seeps through.

Inspectors also look for any worn areas or holes in gowns. Barrier gowns come in four levels of strength (see page 8) with the higher-numbered levels used when medical professionals face a greater risk of exposure to bodily fluids, such as in operating rooms, emergency rooms and intensive care units. If a hole in a Level 3 or Level 4 gown is small, it might be possible to patch it, Skinner said, but since the safety of the medical professional is paramount, damaged gowns typically are ragged out.

"It’s always important to have a testing program in place that is documented, explainable and logical, and that your infection-control people agree with," Skinner said. "In my mind, it’s up to the laundry to provide the product and the testing methodology to prove the gowns are performing like they should. The hospital may want to spot-check them. There’s always someone who has to watch the watchers."

Skinner said that for a reusable gown program to succeed, all stakeholders must be engaged early in the process, getting support from the manufacturer and input from infection-control specialists, nurses and other medical professionals. Clinicians will want to be involved in the decision making on the level of gown being used for each department, since the risk for exposure varies by setting.

"You need representation from every group that will be affected by switching to a reusable gown," Skinner said. "You have to have buy-in from everybody, and you have to educate people, letting them know that it’s more sustainable, it’s cheaper and it provides superior protection. If you do the homework in the beginning and get it done right, you’ll be very satisfied with the outcome."

Kristy Warren, director of clinical resources for Encompass Group LLC, a medical supply company based in McDonough, Ga., said healthcare professionals usually grow comfortable with reusable gowns once they have been fully informed. By being transparent about the washing, drying and testing processes, laundries can alleviate the concerns of medical workers.

"Laundries have great protocols in place; therefore, the risk of cross contamination through reusables is low," said Warren, a former nursing supervisor in a critical care unit. "Even the [Centers for Disease Control and Prevention] says there’s negligible risk for cross-contamination from laundry items, so healthcare providers should feel safe and comfortable wearing a clean, reusable isolation gown."