Case Study

Title: Conversion from Disposable to Reusable Isolation Gowns Results in Tremendous Savings for Health System

Facility: Carilion Clinic – Roanoke, VA

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BACKGROUND

Carilion Clinic is a not-for-profit healthcare organization based in Roanoke, Virginia, which employs over 600 physicians representing more than 60 specialties. Carilion Clinic is a comprehensive network of over 195 sites including hospitals, clinics and other complementary services. Combined, these facilities represent approximately 1,187 patient beds with over 50,000 admissions, 187,176 Emergency Department visits and 850,000 primary care visits each year. With a mission of enduring commitment to the health of the region, the Carilion Clinic seeks to advance care through medical education and research.

With a corporate vision of providing better patient care and better community health at a lower cost, the Carilion Clinic is always looking for opportunities to achieve cost savings while maintaining high levels of patient satisfaction. With the growing demand for isolation gowns in the healthcare environment, Commonwealth Laundry Services identified a significant savings opportunity for the Carilion Clinic after examining the costs associated with disposable versus reusable isolation gowns.

OBJECTIVE

Over the past several years, acute and long term care facilities have seen a significant increase in infections caused by superbugs like MRSA, VRE and C Diff among the general population. In addition, the spread of pandemic viruses like the H1N1 and SARS are also occurring more frequently. Both of these factors are driving up the isolation patient population in healthcare facilities.

The wearing of isolation gowns and other personal protective equipment (PPE) is mandated by OSHA to protect healthcare workers against blood-borne and other pathogens present in the isolation patient population. These recommendations are designed to prevent transmission of infectious agents among patients and healthcare personnel in all settings where healthcare is delivered.
The use of isolation gowns is also specified in the “Standard and Transmission-Based Isolations” as defined by the CDC to protect the health care worker’s arms and exposed body areas and prevent contamination of clothing with blood, body fluids and other potentially infectious material. The need for and type of isolation gown selected is based on the nature of the patient interaction, including the anticipated degree of contact with infectious material and potential for blood and body fluid penetration of the barrier. In its "Transmission-Based Isolations" guidance, the CDC categorizes anticipated exposure as contact, droplet or airborne transmission-based risks.

Based on the growing need to provide isolation gowns throughout all areas of healthcare and Carilion Clinic’s commitment to providing better care at a lower cost for their patients, Commonwealth Linen Services established the objective to evaluate the costs associated with isolation gowns for the entire Carilion Clinic system. The goal of the evaluation was to determine whether disposable or reusable isolation gowns best met the needs of the system while taking the following factors into consideration:

- Clinical Performance
- Cost Effectiveness
- End User Satisfaction
- Environmental Impact

**STRATEGY**

Commonwealth Laundry Services worked with Standard Textile to identify an isolation gown that met AAMI (Association for the Advancement of Medical Instrumentation) standards and was sized appropriately. In addition, a preliminary cost analysis that compared disposable to reusable costs was completed. The initial analysis identified considerable savings if the system went forward with a conversion from disposable to reusable isolation gowns.

**AAMI Selection & Use Guidelines**

<table>
<thead>
<tr>
<th>Anticipated Risk of Exposure to Etiological Agent or Body Fluids</th>
<th>Appropriate Barrier Performance Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>Level 1 or 2</td>
</tr>
<tr>
<td>Medium</td>
<td>Level 2 or 3</td>
</tr>
<tr>
<td>High</td>
<td>Level 2, 3 or 4</td>
</tr>
</tbody>
</table>

Even though the initial cost analysis demonstrated significant savings for the system, the Infection Control department at the Carilion Clinic was reluctant to move forward with the isolation gown conversion due to the following concerns:
- Efficiency of the linen distribution system
- Quality and Performance of the reusable product
- Proper utilization of the reusable gowns.

The outbreak of the H1N1 virus in 2009 - 2010 opened a window of opportunity to move forward with the isolation gown conversion. Health systems using disposable gowns were put on quotas because suppliers could not meet the significant increase in demand for gowns. In addition, nursing was not happy with the amount of trash that was generated each day from the use of disposable gowns. Given this window of opportunity, Commonwealth Linen Services developed a strategy to address all of the concerns expressed by the Infection Control department at the Carilion Clinic and eventually gain their approval to move forward with the conversion to reusable gowns.

**Product Packaging and Distribution**

Commonwealth Linen Services determined one of the key factors to gaining acceptance from the clinical staff for the reusable isolation gowns was to package the product similar to the disposable gowns. After a short period of trial and error, the laundry came up with the method of packaging 10 gowns in a 14” by 16” zip-lock bag. The final package looked similar to package of 10 disposable gowns but actually took less space.

Another hurdle that had to be addressed was the distribution and storage of the reusable gowns in the units. The disposable gowns were delivered from the materials department on a weekly basis to the supply room in each unit. Since the delivery was a week’s worth of disposable gowns, it consisted of several cases taking up a considerable amount of space. Storing several cases of the disposable gowns in each unit was an ongoing issue due to space constraints in the supply rooms.
The new method of distribution of the reusable gowns would be handled by the linen distribution staff. Daily par levels of reusable gowns were established for each unit and the linen staff inventoried the gown supplies each day, restocking the quantities back up to established par levels. Since the units only had to store a one day supply of gowns, the space requirements were significantly less than with the disposable gowns. Gowns could easily be stored on shelves in the supply room instead of a large stack of cases.

Product Quality

Maintaining the barrier performance throughout the useful life of the product was another concern expressed by the Infection Control department. Several measures were put in place to ensure the product quality.

- Inspection – During processing, all gowns are inspected for stains and tears in the Commonwealth Linen Service surgical pack room before they are folded and packaged in the zip-lock bags.
- Quality-Control Grids – The isolation gowns provided by Standard Textile were marked with quality control grids. After inspection the grids were marked by a symbol assigned to only one employee. Marking the grid provided two benefits: it tracked the useful life of the product and also allowed any quality control problems to be tracked back to a specific employee.
- Barrier Performance – To reinforce the barrier properties of the isolation gown a barrier re-treatment product was added to the final rinse.
Product In-service

One of the primary concerns of the Infection Control Department was the correct use of the reusable gowns. Working with the nursing management at the Carilion Clinic, an in-service was developed to train the end-users on the proper utilization techniques for the reusable isolation gown. The reusable isolation gown in-service specifically addressed the following:

- Wearing gowns multiple times (Gowns should only be worn once and then removed before leaving patient room).
- Removing gown in proper manner (Unfasten neck and waist ties, peel off gown turning it inside out).
- Wearing gowns for inappropriate use (As warm-up or smoking jacket)
- Returning gowns back to laundry (After use, all gowns should be placed in soiled linen hamper and returned back to laundry for processing).
- Environmental Impact (Less trash going to landfills)
- Cost Savings

Product Trial

Once all of the concerns from infection control were addressed, the next step in the conversion process was the product trial. Before the Carilion Clinic went forward with a system wide conversion from disposable to reusable isolation gowns, they determined it was necessary to obtain crucial feedback from the clinical staff regarding the performance of the reusable isolation gown.

Four units that used a significant amount of isolation gowns were selected to trial the reusable isolation gowns for a 60-day period. The staff was surveyed after 30 and 60 days to obtain their feedback and evaluate the performance of the gowns.

RESULTS

End User Satisfaction

The results of the surveys conducted at 30 and 60 days were compiled. Overall, the feedback from the end users was very positive. The following is a synopsis of the comments made regarding the reusable gowns:

- Improved comfort and ease of use
- Increased coverage and protection
- Reduced storage space requirements; provided more room for other supplies
- Decreased amount of trash; positive environmental impact
The product trial resulted in a full approval from the Infection Control Committee and the Nursing Product Standardization Committee. From there the reusable gowns were added to four additional units every six weeks until the entire Carilion Clinic system was completely converted to the reusable isolation gowns.

Cost Savings

By developing a coordinated and systematic approach to addressing the concerns of the Infection Control department at the Carilion Clinic, Commonwealth Laundry Services was able to successfully convert the entire system from disposable to reusable isolation gowns. One of the main benefits of the conversion was the significant cost savings realized by the health system. The following graph compares the cost per use associated with disposable and reusable gowns.

The disposable cost per use was calculated using the cost to purchase the disposable gown and cost to dispose of the gown once used. The reusable cost per use was calculated using the purchase, replacement, processing and packaging costs. The $0.37 difference between the disposable and reusable isolation gown cost has resulted in a tremendous savings for the Carilion Clinic. The table below outlines the total savings achieved each year since the system converted to reusable gowns.

Cost Savings

<table>
<thead>
<tr>
<th>Year</th>
<th>Annual Reusable Gown Usage</th>
<th>Actual Cost Savings</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY 2011 (Oct. '10 – Sept. '11)</td>
<td>856,935</td>
<td>*$95,844</td>
</tr>
<tr>
<td>FY 2012 (Oct. '11 – Sept. '12)</td>
<td>962,480</td>
<td>$356,118</td>
</tr>
<tr>
<td>FY 2013 (Oct. '12 – Sept. '13)</td>
<td>1,081,140</td>
<td>$400,022</td>
</tr>
<tr>
<td>Total</td>
<td>2,900,555</td>
<td><strong>$851,984</strong></td>
</tr>
</tbody>
</table>

*Savings in FY 2011 takes into account the cost of an 11 par startup injection of isolation gowns. ROI for the cost of startup injection was 0.6 years.
Environmental Impact

In addition to the increased end user satisfaction and the reduced cost, the conversion to reusable isolation gowns also had a tremendous environmental impact. Over the past three years, the conversion has eliminated over 500,000 pounds of waste.

Reduced Waste

<table>
<thead>
<tr>
<th>Year</th>
<th>Annual Reusable Gown Usage</th>
<th>Pounds of Waste Eliminated</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY 2011 (Oct. ’10 – Sept. ’11)</td>
<td>856,935</td>
<td>152,106</td>
</tr>
<tr>
<td>FY 2012 (Oct. ’11 – Sept. ’12)</td>
<td>962,480</td>
<td>170,840</td>
</tr>
<tr>
<td>FY 2013 (Oct. ’12 – Sept. ’13)</td>
<td>1,081,140</td>
<td>191,902</td>
</tr>
<tr>
<td>Total</td>
<td>2,900,555</td>
<td>514,849</td>
</tr>
</tbody>
</table>

Summary

The conversion to the reusable isolation gown has been so successful on all fronts; the system is now looking at converting some of the disposable surgical products to reusable products. Moving forward, Standard Textile will continue to partner with the Carilion Clinic to identify opportunities to reduce cost, reduce waste and improve end user satisfaction.