Demographic:
Spectrum Health, a not-for-profit health system located in Grand Rapids, Michigan, has the largest multi-specialty physician group in West Michigan. Spectrum Health includes nine hospitals and more than 170 service sites. In 2010, Spectrum Health was recognized as a Top 10 Health System by Thomson Reuters. Spectrum Grand Rapids, consisting of Blodgett Hospital, Butterworth Hospital, Helen DeVos Children’s Hospital, and ambulatory care sites, has a total of 1,065 licensed beds, and 29 operating rooms totaling 18,875 square feet. The organization conducted 4,764 surgical procedures in 2010.

Executive Summary Statement:
Three years ago, Spectrum Health hired a sustainability coordinator, Josh Miller, as part of its efforts to become a more sustainable organization. One of the first areas the system wanted to address was recycling. Spectrum Health’s goal was to reduce its overall waste stream by 30% by 2010 focusing on regulated medical waste reduction and recycling efforts at the Butterworth and Blodgett Hospitals. The system was already recycling and wanted to build on its recycling program. The operating room (OR) was a large-scale generator of waste and generated significant volumes of plastic—none of which were being recycled at the time. Medical plastics had not traditionally been collected for recycling. The system—under Miller’s leadership—reached out to its recycling hauler and explored the potential to recycle a variety of different clean medical plastics being generated in the OR. Spectrum Health was able to work with its vendor to implement a rigorous recycling program within the operating rooms of the health system that saved the organization money while reducing waste and environmental impact.

The Problem:
Generating between 20 percent and 33 percent of total waste in a hospital, the OR is one of the largest contributors of general and regulated medical waste. ORs have increased their use of single-use medical products due to concerns over infection prevention, sterility, and ease of use. It is estimated that single-use devices will grow steadily at 4.6 percent annually reaching $59 billion dollars in 2013. Each one of these products comes...
wrapped in packaging that must also be disposed of. Blue wrap alone is estimated to comprise 19 percent of surgical waste.\(^5\) It is made of polypropylene and is used to protect and cover sterilized instrument trays in the OR. Blue wrap is not reusable since the material cannot sustain sterilization, and recycling of this plastic has traditionally been difficult. Spectrum Health began a single-stream recycling program in 2009 in the system’s Butterworth Hospital and Blodgett Hospital facilities. Spectrum Health’s recycling program was able to grow considerably, once the system was no longer required to separate recyclables.

**Strategy & Implementation:**
Gail Greco-Bieri, Support Staff Educator and Supervisor in the OR, reached out to Spectrum Health’s new sustainability coordinator in 2007 with an idea to reduce styrofoam usage. Once the two met, they collaborated and brainstormed to determine opportunities to reduce the waste generated by the ORs. In evaluating the make-up of waste being disposed of by the OR, together they realized that much of the waste was clean plastics generated during procedure set up, which was not only clean but overwhelmingly plastic. Miller was in the midst of working with Spectrum’s recycling hauler to evaluate whether the system could move to single-stream recycling. As part of this dialogue, he reached out to the hauler and asked whether he would be willing to review the plastics being generated by the OR and determine if any were recyclable. Spectrum Health’s vendor is very progressive and often presents new recycling opportunities to the organization and welcomed the opportunity to work with the system to address this issue.

Miller and Greco-Bieri worked with the OR staff at Spectrum Health’s Butterworth Hospital—the organization’s largest hospital—to collect clean plastic waste from several surgical set ups. These items were then shared with the hauler, who was able to correctly identify the types of plastics and determine whether there was an available recycling market for each. Miller and Greco-Bieri were thrilled to learn that many of the clean disposable plastics in the OR were recyclable, including polypropylene blue wrap, plastic casing, hard plastic from devices, paper lined with plastic, plastic from surgical gowns, outer casings of syringes, soft plastics from glove wrappers, rigid saline bottles, wash basins, and surgical preparation kits.

Spectrum’s focus on waste reduction across the organization has yielded dramatic results:
- 15% reduction in solid waste between 2007 and 2010
- 40% increase in recycled materials between 2007 and 2010
- 32% reduction in regulated medical waste between 2007 and 2010
- 8% reduction of total waste between 2007 and 2010

Single stream recycling was vital in the OR for a number of reasons. The OR had limited space and single stream recycling would reduce the number of recycling containers since all recyclables could now be placed into one container. Training staff to recycle would be easier as well. Miller knows of a hospital outside of Spectrum Health System that increased its recycling rate to 55% upon implementing single stream recycling. Miller is confident that Blodgett and Butterworth Hospitals can also achieve this rate from their current recycling rates of 31% and 19%, respectively.
While there are typically some hauling fees for managing recyclables, there is often a rebate on materials as well, which can result in a break-even or sometimes a small cost-savings. One also has to consider that any waste diverted into recycling is no longer going into either the regulated medical waste stream (RMW) or the solid waste stream, which also can help the organization realize avoided disposal costs. In Spectrum’s case, it already had a strong regulated medical waste (RMW) segregation in place, which meant much of this waste was being diverted from solid waste rather than RMW. In a typical organization where the ORs have not yet focused on comprehensive RMW segregation, waste avoidance savings can be markedly higher as these plastics are mostly being diverted from RMW rather than solid waste.

Spectrum’s hauler confirmed that he had a market for the majority of medical plastics being generated in the OR and that he could begin collection immediately. As part of the new program, the hauler was also able to recycle the blue sterile wrap—often a difficult recyclable—and was willing to accept the material with the indicator tape still attached. Often the indicator tape can be considered a contaminant—especially if it contains lead. Spectrum’s vendor then separates the blue wrap and sells it, where it is then melted and used in the manufacture of skids and soda bottles.

Miller and Greco-Bieri reached out to the organization’s Environmental Services Director to determine proper collection receptacles in the OR and a collection schedule. The program started at Blodgett and Butterworth, and then expanded to the system. They placed 32-gallon recycling containers in each operating room and in other areas like the intake area and the post-anesthesia care unit. The supply core area was implemented with the 23-gallon, Slim-Jim® container. They purchased green bags that stood out from other waste streams to collect recyclables—tying in with the organization’s green recycling bins. EVS staff picks the waste up every hour. As a result of the surge in recycling, EVS was picking up two bags, instead of one, which challenged their labor capacity.

The sustainability team emphasized that the process for recycling needed to be easy to maximize staff participation and support. Staff needed to know how to divert plastics and which plastics to divert through various channels. The Green Team created posters with visuals to avoid any confusion. They held In-Services with staff and sit-downs with nurse managers. The sustainability coordinator makes a yearly OR-specific sustainability presentation discussing new opportunities to engage the OR staff. The responsibility of recycling is placed with staff members and not patients. Furthermore, Spectrum staff members undergo training where they learn the connection between negative environmental impact and public health, as a way to tie employees to the work.

### Butterworth & Blodgett Waste Stream 2007-2010

<table>
<thead>
<tr>
<th>Year</th>
<th>Solid Waste (%)</th>
<th>Recycle (%)</th>
<th>RMW (%)</th>
<th>Hazardous (%)</th>
<th>Total Waste (tons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>72.25</td>
<td>15.04</td>
<td>9.59</td>
<td>0.12</td>
<td>4,068</td>
</tr>
<tr>
<td>2008</td>
<td>74.47</td>
<td>18.88</td>
<td>6.47</td>
<td>0.18</td>
<td>3,988</td>
</tr>
<tr>
<td>2009</td>
<td>74.68</td>
<td>19.39</td>
<td>5.77</td>
<td>0.16</td>
<td>3,724</td>
</tr>
<tr>
<td>2010</td>
<td>69.92</td>
<td>22.87</td>
<td>7.08</td>
<td>0.13</td>
<td>3,743</td>
</tr>
</tbody>
</table>
Benefits:

- 42,000 pounds of blue wrap diverted to recycling in 2010
- Also recycling plastic casing, hard plastic from devices, paper lined with plastic, plastic from surgical gowns, outer casings of syringes, soft plastics from glove wrappers, rigid saline bottles, wash basins, and surgical preparation kits
- 100 bags per day diverted from OR
- Recycling cost half as much as general waste
- Increases staff satisfaction relative to reducing environmental impact of the OR

Challenges and Lessons Learned:

Spectrum emphasized that education prior to rolling out a new program is key. Staff members are more willing to support the effort when they have knowledge of the reasons behind the process changes. The health system also indicated that the implementation plan is more likely to succeed if a system is in place that is easy and simple for people to follow. The Environmental Services staff faced challenges due to a lack of full-time employees to pick up the additional bags generated by the surge in recycling. The recycling program continued to grow but available labor did not. While the department is still challenged from a labor standpoint, it has been able to stretch and make the new initiative work for the organization. The success of the medical plastics recycling initiative has also built momentum within the OR, and is driving nurses to recognize new opportunities for sustainable practices within the operating room.

Endnotes


Practice Greenhealth would like to thank intern Ms. Anuja Deo, MBA Candidate in Healthcare Management at George Washington University for her great work in producing this case study.