

Diagnosing Sustainability in the Healthcare Industry:

New York State Pollution Prevention Institute (NYSP2I)

Involvement in Greening New York State Healthcare

The healthcare sector plays a tremendous role in our local and national economy. So much so, that improving sustainability at hospitals means realizing the benefits across financial, community, and environmental levels.

The Healthcare Industry is Big Business

The healthcare industry, which comprises over 17% of the nation's Gross Domestic Product,¹ significantly impacts the job market and economy on both a state and federal level. Health expenditures reached \$3.2 trillion in 2015, or an average of \$9,990 per person according to the annual report generated by the Centers for Medicare and Medicaid Services. Hospital spending increased to over a trillion dollars in 2015.¹

In 2014, the healthcare industry employed almost 8 million people across the United States. That number is poised to increase by an estimated 17% and 16% in healthcare workers and healthcare support workers respectively by 2022.² The industry either directly or indirectly supports one in every nine jobs in the United States.³

It is clear that the healthcare industry is significant when it comes to affecting the economy and job market. However, the industry's impacts can be observed on an environmental level as well. According to a study done at the University of Chicago, the healthcare industry (see Healthcare Value Chain in Figure 1), is responsible for almost a tenth of the country's carbon footprint.⁴ Hospitals in particular, which fall under the "providers" category in the value chain, are resource intensive facilities. In addition to being the second most energy-intensive facility type across the country,⁵ US hospitals also collectively generate an estimated 11,888 tons of waste every day. Not only do energy and municipal solid waste create an impact, hospitals across the country use about 790 million gallons of water each day³ and produce an average 1.8 lb. of food waste per day for every patient bed filled.⁶

Given these environmental impacts from hospitals, it is important to look upstream in the healthcare value chain at "purchasers" and "providers". The cost of supplies is second only to that of labor within the healthcare industry and is predicted to exceed that of labor as technology continues to advance.³ These supplies, along with associated manufacturing, packaging, and transportation, contribute to the environmental impacts that hospitals incur. This highlights the importance of focusing sustainability efforts throughout the entire value chain from the producers and purchasers, as well as providers, to reduce waste generation and other impacts.

Efforts are being made across the country to reduce the environmental impacts from the healthcare value chain. Organizations such as Practice Greenhealth, including the Healthier Hospitals Initiative and the

¹ National Health Expenditure Accounts; <https://www.cms.gov/research-statistics-data-and-systems/statistics-trends-and-reports/nationalhealthexpenddata/nhe-fact-sheet.html>

² U.S. Department of Labor, Bureau of Labor Statistics; <http://data.bls.gov/projections/nationalMatrixHome?ioType=o>

³ American Hospital Association: Sustainability Roadmap for Hospitals, <http://www.aha.org/>

⁴ <http://www.uchospitals.edu/news/2009/20091110-footprint.html>

⁵ New York State Department of Environmental Conservation (NYSDEC)

⁶ Massachusetts Recycling Works <http://recyclingworksma.com/>

Safer Chemicals Challenge, are working with hospitals and suppliers to educate, implement changes, and identify continuous improvement opportunities towards sustainability.

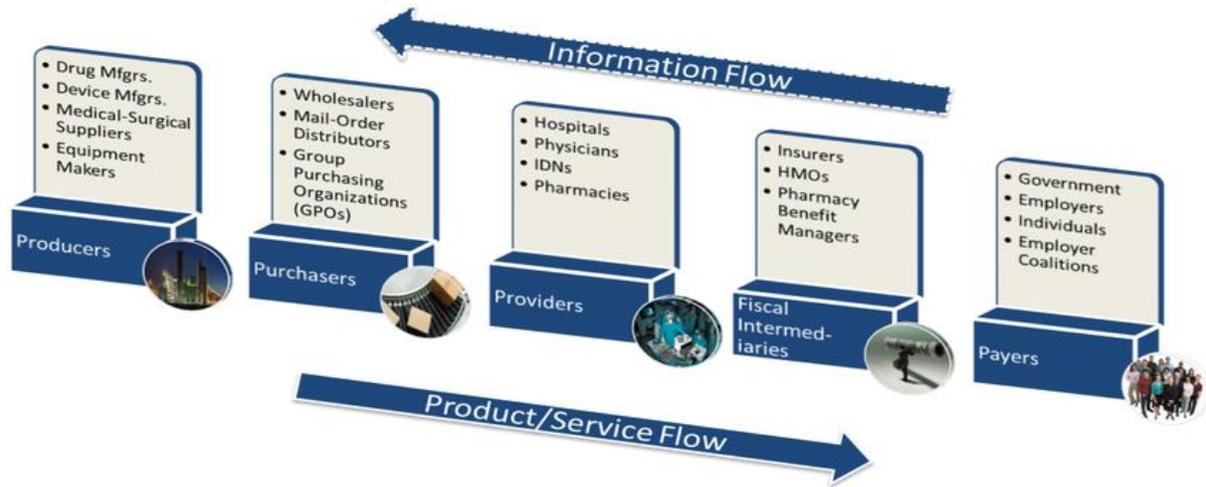


Figure 1: Healthcare Value Chain⁷

Taking New York State's Temperature on Sustainable Healthcare

New York is home to the highest number of staffed hospital beds in the country at almost 60,000 beds⁸ across 269 hospitals.⁹ In total, the State's healthcare industry employs over half a million professionals, making it the third largest employer of healthcare professionals in the US.¹⁰

It is estimated that an average hospital uses 139, 210 gallons of water per day and generates 25 lb of solid waste for every patient daily.¹¹ Based on these estimates, New York hospitals would be responsible for the generation of 750 tons of solid waste and use of 35 million gallons of wastewater every day.¹¹

Studies show that the healthcare industry understands the potential value of implementing sustainable changes, but has not yet adopted these changes industry-wide because of specific barriers. This potential value was identified in a global Harris Poll survey commissioned by Johnson & Johnson. Three-fourths of healthcare professionals across six countries believe sustainability initiatives protect employees and 70% agree sustainability initiatives make business sense. In addition, hospitals expect the integration of sustainability into purchasing to increase by more than 45% by 2016,¹² however, only 22% of US hospitals have an environmental purchasing policy. The number of hospitals that have an environmental management system or sustainability plan in place is unclear.

⁷ Adapted from *The Health Care Value Chain* by Lawton R. Burns and Wharton School Colleagues

⁸ American Hospital Directory; https://www.ahd.com/state_statistics.html

⁹ U.S. Department of Commerce, United States Census Bureau;

http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=BP_2013_00A1&prodTydcpe=table

¹⁰ U.S. Department of Labor, Bureau of Labor Statistics; <http://www.bls.gov/oes/current/oes290000.htm#st>

¹¹ American Hospital Association: Sustainability Roadmap for Hospitals; <http://www.aha.org/>

¹² Greener Hospitals: Building Consensus for Health Care Sustainability; <http://www.jni.com/sites/default/files/pdf/cs/IGEL-Greener-Hospitals-Report-20150311.pdf>

Healthcare professionals have identified the cost of implementation, affordability, and availability of green products as specific barriers to implementing sustainability initiatives and have demanded solutions to these barriers.⁹ In addition to demands for lower prices and increased availability of sustainable product alternatives, the healthcare industry has also requested more information on the benefits of sustainability.⁹

Given these factors, and as home to the fourth highest number of healthcare facilities nationwide, New York is poised as a strategic location to implement reproducible and scalable change surrounding sustainability within the healthcare industry. Efforts by the New York State Pollution Prevention Institute (NYSP2I) have identified opportunities to improve sustainability across the value chain by reducing costs and waste generation with specific focus on regulated medical waste, solid waste, food waste and “environmentally preferable purchasing” (EPP). NYSP2I’s efforts in the healthcare sector across the state have resulted in direct assistance provided to eight different hospitals, ranging from on-site food waste assessments to regulated medical waste audits, to guidance on evaluating sustainable products. In addition to the direct benefit realized by these hospitals, NYSP2I has also disseminated the findings from these projects through a roundtable discussion, a webinar in partnership with Practice Greenhealth, and sharing of tools developed online.

NYSP2I Engages the Value Chain to Implement Change

In March 2013, NYSP2I hosted a healthcare industry roundtable with healthcare value chain professionals to discuss common interests, share best practices, and learn about sustainability initiatives within the Healthcare Industry. Several key learnings were identified:

1. There is a need for educating regional facilities on nationally available healthcare resources
2. There are a lot of “low-hanging fruit” within the healthcare sector
3. Waste reduction strategies, while following healthcare codes, are necessary
4. More interaction needs to take place along the healthcare supply chain
5. Many institutions would need someone to champion projects while everyone else takes care of day-to-day business

In response to the first key learning, NYSP2I held a workshop in June 2013 entitled “Sustainability in Healthcare: Sustainable Strategies for Hospitals”. The topic of “Lean” addressed a systematic approach to waste reduction through continuous improvement by using tools to evaluate value add and non-value add activities which, in addition to reducing waste, also provides for better patient service and improved quality of care. Lean workforce practices include the use of “Patient Care Teams” with rotation of highly-specified jobs, cross-trained and multi-skilled employees, and a continuous improvement mindset and culture. An example of implementing lean in hospitals was presented by United Health Services (UHS), a network of hospitals, emergency rooms, and other medical service centers with locations across New York’s Southern Tier. Lourdes Hospital also presented on environmental efficiency including actions to reduce carbon footprint and disposal costs through reduce / reuse / recycle & restore. Funding for their efforts was secured by leveraging accounts with disposal services, a green appeal, and grants from NYSEG and NYSERDA. Rochester General Hospital, a member of the Rochester Regional Health System, presented on “Principles of Successful Recycling” including new employee orientation, partnering with waste vendor(s), correcting container accessibility, analyzing data, and knowing costs of non-compliance and fines. This presentation can be found [here](#).

NYSP2I has worked on another key learning from the roundtable, waste reduction strategies, with a number of hospitals around New York State. Six of these hospitals were assisted in quantifying their food waste generation and subsequently provided with recommendations on improvement opportunities within their food waste operations for first reducing waste generation and then diverting food waste from their MSW stream. The hospitals ranged in size from 368 beds (Ellis Hospital) to 800 beds (Strong Memorial Hospital/URMC), but the approach remained consistent for each. NYSP2I brought a team of staff members to the hospital, where an assessment station was set up near their garbage room, loading dock or dumpster. The team intercepted bags containing food waste from the kitchen and patient rooms and then weighed and categorized the wasted food. Based on the data collected as well as the observations made of the food service operation, NYSP2I provided a comprehensive report of the assessment findings, complete with recommendations on how to decrease food waste. The hospitals assisted included Rochester General Hospital, Unity Hospital, Ellis Hospital, Strong Memorial Hospital/URMC and the Sisters of Charity and Buffalo-Mercy Hospital, in Buffalo NY. These hospitals are now in various stages of implementing the recommendations made as part of the NYSP2I food waste assessment. In particular, Rochester General Hospital has implemented a pilot food waste diversion program at one location and is in the process of rolling this practice out to the other five hospitals within the Rochester Regional Health system.

By working with these six hospitals individually, NYSP2I was able to develop a comprehensive self-assessment toolbox, designed to assist healthcare institutions perform their own food waste quantification and analysis. This toolbox, comprised of a how-to guide, best practices document, log-sheets, and analysis spreadsheet is now housed on the [NYSP2I Food Clearinghouse](#).

The waste-related assistance provided by NYSP2I was not limited to food waste, but extended to the municipal solid waste (MSW) and regulated medical waste (RMW) streams as well at the Rochester Regional Health System (RRHS) and Southampton Hospital. At Rochester General Hospital (RGH), NYSP2I focused on understanding the composition of the RMW stream and the amount of MSW being improperly disposed of in the RMW stream. The purpose of this work was to identify strategies for improving waste collection and segregation practices, employee training, and ultimately cost saving opportunities. The improvements made to the regulated medical waste disposal practices saved RGH close to \$200,000 annually. In follow-on activities to RGH, assessments were performed at two additional RRHS hospitals, Clifton Springs and Newark-Wayne hospitals, to determine improvement opportunities in their regulated medical waste disposal habits. The audits conducted at these two hospitals revealed that the training practices implemented at RGH had been successfully rolled out to their full hospital network, as a negligible amount of MSW was found in the RMW stream.

The work done with Southampton Hospital provided guidance on both waste generation concerns as well as environmentally preferable purchasing (EPP). EPP is the practice of purchasing products and supplies whose environmental impacts have been found to be less damaging to the environment and human health when compared to competing products and supplies. One of the outcomes of the project at Southampton was the development of an EPP framework. Created using Microsoft Excel®, it was developed to aid purchasers at hospitals with making product comparisons based on environmental and

economic aspects. The tool, which is now available for download on the NYSP2I [website](#),¹³ uses backend data on environmental and financial cost of product materials to provide comparative scores for products under consideration from healthcare purchasing teams. Through its focus on EPP, the Southampton Hospital project helped to address a third key learning from the roundtable in March 2013, that “greater interaction along the healthcare supply chain” is needed.

EPP is growing across industries, but because of the vast quantity of supplies necessary to provide medical services, opportunities abound in healthcare. Many EPP options are available at similar or lower prices as the alternative. Practice Greenhealth facilitated a webinar in 2016 where NYSP2I and RRHS staff discussed “[Driving Waste Prevention Solutions through Sustainable Purchasing](#)”.¹⁴ The webinar highlights the purchasing aspects of waste generation with case studies highlighted from both RRHS and Southampton hospitals.

Conclusion

Hospitals are under increasing pressure to provide high quality care while reducing costs. In addition to improving the environmental health of their communities, healthcare institutions in New York State and around the country are realizing the value of adopting sustainable practices as a means to reduce costs without compromising quality care.

Through hands-on experience on nearly ten projects with healthcare facilities, NYSP2I has gained unique insights and expertise on reducing waste, greening the supply chain, and increasing communication along the healthcare value chain. NYSP2I has also quickly identified “low hanging fruit” to reduce costs and operate more efficiently, while at the same time being sensitive to the complexity of the healthcare environment and the importance of patient care outcomes.



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¹³ <http://www.rit.edu/affiliate/nysp2i/business-assistance/industry-initiatives/healthcare>

¹⁴ <https://www.rit.edu/affiliate/nysp2i/sites/rit.edu.affiliate.nysp2i/files/docs/workshops/Webinar%20-%20062916-%20all%20slides%20rev%201.pdf>