



# **Recycle At Work Medical Sector Outreach Plan**

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**Prepared for Metro  
by  
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## APPENDICES

Appendix A: Barriers and Recommendations on Waste Prevention and Waste Reduction Practices for Healthcare Institutions

Appendix B: Notes from Stakeholder Focus Group

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## **Introduction**

The purpose of the **Recycle At Work Medical Sector Outreach Plan** is to identify targeted waste prevention and reduction strategies for the healthcare industry for use by the Recycle At Work program. At Metro's direction, this Plan focuses on the practices of large hospitals; however, it may be possible to scale and adapt some tools and tactics to smaller healthcare facilities and clinics. The Outreach Plan was prepared for Metro by the project team of Tabor Consulting Group, Kies Strategies, Practice Greenhealth, and Jan O'Dell Marketing & Communications (hereafter "Project Team").

Development of this Plan began with input from Metro staff and representatives from the regional Recycle at Work program. The Project Team then created a "*Barriers and Recommendations on Waste Prevention and Waste Reduction Practices for Healthcare Institutions*" report (see Appendix A). The findings in this report were based on a scan of medical sector research, best practices, existing case studies and significant input from Practice Greenhealth, the nation's leading membership and networking organization for healthcare institutions that are committed to implementing sustainable, eco-friendly practices.

Metro and the Project Team then formed a focus group comprised of representatives from a cross-section of the medical community within the Portland-metropolitan area. The focus group discussed waste reduction practices currently in place in their facilities and the waste types they address; obstacles and challenges staff has experienced in implementing successful waste-reduction strategies; which waste types and practices should be prioritized in this Outreach Plan; and methods for tracking and evaluating effectiveness. The focus group's discussion echoed many of the same concerns, priorities and obstacles faced by hospitals nationwide as reflected in existing research and case studies. See Appendix B for notes from the focus group.

### **Priority Focus Areas**

Focus group discussion led to agreement on three waste reduction and recycling focus areas to prioritize for large hospitals in the Metro region:

- Regulated medical waste reduction. This includes the general reduction of regulated medical waste, switching to reusable sharps containers, and the implementation of fluid management systems.
- Single-use device reprocessing/remanufacturing.
- Recycling medical plastics, including blue wrap and other plastic packaging.

In addition, the focus group voiced agreement that the success of any program depends on the existence of an infrastructure that supports sustainability. Critical ingredients include: leadership support from top management, an active Green Team with cross-departmental involvement, a firm foundation and reporting structure, access to technical guidance, clear communication/education and employee engagement strategies.

This Outreach Plan addresses waste-specific recycling and waste reduction strategies, tools and tactics with an infrastructure that supports sustainability as the over-arching focus. It also offers recommendations for evaluating the success of hospital-wide waste reduction and recycling programs.

### **Community-Based Social Marketing**

The Outreach Plan is created within a Community Based Social Marketing (CBSM) framework. This approach involves identifying barriers to a desired behavior or practice and then designing strategies that utilize behavior change tools and tactics. The CBSM approach also typically includes piloting the outreach strategy with a small segment of a community, and then evaluating the impact of the program once it has been implemented.

## Healthcare Sector Waste Overview

The healthcare industry has a large environmental footprint. The industry is the second largest industrial user of energy after the commercial food industry and is often one of the largest industrial water users in a community. It also uses a variety of different kinds of toxic chemicals in its daily operations and generates large volumes of waste – an average of 6,600 tons of waste per day nationwide. This represents an increase of at least 15% since 1992, largely due to greater use of disposable products. Approximately 85% of the waste stream of an average hospital is non-regulated medical waste/solid waste; 10% is regulated medical waste; 5% is hazardous/chemical/radioactive waste.

The *Barriers and Recommendations on Waste Prevention and Waste Reduction Practices for Healthcare Institutions* contained in Appendix A provides a national perspective on the healthcare sector, including opportunities and barriers to developing and implementing waste prevention and reduction practices in healthcare facilities. In summary, a successful outreach strategy for reducing hospital waste must consider a number of critical factors:

- **Staff diversity** – Healthcare’s employee population is very diverse, with highly educated and degreed administrators, physicians and nurses working side-by-side with front-line workers such as housekeeping staff, food service workers and patient transporters who may not speak English as their primary language and whose training and education levels may be substantially lower.
- **Time** – With a critical nursing shortage and a pending physician shortage, many of the clinical staff are overwhelmed at the sheer number of responsibilities they have in keeping patients safe and healthy. Similarly, employees tasked with managing the waste stream or other facility-related duties are overloaded with multiple responsibilities, such as purchasing or other special projects.
- **Patient safety** – The clinical environment has its own patient safety requirements, many of which are highly regulated and must be followed. Patient safety is paramount to every decision made across the healthcare sector.
- **Costs** – Reimbursement, uncompensated care and liability are just three fiscal issues impacting healthcare facilities today. In this fiscal environment, investing resources in green practices may seem impossible—even though such investments save money in the long term and create a viable healthcare industry that can thrive into coming decades.
- **Diverse waste types** – Healthcare operations create an unusually diverse set of wastes, from typical commercial wastes like electronics, food, paper, cardboard and beverage containers, to sector-specific wastes such as pharmaceuticals, biological waste, sharps, radiological waste and a wide variety of chemical wastes. Each type of waste requires specific and unique management strategies.

## **Outreach Plan Fundamentals**

This section explores the four priority focus areas identified by Metro and the focus group:

Focus Area 1: An infrastructure that supports sustainability

Focus Area 2: Regulated medical waste

Focus Area 3: Single-use device reprocessing/remanufacturing

Focus Area 4: Medical plastics packaging

Barriers, strategies and potential tools and tactics are identified for each focus group area. This Plan also addresses and for program evaluation. The resources section contains material that supports the tools and tactics for each of the four focus areas and program evaluation. Next steps for determining and implementing selected strategies are described for consideration.

### **Focus Area 1**

#### **Infrastructure that supports sustainability**

A general infrastructure that supports sustainability is critical to the success of implementing new programs and maintaining existing ones. This infrastructure is based on leadership support from top management and cross-departmental involvement and participation. It also includes dedicated staff time, a tracking and reporting structure for greening activities, technical guidance, clear communication/education and employee engagement strategies.

An infrastructure that supports sustainability is especially important in the healthcare setting due to the level of regulation and concerns about liability. The primary goal of managing waste from a healthcare facility is to prevent the accidental spread of disease. As a result, many waste prevention and reduction practices require support from top management as well as approval from various departments.

#### **Barriers**

The barriers from the healthcare industry's perspective to developing an infrastructure that supports sustainability include the following:

- Lack of understanding about the need for and benefit of an infrastructure that supports sustainability.
- Time. Management and clinical staff are extremely busy and may feel they do not have time for new responsibilities and initiatives. Similarly, employees tasked with managing the waste stream or other facility related duties are overloaded with multiple responsibilities, such as purchasing or other special projects.
- Money. Healthcare facilities are facing fiscal challenges. Investing staff time and resources in green practices may seem impossible.
- Lack of data. Various departments often manage the costs of their own waste streams, and the facility as a whole may not understand the total impact of its various waste streams and waste management systems.
- Difficulty quantifying results. If the return on investment is unclear, management may be reluctant to invest in the staff time needed to develop an infrastructure that supports sustainability.

#### **Strategies**

Strategies, including tools and tactics, that may be considered for implementation by the Recycle At Work program include the following:

***Strategy: Encourage involvement at the top management level***

Tactics and tools:

- a. Develop expertise at the regional or local government level specific to the healthcare sector. Attend trainings offered by Practice Greenhealth or other organizations concerned with working with healthcare institutions.
- b. Host an event, establish a forum or seek existing forums for area hospital administrators to meet so they can share common challenges and innovative solutions.
- c. Continue to facilitate the Sustainable Hospital Roundtable to provide support to healthcare professionals in encouraging and maintaining involvement at the top management level.
- d. Create a business case to appoint/hire a sustainability coordinator to implement waste reduction and recycling programs by providing cost-benefit statements from facilities with well-established sustainability infrastructures and successful programs. This could include creating a template spreadsheet for calculating cost-benefit for specific actions at any facility.
- e. Use the mainstream media to tout facility achievements to the community and provide positive publicity and recognition for the healthcare facility.
- f. Provide examples of media coverage about other facilities' achievements and awards to illustrate the positive publicity that can result from successful programs.
- g. Consider providing grants to area healthcare professionals to attend trainings and workshops offered by other organizations on developing infrastructure and setting up successful sustainability programs.
- h. Develop case studies and template letters of commitment to and support for sustainable practices from hospital administrators to all staff.
- i. Seek outside funds and grants available to healthcare facilities for green projects and incentive opportunities. Potential sources include Metro, Oregon Department of Environmental Quality and national foundations.
- j. Involve the purchasing and finance departments in analyzing and communicating cost savings to staff and management to reinforce practices.

***Strategy: Assist in the development of Green Teams and provide ongoing support***

Tactics and tools:

- a. Use existing checklists and case studies for creating and maintaining effective Green Teams.
- b. Provide job descriptions to help ensure that the responsibilities of a Green Team leader or Sustainability Director are identified formally in someone's job description.
- c. Help establish a collective process for setting priorities to ensure that the Green Team is actively involved in assessing opportunities for reducing waste and generating ideas and tools to address the waste stream. Establish criteria to consider when selecting initiatives such as ease of completion, cost savings, visibility, regulatory compliance, safety and environmental impact.
- d. Conduct a team-building training or workshop. Objectives could include identifying changes in work rather than new work to meet sustainability goals, and building awareness of links between departments such as purchasing choices and waste reduction.
- e. Provide training on how to set up and maintain waste reduction and recycling programs for the

Green Team to develop internal capacity for training other employees in each department at each facility.

- f. Consider providing grants to area healthcare professionals to attend trainings and workshops offered by other organizations.
- g. Provide examples of an organizational Environmental Mission Statement or overarching policies including values and goals.
- h. Provide examples of commitment tools, such as signed pledges and goal statements.
- i. Draft language that can be included in a human relations/personnel department's hiring policies to make "compliance with hospital waste management policies" a part of every job description.
- j. Assist in analyzing organizational charts to ensure the establishment of a multidisciplinary team that includes representatives from Environmental Services, Infection Control, Nursing, Housekeeping, Safety, Facilities, Employee Education, Employee Health, Laboratory, medical staff and clinicians, particularly those from the operating room.

***Strategy: Assist with data collection***

Tactics and tools:

- a. Assist in developing a baseline assessment of waste for each facility. This could include creating a template spreadsheet for recording baseline data and conducting a waste audit specific to the healthcare industry.
- b. Provide a list of the reports and invoices over what period of time that needs to be gathered and analyzed to develop a baseline (i.e., waste collection and purchasing).
- c. Assist in the collection of this data.
- d. Provide examples of tracking tools and reports.
- e. Identify ways to measure and improve data management.
- f. Provide examples of rewards/staff recognition based on reporting results.

See the section titled Evaluation more information on data collection.

***Strategy: Provide technical guidance***

Tactics and tools:

- a. Join Practice Greenhealth or other organizations concerned with working with healthcare institutions that are committed to sustainable practices, education and networking.
- b. Provide examples of clear plans and policies that can be integrated into new employee orientations, routine employee training, continuing education and hospital management evaluation processes for systems and personnel. This includes customized assistance in tailoring any examples or templates for individual facilities.
- c. Develop sample newsletter articles and other outreach tools to communicate successes and provide information/tips for improvements within the facility.
- d. Continue to provide personal onsite assistance and outreach materials specific to each healthcare facility and each department within the facility through the Recycle At Work program. This includes customized assistance in tailoring any examples or templates for individual facilities.

## **Focus Area 2**

### **Regulated Medical Waste**

Regulated Medical Waste (RMW) is generated in direct patient treatment or diagnosis and may pose an infectious risk to human health. RMW is defined at the state level, typically by the state health or environmental agency. The transport, handling, processing and disposal of RMW is highly regulated by local, state and federal agencies. Following is a link to rules and compliance resources for the State of Oregon prepared by the Healthcare Environmental Resource Center (<http://hercenter.org/rmw/or-rmw.cfm>).

The primary objective of RMW management is to minimize the risk of disease transmission. However, every facility has the opportunity to reduce both risk and cost through improved collection and segregation of RMW. Studies show that healthcare facilities can reduce RMW from 15% or more to 6-10% of total waste generation. This can represent a significant savings since disposal of RMW is at least five times more expensive than disposing of non-regulated medical waste.

Three following strategies were identified to reduce RMW:

- General reduction through improved education and segregation programs
- Reusable sharps container programs
- Fluid management systems

#### **Barriers**

Many of the same barriers apply to each of the three strategies noted above; others are specific to a waste type.

- Lack of sustainability infrastructure. If there is no structure to communicate between departments and coordinate efforts it is difficult to implement and maintain programs.
- Lack of access to and support from upper management. Often new programs require approval from upper management. It can be difficult for staff to access upper management to get this support.
- Lack of support from infection control. The medical industry is highly regulated and liability is a very real concern. Programs such as switching to reusable sharps containers and fluid management systems require buy-off from infection control.
- Lack of support from purchasing. Programs such as reusable sharps containers and fluid management systems involve the purchase of equipment and supplies. Purchasing must be involved. In addition, purchasing and upper management need to understand the cost and benefit as well as the return on investment in order to provide approval for initiatives.
- Time constraints. People do not want to take the time to properly separate their waste. In addition, staff members are busy doing their jobs and it is difficult to schedule time to educate them about waste reduction programs.
- Lack of Education. Staff does not understand what regulated medical waste includes and does not know how to properly sort materials.
- Fear of waste/perception. Fear of improperly handling waste can lead staff to treat any material that touches blood as regulated medical waste.

- **Poor Sorting Programs.** Strategically placed and well-labeled containers are critical to any waste sorting effort. In order to place the correct type of container in a given area and provide effective signage it is important to know what types and volumes of waste are generated in that area. An understanding of the specific collection program options, regulations and requirements for each jurisdiction is also necessary.
- **Lack of Space.** In patient care areas, facilities need several collection containers to manage the resulting waste streams. Many facilities are challenged finding space for an assortment of containers. In addition, some container types and sizes are regulated by fire code so size cannot be adjusted to match space available. Storage near the loading docks may also have space restrictions.
- **Difficult to quantify intangible benefits.** A strict cost-benefit analysis does not assign financial value to intangible or other benefits that are more difficult to quantify than simple savings in trash collection bills and RMW management costs. For example, improved employee morale, health and safety benefits, awards and recognition and opportunities for improved operations can result from changes to reduce waste.

### **General reduction through improved education and segregation programs**

The key to minimizing RMW is a comprehensive sorting and education program that separates “true” biohazardous or infectious medical waste from solid waste. Many hospitals routinely throw more than 50% of their waste into the RMW stream—partly due to an outdated philosophy that anything that comes into contact with a patient or clinician is medical waste. The tremendous opportunities for cost and volume reductions do not come from the “gray areas” where it is difficult to determine whether the item is “significantly contaminated” with blood and body fluids or not; rather the most significant opportunities for RMW reduction come from segregating the coffee cups, packaging, paper towel waste, gloves, clean blue wrap and sandwich wrappers that inadvertently get tossed into the RMW containers known as “red bags.”

Strategies, including tools and tactics, that may be considered for implementation by the Recycle At Work program to improve education and segregation programs include the following:

#### ***Strategy: Assist with establishing a baseline awareness of RMW and opportunities for reduction***

Tactics and tools:

- a. Provide staff with trainings and documents about the legal definition of RMW and rules for managing waste.
- b. Create a cost-benefit analysis worksheet to determine the potential cost savings of reducing RMW including the baseline cost to dispose of RMW and a process to collect and report cost data on an ongoing basis. (See Evaluation section for additional information.)
- c. Provide guidelines for how to implement a RMW plan.
- d. Develop an informational tool that defines RMW by state law and summarizes federal, state and local regulations regarding the handling, collection, transportation, and disposal of RMW.
- e. Review the facility’s RMW disposal policies and practices. Meet with infection control staff to refine facility guidelines.

- f. Create a tool that the Green Team can use to work with department heads and nurse managers in each area of the facility. This could be a checklist or matrix used to conduct a baseline assessment of the types and quantities of waste generated, what types of containers are used, where containers are placed, how they are used, etc. The tool could also include a facility-wide-container inventory spreadsheet for custodians that lists all containers and specific days they are serviced per week for each department.
- g. Review RMW contracts and talk with waste haulers and recyclers that accept the facility's waste to discuss opportunities for reduction and proper sorting.

***Strategy: Optimize container-placement and signage***

Tactics and tools:

- a. Use the results of the baseline assessment to work with each department head and nurse manager to determine proper container size, placement and signage.
- b. Recognizing that operations at each individual hospital may differ, develop best management practices for RMW collection programs such as:
  - ✓ RMW containers should be as small as possible for a given area and covered to reduce the amount of solid waste or recyclables that are tossed in.
  - ✓ Make sure that there is always a larger solid waste container placed beside the regulated waste container; sign it appropriately.
  - ✓ Remove RMW containers from underneath sinks, non-critical patient areas, hallways and other areas where people are likely to dispose of their solid waste or recyclables in RMW containers.
  - ✓ Use different colored liner bags for different materials (i.e., RMW is red, solid waste is clear, recycling is blue).
- c. Create and place signs and posters at the point of collection, above the receptacle and on the lid. Make sure the signs are easily understood – few words, more pictures, bulleted text, multiple languages if necessary.

***Strategy: Assist with building an education and awareness program***

Tactics and tools:

- a. Poll area hospitals and collect existing signage, videos, PowerPoint presentations and other education materials and prompts that could be adapted.
- b. Create articles about waste segregation for Intranet and employee newsletters, and use in-service presentations and new employee training opportunities to educate and reinforce.
- c. Use commitment and recognition tools developed as part of creating an infrastructure that supports sustainability.
- d. Implement a monitoring and feedback system; reward employees/work groups when progress is made – movie tickets, pizza parties, public recognition – whatever is appropriate.

## **Reusable Sharps Container Program**

Sharps management can be a significant factor in reducing RMW. For example, an average 250-bed hospital may throw away 13 tons of disposal sharps containers every year. Reusable sharps container programs employ an outside company to come in and remove sharps containers that are 75% full, and replace full containers with a clean and sterilized container. In a typical sharps disposal program, containers are picked up by environmental services staff and the entire container is sent for disinfection as medical waste. This means that the facility is paying for disinfection and disposal of the container, as well as the contents.

A reusable sharps container program utilizes an outside vendor to sterilize the sharps containers in a strictly regulated manner and eliminates the need to pay for the container weight as part of the disposal fees. A single sharps container may be able to be reused up to 500 times, according to the U.S. Food and Drug Administration (FDA). Staff from the outside company usually perform an audit to determine the proper number of containers and the frequency of a pick up and replacement schedule that ensures that containers are never overflowing—protecting clinicians from potential needlestick injuries.

Strategies, including tools and tactics, that may be considered for implementation by the Recycle At Work program to assist in the consideration of instituting a reusable sharps container program include the following:

### ***Strategy: Assist in implementation of a reusable sharps container program***

Tactics and Tools:

- a. Prepare a list of vendors that provide reusable sharps container programs solely as a service to regional healthcare facilities. The list may vary by jurisdiction to include vendors approved in each area.
- b. Provide a list of questions – including costs and benefits – that healthcare facility staff can use to evaluate vendors for best practices including information about safety and liability issues.
- c. Ask facilities to work with their Group Purchasing Organization (GPO) to research available contracts for reusable sharps containers in order to take advantage of group purchasing discounts.
- d. Provide testimonials and case studies from healthcare facilities using reusable sharps containers.
- e. Provide a tool to identify potential costs savings and benefits for staff to present to decision-makers.
- f. Use this tool or develop another for staff to use to track cost savings and benefits for reporting on effectiveness to decision-makers and administrators. (See Evaluation section for additional information.)
- g. Develop sample contract language and policy to ensure reusable containers are properly cleaned prior to reuse.

### ***Strategy: Educate and train staff about reusable sharps containers***

Tactics and Tools:

- a. Identify educational tools used by area hospitals and available through service providers to educate and train staff. Develop additional tools as needed.

- b. Draft sample materials to announce a reusable sharps container program to staff through employee trainings, staff meetings, Intranet, newsletters or other familiar means of communications.

### **Fluid Management Systems**

Suction canisters hold body fluids and saline solution that are suctioned out of a patient by an aspirator during surgical procedures and patient care. Waste body fluids are considered RMW. Some liquid infectious waste, including suction canister contents, can be disposed into a sanitary sewer system. Once the canisters have been emptied and are no longer dripping they can be disposed of as solid waste. A vacuum system that uses reusable canisters or empties directly to the sanitary sewer can help a facility cut its infectious waste volume, reduce exposure risk and save money on labor, disposal and canister purchase costs.

Strategies, including tools and tactics, that may be considered for implementation by the Recycle At Work program to assist in the consideration of instituting an improved fluid management system include the following:

#### ***Strategy: Institute a fluid management system that reduces waste***

Tactics and tools:

- a. Prepare a list of canister-free and reusable canister vacuum systems solely as a service to regional healthcare facilities.
- b. Provide a list of questions including costs and benefits that healthcare facility staff can use to evaluate vendors for best practices including information about safety and liability issues.
- c. Ask facilities to work with their Group Purchasing Organization (GPO) to research available contracts for fluid management systems in order to take advantage of group purchasing discounts.
- d. Provide a tool to identify potential costs savings and benefits for staff to present to decision-makers.
- e. Use this tool or develop another for staff to use to track cost savings and benefits for reporting on effectiveness to decision-makers and administrators. (See Evaluation section for additional information.)
- f. Provide testimonials and case studies from healthcare facilities using fluid management systems that reduce waste and costs.
- g. Combine cost and benefit from all vendors for best practices.

#### ***Strategy: Train staff and continually reinforce new system***

Tactics and tools:

- a. Develop material to educate staff about management of infectious potential of liquid waste through new employee trainings, in-service presentations and regular communication (Intranet, newsletters, posters, videos, etc.).
- b. Develop and place signage in appropriate locations.
- c. Assist in developing protocols to conduct inspections/audits periodically; document and report as feedback to staff and administrators.

***Strategy: Demonstrate benefits and cost savings to management***

Tactics and tools:

- a. Prepare a tool to help make tangible and intangible benefits clear when demonstrating program value to leadership, such as employee exposure time spent dumping suction canisters and the potential liability of waste disposal.

### **Focus Area 3**

#### **Single-use device reprocessing/remanufacturing**

Single-use device reprocessing is the practice of inspecting, functionally testing, cleaning, packaging and sterilizing medical devices labeled for single-use in such a manner that the quality, physical characteristics and performance functions of the device are not significantly affected and the device remains safe and effective for its appropriate clinical use. Single-use device reprocessing is typically done by a third-party reprocessor that is registered and regulated by the U.S. Food and Drug Administration (FDA). According to one vendor, it is feasible for a hospital to save more than \$500,000 a year in supply costs and cut waste costs as well. Clinicians may not be aware that reprocessing is safe, and so they often dispose of reusable devices after a single use.

Single-use devices (SUDs) represent a significant source of waste in a healthcare facility, both in cost and volume. By reprocessing single-use devices, facilities can reduce the amount of waste sent to the landfill, both in terms of product and packaging. There also is a cost benefit: On average, reprocessed medical devices offer a 50% cost savings, as compared to purchasing a new device. Additional cost savings may be realized through reduced waste generation and material handling.

In addition, many SUD packages contain multiple devices. Some of the devices may never be used, but they are discarded along with the used devices.

There are multiple strategies for reducing SUD waste, from requesting how they are packaged to reprocessing.

#### **Barriers**

Many of the same barriers as those listed for regulated medical waste exist for SUD reprocessing: patient safety concerns, lack of knowledge, time, training and lack of supporting evidence. The barriers from the healthcare industry's perspective to instituting single-use device reprocessing practices include the following:

- Lack of support from purchasing. Some hospitals have purchasing contracts that require the purchase of specific items with may include single-use devices. It may be a challenge to work with purchasing to modify existing contracts. Supply chain logistics may need to change to accommodate delivery and collection of devices for reprocessing/remanufacturing. Original equipment manufacturers (OEM) may also present real or perceived barriers to reprocessing and remanufacturing.
- Fear of waste. Liability is a very real concern in a healthcare setting. Some healthcare facilities are reluctant to establish ways to reuse materials because separating uncontaminated, sterilizable and contaminated materials presents a risk of error and subsequent contamination or infection.
- Lack of knowledge. There is misinformation/conflicting information about SUDs, such as processed devices fail more often than original devices, reprocessing is inadequately

regulated and that patients need to sign a release of liability form if reprocessed devices are used.

- Lack of upper management support. This may be due to lack of knowledge and existing misinformation/conflicting information. In addition, purchasing and upper management need to understand the cost and benefit as well as the return on investment in order to provide approval for initiatives.
- Labeling. Medical devices are labeled as single-use at the manufacturer's discretion, often for economic reasons, not for patient safety reasons.
- Physician and staff resistance. Disposables are seen as convenient and the best choice to ensure patient safety.

### **Strategies**

Strategies, including tools and tactics, that may be considered for implementation by the Recycle At Work program include the following:

#### ***Strategy: Foster understanding and support for SUD reprocessing***

Tactics and tools:

- a. Provide written material and reports supporting single use device reprocessing from organizations such as the FDA and the U.S. General Accounting Office (GAO).
- b. Prepare a list of third-party SUD processors that are registered by the FDA.
- c. Identify leadership champion(s) that will support reprocessing (upper management, administration, physicians, clinical leaders, infection control, contract/materials, for example).
- d. Provide testimonials and case studies from healthcare facilities using SUD reprocessors.
- e. Arrange for a visit to a reprocessing facility with operating room directors, staff and a surgeon to understand how it works.
- f. Develop a tool to track product usage data to determine savings benchmarks and help demonstrate potential savings.

#### ***Strategy: Institute purchasing policies that support SUD reprocessing***

Tactics and tools:

- a. Ask facilities to work with their Group Purchasing Organization (GPO) to research contracts for reprocessing medical devices.
- b. Develop sample contract language and policy to ensure reprocessed or remanufactured medical devices meet specifications.
- c. Develop evaluation criteria to help select a third-party reprocessor.
- d. Determine product return logistics and supply chain process.
- e. Prepare sample letters/emails to notify the original equipment manufacturers and vendors about the new system and requesting their cooperation with reprocessing efforts.

***Strategy: Implement education and training to support SUD reprocessing***

Tactics and tools:

- a. Using leadership champions as spokespeople and presenters, conduct presentations and trainings about the safety, cost-effectiveness and benefits of SUD reprocessing.

**Focus Area 4**

**Recycling medical plastics: blue wrap and other plastic packaging**

“Blue wrap” is universally used in hospitals to protect sterilized surgical instruments from contamination. It is a single-use disposable product comprised of polypropylene, which is #5 plastic. Blue wrap and other plastics such as plastic bottles, clear rigid packaging and containers, and saline bottles are generated by surgical services also known as the operating room (OR). Once transferred to the operating room, the instruments are unwrapped and the cloth is considered a waste. Up to 20% of the waste stream generated by the OR is blue wrap. If other types of plastic packaging are included it can increase to 50% and higher. Almost 80% of packaging waste from a single surgical procedure is generated before the patient even enters the operating room. This means the material is not contaminated and does not have to be treated as RMW.

**Barriers**

There is some overlap between the barriers to recycling medical plastics and those for regulated medical waste and SUDs. Material that could be easily recycled if properly segregated ends up being tossed in with regulated medical waste due to fear of infection, lack of time, lack of information, and long-standing traditions. The barriers from the healthcare industry’s perspective to recycling medical plastics include the following:

- Finding a market/vendor due to the fluctuation in markets for plastics.
- Lack of information about what types of plastic can be recycled.
- Recycling vendor concerns about contamination with medical waste.
- Healthcare facilities concern about liability and potential contamination of material.
- Space for recycling containers in the surgical area.
- Lack of space to consolidate and store material to facilitate collection.
- Location of recycling containers: The right type of container needs to be placed in each area. Different departments generate different types of waste.

**Strategies**

Strategies, including tools and tactics, that may be considered for implementation by the Recycle At Work program include the following:

***Strategy: Assist in implementing an OR recycling program for medical plastics***

Tactics and tools:

- a. Develop a list of medical plastics that can be recycled and a list of vendors that can collect the material.

- b. Work with companies that collect the material, material recovery facilities that process recyclables, and end user markets to establish acceptable sorting protocols and develop trust between the healthcare facility and the processors/markets.
- c. Help establish rigorous protocols for signing containers; color-coding containers. Develop best management practices to support protocols similar to RMW (i.e., red liner bag for RMW, clear liner bag for trash and blue liner bag for recycling).
- d. Include practices to avoid contamination such as the removal of blue wrap from the operating room before the patient arrives. This avoids possible contamination and treatment as regulated medical waste.
- e. Provide a tool to identify potential costs savings and benefits for staff to present to decision-makers.
- f. Use this tool or develop another for staff to use to track cost savings and benefits for reporting on effectiveness to decision-makers and administrators. (See Evaluation section for additional information.)
- g. Reduce the need for blue wrap by working to establish a program to switch to reusable hard cases for sterilization of medical devices.

***Strategy: Educate and train staff about an OR recycling program for medical plastics***

Tactics and Tools:

- a. Identify educational tools used by area hospitals to educate and train staff. Develop additional tools as needed.
- b. Create materials to support OR recycling program such as appropriate signage, education, and commitment letters, for example.
- c. Draft sample materials to announce a recycling program to staff through employee trainings, staff meetings, Intranet, newsletters or other familiar means of communications.
- d. Implement a monitoring and feedback system; reward employees/work groups when progress is made.

## **Evaluation**

A healthcare facility needs to implement an evaluation infrastructure, which may include staff assigned to data collection, models for waste-measurement and tracking, and guidelines for goal-setting. A regional healthcare roundtable or regional and local government waste-reduction staff could play a role in giving the healthcare industry a “leg up” in establishing evaluation protocols and monitoring developments for new program opportunities that may arise..

### **Barriers**

The barriers from the healthcare industry’s perspective to tracking and reporting for program evaluation include the following:

- Waste management services are decentralized: costs and invoices are handled by various departments and facilities/locations.
- Lack of consistency in reported numbers.

- Vendor reports are unreliable.
- Time commitment to track.
- Upper management lacks recognition of benefit/value and support for time spent in evaluation.
- Lack of tracking tool to merge various data points/benchmarks.

### **Strategies**

Strategies, including tools and tactics, that may be considered for implementation by the Recycle At Work program include the following:

#### ***Strategy: Establish baseline generation rates of all waste categories to enhance goal setting and performance tracking***

Tactics and tools:

- Identify data and reports that can substantiate waste diversion.
- Provide tips and tools for working with Accounts Payable and Purchasing to ensure that all waste and recycling vendors are accounted for and that every waste material is included in the baseline profile.
- Provide sample request language to require vendors to provide data reports:
  - ✓ Reports from medical waste disposal vendor to track RMW.
  - ✓ Reports from garbage hauler to track solid waste.
  - ✓ Reports from single-use reprocessing vendor.
  - ✓ Reports from recyclers to track materials recycled.
  - ✓ Reports on donations of medical equipment or other furniture and supplies to track materials diverted from landfill disposal.
  - ✓ Reports on hazardous waste.
- Provide existing tracking tools or create simple spreadsheets and instruction on how to use them to:
  - ✓ Establish a baseline.
  - ✓ Have environmental services department track results.
  - ✓ Generate graphs.
  - ✓ Input data over several years to see measurable results.

#### ***Strategy: Continually monitor and report progress***

Tactics and tools:

- Provide samples and suggestions for staff and administrators to share information about progress and success with all staff through multiple communication channels.
- Continue to assess opportunities for new waste prevention and reduction programs. For example, as the region's capacity for processing organic waste such as food scraps increases, cost-effective opportunities may open for separate collection of food waste as an alternative to landfilling.

## Resources

The following resources support the tools and tactics for each of the four focus areas and evaluation and reporting. They are organized by focus area and associated strategy. Please be aware that many of the materials apply to multiple focus areas and associated strategies. The Resource Disk that accompanies this Outreach Plan contains the referenced sample materials that are not readily available electronically.

### Focus Area 1: Infrastructure That Supports Sustainability

*Strategy – Encourage involvement at the top management level*

- Practice Greenhealth Training:  
Infrastructure and Process for Sustainability: A one-day workshop designed to help participants become familiar with the drivers for sustainability in the healthcare sector, zero in on the process of gaining senior level support and building a team, developing a baseline and collecting data, facilitating change management and culture change in your organization, how to set goals and priorities for action, and measurement/benchmarking techniques for tracking progress.  
  
Cost: \$495 for Practice Greenhealth Members, \$695 for non-members.  
<http://practicegreenhealth.org/tools/services/training/>
- Environmental Commitment Statements:  
  
Boulder Community Hospital (See Resource Disk, Enviro Statement BoulderEnviroStatement.pdf)  
  
Mercy General Hospital (See Resource Disk, Enviro Policy CHWMercyGenEACPolicy.pdf)  
  
Portland VA Medical Center GEMS (See Resource Disk, VA GEMS.pdf)
- Case Studies:  
  
***Business Case For Greening the Healthcare Sector***  
  
The case for green healthcare design is no longer just about energy savings. The rationale for building green today takes into account financial gains, improved patient outcomes, better staff health and reduced turnover, and community benefit through a reduced environmental impact.  
<http://www.practicegreenhealth.org/pubs/toolkit/reports/BusinessCaseForGreening.pdf>  
  
***Going Green — RNs Tackle Hospital Waste***, Melissa Gaskill. April 24, 2006  
<http://www.h2e-online.org/docs/nurseweek42406.pdf>  
  
A variety of case studies are available from Practice Greenhealth  
<http://practicegreenhealth.org/tools/library/tag/Case%20Studies>

*Strategy: Assist in the development of green teams and provide ongoing support*

- Guide to Create a Green Team:  
  
***A Guide for Creating Effective Green Teams in Health Care***

The guidebook provides insight and practical tips on how healthcare organizations can effectively manage and implement green operational initiatives. (See Resource Disk, GuideGreenTeams.pdf)

***Creating Effective Green Teams in Health Care*** - presentation

<http://www.practicegreenhealth.org/pubs/toolkit/greenteam/CreatingEffectiveGreenTeams.pdf> (See Resource Disk, Creating Green Teams presentation.pdf)

- Green Team training and support

GEMS (Green Environmental Management Systems) PowerPoint presentation produced by Portland VA Medical Center provides an overview of the GEMs program and includes a trivia game to aid learning. (See Resource Disk, GEMs overview and trivia game.ppt)

GEMS newsletter – Quarterly newsletter showcases GEMS activities and personnel, and general environmental protection and resource conservation tips. (See Resource Disk, Spring 2010 GEMS Newsletter.pdf)

- Organizational Mission Statements

Northern Michigan Regional Hospital (See Resource Disk, NMichiganEnviroStatement.pdf)

Catholic Healthcare West Brochure(See Resource Disk, CHWEnviroBrochure-1.pdf)

- Job Descriptions

Healthcare Sustainability Director

<http://www.practicegreenhealth.org/pubs/toolkit/greenteam/SampleJDSustainabilityDirector.pdf> (See Resource Disk, job description 2.pdf)

[http://www.practicegreenhealth.org/pubs/sample\\_sustainability\\_coor\\_0809.pdf](http://www.practicegreenhealth.org/pubs/sample_sustainability_coor_0809.pdf) (See Resource Disk, job description.pdf)

- Organizational Charts

New York Presbyterian Sustainability Council Organizational Chart (See Resource Disk, Org Chart Sustainability team NYP.pdf)

Cleveland Clinic Organizational Chart (See Resource Disk, Org Chart OHE)

*Strategy: Assist with data collection*

- Tracking Tool

Greenhealth Tracker™, Practice Greenhealth's environmental data tracking tool helps your facility understand how hundreds of thousands of waste disposal dollars are being spent and organizes information by each type of waste. This information will allow you to see where to prioritize goals for waste minimization and justify addressing the specific contracts that contribute to particular waste streams.

<http://practicegreenhealth.org/tools/greenhealthtracker/>

*Strategy: Provide technical assistance*

- Join Practice Greenhealth or Other Organizations

Practice Greenhealth is a nonprofit membership organization, offering its members a full range of tools, resources, forums, technical assistance, and networking opportunities to engage the healthcare design, construction and operations sectors in creating safe and healthy healthcare environments. The Strategic Resource Network membership category

is reserved for nonprofit technical assistance providers, NGOs, government agencies, and associations. A one-year membership is currently \$199.

<http://practicegreenhealth.org/community/srn/>

- Examples of Strategy Checklists

#### ***Eco-Checklist for Operations***

A tool designed to provide a quick snapshot of where an organization sits on the green spectrum. It also highlights the range of environmental programs being implemented in healthcare. (See Resource Disk, Eco checklist.pdf)

#### ***Green Guide for Healthcare***

A self-certifying sustainable design toolkit integrating enhanced environmental and health principles and practices into the planning, design, construction, operations and maintenance of healthcare facilities. The Operations section of *Green Guide for Health Care* Version 2.2 (released December 2008) consists of 10 credit groups organized around facility departments — Integrated Operations & Education, Sustainable Sites Management, Transportation Operations, Facilities Management, Chemical Management, Waste Management, Environmental Services, Food Service, Environmentally Preferable Purchasing, and Innovation in Operations. This document provides specific guidance for each Operations credit and an accompanying health issues statement.

<http://www.gghc.org/>

## **Focus Area 2: Regulated Medical Waste**

### **General Reduction through improved education and segregation programs**

*Strategy: Assist with establishing a baseline awareness of RMW and opportunities for reduction*

- Guidelines for Implementation

Ten Step Guide to Implement a Regulated Medical Waste Reduction Plan

<http://h2e-online.org/docs/h2e10steprmw20103.pdf> (See Resource Disk, h2e10steprmw20103.pdf)

- State Specific Regulations for RMW

Rules and compliance resources for the State of Oregon prepared by the Healthcare Environmental Resource Center. <http://hercenter.org/rmw/or-rmw.cfm>

- Cost-Benefit Analysis Worksheet

<http://practicegreenhealth.org/tools/library/tag/Regulated%20Medical%20Waste>  
(See Resource Disk, RMWReductionCostBenefitWorksheet-1)

*Strategy: Optimize container-placement and signage*

- Sample Signs and Posters

<http://practicegreenhealth.org/tools/library/tag/Regulated%20Medical%20Waste>

*Strategy: Assist with building an education and awareness program*

- Local Examples of Educational Material

VA Medical Center poster “What is biohazardous waste?” (See Resource Disk, What is biohazardous waste VA MED CTR.pdf)

Providence Recycles posters (2). One poster is a general recycling reminder about all the materials recycled by Providence. The other is specific to certain materials to be placed in the “blue bag” recycling bins (plastics, cans, paper boxes), and what to leave out (IV bags, tubing, gloves), as well as what to recycle separately (glass, cardboard, paper). (See Resource Disk, PROVIDENCE RECYCLES general recycling poster.pdf, and PROVIDENCE RECYCLES blue bag poster.pdf)

### **Reusable Sharps Container Program**

*Strategy: Assist in implementation of a reusable sharps container program*

- General Information <http://cms.h2e-online.org/ee/rmw/reducermw/reusablesharps/>

### **Fluid Management Systems**

*Strategy: Institute a fluid management system that reduces waste*

- Case Studies  
<http://practicegreenhealth.org/tools/library/tag/Regulated%20Medical%20Waste>  
(See Resource Disk, SuctionCanisters2.pdf)

### **Focus Area 3: Single Use Device (SUD) Reprocessing/Remanufacturing**

*Strategy: Foster understanding and support for SUD reprocessing*

- Supporting Information <http://cms.h2e-online.org/ee/rmw/reducermw/sudevice/>

### **Focus Area 4: Recycling Medical Plastics: Blue Wrap and Other Plastic Packaging**

*Strategy: Educate and train staff about on OR recycling program for medical plastics*

- Case Studies (See Resource Disk, 150FS BlueWrap.pdf)

### **Evaluation and Reporting**

- “Providence Recycles” PowerPoint presentation reporting on training efforts, waste stream costs, savings achieved at each facility and recent awards. (See Resource Disk, PPMCORWasteMang.pdf)

## Next Steps

The work of this project confirmed that healthcare institutions are a significant source of specialized waste that requires a targeted and long-term approach for effective recycling and waste prevention assistance to reduce waste destined for landfill disposal.

The following recommended next steps have been developed by the consultant team based on evaluation of the research and results of the focus group conducted for this project; the team's experience with the healthcare industry; and discussions with the project manager, Will Elder, Business Waste Reduction Planner in the Metro Sustainability Center, and local government members of the Business Recovery Work Group.

These next steps are intended to provide a few key actions that can be taken to begin implementation of identified waste prevention and reduction strategies for the healthcare industry for use by the Recycle At Work program.

1. Determine Metro staffing and budget available to support a focused effort on the healthcare sector.

In order to provide focused attention to the healthcare sector, a dedicated staff and budget allocation needs to be determined. This will inform the level of effort that can be expended and the time frame for implementing selected waste prevention and reduction strategies.

2. Use this Outreach Plan as the basis to develop a Work Plan focused on the healthcare sector.

Metro and Recycle At Work staff can use the strategies and tools identified in this Outreach Plan as the basis to develop a Work Plan focused on the healthcare sector. The Work Plan should prioritize areas of effort, assign roles and responsibilities for regional and local government staff, identify tools and tactics to be implemented, and determine timelines. The Work Plan can also identify additional tools needed to support efforts and create the strategy for development.

3. Begin work on Focus Area 1: Infrastructure That Supports Sustainability.

Focus Area 1 is the first priority resulting from the focus group and discussions with Metro and local government staff in the Recycle At Work program. Without upper management support, a Green Team of champions from every department, accurate data and ongoing tracking, it will be difficult to initiate and maintain effective and consistent programs to recycle and prevent waste.

Training of staff is a key first step. For example, organizing a joint training of Metro, local government and hospital staff to learn about federal, state and local rules and regulations regarding Regulated Medical Waste would develop shared expertise and begin to establish new partnerships.

Creating the business case for recycling and waste prevention is also key. Developing a template and/or adapting existing spreadsheets for calculating costs and benefits that can be used by Recycle At Work and/or hospital staff will be very beneficial for making the case to decision-makers for implementing specific recycling or waste prevention programs.

4. Scale tools and tactics to assist clinics.

The focus of this project has been large hospitals. However, Recycle At Work staff has clearly indicated a need to also work with smaller clinics that may or may not be associated

with hospitals but that generate the same types of waste and have similar challenges and opportunities. This may also include private practice medical offices. Several strategies apply, such as encouraging the involvement of top managers and establishing opportunities for reduction of regulated medical waste. As tools and tactics are developed for larger hospitals, an effort can be made to develop expertise at the local government level and tailor outreach, tracking and evaluation tools to be functional for smaller facilities.

5. Maintain existing programs.

Currently, Metro staff facilitates and local government staff participates in the Sustainable Hospital Roundtable. Continuing this role and support to healthcare professionals to learn about effective recycling and waste prevention programs is valuable.

Recycle At Work staff will continue to work with local small clinics, medical centers and large hospitals. This can be supplemented with the increased training and tools described in this Plan.

**Appendix A: Barriers and Recommendations on Waste Prevention and Waste Reduction Practices for Healthcare Institutions**



**Barriers and Recommendations  
on Waste Prevention and  
Waste Reduction Practices for  
Healthcare Institutions**

**Final Report  
May 14, 2010**

**Prepared for Metro  
by  
Tabor Consulting Group**

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## Introduction

The purpose of this report is to identify barriers to waste prevention and waste reduction in healthcare institutions and propose recommendations for addressing these challenges. It was prepared for Metro by the team of Tabor Consulting Group, Kies Strategies, Practice Greenhealth, and Jan O'Dell Marketing and Communications.

The information in this report is drawn from the experience and research of the consultant team, Metro Recycle At Work staff, and the work of Practice Greenhealth (PGH). PGH is the nation's leading membership and networking organization for healthcare institutions that are committed to implementing sustainable, eco-friendly practices.

The report is organized into the following six sections:

1. An overview of the healthcare sector, including the unique circumstances that factor into how environmental issues must be addressed in the healthcare industry.
2. Waste generation data for the healthcare industry.
3. A description of specific challenges or barriers to developing and implementing waste prevention and reduction practices in healthcare facilities.
4. A series of proven opportunities for successfully working with the healthcare employee population to implement waste prevention and reduction practices.
5. Specific examples of successful waste prevention and reduction practices within the healthcare industry.
6. Preliminary recommendations for the Recycle At Work Medical Sector Project for specific practices, communication and outreach.

## Overview of the Healthcare Sector

Healthcare facilities present both a challenge and an opportunity in the development and implementation of waste prevention and reduction practices. Issues such as twenty-four-hour-a-day, seven-day-a-week operations, chemical use, infection control requirements and formidable regulatory requirements can pose significant obstacles. Furthermore, it is necessary that guidelines customized for the healthcare sector reflect the collective fundamental mission to protect and enhance individual and community health. As healthcare institutions adopt waste prevention and reduction practices, they have the opportunity to make a case for themselves as responsible corporate citizens to the community. As significant purchasers of services and supplies, hospitals have great potential to affect markets and supply chains and to advocate for more environmentally friendly products.

The healthcare industry is a large sector of the U.S. economy. A growing industry, healthcare currently makes up more than sixteen percent of gross domestic product and is estimated to hit twenty percent by 2015. The industry employs more than 4.6 million people. It also has a large environmental footprint. Healthcare is named as the second largest industrial user of energy after the commercial food industry. Healthcare is often

one of the largest industrial water users in a community. It also uses a variety of different kinds of toxic chemicals in its daily operations and generates large volumes of waste. Some of the unique circumstances that factor into how healthcare environmental impacts must be addressed include:

- Healthcare's employee population is very diverse with highly educated and degreed administrators, physicians and nurses working side-by-side with front line workers such as housekeeping staff, food service workers and patient transporters who may not speak English as their primary language and whose training and education levels may be substantially lower. Additionally, with a critical nursing shortage and a pending physician shortage, many of the clinical staff are overwhelmed at the sheer number of responsibilities they have in keeping patients safe and healthy. Similarly, employees tasked with managing the waste stream or other facility related duties are overloaded with multiple responsibilities such as purchasing or other special projects. They are challenged to find time for new initiatives. Greening efforts must reach staff on all these levels if they are to be successful. This requires creating a diverse set of tools, resources and training, with pertinent materials tailored to different audiences.
- The clinical environment has its own patient safety requirements, many of which are highly regulated and must be followed. For instance, ineffective infection control and cleaning can lead to a hospital-acquired infection or death for vulnerable patient populations. Likewise, as hospitals pursue a transition to new and safer materials for products, chemicals and equipment, the clinical application of alternative medical devices or chemicals used in lab epidemiology, may require substantive testing and transition protocols to ensure they will not compromise patient safety or care. Patient safety is paramount to every decision made across the healthcare sector.
- Healthcare is also facing a financial crisis. Reimbursement, uncompensated care and liability are just three fiscal issues impacting healthcare facilities today. Many hospitals are struggling to keep their doors open. In this fiscal environment, investing resources in green practices may seem impossible—even though such investments save money in the long term and create a viable healthcare industry that can thrive into coming decades.
- Healthcare operations create an unusually diverse set of wastes—typical commercial wastes like electronics, food, paper and cardboard, as well as sector-specific wastes such as pharmaceuticals, biological waste, sharps, radiological waste and a wide variety of chemical wastes. Each type of waste requires specific and unique management strategies, making environmentally sound operation of healthcare an extremely complex process. In addition, many of these waste streams are subject to stringent regulation, making innovations in how they are handled seem more difficult.
- A large majority of healthcare organizations are not-for-profit and must demonstrate a certain level of “community benefit” in order to retain their tax-exempt status. Tracking environmental benefits toward community benefit can be a significant motivating factor for non-profit healthcare institutions as they weigh which sustainability programs to adopt.

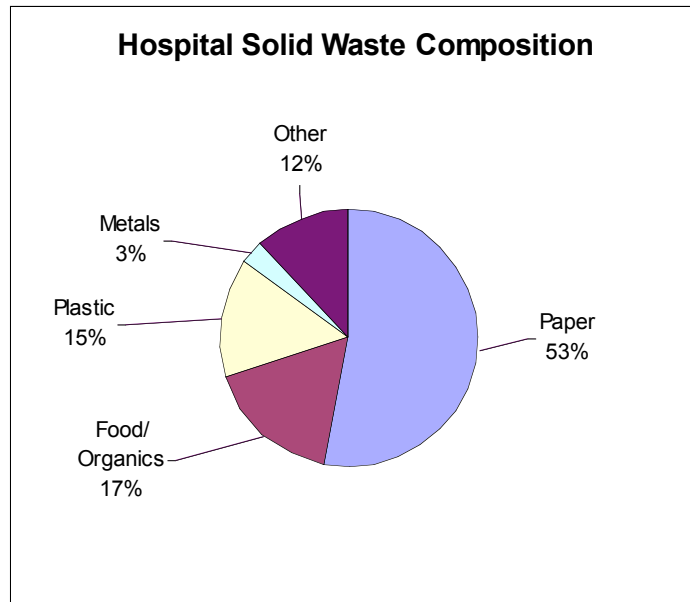
All of the above factors play a significant role in the way different environmental initiatives can be presented, piloted, trained for, and eventually implemented in a healthcare setting.

## Waste Generation

American hospitals generate approximately 6,600 tons of waste per day, according to Practice Greenhealth. This represents an increase of at least 15% since 1992, due to greater use of disposal products. Waste from healthcare facilities can be differentiated into at least four major categories. There are additional sub-categories, but in general the categories can be viewed as:

- **Non-regulated Medical Waste/Solid Waste:** This is the majority of all wastes found in healthcare facilities and is similar to wastes generated by other businesses and institutions (mostly paper), restaurants (organic wastes and packaging), hotels (general trash), warehouses (packaging), construction wastes and other wastes commonly found in the general municipal solid waste stream.
- **Regulated Medical Waste/Infectious Waste:** The wastes generated in direct patient treatment or diagnosis that are suspected to contain pathogens (bacteria, viruses, parasites, or fungi) in sufficient concentration, quantity and virulence that they could cause disease in a susceptible host. This includes cultures and stocks from labs, blood, sharps, and pathological waste. The transport, handling, processing and disposal of infectious waste is highly regulated by local, state and federal agencies. Following is a link to rules and compliance resources for the State of Oregon prepared by the Healthcare Environmental Resource Center:  
<http://hercenter.org/rmw/or-rmw.cfm>.
- **Hazardous Chemical Waste:** Large numbers of hazardous chemicals are used in hospitals to disinfect, clean, operate equipment, treat and diagnose disease. These range from genotoxic chemicals used in cancer treatment to oils and solvents used to operate boilers.
- **Radioactive Waste:** Used in treatment and diagnosis.

Approximately 85% of the waste stream of an average hospital is non-regulated medical waste/solid waste, 10% is Regulated Medical Waste, and 5% is hazardous/chemical/radioactive waste. The chart below \* illustrates the composition of the hospital non-regulated medical waste/solid waste stream.



Source: Practice Greenhealth/Health Care Without Harm

## Challenges

Given the general characteristics and attitudes described above, the major challenges or barriers in the development and implementation of waste prevention and reduction practices in healthcare facilities include the following:

- **Need to Prevent and Control Infection:** As resistance to antibiotics has increased, in-patient facilities have taken a greater interest in using disposable items. Dressing trays, bedpans, and other durable items have been replaced by “kits” that are purchased sterile and discarded when a patient is done with them. The plastic wrap that protects these disposable products further increases the quantity of solid waste involved. Reusable alternatives exist for most items; however, there is a lack of knowledge and understanding of how switching to reusables can be as safe as disposables.
- **Fear of Waste:** Liability is a very real concern in a healthcare setting. The primary goal of managing waste from healthcare facilities is to prevent the accidental spread of disease. Fear of improperly handling waste can lead staff to treat material that could be reused or recycled as regulated medical waste. In addition, some healthcare facilities are reluctant to establish ways to reuse materials because separating uncontaminated, sterilizable and contaminated materials presents a risk of error and subsequent contamination or infection. Increased training and education could help address this fear.
- **Lack of Training:** A majority of waste in hospitals is paper, food and cardboard, yet many healthcare facilities throw 50 percent to 70 percent of their waste into the regulated medical waste stream. Facilities pay up to five times more to dispose of

regulated medical waste than to dispose of non-regulated medical and solid waste. There is a critical need for training about proper sorting and disposal. Staff needs clear, coherent information to understand the reasons for any program including: regulations, cost implications and environmental leadership.

- **Poor Sorting Programs:** Strategically placed and well-labeled containers are critical to any waste sorting effort. The types of containers applicable to patient care areas include solid waste, hazardous waste, empty sharps, recycling (paper, cans, plastic, etc), biohazardous, chemotherapy, and pharmaceutical wastes. In order to place the correct type of container in a given area and provide effective signage it is important to know what types and volumes of waste are generated in that area. An understanding of the specific collection program options, regulations and requirements for each city and state is also necessary. Improved program management and employee training specific to each area and department of a facility are essential.
- **Lack of Space:** In patient care areas, facilities need several collection containers to manage the resulting waste streams. Many facilities are challenged finding space for an assortment of containers. In addition, some container types and sizes are regulated by fire code so size cannot be adjusted to match space available. Storage near the loading docks may also have space restrictions.
- **Lack of Data:** Various departments often manage the costs associated with different waste streams and no one department ever adds up the various waste streams to get a clear understanding of the cost of waste removal. Healthcare facilities may also lack a basic understanding of the waste streams in the facility: how and where waste is generated, how it is handled within the facility, who is responsible for it, and what are the treatment and disposal costs of each waste stream. Facilities need a clear picture of how much waste is generated and what the associated fees are before setting realistic reduction and segregation goals. Metrics to measure progress and reporting systems also need to be established.
- **Clear Return on Investment:** Most facilities continuously require a clear return on investment before embarking on environmental initiatives and are challenged when eco-activities do not reduce costs. When outcomes are harder to quantify (waste removal fee reduction, for example) the program may become stalled.

## Opportunities

The sustainability movement in the healthcare sector has increased significantly in recent years. Innovative projects are being implemented through a broad range of programs, from extensive recycling programs, to safer materials purchasing, to utilities management.

For example, a Sustainable Hospitals Roundtable has been organized in the Portland metro area. It is facilitated by Metro with support from City of Portland, Clackamas County, Washington County, Health Care Without Harm and Oregon Physicians for Social Responsibility. The Roundtable provides networking and educational opportunities for staff of medical facilities, local governments and related organizations.

This section describes several opportunities for increased waste prevention and reduction in hospitals and medical centers.

### **General Sustainability Infrastructure**

The majority of healthcare facilities with successful environmental programs have an active Green Team with broad representation from many different departments within the facility, including environmental health and safety services, facilities, engineering, purchasing and administration. Medical staff (doctors or nurses) are critical to the success of environmental programs and they generally participate on a Green Team as well. In addition to a Green Team, a large percentage of the leading facilities have someone on staff whose job description includes sustainability. As a rule, getting buy-in from the hospital administration and participation of all staffers results in a firm environmental improvement strategy.

Green Teams offer healthcare facilities an opportunity to achieve many benefits:

- According to several reports, companies that show a commitment to the environment are viewed as more attractive places to work. This leads to increased employee retention and improved recruitment.
- Knowing a facility is concerned about the environment and is taking steps to improve the health of patients and staff sends a positive message to the community.
- Green Teams often produce results that improve staff and patient health and safety. Actions may reduce the potential, for example, for sharps injuries by switching to reusable sharps containers.
- Analyzing opportunities for potential cost reductions is generally the first job of a Green Team and these efforts can lead to cost savings. Efforts to conserve resources generally result in reduced expenses.
- Efforts that are considered “low-hanging fruit” are often targeted at the start so that the easiest tasks can be accomplished first. Early successes and results can be promoted to demonstrate clear value.

In addition to a Green Team, sustainability infrastructure can also include an environmental commitment statement and environmental management plan or policy that guides the program, regular staff training, and a system to track environmental improvement initiatives.

### **Regulated Medical Waste (RMW) Reduction**

Hospitals are saving significant amounts of money through Regulated Medical Waste (RMW) reduction programs that include education and improved segregation practices. RMW is generally defined as materials that are soaked or saturated in blood, but often solid waste is also tossed into the red bag containers. If RMW makes up 15% or more of a healthcare facility’s overall waste generation, it should be targeted for reduction. Studies show that healthcare facilities can reduce RMW to 6-10% of total waste generation. The Center for Disease Control suggests that RMW can be reduced even further to 3-5% of total waste generation through an effective education program.

With an effective education and segregation program as the foundation, RMW reduction targets can include fluid management systems to avoid placing containers in regulated waste, single use device reprocessing, reusable sharps containers, and blue wrap recycling. “Blue wrap” is polypropylene plastic cloth typically designed and used to wrap surgical instruments prior to sterilization. Once transferred to the operating room, the

instruments are unwrapped and the cloth is considered a waste. Replacing wrap with hard cases may also be considered. Sterilization containers, also known as “hard cases,” are stainless steel boxes into which sterilized instruments are placed. They are reusable and can substitute for blue wrap in many applications.

An average 250-bed hospital may throw away 13 tons of disposable sharps containers every year. Reusable sharps container programs reduce not only the waste associated with this practice but also the time and labor involved in managing a disposal sharps container program. Reusable sharps container programs employ an outside company to come in and remove sharps containers that are three-quarter’s full, and replace full containers with a reusable, clean and sterilized container. These programs have also been shown to decrease needlesticks by 10-30%. Hospitals implementing reusable sharps container programs have seen a positive return on investment along with a short payback period.

Finally, according to the Association of Medical Device Reprocessors (AMDR), approximately 13 tons of RMW has been saved over the last eight years through single-use device reprocessing. Single-use device reprocessing is the practice of inspecting, functionally testing, cleaning, packaging and sterilizing medical devices labeled for single-use in such a manner that the quality, physical characteristics and performance functions of the device are not significantly affected and the device remains safe and effective for its appropriate clinical use. Single-use device reprocessing is typically done by a third-party reprocessor that is registered and regulated by the U.S. Food and Drug Administration (FDA). According to one vendor, it is feasible for a hospital to save more than \$500,000 a year in supply costs and cut waste costs as well. Clinicians may not be aware that reprocessing is safe, and so they often dispose of reusable devices after a single use.

### **Environmentally Preferable Purchasing**

In the last few years, Environmentally Preferable Purchasing (EPP) programs in healthcare have matured from simple “what percentage of recycled content is in our copy paper?” to a much broader awareness of environmental considerations for all types of purchases made throughout the hospital or medical center. These considerations may include more advanced concepts, such as total lifecycle analyses that include the environmental impacts of manufacturing, use, recycling, and final disposal of the item.

Examples of disposal items that healthcare facilities have replaced with reusable items include: reusable sharps containers and single use devices, linens and linen bags, gowns, uniforms, scrubs, reusable plastic totes, reusable patient information booklets, pharmacy waste containers, bio-waste tubs, and rigid sterile containers for surgical instruments and items.

Purchasing strategies, including an EPP Policy and establishing a medical product evaluation committee, can play a key role in reducing waste. By incorporating relevant language into purchasing contracts to address reduced packaging, reusable or recyclable packaging, end-of-life management, leasing, or product take-back programs, facilities will be able to target waste reduction before the product enters the facility in the first place.

Recently EPP has spread to hospital kitchens where sustainability has become a topic of interest. Farmer's markets, locally grown foods, and eliminating fried foods are just part of a healthy foods initiative. Many hospitals are no longer offering bottled water at meetings, and have replaced that practice with pitchers and drinking glasses. They are also handing out reusable coffee or travel mugs, offering discounts on beverages when using reusables, or charging small fees for disposable cups. One hospital in Colorado found cost-savings switching from Styrofoam cups to compostable cups used for hot and cold applications. Many hospitals are interested in being Styrofoam-free and use reusable or compostable food service ware.

### **Donations**

Pallets full of medical equipment, furniture, linens, books and supplies are donated regularly to organizations that distribute the materials to third world countries, avoiding a premature trip to the local landfill and benefiting those in need. Online resources are also used by hospitals to advertise obsolete furniture to the public that are not accepted by charity organizations for shipment overseas. Healthcare facilities can use certification programs ensuring their electronic waste is recycled in an environmentally responsible manner and not sent overseas to developing countries where it is burned for metals. Many facilities are also donating edible food to local food banks.

### **Recycling**

There are more than 25 materials in a hospital that can be safely and easily recycled. These items include common recyclables such as cardboard, glass, office paper, aluminum cans, newspaper and plastic bottles, as well as items specific to healthcare facilities such as linens and X-ray film. Most facilities can achieve at least a 10% recycling rate while many hospitals are achieving 25% or more.

Similar results were found in several waste sorts conducted for hospitals in the Portland metropolitan region in 2006 and 2007. The waste sorts were conducted by the Waste Assessment Services team of Community Environmental Services. The hospitals included Legacy Mt. Hood Medical Center, Providence Milwaukie Hospital and Providence Portland Hospital. A random sample of waste was taken from each facility and sorted into eleven or twelve categories. Non-recyclable material comprised between 68% and 76% of the waste stream and recycling made up 24% to 33%.

## **Examples of Successful Waste Prevention and Reduction Practices**

This section summarizes selected waste prevention and reduction programs in healthcare facilities. A wide variety of waste prevention and reduction strategies can be implemented, including regulated medical waste (RMW) reduction, single use device reprocessing, durable sterilization cases, blue wrap recycling, other recycling, and equipment donation. These case studies highlight only a few.

### ***Reducing Blue Wrap – St. Luke's Hospital, Duluth, Minnesota and Boulder Community Hospital, Boulder, Colorado***

Most surgical instruments go through decontamination and sterilization. They are washed, assembled into sets based on the surgical procedure, and most often enclosed

in blue wrap. The instruments are sterilized; steam is the most commonly used method. Blue wrap is a single-use disposable product comprised of polypropylene. It is used to envelop surgical instruments and ensure sterility. Also, to ensure sterility, indicator systems are used. One such indicator is tape, which is used to secure the blue wrap around instruments. The tape often contains a lead salt which presents hazardous waste and human exposure concerns. When the lead-containing tape is adhered to the blue wrap, the entire package is considered hazardous waste.

Healthcare facilities can reduce the quantity, cost, and toxicity associated with blue wrap by using sterilization containers. Sterilization containers, also known as hard cases, are stainless steel boxes into which sterilized instruments are placed. They are reusable and can substitute for blue wrap in many applications. Hard cases are also better for protecting instruments from damage. Hard cases also use lead-containing indicators; however, the tags and filters with lead indicator dots are smaller in quantity and easier to manage than the tape adhering to blue wrap.

St. Luke's Hospital was interested in reducing their blue wrap purchase and disposal costs. They conducted a cost and disposal analysis for the purchase of hard cases.

Results:

- Each hard case offset blue wrap purchase and disposal of hazardous waste by approximately \$391 and reduced almost 50 pounds of waste annually.
- Each hard case cost \$400, providing a return on investment of less than one year.
- By purchasing an additional 224 sterilization containers, St. Luke's can reduce blue wrap waste by 5.4 tons, reduce lead-contaminated indicator waste by 22.4 pounds and save almost \$100,000 annually.

Boulder Community Hospital in Boulder, Colorado conducted a waste audit and identified blue wrap as a significant portion of the waste stream. They invested in hard cases for sterilization of instruments in the operating room setting.

Results:

- Invested \$120,000 in one-time cost for hard cases.
- Reduced the purchase of disposable blue wrap from \$250,000 in 2003 to \$60,000 in 2005. This resulted in \$190,000 in cost savings. (This does not include reduction in waste costs.)
- Manufacturers are now required to provide the durable container as part of the equipment purchase.

***Packaging Reduction – Legacy Health Systems, Portland, Oregon***

Nurses at Legacy Good Samaritan Hospital & Medical Center reduced the amount of plastic wrap needed to package gloves by working with their supplier. When the supplier switched its packaging from a paper waxed envelope to plastic that was not recyclable the nurses contacted the company and asked them for an alternative. The company reduced the amount of plastic packaging by folding the gloves in half.

Five Legacy hospitals convinced a supplier of custom surgery packs to eliminate items not used often enough to justify being included. This saved the system roughly \$30,000 per year and eliminated 11,000 pounds of waste.

***Paper Reduction – St. Elizabeth Medical Center in Edgewood, Kentucky***

St. Elizabeth Medical Center reduced paper usage by thousands of sheets through placement of all Administrative, Human Resources, and Nursing Policies and Procedures—as well as their Safety and Infection Control Manual and over 4,000 MSDS sheets—on their intranet system instead of making paper copies for multiple binders in numerous departments.

***Single-Use Device Reprocessing – Fletcher Allen Health Care, Burlington, Vermont***

Historically, most items in the hospitals were designated as reusable and were reprocessed and reused. The use of disposables became popular because of convenience and reducing the risk of cross contamination. However, as the cost of waste disposal increased, hospitals looked for opportunities to reduce waste. They attempted to return to the use of reusable items and began to reprocess certain items.

Hospitals have found that many of the devices labeled for single use can be safely reprocessed and reused. Single-use devices (SUDs) reprocessing is typically done by a third party registered with and regulated by the U.S. Food and Drug Administration (FDA). The third-party reprocessor inspects, functionally tests, cleans, packages and sterilizes medical devices labeled for single-use in such a manner that the quality, physical characteristics, and performance functions of the device are not significantly affected and that the device remains safe and effective for its appropriate clinical use.

In 2008 Fletcher Allen Health Care piloted a program with a national vendor to reprocess SUDs from the operating room. The success of the program led to a three-year contract to continue reprocessing SUDs. Using two vendors, Fletcher Allen saved over \$380,000.

***Reusable Sharps Containers – Catholic Healthcare West, a system with 40 hospitals in Arizona, Nevada and California***

Catholic Healthcare West switched to reusable sharps containers that can be filled as many as 500 times. The result was that at least 392,000 sharps containers were diverted from the landfill in one year.

***Reusable Gowns and Basin Sets – Kaiser Permanente, California***

Kaiser Permanente uses 800,000 gowns each year. In 2009, 700,000 of those were disposable and 100,000 reusable. 700,000 disposable gowns create 158 tons of waste. Kaiser Permanente uses 85,000 basin sets each year. In 2009, 75,000 were disposed and 10,000 were reused. 75,000 disposable basin sets create 56 tons of waste. Kaiser Permanente wanted to compare the performance of reusable gowns and basin sets vs. disposables with respect to clinical performance, total cost, and environmental trade-offs.

**Actions Taken:**

- Formed a California cross-regional, cross functional group.
- Constructed a total cost of ownership model to compare the cost of reusables and disposables over their lifetime (including purchase price, tax benefits from renting, distribution, disposal).
- Constructed a model to evaluate the environmental trade-offs.

- Conducted a facility assessment to understand the operational impact of the reusable gown system.
- Interviewed clinicians to understand their performance requirements for these products to create evaluation forms.
- Conducted clinical trials at three facilities to gather clinician feedback on the performance of reusables.

Results:

- Awarded national contract to SRI for reusable gowns and basin sets.
- Surgeons and Infection Control were not comfortable at this time contracting for reusable drapes.
- This delivers a 3.8 percent savings over disposable products.
- Usage of reusable gowns diverts 22.5 tons and usage of reusable basin sets diverts 7.5 tons of waste from landfills each year.
- Water consumption associated with the sterilization of reusable products was calculated at 180,000 gallons per year. However, the project team was unable to determine water consumption in the manufacturing of disposable products and therefore unable to determine if reusables pose an overall negative impact on water consumption.

Lessons Learned:

- It was important to fully understand all environmental trade-offs between reusables vs. disposables to confirm which one was the more environmentally beneficial system.
- Reusables were determined to be the clear environmentally preferable alternative.

Next Steps:

- Educate facilities on total cost equation for using reusable gowns and basin sets, and educate them on the importance of conducting a facility assessment and assessing appropriate gown utilization (“right gown for the right procedure”).

***Recycling – St. Joseph’s Medical Center in California***

St. Joseph’s reduced the amount of solid waste going to the landfill by 52 tons in 2004, and recycled more than 128 tons of waste – largely paper, but also pallets, cardboard, and green waste recycling, which accounted for approximately 21% of the system’s total waste stream.

## **Preliminary Recommendations on Waste Prevention and Reduction Practices and Outreach Strategies and Tools**

The primary purpose of the Recycle At Work Medical Sector Outreach Plan and Tools Project is to work with the healthcare industry to identify targeted waste prevention and reduction practices; develop effective tools, resources and outreach programs that may assist the involved parties in implementing and maintaining the targeted practices; and evaluate the effectiveness of the tools, resources and outreach programs at healthcare institutions.

The following preliminary recommendations are based on awareness of the challenges, barriers and unique circumstances that factor into how healthcare environmental issues must be addressed, and research and direct experience working with the healthcare employee population to implement waste prevention and reduction practices.

- Assist in the development of a general sustainability infrastructure to help create and foster a culture of environmental excellence. There are critical ingredients to success in not only implementing new programs, but maintaining existing ones. To continuously build upon programs and transition from departmental or grassroots programming to a cohesive and well-organized structure. Critical ingredients include: leadership support from top management, cross departmental involvement, a firm foundation and reporting structure to greening activities, access to technical guidance, clear communication/education and employee engagement strategies.
- Provide assistance in the development of a Green Team. This may include providing a guide to how to develop and maintain an effective Green Team; sample materials such as organizational charts, job descriptions, and environmental goals; policies and commitment statements; or providing team-building training and assistance.
- Assist with data collection. Assist in developing the baseline assessment of waste and identify ways to measure and improve its management. This will help facilities get a clear picture of how waste is generated and the associated fees in order to set waste prevention and reduction goals. This could be done through assistance with the collection of existing data or the use of available data collection and management tools.
- Target RMW. Regulated medical waste (RMW) is at least five times more expensive to dispose than non-regulated medical waste. It is therefore vital to keep recyclables and standard trash out of RMW collection. Only 6 percent to 15 percent of a facility's total waste should go into RMW containers. Provide assistance in setting up simple and effective segregation programs, including container placement and signage, assist in developing an ongoing training component, and help design tracking and reporting programs. Include specialty RMW streams such as sharps management and single-use device reprocessing.
- Encourage environmentally preferable purchasing practices. Resources that target major components of the waste stream such as blue wrap and single-use items can be provided to help evaluate replacing such products with reusable items and

switching from disposable food containers to reusable or compostable food service ware.

- Continue to provide the range of resource materials currently offered on recycling, waste prevention, purchasing and material-specific resources such as battery and computer recycling. If not done already, perhaps produce a list of resources and accompanying website addresses for sources such as local governments and Metro Recycling Information, for example.
- Continue to provide personal onsite assistance and outreach materials specific to each healthcare facility and each department within the facility, recognizing that the effectiveness of outreach materials is very dependent on the quality and responsiveness of the personal and technical assistance.
- Consider providing more templates that can be customized by a healthcare facility that are compatible with their other facility information but can reflect differences between jurisdictions and services.
- Consider offering janitorial and staff trainings, if not already provided.

## Appendix B: Notes from Stakeholder Focus Group

### Metro Recycle At Work: Medical Sector Outreach Plan and Tools

#### Stakeholder Focus Group Meeting – May 20, 2010

On May 20, 2010, Tabor Consulting Group conducted a stakeholder focus group with representatives from a cross-section of the medical community. Seven participants were expected; four attended.

Name	Department	Hospital	
Ted Greene	Food Service	Providence Health Systems	absent
Mike Geller	Sustainability	Providence Health Systems	present
Martin Phelps	Nursing (RN)	Kaiser Permanente	present
Alex Huerta	Environmental Services	Shriners Hospital for Children	present
Jeff Kyle	Purchasing	Kaiser Permanente	absent
Wendy Trap	Environmental Services (GEM leader)	VA Portland	present
Bill Clark	Sustainability	Legacy Health Systems	absent

#### Focus group purpose

Tabor Consulting Group designed questions and scenarios to gather information that will lead to creation of an outreach strategy that Metro will use to help the medical sector reduce waste. The focus group was structured to have the participants talk about:

- the range of waste reduction and recycling practices and systems currently in place and which are most successful
- types of waste these practices address
- what new and existing strategies should be prioritized to address specific waste types and why (return on investment, ease of implementation, environmental impact)
- obstacles and challenges to implementing new strategies
- methods for tracking and evaluating effectiveness

#### Prioritized waste types

Discussion throughout the two-hour meeting led to agreement on four waste types that should be prioritized for waste-reduction and recycling strategies:

1. Reduce Regulated Medical Waste – Including General Reduction, Reusable Sharps Containers, and Fluid Management Systems
2. Single Use Device Reprocessing/Remanufacturing
3. Recycling Medical Plastics: Blue wrap, film plastic, etc.
4. Composting and Organics

(NOTE: Composting/organics was removed from the list after discussion. Will Elder explained that until there is adequate capacity for increasing organics collection and processing in the region, this is not a strategy that will be included in the medical sector outreach planning. Similarly, strategies for paper recycling need not be addressed in this current effort, since existing Recycle at Work strategies and tools are available, although they may need to be customized to some degree for the medical sector.)

### **Summary of focus group discussion**

The following summarizes the focus group’s discussion on waste types, strategies, barriers and evaluation. For the prioritization portion of the discussion, participants were given colored dots – two pink and two green – to place on the flipcharts next to the topics they think should receive top priority when designing an outreach strategy that could be used in hospitals regionwide. Pink dots indicate high priority materials and strategies; green dots indicated “next-level” priority materials and strategies.

### **Waste Reduction Ideas – All Ideas**

- Reduce Regulated Medical Waste (two pink dots)
  - General reduction through education
  - Reusable sharps containers (two green dots)
  - Fluid management system in the operating room (two pink dots)
- Single Use Device Reprocessing/Remanufacturing (two pink dots)  
*prioritization criteria: cost savings and waste reduction/reuse*
- Recycling of Medical Plastics – blue wrap, film plastic, etc. (two pink dots & one green)  
*prioritization criteria: waste reduction and ease of implementation*
- Energy and Water Reduction (two pink dots)
- Composting Food Waste (one pink dot & one green)
- Centralized Recycling Center to Sort Material (one pink)
- Universal Waste (batteries and fluorescent light tubes and ballasts)
- Pharmaceutical Waste
- Paper Reduction
- Electronic File Management (*slowly being implemented*)
- Phone Book Reduction
- Switch to Digital X-rays
- Solvent Recovery Systems
- Electronic Waste
- Donations
- Reusable Gowns and Drapes (in operating room)
- Construction and Demolition Debris
- Design for Recycling During New Construction or Remodel

## **Prioritized Waste and Strategies, Barriers, Potential Strategies**

### **1. Reduce Regulated Medical Waste – Including General Reduction, Reusable Sharps Containers, and Fluid Management Systems**

#### Barriers

- Time constraints: people do not want to take the time to properly separate their waste. In addition, staff is busy doing their jobs and it is difficult to schedule time educate them about waste reduction programs.
- Lack of sustainability infrastructure: If there is no structure to communicate between departments and coordinate efforts it is difficult to implement and maintain programs.
- Lack of Education: Staff does not understand what regulated medical waste includes and does not know how to properly sort materials.
- Fear of waste/perception: Fear of improperly handling waste can lead staff to treat any material that touches blood as regulated medical waste.
- Lack of access to upper management: Often new programs require approval from upper management. It can be difficult for staff to access upper management to get this support.
- Lack of support from upper management: If upper management is not supportive of the program, broad success of any initiative is difficult.
- Lack of support from infection control: The medical industry is highly regulated and liability is a very real concern. Programs such as switching to reusable sharps containers and fluid management systems require buy-off from infection control.
- Lack of support from purchasing: Programs such as reusable sharps containers and fluid management systems involve the purchase of equipment and supplies. Purchasing must be involved. In addition, purchasing and upper management need to understand the cost and benefit as well as the return on investment in order to provide approval for initiatives.

#### Strategies

- Education:
  - Signs at the point of collection – “less words, more pictures”
  - Presentations
  - Posters
  - Videos
  - New employee training
  - Management pledge
- Strategically placed and well labeled containers
- Conduct Audits: Do periodic audits and take pictures of RMW container. Provide department pictures of their containers.
- Baseline Assessment: This will allow you to communicate progress
- Clearly Define the Rules: Educate the staff about what RMW includes and does not include.

### **2. Single Use Device Reprocessing/Remanufacturing**

#### Barriers

- Same as those listed for Reduce Regulated Medical Waste
- Purchasing contracts that require the purchase of specific items
- Fear of waste – liability concerns, lack of knowledge and understanding of how switching to reusables can be as safe as disposables.
- Misinformation/conflicting information

### Strategies

- Develop vendor partnerships
- Invite surgeons into meetings and trainings about single-use reprocessing
- Securing upper management and infection control support are key to success
- Secure buy-in from the purchasing department
- Conduct a pilot project
- Education including: regulations, cost implications and environmental leadership.

### **3. Recycling Medical Plastics: Blue wrap, film plastic, etc.**

#### Barriers

- Finding a market/vendor
- Vendor concerns about contamination with medical waste
- Information about what types of plastic can be recycled
- Space for recycling containers
- Location of recycling containers: The right type of container needs to be placed in each area. Different departments generate different types of waste. A knowledge of what type and quantity of waste is generated in each area is needed to strategically place containers.
- Fire marshal requirements for containers

#### Strategies

- Partner with market/vendor: assure proper segregation of materials, establish trust, and get information about types of plastic that can be recycled
- Strategically placed and well labeled container: Conduct an assessment of each department to determine the types and volumes of waste generated then provide appropriate containers, signage and education
- Provide employee training and signage specific to each department
- Remove it before it becomes contaminated: Most blue wrap and many other recyclables can be removed from the operating room before the patient arrives. This avoids possible contamination and treatment as regulated medical waste.
- Blue Bag Strategy: provide a different colored bag for recyclable material
- Lids on containers to avoid contamination: put lids on containers for recyclable to avoid contamination with regulated medical waste or other non-recyclable materials.
- Information about containers that are acceptable – fire marshal requirements

#### **Tracking/Evaluation**

- Require vendors to provide data reports
  - ✓ Reports from RMW reports from medical waste disposal vendor
  - ✓ Reports from garbage hauler to track solid waste
  - ✓ Reports from single-use reprocessing vendor
- Use existing tracking tools or create simple spreadsheets
- Establish a baseline
- Have environmental services department track results
- Generate graphs
- Share information about progress and success.

## Compilation of participants' comments

The summary above consolidates participants' comments and identifies areas of agreement. The following is a comprehensive accounting of comments made throughout the session, presented with minimal editing and without attribution.

### General discussion about what is being done currently

- Education for employees, is important; knowing what's waste, what's recycling – mainly recycling, we don't have composting yet.
- I would want to look at what others are doing elsewhere so we can get going. What we're doing now is separating blue wrap, separating recycling, glass. We're not doing a whole lot. Getting pushback on reprocessing. Need to pull in MDs. We need sustainability coordinator. Consolidation of ideas. Getting people together, channel energy and focus. Even just changing out light bulbs. We're going to take away disposal serviceware in the lunchroom. I am focusing on my little department. People don't understand reprocessed materials – fear around hurting people. Education is needed.
- Some facilities don't even have a green team. It can't just be one person. We looked at our medical waste and did a huge program, focused on biohazardous waste. Create "BioMan" video. We took all biohazard bins out of the rooms. People were putting everything in them.
- By remanufacturing devices we saved a lot of money. Reprocessing/remanufacturing takes getting the right people in the room, forming a relationship with the vendor. We have a monthly meeting. If there's an issue, we can resolve in quickly. If we get pushback from a doctor, we invite them to the room.
- Scissors and other things are going into the Sharps containers. All those single-use tools – 1000 pounds a month – now get cleaned and recycled as metal, not as Sharps. We have an onsite autoclave.
- I use PowerPoint presentations and the Green Team to help educate. Education and signage are key. We've reduced our medical waste to 8 percent of total. We've removed red bags from patient rooms so everything doesn't end up in there. Composting – pre and post container food waste, yard debris.
- One lesson learned is when we put recycling containers in lunchroom, staff put things in the wrong bin. Now we put better signage and things are recycled and put in the compost bin behind the scenes.
- Fluid management system in OR. Can't use solidifier in Oregon for suction fluids. The next thing we'll look at it reusable suction canisters. Like a Neptune system, but not as high volume. Fluid management is my next frontier. We're already doing reusable Sharps container program. I have Purchasing doing a cost-analysis on fluid system management.
- Recycling: Everything is sorted on site. Blue wrap, peel-pack, plastics 1-7, and they sort it themselves. Sells material to help offset costs.
- Not just waste reduction, but look at universal and pharmaceutical waste. May not be a reduction, but you want things in the right place. Mercury, sliver: all can be recovered and sold.
- Batteries, bulbs, ballasts (even alkaline batteries). Fee for service, but it's a best practice.
- Digital recordkeeping: Implementation and networking all the sites together. We're part way there. We have facilities where all the charts are electronic, but we're not doing all of our

documentation electronically yet. It's piecemeal. Every time we do an upgrade, we look at what department is coming on line and whether it makes sense for them.

- Look at paper, purchasing. Do you need a room of 30 printers? Default to duplex printing. There is so much printed in hospitals that is not medical records. Departments get hundreds of pages (single sided) that they don't need. Need distribution management. Phone books – reduced number they deliver to us.
- There's a lot you can do in HR, employee records, digital x-rays, meetings. We could go all digital.
- Solvent recovery. (Depends on whether there is zinc in it.) We neutralize it and pour it down the drain. Don't have to pay for it to dispose of it as hazardous waste.
- We outsource it all. Shriners is going to digital x-rays this year.
- Electronic waste: Buy stuff that lasts, donate usable equipment.
- What about reusables – gowns, basin sets etc...Everything in OR is disposal. Not reusable drapes, gowns. We're on contract with our scrubs, but the surgical gowns themselves in the sterile field, are considered contaminated. Unless it's dripping, it gets thrown away.
- Medical plastics. Basins that can go through washer and used again. Had to have a conversation with our recycler.
- Talked with Agriplas – Tried to get them on campus.
- Construction debris, too. Need to get recycler on campus to look at waste.
- When you're building a facility, plan for waste reduction. Leave room for space for recycling. Plan for the recycling functions and room to do it.

#### Discussion on priorities

- Dollars and reasonable – reusable Sharps container program. At one hospital, 25 tons saved from landfill a year. Sharps container (empty) weights 3 pounds.
- I'd like to tackle the internalization of the recycling. So much of our solid waste is being disposed. Either handling it/sorting it on site, or taking it to a central MRF.
- There are nonprofits that use developmentally disabled workers to sort it. Garten Services. I have my own facility, but I ended up with cabinets with locks, so Garten Industries is going to pull the locks, take off the containers (outside housing of Sharps) and recycle them.
- Biohazard waste – every hospital should do some part of it. All our medical waste is being burned – it uses steam to make energy. All biohazards and other things are used for energy (PGE).
- They all have benefits. Depends on what goal is. Waste reduction, cost benefits, other.

#### Discussion on challenges and barriers

##### **REDUCING REGULATED MEDICAL WASTE:**

- Reusable sharps and fluid management systems
- Done at small scale. Biggest barrier is staff taking the time to do it. They are so busy doing patient care. Staff doesn't know what it would take to put it in place.
- Educating people about not putting trash in regulated waste containers.
- We don't have a sustainability coordinator, no one person who can rally green team to roll it out. Education is a barrier. Reinforce education. Time is a barrier. Need time to get the people

together, pull them off their jobs. Use signage. The easier you can make it the better. Somebody who could coordinate those efforts would make a big difference.

- Our biggest barrier is educating people about what biohazardous waste is and how to treat it. We did a big education piece: signage, videos, audits, in-service programs. Changing perceptions, beliefs.
- Forming the right team. We tried to do remanufacturing a few years ago, put out a few containers, signs. We found an administrative champion to formalize it, it comes from our CEO. He called a meeting the Friday before Labor Day in the afternoon and everyone showed up. Need top management support.
- You also need infectious control to get on board.
- Also need to get Purchasing on board. It's a change. We found an administrative sponsor/champion.
- Time, perception fear, lack of upper management support, lines of communications lacking, time.

#### **REPROCESSING SINGLE USE DEVICES:**

- Many barriers are the same as above.
- They are building a toolkit right now to help organizations with reprocessing. Cost is not a barrier.
- Had a doctor tell us he didn't want to see our name in the paper because we shipped out HIV in a medical waste container. Huge fear and misinformation.
- Suppliers will tell you that you can reprocess it. Nobody tells you have to put "single use only" on the packaging, but you see that all the time.

#### **RECYCLING BLUE WRAP, PLASTICS – includes urine sample bottles, pipettes, tubes, rigid plastic packing (injection-molded)**

- Barrier – vendors. Finding a market. Costs. Trust with vendors. Vendor relationship. No needles in the blue wrap.
- Knowing what you can/can't recycle and who can do it for you.
- Space and location for recycling containers. Make it easy for people to find and use. Space in the storage dock too.
- Proper recycling containers. Can't use cardboard paper recycling boxes. It's a barrier. Some fire marshals won't allow paper recycling boxes.
- Are the barriers different for clinics? Yes, they are different – scale, location. Clinics have less waste to manage.

#### **STRATEGIES**

- What about a commitment pledge, using community based social marketing principles? Not just a head nod, but making it policy?
- We do have a waste-disposal policy, but it doesn't take into sustainability.
- No formal policy. But we make new employees go through training.
- Signs at point of collection. Use pictures. Different colored bags. Red, yellow, blue. Less words, more pictures.
- Do hospitals need individual, site-specific signs? Templates could work.

- We use actual pictures of stuff we've found. It becomes personal. "You found that in MY biohazard bin?"
- Need ongoing audits and communications. Open bags, take picture. Did it every week at first, now do it quarterly.
- Green committee says materials should be in English, Spanish and Russian.
- Would like to see some standardized. It is not clearly defined, what is biohazard, what is not. Define the rule – Oregon Administrative Rules.

### **STRATEGIES FOR PROCESSING SUDs**

- Vendor relationships. Also, invite surgeons into meetings, make meetings at times they can attend. Have coffee and foot at 6 a.m.
- Purchasing strategies – Have to bring everyone together in the same room. Upper management and infectious control, risk, quality management.
- We have reprocessing in place at a small scale. We need buy in from the purchasing department.
- Do pilots. Start in the OR or somewhere and figure out kinks.
- We have a national committee. We have some naysayers on committee. Endo doc is one of the naysayers. Maybe a pilot program would work.
- Find out the naysayers and focus on them, show them, prove it, turn them into supporters. Won't get everyone. But some negative ideas will damage program.

### **RECYCLING MEDICAL PLASTICS:**

- Contamination is a big issue. The more valuable, the easier it is to find a market.
- We use a video. Education is key. Signage. Location of containers. Proper labeling of containers. Capture it before it's contaminated. Remove it. Get it off the field before it contaminates everything else.
- If it's in the OR, you can probably replace it with something that's reusable. If it's contaminated, don't put it in the recycling.
- Collection of recyclables – leak-proof, no cardboard. Lids are helpful.

### **EVALUATION**

- Vendors can give your reports – pounds, costs.
- Track your data. Mike tracks data, Excel spreadsheet. Track solid waste, composting, recycling – all waste streams on one chart for all hospitals.
- Environ. Services manager or staff to do the tracking.
- We create spreadsheets, do graphs, provide reports to our committee quarterly. Track by pounds.
- Regulated medical waste? Yes, they can get reports to evaluate success.
- If I'm not getting calls from Waste Management, I figure I am doing it right. I have not idea what our baselines are, I just figure I am doing it right if I don't get a call from WM. The one thing that does help is the reprocessing vendor – they give me a report that is a point of pride. Feedback to staff.

- We're just getting started with recycling medical plastics. Vendor says they can give us a report, how much we're saving, recycling.
- Need to know whom to ask for a report on amount of waste/recyclables at the Waste Hauling Company.
- Graphs. Put things on the Intranet. Post how much you've achieved. Reward programs, successes.
- Pounds per adjusted patient day.

**MISC.**

- Networking opportunities, ability to share ideas, resources.