

Waste Optimization Toolkit

Guidelines and Recommendations
for Meeting Environmental Stewardship Waste Goals



WASTE

 Providence



WASTE

ENERGY & WATER



AGRICULTURE & FOOD

CHEMICALS

TRANSPORTATION

TM

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Introduction



At Providence, we are inspired by a vision of good health creating a better world. We understand that the Earth, our common home, is a fundamental component of good health, and that we all must take responsibility for our contributions to environmental degradation. Our commitment to environmental stewardship is rooted in our core value of Justice, we strive to care wisely for our people, our resources, and our earth while focusing on finding solutions that are equitable for all.

We are proud to partner with other leading organizations and agencies to transform the health care sector. To show our leadership, we are doing all we can to work toward becoming carbon negative by 2030. To meet this aspirational goal, we are guided by our mitigation framework WE ACT, our resiliency framework We REACH and our advocacy framework We SHARE.

In service to our waste goal, to divert more than 50% of total waste away from landfill, and hazardous waste streams by 2030, this Playbook initially was created to provide guidance and best practice recommendations to optimize waste management while meeting regulatory requirements, ensuring patient and staff safety, being fiscally responsible and meeting our environmental stewardship goals. We have now adapted it to share with others in the healthcare sector.

We created this Playbook to consolidate guidelines, best practices suggestions and education about management of the varied waste streams related to our health care operations. These recommendations are based on Providence performance data and industry best practices.

This document is intended to be used as a guideline for the development of site - specific plans, policies, and process changes for the optimization of waste streams within each facility at your organization.

OUR COMMITMENT

We are dedicated to caring for the poor and vulnerable by reducing environmental harm and injustice.

To show our dedication, we are doing all we can to work toward becoming carbon negative by 2030.



What is Waste Optimization?



Waste Optimization:

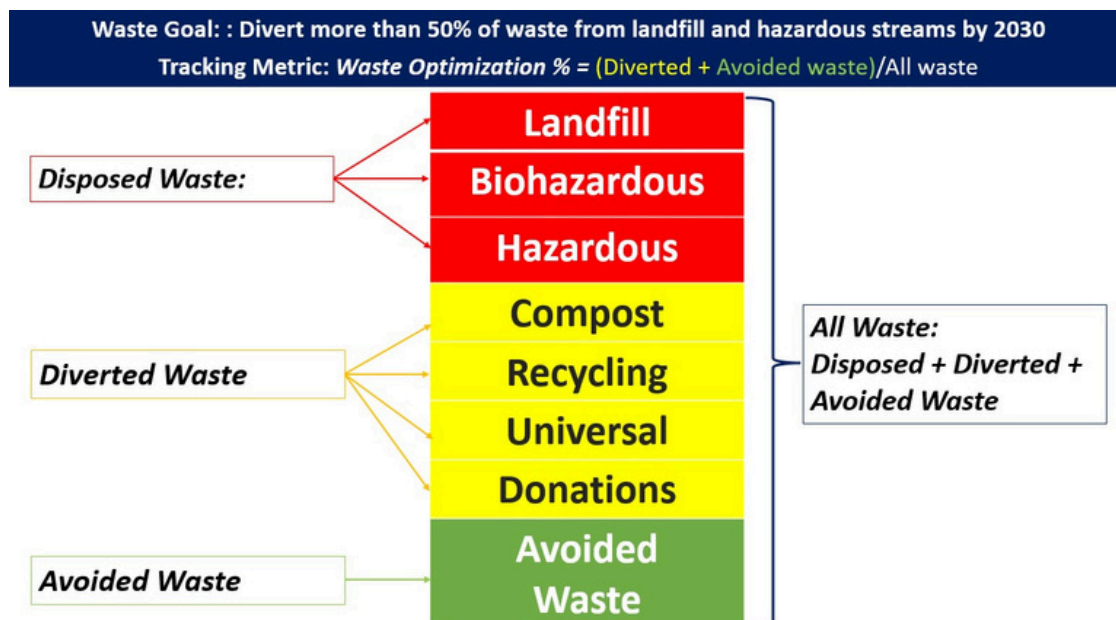
Assuring the right waste volume goes to the right stream at the right cost and the right carbon emissions.

About Providence's 2030 Waste Goal

On Earth Day, 2020, Dr. Hochman announced Providence's goal to work toward carbon negative by 2030. An additional and related goal is that by 2030, we intend to divert more than 50% of waste from landfill and hazardous streams by 2030. In achieving this, we expect to reduce our greenhouse gas emissions from waste by at least 30%, reduce the pollution burden on the communities we serve and save significant financial resources.

Our waste optimization strategy focuses on proper segregation, to avoid unnecessary treatment as municipal solid waste, biohazardous or hazardous waste (disposed waste), establishing or enhancing waste streams that are less polluting (and often less expensive) such as recycling, composting, and donations (diverted waste). Importantly, we will focus on source reduction, or using less, purchasing less, and consuming less (avoided waste).

In the WE ACT scorecard we track weight, cost, and carbon for all waste streams identified in the Playbook. This image indicates the wastes categories, and how the goal percentage is calculated.



Leadership

Cross Functional Teams

Waste management is complex and cross - functional, requiring commitment and close coordination to achieve efficient and accurate segregation. Every caregiver within a given ministry has a role to play in waste optimization - understanding proper segregation and complying with these plans and policies. To achieve optimization, a facility will need a well - coordinated approach in which data are tracked and shared, costs are understood and minimized, education and communication about waste is coordinated and seamless. This will require a cross-functional team, or at a minimum, regular cross-functional communication.

Team members may include: EVS, Facilities, Nursing, Peri-Operative Services, Pharmacy, Food & Nutrition Services, Information Services, Clinical Technology Management, Supply Chain, Security, Risk Management, Regulatory Compliance / Safety, Administration, Finance, Environmental Stewardship.

Using Data to Drive Improvements

Waste efficiency is tracked through both weight and cost. Further, it is normalized by metrics such as price per pound, pounds per APD (adjusted patient day) and others. In Providence, waste data are tracked centrally through the WE ACT Scorecard. To optimize, the team will examine the results on an ongoing basis, set goals, and work toward meeting best practices for each waste stream.

Coordination with Hazardous Waste Management Plan

Each site is required by the Joint Commission to have a Hazardous Materials and Waste Management Plan. This presents an excellent opportunity to coordinate the entire waste management program with the Plan to ensure that regulatory requirements are being met across all streams.

Education and Engagement

Numerous waste streams are highly regulated, and very expensive. It is essential that caregivers have the knowledge needed to segregate and handle waste properly. Accurate and current signage at the point of disposal is important. Regular updates for complex segregation decisions for streams such as pharmaceutical waste, narcotics waste, and hazardous waste are necessary. Engagement of staff to develop and support streams for donation will reduce the volume of waste sent to landfill. Further, education and engagement can help change the culture to focus on source reduction, a focus on using fewer supplies, fewer single-use items, more reusable or reprocessed supplies. This is one of the most important changes toward meeting an organization's waste goals.

Assessment of Waste Management

Site Waste Assessments

It is necessary to understand the entire waste operation at a hospital (all waste streams), to maximize efficiency, minimize cost and understand impacts on labor. Understanding the waste operation requires cataloguing current waste practices, waste streams established and needed, containers, and the frequency of hauls/pickups from vendors. The waste action plan template at the end of the playbook includes a site assessment, which should be completed initially as a snapshot of current practices and updated regularly.

Continuous Quality Improvement

Waste is created every day and waste services available in the community are regularly evolving, so managing and optimizing the waste program is an ongoing process. As data are collected and metrics developed for each site, it is preferred to monitor weight and costs monthly, and to adjust as needed. This is a key feature of waste optimization.

Common Challenges and Solutions

- C: Lack of education/information about regulatory requirements.
- S: It is important to assess the knowledge base of staff and provide educational resources as needed.
- C: Lack of waste stream resources available within a community. In some communities, there may not be a vendor who provides industrial composting or in small communities, recycling may be a challenge.
- S: It is important to check with the city, vendors, and other organizations regularly to stay informed about when services are developed and available. To meet our environmental goals, we are prioritizing keeping waste out of the landfill, and we need partners to achieve this. Often the hospital is one of the largest generators of waste, recycling and compost within a community and can be influential in helping in the establishment of processes to manage these waste streams.
- C: Lack of clarity about waste segregation. Caregivers are busy and often rushed. If signage is not clear, or if insufficient education has been provided (including orienting new caregivers), they are understandably likely to make errors in segregation of waste.
- S: Correct segregation is required by regulation for several streams. Correct segregation is required for us to meet our waste goals. It is very important that all caregivers know what waste goes where. We recommend developing a plan, guidelines, consistent signage, and ongoing education about waste segregation.

Waste Optimization Categories:

Disposed Waste

Biohazardous

According to OSHA (Occupational Safety and Health Administration) “biohazardous waste is any waste product containing recognizable human blood, bodily fluids, or infectious materials. This includes dressings, gauze, containers, and other products or equipment that are noticeably contaminated with such fluids and thereby potentially harmful to a human being upon direct contact.”

Regulated Medical Waste (RMW): Sometimes called Red-bag waste or Infectious Waste, has liquid or at least semi-liquid blood, other potentially infectious materials (OPIM), items contaminated with either of the above, or packages containing dried blood or OPIM. It is required to be sterilized before landfilled, often achieved through autoclave. It can be treated through incineration, pyrolysis, or chemical treatments.

Commingled Sharps/Pharmaceutical Waste: A service in which contaminated sharps (needles, scalpels, etc.) are collected in the same bin as non-hazardous pharmaceutical waste. Each can be collected separately but comingling these two waste streams is convenient for caregivers. Reusable bins can be sterilized and reused many times.

Sharps Waste: Can be collected separately as well, usually in red containers, depending on the vendor. The containers and contents are typically incinerated.

Pathology/Chemo Waste: Pathologic waste includes tissue samples, removed organs, or body parts. This needs to be incinerated or interred (buried). Chemo waste includes gowns, gloves, empty IV bags and tubing, syringes, and other equipment used to administer chemotherapy. These two waste streams are collected separately from RMW and are incinerated.

Best practice suggestions for biohazardous waste optimization

- Refer to site hazardous material and waste management plan for detailed guidance for handling and securing biohazardous waste.
- Perform regular education and reminders about proper segregation; provide simple, easy-to-follow signage.

Waste Optimization Categories: Disposed Waste

Hazardous

RCRA Hazardous Waste: is defined by the Environmental Protection Agency (EPA) as waste that is dangerous or potentially harmful to our health or the environment. RCRA stands for the Resource Recovery and Conservation Act. This law from 1976 created the framework for the proper management of hazardous and non-hazardous solid waste. RCRA designated hazardous waste must be treated according to regulation, based on the type of waste and its hazards. This applies to collection, storage, transport, and destruction of the waste. RCRA waste is often collected in black bins, or in drums or other containers stored in a designated space, clearly labeled and meeting regulatory requirements.

RCRA Pharmaceutical Waste: A designation for certain pharmaceuticals that are deemed hazardous by RCRA regulations. RCRA pharmaceutical should NOT be comingled with sharps, instead placed in the proper black bin, or otherwise as instructed.

Narcotics/Controlled Substances Waste: Narcotics/controlled substances are regulated by the federal Drug Enforcement Agency (DEA), which requires that disposal of the drugs must render them “non-retrievable”. Many hospitals use a vendor-provided system with containers which contain a charcoal-based agent that deactivates the drugs are mounted near pharmaceutical stations. These containers are treated as hazardous waste and incinerated.

Best practice suggestions for hazardous waste optimization

- Refer to hazardous material and waste management plan for detailed guidance for handling and securing hazardous waste.
- Perform regular education and reminders about proper segregation; provide simple, easy-to-follow signage.

Waste Optimization Categories: Disposed Waste

Municipal Solid Waste (Landfill and Waste-to-Energy)

Exterior Storage and Handling: Waste disposal vendors typically lease or sell compactors, open top containers, rear loaders or other bins to the hospital. They schedule pick-up regularly and can adjust both the size of containers and pick-up frequency as optimization proceeds.

Interior Storage and Collection: Municipal solid waste is typically collected in numerous containers in every area of the hospital. Bin placement should be planned by understanding the day-to-day operations and flow of waste inside the facility, while ensuring regulatory compliance.

Best practice suggestions to optimize landfill waste:

Regarding collection containers, determine the optimal number, size, type, and location.

- Interior containers: Determine minimum number of containers to meet need while meeting regulatory compliance, convenience, and sanitation. Consider encouraging office staff to use a small desktop waste container and carry their waste to a central location.
- Exterior containers
- Right size and number – Examine invoices to determine how full the containers are when emptied. Compacted waste has an expected weight. Compacted hospital waste is expected to weigh 400-700 pounds per cubic yard. [See EPA guidance here.](#) For instance, a 100% full 35-yard compactor should weigh between 7 and 12 tons. If the hospital's weights are considerably less, perhaps hauls could be less frequent, saving both effort and dollars. Consider whether waste will be handled more efficiently with a larger or smaller compactor.
- Right container type – Waste in an open (non-compacted) container is expected to weigh 250-300 pounds per cubic yard. Waste collected in an open container requires more frequent trips to the landfill. Consider whether the site would be served better by collecting most waste in a compactor.
- Right location – ensure safety and convenience for caregivers. Ensure that preferred waste streams (recycling and composting) are conveniently located (see below).

Waste Optimization Categories:

Diverted Waste

Recycling

Single Stream Recycling: Single-stream, or co-mingled recycling is a service offered by some recyclers when several types of recyclable items are mixed in a single container for sorting at the vendor's central recycling site. This may include paper, plastic, cans, cardboard, etc. The vendor will provide instructions for what can be included. Single-stream recycling is more convenient for the organization but may yield lower quality recyclables due to contamination (waste collected that is not suitable for recycling).

Cardboard Recycling: Many vendors accept cardboard separately, typically preferring that it is baled or compacted. It is often more efficient to recycle cardboard separately from other commodities, which avoids soilage or loss and allows more products to be returned to a circular economy in which it can be recycled for additional uses.

Shredded Paper Recycling: A common treatment for paper with protected information is shredding by a licensed vendor. The shredded material is sometimes recycled. Check with your vendor to explore this possibility.

Collection of Previously Used Supplies and Equipment Suitable for Reprocessing: The FDA has approved several items originally developed for single use to be "reprocessed". This means they are collected, cleaned, repaired, sterilized, and resold. Typically, the purchase of reprocessed items is less expensive than new, which can bring significant savings to the organization. Working with your reprocessing vendor, place collection bins strategically, accompanied by clear and appropriate signage. Volume and cost data is typically collected and reported by the vendor.

Construction and Demolition (C&D) Debris Recycling: Construction contractors often handle waste and recycling on a project-by-project basis. Hospital guidelines can require a minimum percentage of recycling from materials. Construction agreements should include that C&D recycling reports be provided by the construction contractor to demonstrate the effectiveness of these programs. Larger facilities may have enough C&D debris to warrant dedicated ongoing on-site bin for this purpose. Work with construction teams to participate in "take back" programs for carpet, ceiling tiles and other building materials at the end of their life, which are offered by some vendors. Ensure the new building design provides sufficient space for storage of all waste streams at the point of collection and disposal.

Waste Optimization Categories:

Diverted Waste

Recycling

Semi-precious Metal Recycling: Metals such as steel, copper and aluminum collected through the demolition process have sales value and could bring revenue back to the ministry (possibly to support environmental stewardship programs). Facilities should establish locations and processes to segregate recyclable metals for recycling. They will need to establish a service with a local vendor. Some sites have created an account with the vendor for ongoing rebates, with the vendor mailing a check or transferring funds quarterly. These funds could be used to support environmental stewardship programs.

Medical Equipment: Several vendors provide services to hospitals as a third – party collection / auctioneer for medical / facilities equipment that no longer has a beneficial use by a local ministry. This program can bring revenue and waste reduction.

Best practice suggestions to optimize recycling:

- Single-stream Recycling:
 - Well-marked containers should be placed throughout the facility, with clear signage and instructions posted nearby. It is best practice to place recycling bins near waste containers to minimize contamination of recycling.
 - Collection containers should be right sized for the materials being collected
 - Some recycling vendors do not allow bag liners to be included in recycled materials. If this is the case, the site will need to develop a process for avoiding bag liners or removing them prior to recycling.
 - If the service is new to the site, arrangements will need to be made regarding who is responsible for hauling recycling. .
 - For large sites, a recycling compactor may help manage collections. This needs to be approved by the vendor before making this decision.
 - Generally, recycling is less expensive than landfilling, and is better for the planet by reducing greenhouse gas emissions and creating the possibility that materials can be used repeatedly.

Waste Optimization Categories:

Diverted Waste

Composting

Food Waste Composting: Practice Greenhealth estimates that 10–15% of hospital waste is food waste. Because it is biological, it creates methane, a potent greenhouse gas, as it slowly breaks down in landfills. Composting food avoids costly extra biological oxygen demand discharges from wastewater treatment due to food waste sludge created by industrial food disposal systems. Food waste can be collected for composting in food preparation areas, from plate scraping, or from leftover food that cannot be otherwise used or donated

Yard/Landscaping Composting: Hospital grounds require maintenance, including pruning and mowing, thereby creating organic yard waste. Composting the biological waste that is generated saves landscaping budget by increasing water retention, aeration, and soil nutrients, which reduces mulch, fertilizers, and pesticide purchases.

Best practice suggestions for composting waste optimization

- If suitable property exists on campus, consider a yard waste compost processing site, and return compost organics to planting beds.
- Consider a process in which food service caregivers (rather than customers) segregate food waste from returned cafeteria trays. Some sites have found this improves compliance with program requirements by reducing contamination.
- Understand local health department regulations for composting.
- Investigate available composting services in the community and explore composting methods to determine an optimal approach for the site.
- Composting can create extra odors/liquids and draw pests if not properly handled and monitored, so it is important to maintain clean storage areas, and to be aware of pick-up frequency and timing.

Waste Optimization Categories:

Diverted Waste

Universal Waste

Spent Fluorescent Light Tubes: State regulations may allow disposal of low mercury content and LED light tubes as landfill waste. Otherwise, these tubes will need to be disposed of as a hazardous waste stream under streamlined universal waste regulations. Under no circumstances should a “bulb crusher” be used to pulverize lamps as this may expose the environment to mercury contamination.

Rechargeable Batteries: Rechargeable batteries contain valuable materials that can be reused to make new batteries and other products. The materials contained within rechargeable batteries may be either volatile or hazardous. This means they can cause explosions if handled improperly, especially if they are overheated or compressed. Most of the materials used to make batteries are non-renewable, and by recycling, we extend the use of these materials.

Electronic Waste: Hospitals create an enormous amount of electronic waste. Several vendors provide full service to manage data security, resell, and recycling of these products. In any approach, aim to meet the following goals for e-waste recycling:

- Adherence to environmentally responsible recycling practices via R2 certification
- Streamlined secure, self-funded program
- Real time access to asset detail/certificate of erasure and destruction
- Enterprise reporting and metrics

Recycling Options for Rechargeable Batteries: Numerous vendors offer battery recycling, including your universal waste hauler. Work with IS and clinical engineering departments to establish a process. This may generate a small amount of income for the organization.

Alkaline Batteries: Local battery suppliers may have take-back programs for non-rechargeable alkaline batteries as an alternative to landfill disposal.

Best practice suggestions for universal waste optimization

- Convert lamp technology to LED for longer lamp life, higher color rendition and improved energy efficiency. The lamp life extension of LED will dramatically reduce labor/ inconvenience of lamp replacement and easier waste disposal.
- E-Waste Recycling: Facility and Clinical Technology Management Divisions should coordinate with on-site IS staff to establish a process for collecting and recycling e-waste at each site.

Waste Optimization Categories:

Diverted Waste

Donations

Medical Supply Recovery: Several non-profit organizations or vendors can help hospitals repurpose equipment and supplies they can no longer use. The vendor collects excess or unneeded supplies that hospitals and clinics would otherwise discard for donation to domestic and international programs in need of these materials. They collect high-quality, unexpired, unopened supplies. Each year they donate many tons of these supplies so they can be used for good. Supply chain departments can establish collection bins and processes to ensure that items are donated properly. Further, clinical caregivers can establish processes to collect usable items from surgical services and care units.

Community Needs: Each community will likely have opportunities to use supplies, equipment, and furnishings that the hospital or clinic no longer needs and chooses not to store. Each hospital can check with these sites and establish a system for collecting these items. The community site may be able to retrieve the items from the ministry, or perhaps a volunteer could transport them to the sites. Make a plan to track the weight of the items that are donated.

Linen: Laundry services often donate linen to various sites that can use the items once retired from use. The donations may go to nursing homes, ambulance services, veterinarians, schools, homeless shelters, or other sites. The laundry facility will typically track the amount in pounds, and this can be reported as donated materials for the hospital, depending on the arrangement with the laundry vendor.

Food: Sites may donate food items to shelters, farms, or other recipients. The food service can track this amount in pounds, and this can be reported as part of donations.

Best practice suggestions for donation optimization

- Develop/support regular donations from supply chain that are redundant or will expire soon.
- Consider developing collection processes in patient care units across the hospital.
- Community needs donation optimization:
 - Animal Control/Shelters/Veterinarians: Clinical supplies such as dressings, pads, blue wrap, and many others that have been opened are not eligible for other donation. However, animal care locations can sometimes use these and may be very grateful.
 - Homeless shelters/temporary housing/young pregnancy centers: Some supplies may be appropriate to share with communities in need. These may include infant diapers, toiletries, cleaning products that have been opened but unused.
 - Reuse Facilities: Habitat for Humanity or other building/construction reuse programs may be able to collect and share items such as toilets, sinks, cabinets, or other results of remodeling and refreshing.

Waste Optimization Categories:

Avoided Waste

Avoided waste is “the waste we don't create.” Source reduction is the most effective way to reduce waste, by reducing what is purchased in the first place, especially regarding single-use (or minimally used) items.

Reusable sharps containers: Medical waste haulers may offer co-mingled sharps and non-hazardous pharmaceutical waste, which are collected in reusable wall-mounted bins. These containers can be used up to 600 times, saving the equivalent of plastic from 600 containers.

Purchase of reprocessed items: When clinical staff purchase reprocessed items, they are not purchasing new. By not bringing new items into use, we avoid that addition to the waste stream.

Reusable dishware: The use of reusable dishware (ceramic, plates, bowls, mugs, and metal cutlery) can save thousands of tons of waste each year, compared to disposable dishware. When sites choose reusable dishware, an estimation can be made of the amount of waste that would have been produced if they used disposable dishware. This can be done by counting the number of dishes used per meal or per day and multiplying by the weight of the disposable alternative. Compostable dishware is an option. However, reusable dishware, once the initial costs are recovered, has shown to be the most cost-effective, and the least polluting over time.

Washable gowns: The use of washable isolation gowns and other clinical linens can save significant money and many tons of waste. The choice of using reusable linens is a clinical decision, and because it has waste implications, it is important to include in the waste stream. The weight of disposable items NOT used can be calculated and included.

Distilled Lab Solvents: Xylene, formalin, alcohol, and acetone can be successfully distilled for reuse. This saves money from the purchase of the solvents, and from the hazardous waste disposal. If this is in place, help to track the volume of solvents that were not purchased each year. If solvent distillation is not in place, discuss it with lab staff and medical directors.

Fluid Management System: In surgical services, fluid management systems can be installed which eliminate the use of plastic suction containers, while enhancing staff safety and convenience. If not in place, discuss with leadership.

Waste Optimization Categories:

Avoided Waste

Surgical Preference Card Management: Items opened for use in surgical cases are determined by what is specified on the surgeons' preference list or card. By regularly pruning unneeded items from the lists, opening supplies that are not likely to be used can be eliminated, saving many tons of waste and many dollars in savings.

Additional source reduction opportunities:

- Minimize paper use, waste, and recycling by converting (where feasible) to electronic forms of communication.
- Identify redundancies in prepacked clinical supply kits. Based on clinician input, request a redesign or new product that creates less waste.
- Minimize extra supplies (and linen) that are taken into patient rooms, especially if the hospital policy does not allow them to be restocked.

Best practice suggestions for source reduction optimization

- Avoided waste is a new concept for many employees. Help educate by reporting on the waste that is not created in the first place. This depends on estimating or tracking waste not created, as in the examples above.

Data

Waste Data Tracking

To understand current state, set goals and measure progress, it is important to collect weight and cost data for all waste streams. Waste data can be challenging to track, since there are many streams, and not all vendors report weights of the waste collected. The most accurate waste weights are obtained from the weight reported on invoices. When this is not available, weight can be estimated using [EPA Volume to Weight](#) factors.

Normalized Targets by Waste Stream

To be able to compare data accurately and benchmark internally or with other hospitals the data need to be normalized or expressed using common units. For instance, landfill waste data may be normalized by pounds of waste per adjusted patient day, or per patient day, or per FTE, or even per square foot. In Providence we have chosen to normalize waste weight by adjusted patient day. Costs of waste may be normalized by volume, like dollars per ton of landfill waste, or hazardous waste, as examples. With this information it is possible to compare normalized waste data across sites, and over time to identify best practice opportunities for improved waste management.

Comparing Normalized Data for Best Practice

In Providence, we compare performance across our 54 hospitals using normalized volume and cost data. We are identifying best practice targets and establishing goals for specific waste streams. Further, we can compare our data to national benchmarks, when available, to see if we are achieving similar results compared to other health systems, to better understand the effectiveness of our operations, to improve and to reach best practices that compare favorably to excellence across the nation and against our own targets.

Appendix

I.0 Definitions and Descriptions

Disposed Waste: Waste materials that leave the hospital for disposal treatment.

Biohazardous Waste: Biohazardous waste (also called Regulated Medical Waste and Infectious Waste) is healthcare waste that may be contaminated by blood, body fluids or other potentially infectious materials. Other potentially infectious materials means (1) The following human body fluids: semen, vaginal secretions, cerebrospinal fluid, synovial fluid, pleural fluid, pericardial fluid, peritoneal fluid, amniotic fluid, saliva in dental procedures, body fluid that is visibly contaminated with blood, and all body fluids in situations where it is difficult or impossible to differentiate between body fluids; (2) Any unfixed tissue or organ (other than intact skin) from a human (living or dead); and (3) HIV-containing cell or tissue cultures, organ cultures, and HIV- or HBV containing culture medium or other solutions; and blood, organs, or other tissues from experimental animals infected with HIV or HBV.

Hazardous Waste: This includes materials that meet the definition of hazardous waste under the US EPA's Resource Conservation and Recovery Act (RCRA) or is sent out for treatment as hazardous waste as a proactive and environmentally protective measure. This includes RCRA pharmaceuticals, mercury spill clean-up, solvents, refrigerants, oil, and other regulated materials.

RCRA Pharmaceutical Waste: This includes any pharmaceutical waste that is collected, managed, and disposed of as RCRA hazardous waste. This includes any characteristic hazardous waste (ignitable, toxic, reactive, corrosive) and P- and U-listed wastes. It also typically includes any bulk chemotherapeutic waste. This is collected in a black rigid container labeled RCRA-Hazardous Pharmaceuticals.

Controlled Substances/Narcotics Waste: Narcotics are regulated by the federal Drug Enforcement Agency (DEA), which requires that disposal of the drugs must render them "non-retrievable". Several vendors offer solutions including placing narcotics in containers which contain a charcoal-based agent that deactivates the drugs are mounted near pharmaceutical stations. These containers are treated as hazardous waste and incinerated.

Municipal Solid Waste (MSW): MSW is typically treated by burial in a landfill, though in some cases it is combusted in a Waste-to-Energy plant. Hospital MSW includes packaging materials, diapers, gloves and other trash, which while similar to hotel or municipal waste, has a higher plastic content, due to various disposable medical devices like IV bags, tubing, foley bags and more.

Appendix

I.0 Definitions and Descriptions

Diverted Waste: Waste that would have gone to landfill but is diverted for a higher value use.

Composting: Can include organic yard waste debris as well as food waste from kitchen operations.

Recycling: Material that is segregated and processed as a commodity to make into a new product. Examples – universal waste, corrugated boxes, HIPAA/confidential paper/PHI, mixed-grade paper, mixed plastics, construction recycling, electronic waste (computers, monitors and batteries), film plastics.

Construction and Demolition Debris Recycling: Construction and demolition (C&D) recyclers can achieve up to a 90 percent recycling rate for construction materials during demolition, renovation, and new construction. This work is often managed by construction firms under contract, and may include bricks, cement, wood, metal, window framing, ceiling tiles, carpeting and more.

Universal Waste: Universal waste regulations streamline the hazardous waste management standards for certain categories of hazardous waste that are commonly generated by a wide variety of establishments. The five types of universal waste are: batteries, pesticides, mercury – containing equipment, fluorescent lamps (based on quantity of mercury) and aerosols.

Electronic waste: Includes laptops, desktops, printers, mobile devices, monitors, servers and storage devices. Some of these products have reuse value. Component recycling of these devices produces precious metals, plastic, steel, aluminum, CRT materials, and batteries.

Donations: Items that are not usable by the hospital but may be of value to others may be donated in some cases. Other organizations in a community may be happy to receive items, including animal control or pet shelters, homeless shelters, food banks, etc.

Collections for reprocessing: Some single-use items are approved by the FDA to be reprocessed and resold to hospitals. Staff can collect appropriate items in surgical services, cardiac catheterization labs, and patient care areas.

Avoided Waste: “Waste we don't create” due to efficient practices, selection of reusable products, policies that prioritize reuse, and re-examination of purchasing needs.

Purchase of reprocessed items: When a reprocessed item is purchased, no new items are brought into the hospital. This is an example of avoided waste. Savings of reprocessed devices versus purchasing new can be in the order of 50% – justifying the added effort of collection and purchasing.

Appendix

I.0 Definitions and Descriptions

Waste Management Principles

Waste Optimization: Managing waste to ensure getting the right volume of waste to the right waste stream at the right cost and the right carbon.

Waste Segregation: As is described in this document, healthcare waste is complex, with up to 30 separate streams. Sorting the waste properly, placing it in the correct bin, is called waste segregation. Waste segregation is up to the person discarding the waste, which impacts everyone. We each have one opportunity to put the right waste in the right bin – no one comes behind us and sorts it out. Education about waste education, and having well-placed, clear instructions is crucial.

Waste Storage and Collection: Interior management of waste is a key component of sorting and assuring the proper materials are being properly stored and distributed to the right treatment facility. Biohazardous and hazardous waste storage are dictated by regulation. Each site needs to establish clear processes for transporting throughout the building for transfer to the treatment facility.

Waste data and reporting: As for any improvement project, it is important to establish goals, track progress and report successes. Because hospital waste streams are complex, it is necessary to establish a framework, process, and mechanism for collecting and reporting waste data, including volume/weight, cost, and carbon emissions.

Appendix

2.0 National Organizations and Resources

- Practice Greenhealth
- Health Care Without Harm
- American Society for Healthcare Engineering (ASHE)
- Association for the Healthcare Environment (AHE)
- Certified Healthcare Environmental Services Professional (CHESP)
- EPA Volume to weight Conversion Factors

Appendix

3.0 Best Practice Suggestions for Waste Optimization

Category	Best Practices
Landfill	<ul style="list-style-type: none">• Interior containers: Determine minimum number of containers to meet need while meeting regulatory compliance, convenience, and sanitation. Consider encouraging office staff to use a small desktop waste container and haul their waste to a central location.• Right size and number - Examine invoices to determine how full the containers are when emptied. Compacted waste has an expected weight. Compacted hospital waste is expected to weigh 400-700 pounds per cubic yard. See EPA guidance here. For instance, a 100% full 35-yard compactor should weigh between 7 and 12 tons. If the ministry's weights are considerably less, perhaps hauls could be less frequent, saving both effort and dollars. Consider whether waste will be handled more efficiently with a larger or smaller compactor.• Right container type - Waste in an open (non-compacted) container is expected to weigh 250-300 pounds per cubic yard. Consider whether the site would be served better by collecting most waste in a compactor.• Right location - ensure safety and convenience for caregivers. Ensure that preferred waste streams (recycling and composting) are conveniently located (see below).
Bio-hazardous	<ul style="list-style-type: none">• Refer to site hazardous material and waste management plan for detailed guidance for handling and securing biohazardous waste.• Perform regular education and reminders about proper segregation; provide simple, easy-to-follow signage.
Hazardous	<ul style="list-style-type: none">• Refer to hazardous material and waste management plan for detailed guidance for handling and securing hazardous waste.• Perform regular education and reminders about proper segregation; provide simple, easy-to-follow signage.

Appendix

3.0 Best Practice Suggestions for Waste Optimization

Category	Best Practices
Compost	<p>If suitable property exists on campus, consider a yard waste compost processing site, and return compost organics to planting beds. Food service operators should plan for efficient use of food supplies to minimize waste (and cost). Consider a process in which caregivers segregate food waste from returned cafeteria trays (rather than customers). Some sites have found this improves compliance with program requirements by reducing contamination. Understand local health department regulations for composting Investigate available composting services in the community and explore composting methods to determine an optimal approach for the site. Composting can create extra odors and draw pests if not properly handled and monitored, so it is important to maintain clean storage areas, and to be aware of pick-up frequency and timing.</p>
Recycling	<ul style="list-style-type: none">• Well-marked containers should be placed throughout the facility, with clear signage and instructions posted nearby. It is best practice to place recycling bins near waste containers to minimize contamination of recycling.• Collection containers should be right sized for the materials being collected.• Some recycling vendors do not allow bag liners to be included in recycled materials. If this is the case, the site will need to develop a process for avoiding bag liners or removing them prior to recycling.• Establish who is responsible for hauling recycling.• For large sites, a recycling compactor may help manage collections. This needs to be approved by the vendor before making this decision.• Generally, recycling is less expensive than landfilling, and is better for the planet by reducing greenhouse gas emissions and creating the possibility that materials can be used repeatedly.
Universal	<ul style="list-style-type: none">• Convert lamp technology to LED for longer lamp life, higher color rendition and improved energy efficiency. The lamp life extension of LED will dramatically reduce labor/ inconvenience of lamp replacement and easier waste disposal.• E-Waste Recycling: Facility and Clinical Technology Management Divisions should coordinate with on-site IS staff to establish a process for collecting and recycling e-waste at each site.

Appendix

3.0 Best Practice Suggestions for Waste Optimization

Category	Best Practices
Donations	<ul style="list-style-type: none"> • Develop/support regular donations from supply chain that are redundant or will expire soon. • Consider developing collection processes in patient care units across the hospital. • Community needs donation optimization: <ul style="list-style-type: none"> ◦ Animal Control/Shelters/Veterinarians: Clinical supplies such as dressings, pads, blue wrap, and many others that have been opened are not eligible for other donation. However, animal care locations can sometimes use these and may be very grateful. ◦ Homeless shelters/temporary housing/young pregnancy centers: Some supplies may be appropriate to share with communities in need. These may include infant diapers, toiletries, cleaning products that have been opened but unused. ◦ Reuse Facilities: Habitat for Humanity or other building/construction reuse programs may be able to collect and share items such as toilets, sinks, cabinets, or other results of remodeling and refreshing
Avoided Waste	<ul style="list-style-type: none"> • Avoided waste is a new concept for many employees. Help educate by reporting on the waste that is not created in the first place. This depends on estimating or tracking waste not created, as in the examples above. • Common opportunities to address include reusable sharps containers, washable gowns, reusable/durable dishware, washable linen and cubicle curtains, lab solvent distillation, surgeon preference card management.
General	<p>Clear education and signage are imperative. Develop a poster/document with images to help educate caregivers about segregation. It may be helpful to develop waste experts in each division or unit. These individuals can receive additional information and updates and help to spread this knowledge in their areas. Understanding the volume and cost data for waste is crucial to understanding efficiencies and best practices. By comparing results across sites, you can learn from and challenge each other.</p>

Appendix

4.0 Waste Assessment Template

Disposed Waste			
Municipal Solid Waste/Landfill/Waste-to-Energy)			
Collection Containers	Volume capacity (e.g., cubic yards)	Location (address)	Frequency of hauls/tips per week
Compactor 1			
Compactor 2			
Open container 1			
Open container 2			
Rear loader 1			
Rear loader 2			
Other			
Vendor			
Biohazardous			
Waste stream	Yes, in place	No, don't use	Need to establish
Infectious waste/RMW/Red Bag waste/liquid biohazard waste			
If yes, is infectious waste autoclaved on site?			
Chemo waste			
Pathological Waste			
Sharps – collected separately			
Sharps and Pharmaceutical waste co-mingled			
Vendor			
Hazardous			
Waste stream	Yes, in place	No, don't use	Need to establish
RCRA Hazardous Waste			
RCRA Pharmaceutical Waste			
Narcotics / Controlled Substances Waste			
Licensed Hazardous Waste hauler (Name)			

Appendix

4.0 Waste Assessment Template

Diverted Waste			
Recycling: Single stream/co-mingled or separate streams			
Collection containers	Volume capacity (e.g., cubic yards)	Location (address)	Frequency of hauls/trips per week
Compactor 1			
Rear loader 2			
Rear loader 1			
Other			
Vendor			
Recycling: HIPAA paper			
Is paper recycled after shredding?			
Vendor			
Recycling: Collections for Reprocessing			
Clinical Area	Collection bins in place? Y/N	Meeting collection targets? Y/N	Adequate education for staff? Y/N
Surgical Services			
Electrophysiology			
Patient Care Areas			
Vendor			
Composting: Food waste			
Collection containers	Volume capacity (e.g., cubic yards)	Location (address)	Frequency of hauls/trips per week
Compactor 1			
Rear loader 2			
Rear loader 1			
Other			
Vendor			

Appendix

4.0 Waste Assessment Template

Diverted Waste			
Universal Waste			
Waste stream	Vendor	Yes, in place	Need to establish
Fluorescent Tubes			
Batteries - Rechargeable			
Batteries - Alkaline			
Electronic Waste			
Donations: MSRO - Medical Supply Recovery Organization			
Does your ministry send donations to a Medical Supply Recovery Organization (MSRO)?			
If yes, Name and location			
If no, what is available in your area?			
Donations: Community Partner Needs			
Recipient Type	Organization Name	Location	Donated Product(s)
Animal Shelters			
Veterinarians			
Shelters (homeless, pregnancy, YWCA, etc.)			
Reuse Facilities (Habitat for Humanity, etc.)			
Schools: nursing, tech, veterinary science programs, both office and clinical supplies			
Other			

Appendix

4.0 Waste Assessment Template

Diverted Waste	
Donations: Linen	
Provider of laundry services (vendor name or self-op)	
Does your laundry service donate usable items?	
If yes, to what organizations	
If no, what is available in your area?	
Donations: Food	
Provider of Food & Nutrition services (vendor name or self-op)	
Does your F&N service donate edible food?	
If yes, to what organizations	
If no, what is available in your area?	
Donations: Clinical Equipment	
Provider of Clinical Equipment Donation/Recovery services (vendor name)	
Does your ministry donate clinical equipment?	
If yes, to what organizations	
If no, what is available in your area?	

Appendix

4.0 Waste Assessment Template

Avoided Waste			
Reusable Sharps Containers			
Does your ministry use reusable sharps containers?			
If so, any issues with the process?			
If yes, please describe			
Vendor			
Reprocessed Items Purchased			
Does your ministry purchase reprocessed items?			
Are you meeting targets for purchases?			
If not, please describe			
Vendor			
Reusable Gowns and Linens - Indicate items that are reusable			
Item	Disposable Only	Washable Only	Mix
Isolation gowns			
Surgical linens			
Slide tubes for patient repositioning			
OR Fluid Management System			
Does your ministry distill and reuse laboratory solvents? Y/N			
Distilled lab solvents			
Does your ministry use a fluid management system?			
Name of system			
Additional Opportunities			
Example	Site has done this Y/N		
Revised surgical/procedural kits to reduce waste			
Convert to electronic communication to reduce paper use			
Minimize extra supplies taken into patient rooms			

Providence Environmental Stewardship Goals

Working Toward Carbon Negative by 2030

WE ACT: Mitigation

WASTE	ENERGY/WATER	AGRICULTURE/ FOOD	CHEMICALS	TRANSPORTATION
Divert >50% of waste from landfill and hazardous streams by 2030	By 2030, at all sites: • Electricity EUI < 85 • Thermal EUI < 110 • Water use <30 gal/sf	• Decrease carbon intensity of meals • Decrease waste • Healthy, sustainable foods	• Reduce GHGs from Nitrous oxide by 90% • Reduce GHGs from volatile anesthetics by 70%	• GHG emissions from business travel 50% less than 2019
Data	Caregiver Engagement		Procurement	
• Expand industry leading WE ACT Scorecard for effective data tracking and action planning	• Communications reach 50% of caregivers • Active green teams and affinity groups at all sites/regions • ES Anchored in our core value of justice		• Reduce GHGs from purchases by 30% • Reduce single-use disposable device purchases by 30%	

We REACH: Adaptation

Develop climate resilient care delivery, helping our communities adapt to changes in our environment through:
• Operations • Clinical • Community

We SHARE: Advocacy/Leadership

- Advocacy for healthy climate
- National leadership groups (NAM, HCWH, IHI, AHRQ, TJC, etc.)
- Share our knowledge with other health systems to model sound practices in Environmental Stewardship



ACKNOWLEDGEMENTS

This project demanded a multidisciplinary team of amazing, dedicated individuals across multiple departments and institutions. The expertise and support of the following people was critical to the success of this work, Thank you all so much:

Primary Authors: Beth Schenk, PhD, RN; Geoff Glass, PE, CEM			
Oriana Turley	Frank Papp	Darcy Moxon	Sarah Johnson
Dave Thomsen	Mike Geller	Kristy Pelletier	Sister Sara Tarango
Kelly Flippen	Asif Khattak	Sherie Bialous	Ubong Okpon

And all the environmental services and facilities colleagues who help lead, support and pioneer this work.



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As expressions of God's healing love,
witnessed through the ministry of Jesus,
we are steadfast in serving all, especially
those who are poor and vulnerable.

OUR VALUES

Compassion, Dignity, Justice, Excellence,
Integrity