Contents

- Acknowledgements .......................................................... V
- Preface ............................................................................. vii
- Chapter 1. Planning for Change ........................................... 1
- Chapter 3. Managing Solid Waste ....................................... 47
- Chapter 4. Managing Recyclable Wastes ............................. 57
- Chapter 5. Source Reduction ............................................. 63
- Chapter 6. Pollution Prevention Planning and Program
  Implementation Guidelines .................................................. 73
- Chapter 7. Managing People to Manage Waste .................... 89
- Chapter 8. Assuring Quality, Compliance and Cost Containment .97
- Chapter 9. Practicing Proactive Waste Management ............... 103
Acknowledgements

Although many people and institutions have contributed to our knowledge and understanding of the issues confronting hospitals, and the health care industry, we wish especially to thank the following individuals who have properly managed the wastes generated as a result of quality health care in this country:

The waste team members, staff, clinicians, and leadership of Burlington, VT-based Fletcher Allen Health Care, for their continuing dedication and foresight in minimizing waste and pioneering environmentally and community-friendly ways of operating a large health care system.

Our colleagues and friends from the Health Care Resource Conservation Coalition, who through their actions and efforts have demonstrated that cooperation in solving industry-wide problems is possible.

Connie Leach Bisson, who continues to be a trailblazer in the fields of waste reduction and reuse, for supplying us with inspiration and information from her new enterprise ReStore Resources, Ltd.

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Preface

In the two years since the publication of An Ounce of Prevention: Waste Reduction Strategies for Health Care Facilities, we have received hundreds of inquiries and questions from health care facility managers, nurses and other professionals at hospitals throughout the United States and a number of other countries. The most frequently asked questions are:

- How do I get a waste reduction or a recycling program started?
- How do I get administrative support for a program?
- How do I cut my waste management and disposal costs?
- What do I do now that we have shut down our incinerator?

These questions emerge against the three “no’s” that are repeated by almost every environmental services manager when confronted with addressing waste:

**NO TIME  NO SPACE  NO MONEY**

In an attempt to answer those questions, we have held dozens of workshops and training programs around the county. These forums were attended by more than 1,000 participants. This has been an interactive process, where we have learned at least as much as we have taught. There are now some amazing examples of waste-minimization efforts in hospitals throughout the country. Ultimately, there will be as many different approaches as there are hospitals, with each being uniquely suited to its environment. In reviewing the growth of such efforts, we have continued to draw out some basic standards and guidelines that are universally applicable, most of which confirm the approach detailed in An Ounce of Prevention.

This new volume is not intended to replace An Ounce of Prevention, but rather to build on the approach and guidelines that we established there. This guidebook will continue to provide some ways of answering the essential questions asked above, and will provide some new approaches and information that we have learned.

The goal of the guidebook is to provide you with a template for planning and implementing an integrated waste-management program at your facility.

There have been numerous developments in the last several years. These include:

- Formation of a national coalition of hospitals and health care supply companies to address common waste-minimization concerns in health care institutions
- Establishment of new JCAHO standards for managing hazardous materials and wastes
• Drafting of new EPA standards for air emissions; public and scientific concerns associated with medical waste incinerators and dioxin, which could result in a further massive shutdown of these incinerators nationwide

• Increase in consolidations, restructuring, mergers, downsizing, and decentralization in the delivery of health care services brought on by managed care networks and other new organizational configurations

Managers who never were responsible for waste management in the past, now are having to confront the issue as a result of downsizing.

Responding to these new developments will be a continuing challenge for everyone in the health care field. Managers responsible for waste in health care facilities now will be seeing waste as either a greater burden or a developing opportunity for their organization.

The opportunity will be to create waste-management systems that can cut costs, increase worker safety, and comply with existing and future regulations and standards. The challenge will be to do this within the guidelines and multiple regulations currently in place, and in an environment where waste management is still viewed as a relatively inconsequential part of the organizational structure — until a crisis hits.

Most hospital waste-management systems still exist in a system governed by deferred maintenance, with the chief management rule being, “If it ain’t broke, don’t fix it.” We hear weekly from managers who have been in or just inherited such systems that have finally broken. As we all know, fixing a system during a crisis hardly ever leads to long-term solutions. If it is your intent to get beyond waste crisis management and become proactive, then this guidebook should help you in your decision-making and planning process.

After reviewing the rationale for addressing your waste-management system in an aggressive and systematic manner, we will offer an approach to integrated waste management. Although it is useful to separate out different waste streams (e.g., regulated medical waste, solid waste, hazardous wastes, recyclable wastes), it is necessary to see all wastes as a whole in order to create the best long term approach and reap the greatest benefits from any actions you will take. The focus of this approach is to ensure regulatory compliance and worker safety, while decreasing costs. The method is to reduce waste volumes of the more hazardous wastes by source reduction and conscientious segregation. This will increase the volumes of the less hazardous types of waste (e.g., reduce RMW and increase solid waste). Worker safety will be less compromised, and the opportunities to further segregate wastes for recycling and composting will continue to reduce costs, and meet other secondary goals (e.g., a hospital environmental policy or positive public relations).

This guidebook will tackle each waste stream individually, outlining approaches which have been successfully implemented in facilities around the country. We will provide guidelines, tools and information that can be readily adapted to your facility. As part of this integrated approach we will also address some of the key management issues (staffing, use of limited resources,
facilities in transition). This guidebook does not present a “cookie cutter” approach to solving waste problems. It should however give any waste manager a jump start in learning to address the issue. More in depth support can still be found in An Ounce of Prevention. We hope that you will continue to let us know how both An Ounce of Prevention and this guidebook have been able to assist you in addressing the waste management issues at your facility.

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Assemble Your Tool Kit

Guides

- Ounce of Prevention: Waste Reduction Strategies for Health Care Facilities
- Guidebook for Hospital Waste Reduction Planning and Program Implementation
- JCAHO New Environment of Care Standards
- State RMW regulations
- State Hazardous Waste regulations
- State and Local Recycling and Waste Reduction Regulations and goals
- State OSHA Worker Safety Guidelines

People

Internal:
- Environmental Services
- Infection Control
- Safety
- Hazmat
- Risk Management
- Physical Therapy/Ergonomics
- Facilities Management
- Purchasing
- Nurse Training and Education
- Public Relations

External:
- Local and state waste officials
- Fire marshal
- OSHA safety inspector
- State pollution prevention office
- Local waste vendors
- Supply companies with programs

Resources

- Open Minds
- Ability to network with other hospitals and facilities
- Training and Education
- Energy and Commitment
- Mission
Chapter 1

Planning for Change

As the link between human health and environmental quality is made clearer, the commitment to safeguarding the natural environment is growing in such major institutions as the health care industry. New and greater opportunities will open up to reinforce our primary institutional mission—that of caring for the health needs of the community we serve, which include caring for the environment. Developing and implementing effective programs to reduce, recycle and minimize the toxicity of hospital generated wastes (even wastes generated in the care and treatment of patients can be reduced) is one of the most significant environmental challenges the health care industry faces.

Hospitals generate one of the most diverse and difficult to manage waste streams of any institution. Hospitals generate hazardous chemical, infectious, and radioactive wastes, along with solid waste—and they generate it in close proximity to people, both workers and patients whose well-being and safety must be safeguarded. Hospitals are not factories where a hazardous process or material can always be easily isolated. Hospitals work with and serve people. Hospitals provide services throughout their facilities to patients and families for whom there is not always a clear line of communication or control. Some of these people are physicians, nurses, med techs, laboratory personnel, environmental and nutrition services staff, and outside contractors. Although everyone from hospital administrators to the general public agree that a comprehensive approach to hospital waste management is desirable, there are very few established common-sense guideposts to follow.

The widespread successful development of comprehensive waste-reduction programs has been limited by the public perception and regulatory interpretation that all patient-generated waste is “medical waste,” and therefore must be infectious or somehow hazardous. In many cases, concern over the hazards and risks has resulted in an ultraconservative approach to hospital waste management in which a significant portion of the solid waste generated in patient care and clinical areas is treated as regulated medical waste. Developing and implementing practical waste-management plans can reduce the volume of both general solid waste and regulated medical wastes, which results in reduced costs for on-site treatment and off-site transportation, treatment and disposal.
The health care industry should not rely solely on regulatory agencies and government for specific guidelines. Model programs that provide how-to information and guidance must come from within the health care community, who knows it’s own waste streams the best. In many cases, such programs will require that progressive hospitals break new ground with innovative approaches to waste management, balancing risks, regulatory compliance, public perception and common sense. The hospitals and members of the health care supply industry who have already taken up this challenge have not only found that they have contributed significantly to improving environmental quality, but that significant cost savings can be achieved for suppliers through reduced material use in packaging and cost of shipping, and for hospitals in reduced waste from packaging to discard. Hospitals are finding that worker safety increased, compliance with local and state waste regulations assured, and community fears over "medical waste" eased.

In 1995, the JCAHO introduced new environment-of-care standards, which for the first time included comprehensive standards and explicit guidelines for the handling of hazardous materials and wastes (defined as any materials and wastes that require special handling in order to address identified occupational and environmental hazards). This will include infectious, hazardous and radioactive materials. The Joint Commission standards call for a documented management plan for these wastes. (See the end of this section for JCAHO standards).

**Administrative Support**

In today’s health care environment, administrators and managers are having to plan and work within a constantly changing environment. Downsizing, mergers, managed care, increased competition, the shift of care to outpatient settings, Congressional Medicare reform, and state health care reform initiatives are all part of the daily diet of health care administrators. In many ways, waste management (a byproduct of providing health care) has less of a chance than ever of being on the agenda of health care administrators. For many, it is dealt with as a non-issue. This would seem the worst of times to be establishing innovative or new waste-management practices.

It also is a time ripe with opportunities, some emerging out of other crises that administrators cannot ignore. There still are several thousand medical-waste incinerators being operated by hospitals in the United States. These incinerators, many antiquated burners, are under increasing attack by environmental groups, communities, and federal regulators as community health hazards. Although the specifics of the pollution caused by hospital incinerators still is being debated, many hospitals operating this treatment equipment are under great pressure to change. Communities worry that hospitals, responsibly seeking to control biological hazards associated with waste, are unwittingly creating chemical hazards for the community through the incineration of those wastes, potentially creating a greater problem than the one they are trying to solve. From another angle, in many communities, local and state mandates for recycling and waste reduction—including landfill bans on specific materials—have been implemented for the commercial sector, which includes hospitals. Hospitals are being forced to comply with meeting specific recycling goals (15-30%)
Planning for Change

around specific materials. These types of considerations are capturing the attention of administrators.

Some top-level hospital administrators have championed waste reduction at their institutions for a variety of reasons. These men and women have worked to address an immediate crisis brought on by waste, or have seen waste minimization as a means to solving another issue or problem. In some cases, it can be as simple as reducing the bottom line, taking the significant cost savings realized from waste reduction to meet other needs. Annualized cost savings for hospitals that the authors have documented go as high as 1 million dollars. Some hospitals that have developed good waste-segregation practices have been able to capitalize on the lucrative recycling markets and are receiving revenues for paper, plastics and other materials, which in one case exceeds $100,000 per year.

Successful waste-reduction programs have in large part come to institutions where top-level management support has been secured for the necessary changes, investments, and personnel. This can happen with or without direct involvement of top administrators. In making the case to administration, a mix of the following factors can be beneficial:

**J** Cost reduction — Document opportunities for reducing costs associated with disposal by instituting new segregation and collection efforts. Many hospitals are instituting across-the-board cuts. The departments responsible for waste at many facilities cannot cut FTE’s and still perform their function. Changing practices can reduce operating without having to reduce staff.

**J** Compliance — Are there local recycling, waste-reduction, or landfill ban ordinances under which your institution must conform with to be in compliance with the law? Are there fines for noncompliance? Bad press?

**J** Improving Public Relations — During a time when many communities are having to invest in expensive new waste-disposal infrastructure, hospitals can become good community partners by reducing their waste and supporting local recycling. During a time when there is increased public concern over incineration, hospitals need to be responsive to these concerns and proactive in their waste management.

**J** Worker Safety — Waste systems should be established that protect workers, both clinical staff and the staff that collects and handles waste. The less waste that has to be collected and treated as hazardous and infectious, the less likely it is that workers will be exposed to risk.

**J** JCAHO’s new standards for the environment of care require thorough planning for waste management and safe practices.

Claude Rounds, Vice President of Plant Management at Albany Medical Center, realized an opportunity when faced with closing down his hospital’s incinerator. Facing an enormous increase in waste disposal for regulated medical waste being sent off-site, he lead the development of The Center’s “Cure Waste” Program. This efforts reorganized the waste collection and management systems to implement a rigorous segregation program designed to reduce waste disposed of RWM collection containers. He also launched an aggressive recycling program and worked with purchasing to conduct an ongoing review of product procurement decisions and their impact on waste. He worked with several major supply companies to reduce wasteful packaging, and obtain their assistance in instituting new recycling efforts. Rounds worked with other health care providers to change waste classification regulations in New York state, which were left over from the Medical Waste Tracking Act. This comprehensive approach has earned Albany Medical Center a national reputation for their waste minimization efforts. It has created a positive environment for the Medical Center to work cooperatively, and in a spirit of trust, with the local community on other projects, now that waste incineration is not perceived to be a threat. Finally on the bottom line, Albany Medical Center has saved more than $1.7 million since implementing its “Cure Waste” program in 1991. All of these factors combined made this a very worthwhile investment for a top level administrator.
Hollie Shaner, RN, started recycling programs when she worked as a full-time nurse at the Medical Center Hospital of Vermont. Beginning with little projects like office paper recycling, and finding reuse opportunities for plastic trays and other packaging, she soon began to talk with the head of Environmental Services to explore other opportunities. She used the hospital newsletter to communicate ideas to employees, worked with public relations, and took every opportunity to address waste issues with top administrators—short of becoming an irritant. Taking advantage of community recycling resources to educate herself, she soon compiled far more ideas than the hospital could take advantage of or that she could address through volunteer efforts on her own time. When the local community passed a mandatory recycling ordinance that would require the hospital to set up recycling programs for the whole facility, she was hired part-time by Environmental Services to bring the hospital into compliance. In just a few months, so much activity was generated in the facility that she had to stop doing clinical nursing altogether for a full-time position with Environmental Services. In the next three years, building on early success by meeting local ordinances and leveraging a great deal of local and national press on the hospital’s successful recycling programs, Shaner established the premier integrated waste management program for American hospitals in Budington, VT—reducing their waste by 40%, setting up a successful composting effort, building a 5,000-square-foot offsite recycling center for the hospital, and setting the stage to integrate the waste systems from two other health care facilities that recently merged with the Medical Center. She now is designing a waste system to integrate waste management for more than 40 sites.

The Waste-Reduction Champion

Getting started takes a champion. Systems do not change on their own. In every successful waste-management program that the authors examined, there has been one or more champions who provide the ongoing initiative and energy that creates, and then sustains, the program. In some cases, as the program matures, the champion can be replaced by a committee or task force, but only when that committee realizes that it needs to be a committee of champions.

Champions have been top-level administrators who have immediately set in place total systemic changes; they have been nurses who worked quietly setting up small programs in specific departments before looking to take the program facility-wide. In a couple of cases, they have even been physicians! Champions are not always successful, but programs without champions almost never are.

Champions need to follow guidelines and make allies to be successful. Hospitals are complex and diverse institutions. They contain numerous departments, staff with many different relationships to the institution, multiple regulations covering every aspect of operation, and resources that are often not shared between departments. There is an organizational culture and history that must be respected and recognized. There are both external and internal pressures demanding attention, which make waste seem relatively unimportant to many.

In building an approach to integrated waste management, champions must be sensitive to all of these issues if they are going to make changes that will realize the benefits listed above. Opening up communications between departments, and making allies whose responsibilities and authority cross over department lines is critical to success. Responsibility for waste starts with procurement decisions—whatever materials are brought into the institution must be disposed of as waste after they are used—and ends with disposal options at the back door. In between, waste decisions are made in multiple locations by all types of personnel. Shipping and receiving uncrates products from boxes; unit-based staff stock supply carts and closets; nurses use products in treatment and patient care, then make decisions as to how and where to dispose waste. Housekeeping staff pick up waste from a variety of locations, often intermingling it. Environmental services and facilities management staff may move waste to a specified destination for final disposal. All of these players need to be brought together to forge a new partnership, which has clear goals for waste reduction and clear procedures for approaching the process. Developing a recycling or environmental committee has been a common and effective tool used by many hospitals.

An Integrated Waste Management Plan

The following is a recipe for building a waste plan for your organization. Used in conjunction with the other sections of this manual on specific waste streams, a facility waste manager should be able to follow this process, produce or compile documentation, and assemble the paper plan for your institution.
Putting together an Integrated Waste Management Plan will have numerous benefits for your facility. Although the new JCAHO standards for the Management of the Environment of Care require hospitals to have a documented management plan for hazardous materials and wastes, it will be most effective to have a plan that considers waste reduction, management and disposal for all waste streams. Coordination of efforts in managing each different waste stream will create new opportunities rather than new problems. It also will help to build a “waste consciousness” among staff if their training and education around waste is comprehensive rather than piecemeal.

Components of a Waste Plan:

A. Overview: What is the institution’s goal in waste reduction and waste management?

B. Current Situation: A snapshot in time of current practices, generation rates, management systems, listing of staff responsibilities, methods of disposal, costs and external factors affecting choices

C. Objectives: What changes in procurement, management, disposal, staffing, and policies will need to be made to meet the goal?

D. Resources: What resources will need to be secured to meet the objectives?

E. Time line: When will specific steps be taken and by whom?

There should be an overall approach for the facility, and then specific objectives around each waste stream, remembering that making an impact in one waste stream might well impact another. For example, if large reductions are possible in RMW, it likely will mean that at least a portion of those reductions will show up as increases in solid waste. An Integrated Waste Management Plan will account for these shifts.

Since it is likely that responsibilities for waste management are divided among several departments, it is important to involve from the very beginning key players whose input will be needed throughout the process of developing a waste plan and then taking the necessary actions. Remember that waste decisions—how products are brought into the facility in the first place in terms of purchases of supplies and materials, through final pickup of waste at the “back door”—are influenced by many people in your facility, not just those personnel responsible for collecting it. Key members of a waste-reduction committee at your facility might include:

- Environmental Services
- Material Management
- Safety
- Engineering
- Public Relations
- Facilities Management
- Infection Control
- Risk Management
- Nurse Training Coordinator
- Key Department managers for areas generating special wastes

This committee is going to be charged with developing the institutional goals

Ed Barr, Support Services Manager at Thomas Jefferson University Hospital, Philadelphia

Ed Barr is Thomas Jefferson University Hospital’s waste champion. Call Ed on his voice mail to receive an interesting historic tidbit, followed by an inspirational message about recycling. As the individual responsible for managing and paying for waste disposal, Ed had some real incentives to push for reduction. Beyond a dollars-and-cents approach, however, Ed has worked to make recycling effective and fun. He worked with Jefferson’s public relations department to come up with an amusing and inspirational image for TJU’s recycling programs. Ed instituted the now famous landfill audits, in which he invites staff to visit the landfill every month to learn about what they are discarding, and how they can improve the recycling efforts. His style of “walking around management” keeps him in constant touch with waste workers, and allows him to perform informal waste assessments on a regular basis. His humor and diligent work inspires staff to follow waste segregation policies and take pride in minimizing waste. Ed has saved TJU more than $150,000 per year in landfill costs through recycling and waste-reduction initiatives.

Janet Brown, Waste Manager, Beth Israel Hospital, New York City

Janet Brown has led the way at Beth Israel to cost containment through enhanced recycling and waste-reduction programs. She has championed new programs—such as the Tri-State Hospital Supply Company recycling program for basins, urinals and other plastic patient items—and set up IV bag recycling. Janet’s efforts have been comprehensive, looking at each waste stream and finding multiple opportunities. Through increased segregation, she worked with staff to reduce RMW from a high of 11,000 pounds to 3,000 pounds per day, saving $800,000 over the course of a year. She evaluated and installed a sharps collection system using reusable sharps collection containers.

Janet’s secret to success is based first on a tireless and persistent work ethic. She also was very strategic in gaining support at the hospital by first focusing on the area she knew would have the greatest impact and cost savings for the institution—RMW reduction. Her early success, saving the institution hundreds of thousands of dollars, laid the ground work for her to recommend additional projects and gain easy support from administration.
for waste minimization, and setting out the objectives. Objectives and the specific strategies to reach them should be organized around the waste-reduction hierarchy to emphasize the least costly, safest, more environmentally benign approaches first:

- Source Reduction: Stopping waste at the front door
- Segregation: Keeping wastes in the least hazardous categories possible
- Reuse: Examining reuse options for materials, from pallets and totes to diagnostic equipment
- Recycling: Collection of waste materials for diversion to a recycling facility
- Composting: Diversion of organic wastes
- Solid Waste: Clean noninfectious, nonhazardous material
- Regulated Medical Waste: Wastes that meet very tight and specific criteria (definitions of which vary greatly among states)
- Hazardous Material Use and Waste Management

Each of these categories will require specific strategies. Although tight regulatory and safety concerns demand that RMW and hazardous wastes receive a great deal of attention for their rather small contribution to the total waste stream, the order in which these approaches are listed is the order from which a facility’s waste committee will gain the highest return on its investment.

What is possible to accomplish through this waste hierarchy? Following an aggressive effort at source reduction, segregation, reuse and recycling can reduce or divert 40-50% of the current wastes from your facility! With good segregation, solid wastes would be approximately 40% of the remainder, with RMW and HW less than 10%. This scenario would require a full institutional commitment as well as a commitment of resources. But it can, and has, been done.

Calculating Your Baseline

To create a baseline from which to gauge your progress, it is vital to establish a “starting point.” This will provide a clear and accurate set of indicators to measure success and trends. These indicators will tell you how much waste you are producing in each category at this time. They can be used to compare your situation against national averages or other facilities in your state, or to understand how much waste management is costing, and reveal opportunities for improvement.

INDICATORS: Establishing Your Baseline

It is essential to determine how much waste you are currently generating. This includes solid waste, regulated medical waste, recyclable waste, hazardous waste, construction and demolition waste, and grease and compostable waste. If you haven’t already figured this out, complete these forms for the answers you need. In case you don’t know the actual quantities and costs, provide the best available estimates. A quick call to your current or previous waste hauler may provide helpful information.
### HOW MUCH WASTE???? WORKSHEET

<table>
<thead>
<tr>
<th>Disposal Container Type</th>
<th>Container Size</th>
<th>Number of containers at facility</th>
<th>Number of pick ups per month</th>
<th>Volume of waste per month</th>
<th>Annual volume of waste generated</th>
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</table>
* Volume per month calculation = container size × number of containers × pickups per month

Determine costs for solid waste, regulated medical waste, hazardous wastes, construction and demolition wastes, recyclable wastes, and other wastes you pay to have disposed. Convert wastes to a common measure, such as pounds, cubic yards, or other measure to determine the percentages of your waste stream that are solid waste, regulated waste, recyclable waste, etc. Determine the costs of disposal for each waste stream.

<table>
<thead>
<tr>
<th>SOLID WASTE</th>
</tr>
</thead>
<tbody>
<tr>
<td>CURRENT DISPOSAL COSTS</td>
</tr>
<tr>
<td>Solid waste disposal (landfill tip fees or incineration fees)</td>
</tr>
<tr>
<td>Solid waste hauling/transportation costs</td>
</tr>
<tr>
<td>Labor (janitorial) costs attributable to disposal and collection services</td>
</tr>
<tr>
<td>Equipment costs (monthly container rental fees for containers, compactors, etc.)</td>
</tr>
<tr>
<td>Confidential document destruction fees</td>
</tr>
<tr>
<td>TOTAL DISPOSAL COSTS</td>
</tr>
</tbody>
</table>

* Note, you may find it simpler not to include labor in the calculations. If so, omit it from all work sheets and calculations for consistency.
**Annual volume calculation** = (monthly volume × 12)

<table>
<thead>
<tr>
<th>REGULATED MEDICAL WASTE</th>
<th>CURRENT DISPOSAL COSTS</th>
<th>MONTHLY COSTS</th>
<th>ANNUAL COSTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regulated medical waste disposal (off-site, on-site incineration, alternative technology)</td>
<td></td>
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</tr>
<tr>
<td>Regulated medical waste hauling/transportation costs</td>
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</tr>
<tr>
<td>Labor (janitorial) costs attributable to disposal and collection services. Include costs of personal protective equipment and training.</td>
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<td></td>
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</tr>
<tr>
<td>Equipment costs: container purchase, bags, labels, tape, tape guns internal collection containers, external storage containers, etc.</td>
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<tr>
<td>Labor (administrative) for record-keeping and recording, manifests, internal reporting.</td>
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<tr>
<td><strong>TOTAL DISPOSAL COSTS</strong></td>
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</tbody>
</table>

*Note: you may find it simpler not to include labor in the calculations. If so, omit it from all work sheets and calculations for consistency.*
Calculating Your Baseline Work Sheet 3

<table>
<thead>
<tr>
<th>RECYCLABLE WASTE</th>
<th>MONTHLY COSTS</th>
<th>ANNUAL COSTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>CURRENT DISPOSAL COSTS</td>
<td></td>
<td></td>
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<tr>
<td>Recyclable wastes collection services</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recyclable waste hauling/transportation costs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recyclable waste processing fees (baling, compaction)</td>
<td></td>
<td></td>
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<tr>
<td>Equipment costs: baler, compactor, can crusher, glass crusher, scale, forklift</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Labor (janitorial) costs attributable to recyclable wastes: collection and sorting, preparation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Labor (administrative) attributable to recyclable wastes: record-keeping and reporting, education, management</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rental fees for off-site space</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL DISPOSAL COSTS</td>
<td></td>
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</tbody>
</table>

* Note, you may find it simpler not to include labor in the calculations. If so, omit it from all worksheets and calculations for consistency.
Calculating Your Baseline Work Sheet 3A

<table>
<thead>
<tr>
<th>LIST ITEMS CURRENTLY BEING RECYCLED</th>
<th>DATE:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FIBERS:</strong></td>
<td></td>
</tr>
<tr>
<td>☐ CORRUGATED CARDBOARD</td>
<td></td>
</tr>
<tr>
<td>☐ BOXBOARD</td>
<td></td>
</tr>
<tr>
<td>☐ BOXBOARD</td>
<td></td>
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<tr>
<td>☐ WHITEPAPER</td>
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<tr>
<td>☐ WHITEPAPER</td>
<td></td>
</tr>
<tr>
<td>☐ COLORED PAPER</td>
<td></td>
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<tr>
<td>☐ NEWSPAPER</td>
<td></td>
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<tr>
<td>☐ MAGAZINES</td>
<td></td>
</tr>
<tr>
<td>☐ LOW-GRADE PAPER</td>
<td></td>
</tr>
<tr>
<td>☐ PAPER TOWELS; PAPER WASTES</td>
<td></td>
</tr>
<tr>
<td>☐ OTHER:</td>
<td></td>
</tr>
<tr>
<td><strong>METALS:</strong></td>
<td></td>
</tr>
<tr>
<td>☐ ALUMINUM CANS</td>
<td></td>
</tr>
<tr>
<td>☐ STEELCANS</td>
<td></td>
</tr>
<tr>
<td>☐ SCRAPMETALS</td>
<td></td>
</tr>
<tr>
<td>☐ OLD FURNITURE &amp; EQUIPMENT</td>
<td></td>
</tr>
<tr>
<td><strong>GLASS:</strong></td>
<td></td>
</tr>
<tr>
<td>☐ CLEAR HOUSEHOLD GLASS</td>
<td></td>
</tr>
<tr>
<td>☐ CLEAR MEDICAL GLASS</td>
<td></td>
</tr>
<tr>
<td>☐ GREEN GLASS</td>
<td></td>
</tr>
<tr>
<td>☐ BROWNGGLASS</td>
<td></td>
</tr>
<tr>
<td><strong>PLASTICS:</strong></td>
<td></td>
</tr>
<tr>
<td>☐ #1 PET</td>
<td></td>
</tr>
<tr>
<td>☐ #2 HDPE</td>
<td></td>
</tr>
<tr>
<td>☐ #3 PVC</td>
<td></td>
</tr>
<tr>
<td>☐ #4 LDPE</td>
<td></td>
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<tr>
<td>☐ #4 LLDPE</td>
<td></td>
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<tr>
<td>☐ #5 PP</td>
<td></td>
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<tr>
<td>☐ #6 PS</td>
<td></td>
</tr>
<tr>
<td>☐ #7 MIXED</td>
<td></td>
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<tr>
<td>☐ KITCHEN GREASE</td>
<td></td>
</tr>
<tr>
<td>☐ WASTE OIL</td>
<td></td>
</tr>
<tr>
<td>☐ DURABLE GOODS</td>
<td></td>
</tr>
<tr>
<td>☐ CONSTRUCTION AND DEMOLITION WASTES</td>
<td></td>
</tr>
</tbody>
</table>
Calculating Your Baseline Work Sheet 3B

Complete a checklist like this one each year as part of your updated waste plan to identify materials currently being recycled. Remember to date each form.

Calculate revenues generated from material recovery/recycling programs.

Date:

<table>
<thead>
<tr>
<th>Revenues from recyclables (List waste)</th>
<th>Price per ton</th>
<th>Tons per month</th>
<th>Monthly revenue (may vary depending on markets)</th>
<th>Annual Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silver from X-ray film</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Silver from X-ray solutions</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corrugated cardboard</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Office paper</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aluminum</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Steel</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Plastics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Glass</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Toner cartridges</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tyvek suits</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Calculating Your Baseline Work Sheet 4

<table>
<thead>
<tr>
<th>CURRENT DISPOSAL COSTS</th>
<th>MONTHLY COSTS</th>
<th>ANNUAL COSTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hazardous waste disposal fees</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hazardous waste hauling/transportation costs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Labor (janitorial) costs attributable to disposal and collection services</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Equipment costs (monthly container rental fees for containers, or other equipment)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Labor (administrative) attributable to hazardous wastes: record-keeping and reporting, education, management</td>
<td></td>
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</tr>
</tbody>
</table>

**TOTAL DISPOSAL COSTS**

*Note, you may find it simpler not to include labor in the calculations. If so, omit it from all worksheets and calculations for consistency.*
Calculating Your Baseline Work Sheet 5

What’s the real cost of waste management? Use the other completed forms (worksheets 1, 2, 3, 4) to complete the form below to have a one-page snapshot of annual waste-management costs for your organization.

Date:

<table>
<thead>
<tr>
<th>SUMMARY: COST OF MANAGING HOSPITAL WASTE STREAMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>WASTE STREAM</td>
</tr>
<tr>
<td>REGULATED MEDICAL WASTE</td>
</tr>
<tr>
<td>HAZARDOUS WASTE</td>
</tr>
<tr>
<td>SOLID WASTE</td>
</tr>
<tr>
<td>RECYCLABLE WASTE</td>
</tr>
<tr>
<td>TOTAL COSTS</td>
</tr>
</tbody>
</table>

How much waste is in which stream? Complete the following exercise to determine what percentage of your waste is in which category. This can be useful for goal-setting each year and tracking progress. Use footnotes to qualify any unusual events or situations that may account for large volumes or skewed data.

Calculate Waste Stream Volume Percentages:

_____% Regulated medical waste (RMW)
(Solid waste volume + regulated medical waste volume + recyclable waste volume + hazardous waste volume = total waste stream volume.) Next: divide regulated medical waste volume by the total waste stream volume to obtain percent RMW.

_____% Solid waste (MSW) municipal solid waste
(Solid waste volume + regulated medical waste volume + recyclable waste volume + hazardous waste volume = total waste stream volume.) Next: divide solid waste volume by the total waste stream volume to obtain percent MSW.

_____% Hazardous waste
(Solid waste volume + regulated medical waste volume + recyclable waste volume + hazardous waste volume = total waste stream volume.) Next: divide hazardous waste volume by the total waste stream volume to obtain percent hazardous waste.

_____% Recycled waste (RMW)
(Solid waste volume + regulated medical waste volume + recyclable waste volume + hazardous waste volume = total waste stream volume.) Next: divide recycled waste volume by the total waste stream volume to obtain percent recycled.
Calculating Your Baseline Work Sheet 6

SUMMARY DATA: BEFORE AND AFTER

<table>
<thead>
<tr>
<th>CURRENT SITUATION</th>
<th>GOAL SITUATION</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</table>

Use the information on the other sheets to complete this form. Your committee may want to set goals for a future date based on recent performance, or set goals based on numeric data, such as cost savings, or pounds of waste diverted.
Turning the Oil Tanker

Institutional Change Takes Time.

If you are the pilot of an oil tanker, you know that there is no such event as a “quick” turn. To change direction—particularly if you need to change to a significant degree—you need to plan the turn in advance, calculate where you are, what the impact of each action will be as you engage engines, rudders and props, notify others of your action, be aware of obstructions in your path, and watch out for other ships whose paths you cannot predict. Being at the helm of changing a waste-management system is much the same. Like any large change, however, this change can be broken down into a number of simpler components, each building on the one before. This is true of both large and small facilities. From what we have observed, some of the most difficult programs to implement were actually at small facilities where the culture was more rigid and the problem less visible.

The benefits involved in making these changes in waste management are many, with some less visible that others. How can you measure decreased liability for wrongful practice or noncompliance? Improved public relations can be immediately measured in some cases, but the long-term benefits may be less visible. Increased worker safety may have a few specific indicators (decrease in needle sticks for waste workers). Certainly the biggest area of immediate satisfaction will come from health care dollars that were not spent on waste.

Although the coordination and championing of this effort could come from staff from any of a number of departments, Environmental Services staff and managers will have a key role to play in the planning and implementation. They will have more of a role in managing wastes then simply to push it out the back door. The people who maintain the waste containers, collect the waste from every department, and make decisions regarding its ultimate destination need to be trained not just to pick and push, but to check, report and act. The staff who collect waste are the first line of quality control for any waste system based on rigid segregation to decrease costs and increase safety.

In our experience, we have found many Environmental Services Departments not to be overly receptive to waste-planning efforts, even though it is their budget in which waste-disposal costs are often lodged, and they stand to reap the most benefit. Even though waste reduction, recycling and cost reduction may sound good, they are often slow to get involved and have a straightforward reply of

NO TIME  NO SPACE  NO MONEY
The following sections hopefully will address each of these issues and demonstrate the many advantages that can be accrued by finding the time, space and money to start. A number of hospitals throughout the country have started, with many of them taking small steps toward fundamentally changing their waste-management practices. The experience of these efforts has demonstrated that:

1. Time can actually be saved by reorganizing waste collection, which minimizes RMW and diverts recyclables from disposal. In many cases, shifting responsibilities in waste collection resulted in the same number of FTE’s to collect recycling and waste.

2. Space can be found. In facility after facility we have been able to discover more than adequate space for storage of recycling, waste and containers. In many cases, old storage closets containing antiquated equipment or furniture were cleaned out. In other instances, keys had to be wrestled away from departments hoarding space for some undetermined future use. Some departments may be willing to offer “squatter’s rights” for recycling containers. Almost every facility could benefit from a general “de-junking” of all spaces.

3. Money does need to be invested in order to save money. New containers will be needed along with renovations to meet fire code and safety concerns. Workers will need to be trained, and new equipment may be required. Many facilities have done surprisingly well spending little or none of their own funds in making these changes. Leasing equipment or containers is one approach. In many cases, as you negotiate new contracts, vendors can be convinced to provide needed containers or equipment as part of the contract. Given the current prices for recycling paper, many recyclers are willing to give containers and extra service to acquire what they know to be high volumes of quality waste paper from health care facilities. Now in 1995, prices for many recyclable items are high enough so that income from the sale of some of these materials can offset some of the costs of collecting them.

Whatever the barriers facing your efforts to design and implement a waste plan for waste reduction at your facility, your plan should identify and address them. In the following sections you will find a wide range of opportunities and ideas to include.
Waste Plan Summary Sheet

Hospital: ____________________________________________

Waste Plan Coordinator: ____________________________________________

Department: ____________________________ Phone: ____________________________

Committee Members:

1. ____________________________ name ____________________________ department ____________________________ phone ____________________________

2. ____________________________ name ____________________________ department ____________________________ phone ____________________________

3. ____________________________ name ____________________________ department ____________________________ phone ____________________________

4. ____________________________ name ____________________________ department ____________________________ phone ____________________________

5. ____________________________ name ____________________________ department ____________________________ phone ____________________________

6. ____________________________ name ____________________________ department ____________________________ phone ____________________________

7. ____________________________ name ____________________________ department ____________________________ phone ____________________________

8. ____________________________ name ____________________________ department ____________________________ phone ____________________________

9. ____________________________ name ____________________________ department ____________________________ phone ____________________________

A. Overview: State the institution’s overall goal in waste reduction and waste management.

Safety  Environmental Quality  Community Leadership
Cost Control  Employee Involvement  Regulatory Compliance

B. Current Situation: A snapshot in time of current practices.

Staff Responsibilities for Waste:

Solid Waste: ____________________________ Department: ____________________________

Recycling: ____________________________ Department: ____________________________

RMW ____________________________ Department: ____________________________

Hazardous Waste: ____________________________ Department: ____________________________
## Solid Waste Generation

<table>
<thead>
<tr>
<th>Year</th>
<th>Waste Generated (tons)</th>
<th>Cost/ton $</th>
<th>Monthly Cost $</th>
<th>Total Cost of Disposal $</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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Current Hauling Company: ____________________________

Contact: ________________________ Phone: ___________ Term of contract: __________

Other Costs: Equipment Rental/Leasing: ________________________ Hauling fees: __________

### RMW Generation

(If on-site incinerator used, detail operational costs, including staff, maintenance, energy usage, etc. to establish a per-pound cost for waste disposal)

<table>
<thead>
<tr>
<th>Year</th>
<th>Waste Generated (tons)</th>
<th>Cost/ton $</th>
<th>Monthly Cost $</th>
<th>Total Cost of Disposal $</th>
</tr>
</thead>
<tbody>
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</table>

## Off-site disposal

Current Waste Vendor: ____________________________

Contact: ________________________ Phone: ___________ Term of contract: __________

Other Costs: Equipment Rental/leasing: ________________________ Supplies (boxes, tape) __________

## On-site disposal

Technology: ________________________ Contact: ____________ Phone: ________________________

Costs of equipment: ________________ Costs of energy, chemicals, or other items: ________________
<table>
<thead>
<tr>
<th>Waste Generated</th>
<th>Quantity of waste (pounds)</th>
<th>Cost of Disposal ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>Recyclable Material</th>
<th>Quantity Collected Tons/pounds</th>
<th>Costs to divert $ (Processing/hauling)</th>
<th>Income $ (If any)</th>
</tr>
</thead>
<tbody>
<tr>
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**Attachments**

* Copies of current policies, procedures, and directions for staff collecting and disposing of waste. Include general facility requirements for all staff to follow in disposing of wastes, guidelines of waste collection and disposal, including infection-control rules as they affect waste generation and handling.

* Job descriptions of current waste handlers

* Purchasing guidelines for waste reduction

**External Regulations for Waste**

* Attach summaries of any local, county or state rules or regulations that affect wastes generated by the facility, e.g. landfill bans, recycling mandates or goals,
Sample Table of Contents for a Waste Management Plan

Introduction
Overview: Current Situation and Goals
Waste Management Policies (summary)
Composition of Waste Stream
Waste Stream Flows (points of generation, transportation, disposal destination)
Methods of Disposal
  • Hazardous Waste
  • Regulated Medical Wastes
  • Solid Waste
  • Recyclable Waste
  • Compostable (organic) waste
Waste Review of Individual Departments
  • Shipping and Receiving
  • Nutrition Services
  • Facilities Management
  • Laboratory Areas
  • Surgical Services
  • Patient Care Areas
  • Central Sterile Reprocessing
  • Radiology
  • Environmental Services
Policies and Procedures
  Waste Handling and Disposal — Hazardous Waste
  Waste Handling and Disposal — Regulated medical waste
  Waste Handling and Disposal — Solid Waste
  Waste Handling and Disposal — Confidential Paper
  Waste Handling and Disposal — Recyclable Waste
  Waste Handling and Disposal — Reusable and recoverable items
  Waste Handling and Disposal — Unused Medical Supplies
Pollution Prevention Plan
Exposure Control Plan
Job Descriptions (roles and responsibilities)
  Environmental Services Waste Team
  Environmental Services Waste Manager
Tools to Check Progress
  Waste Minimization Initiatives
  Waste Minimization Monthly Reports
  Media Coverage of Waste Management Efforts
  Awards for Waste Initiatives
Resources
  Environmental Services Recycling Manual
  Facilities Management Environmental Specialists (Safety, Hazmat, Risk Management, Ergonomics, Industrial Hygiene)
  Phone Numbers of internal and external waste resources (solid waste hauler, recycler, emergency numbers for hazardous waste spills, etc.)
JCAHO Environment of Care

JCAHO standards (EC.1.5.) call for a documented management plan that addresses the control of hazardous materials and wastes.*

Intent of EC.1.5

A hazardous materials and waste management plan describes how the organization will establish and maintain a program to safely control hazardous materials and waste. The plan provides processes for:

a. selecting, handling, storing, using and disposing of hazardous materials and waste from receipt or generation through use or final disposal;

b. establishing written criteria consistent with applicable law and regulation, to identify, evaluate, and inventory hazardous materials and wastes used or generated;

c. managing chemical waste, chemotherapeutic waste, radioactive waste, and regulated medical or infectious waste, including sharps;

d. monitoring and disposing of hazardous gases and vapors;

e. providing adequate and appropriate space and equipment for the safe handling and storage of hazardous materials and wastes; and

f. reporting and investigating all hazardous materials or waste spills and exposures or other incidents.

g. an orientation and education program for personnel who manage or have contact with hazardous materials and wastes that addresses:
   1. Precautions for selecting, handling, storing, using and disposing of hazardous materials and waste;
   2. Emergency procedures for hazardous material and waste spills or exposure,
   3. Health hazards of mishandling hazardous materials; and
   4. For all appropriate personnel, orientation and education about reporting procedures for hazardous materials and waste incidents, including spills or exposures;

h. performance standards for:
   1. Staff knowledge and skill necessary for their role in managing hazardous materials and waste;
   2. The expected level of staff participation in materials and waste management activities;
   3. Monitoring, inspection, and corrective action;
   4. Routine procedures for emergency and incident reporting that specify when and to whom reports are communicated, and
   5. Inspection, preventive maintenance, and testing or applicable equipment; and
Planning for Change

i. emergency procedures that describe the specific precautions, procedures, and protective equipment used during hazardous material and waste spills or exposures.

The objectives, scope, performance, and effectiveness of the hazardous materials and waste management plan are evaluated annually.

Examples of Implementation for EC.1.5

1. The documented management plan may address the bulleted issues listed in the intent with one or more of the following:
   - Written plans
   - Policies and procedures
   - Performance standards
   - Written criteria
   - Goals and objectives

Examples of Evidence of Performance for EC.1.5

- Management plans for the issue(s) addressed in the standard
- Performance standards for the issue(s) addressed in the standard
- Emergency procedures for the issue(s) addressed in the standard
- Staff interviews

***Hazardous materials and wastes: Materials of which the handling, use, and storage are guided by local, state or federal regulation (for example OSHA's Regulations for Bloodborne Pathogens regarding the disposal of blood and blood-soaked items; Nuclear Regulatory Commission's regulations for the handling and disposal of radioactive waste) and hazardous energy sources (for example, ionizing or non-ionizing radiation, lasers, microwave, or ultrasound).

The Joint Commission recognizes that there are different definitions of hazardous waste. At this time, federal regulations do not define infectious waste or medical waste as hazardous waste. However the intent of this standard is to implement a management process that includes all materials and waste that require special handling in order to address identified occupational and environmental hazards. Infectious waste and medical waste fall into the special handling category since there are recognized occupational exposure issues that must be dealt with properly.

The organization wide hazardous materials and waste management program is expanded, when appropriate, to residential occupancies.
Resources


*Writing a Waste Reduction Plan for Health Care Organizations*, by Keith Ridley, University of Tennessee Center for Industrial Services. 1995, University of Tennessee, Nashville. For information, contact Albert Tieche, 615-532-4926.


*No Time to Waste* is an inspirational video production that proves that every hospital, whether a large urban institution or a smaller community hospital, can achieve some kind of waste and cost reduction. The 30-minute video and study guide provide case studies from the Medical Center Hospital of Vermont campus of Fletcher Allen Health Care in Burlington, VT; Thomas Jefferson University Hospital in Philadelphia; and Yale-New Haven Medical Center in Connecticut. It is an excellent tool for demonstrating opportunities to management, and inspiring staff and employees with the possibilities for waste reduction, cost savings, and environmental enhancement. For information on ordering or renting the video, call (800) 937-4113 or (617) 524-0980.
Managing RMW: Planning Guidelines

Effective management of Regulated Medical Waste (RMW) will result in safe working conditions and lower costs for your organization. Effective management includes ongoing facility-wide staff education, regular system monitoring, and the involvement of infection control, risk management, environmental services, nursing, OR managers, Dialysis-unit managers, and laboratory managers working together to design and maintain the system. It also involves the development of concise, clear policies regarding identification, disposal and treatment of materials to be handled as RMW.

Certain departments generate proportionally more RMW than others. Current hospital accounting and budget-management systems usually include RMW disposal as an operating cost similar to energy and water usage. The generator of the waste rarely gets feedback on how much waste they generate and what effect that waste has on the overall waste budget. If the system were modified to hold each unit financially accountable for the wastes they generate, there would probably be an across-the-board immediate reduction. However, since most departments are not sensitized to the financial burden they create for their organization by careless, indiscriminate or inaccurate waste-disposal habits, it is no wonder that they continue in their current practices. A skillful environmental services manager, through observation and simple monitoring of waste-generation rates within the facility, can sketch together the impact that various departments have on the RMW waste-disposal budget, and reflect that information back to the various departments. This information is a tool to garner support for increased employee participation and diligence in the arena of waste disposal and must be reported to clinical staff.

Most of the RMW generated in health care facilities is generated by doctors, nurses and other health care professionals, people we trust to cut our hearts open, insert needles in our veins and tubes in our bodily orifices. These people have had substantial education and are regarded as intelligent and meticulously careful in their work. When it comes to waste disposal, however, this community of professionals generally has no consciousness of the cost and impact of generating wastes. There often is an attitude that waste is the responsibility of the janitor or housekeeper. It is a vital task for the Environmental Services management and Infection Control practitioner to communicate clearly about
what items constitute RMW and how they should be disposed of. The same intelligence and care that goes into health care can be used to make a substantial difference in waste disposal at little cost to the practitioners.

Forty-two of the 50 states have different definitions for RMW. There is not even a consistent name for what we call it. It is referred to as infectious waste, biohazardous waste, regulated medical waste, contaminated trash, red-bag waste, and a host of other terms (including that “yucky stuff”) to describe such wastes as needles, body parts, cultures and stocks, blood bags and tubing, blood-saturated gauze, etc. Numerous regulatory agencies have some requirements for either handling, labeling or transporting regulated medical waste. Four states consider regulated medical waste to be a hazardous waste. No wonder there is substantial confusion as to what constitute RMW. This confusion has led to a conservative and more inclusive system for disposing of RMW at most institutions.

Many health care workers are transitory—moving from state to state as part of schooling or job-seeking. As they move, they bring their understandings of waste with them. It is necessary to clearly educate staff about what constitutes RMW at your particular organization. It is not uncommon to find different definitions for RMW at different hospitals within the same town, or different hospitals within the same hospital system.

There are many “gray areas” of regulated medical waste. Many people still are operating under the premise that hospital waste is more contaminated than household waste—which it is not—or that the really sick people live in hospitals (most HIV and Hepatitis patients live in the community). Many people operate under the premise that the hospital contributes the most blood to the sewer and landfill system in the community (menstruating women in the community contribute far more at any given time).

Items such as gloves, foley catheters, suction canisters, dialysis tubing, and blood-stained dressings create much confusion for health care workers as they try to participate in waste-disposal programs. The OSHA blood-borne pathogen rule—which promulgated universal precautions, labeling and guidelines for handling potentially contaminated items—often has been misconstrued into medical waste disposal regulations. But they are not. They are rules designed to protect health care workers. OSHA regulates worker safety, not waste disposal per se.

Infection-control guidelines have changed and OSHA requirements have been introduced. Staff often are disposing of wastes with old or incomplete information. A common practice we have observed is for clinical staff to discard broken mercury-based thermometers and batteries in sharps disposal containers. When queried about this practice, they respond that broken glass (broken thermometers) is considered a sharp, and that batteries are placed in there because they know those wastes receive “special handling.” These practices must be changed to minimize the environmental impact of health care wastes. It is no wonder that some of the emissions from hospital incinerators are so troublesome. Mercury products need to be minimized in the work place (see section on pollution prevention) and mercury waste clean-up kits need to be in all
clinical areas, with staff educated in their proper usage. Broken thermometers need to be kept out of sharps containers. Battery-collection containers need to be conveniently placed in clinical areas to keep batteries out of RMW. Every beeper, feeding and medication administration pump, flashlight, and nearly every medical device has some type of battery. During the daytime, staff equipped to collect and handle battery replacement and collection may be around. But what happens on evenings, nights, weekends and holidays, when batteries are changed out?

Managing RMW may seem like a simple task — provide containers, staff, and a system for disposal. But the truth is that managing RMW is an ongoing, complex task, which involves continual system monitoring, educational inputs, record-keeping, feedback to customers, and a vigilance toward product procurement, to insure that product choices be made that minimize RMW generation. The goal of RMW management is to manage the waste in the safest, most responsible, cost-effective manner. Different facilities will find different answers that work best for them, based on access to resources, regional issues, values, cost and convenience.

Cost Reduction

Hospitals, with their current definitions and practices concerning RMW, their sometimes overzealous responses to external regulations and standards, and their fear of public concerns being raised, are spending millions of health care dollars unnecessarily each year on RMW treatment and disposal. Most U.S. facilities have great opportunities to achieve significant cost savings in their RMW management program without compromising safety or compliance (and in many cases increasing both).

Cost reduction does not necessarily mean going out to bid and getting the lowest price for disposal or getting a new incinerator. Cost reduction can best be achieved through volume reduction. The less RMW generated, the less waste to handle (labor costs, supply costs), and the less waste to dispose of — which means fewer hauls and fewer pounds or boxes of waste to dispose of. There are many people in hospitals, regulatory agencies and communities who are convinced that there is no safe way to reduce infectious waste or RMW. The truth is there are a myriad of ways. However, it requires close observation of current practices and a commitment to change. We hold many sacred cows in health care, and RMW reduction is an area that challenges those cows to go out to pasture. It requires a willingness to consider wastes from a scientific perspective rather than aesthetics, and a willingness to swim upstream with your staff. Any action that requires a behavior change (human engineering) is more difficult to achieve than a quick fix or black-box technology that seemingly can solve all your RMW problems.

Packaging for RMW can be a significant portion of the cost in RMW management. Some institutions use a heavy Kraft bag for RMW collection on the patient floors. Just the bag weighs a pound or more when empty. Boxes and tape, if not included in your contract (or sometimes even if included) for packaging RMW for off-site shipment, can be a significant added supply cost that
Eisenhower Memorial Hospital, Rancho Mirage, CA

Thomas L. Fox, Director of Environmental Services, reports a 40% reduction in medical waste since he began his campaign to keep physicians, vice presidents, directors, managers, and supervisors well-informed about wasterelated events. He sends out memos advising them of an inspection or events dealing with medical waste. In one flyer (see below)—which details the distinctions between biohazardous and solid wastes in simple, clear language—Mr. Fox developed a tool that could be used over and over again, and continue to be an effective educational instrument that achieves significant savings.

is not included in disposal costs quoted by a vendor. RMW red bags can be expensive. One facility accidentally used autoclave bags instead of regular red bags for a substantial cost increase. Collecting a lot of solid waste in red bags is expensive. Collecting mostly empty red bags is expensive. Using “cheap” thinner, red bags can be costly if breakage and leakage causes staff to double and triple bag. If a vendor uses reusable tubs, make sure that the weight of the tubs is deducted from the total weights of your waste if you pay by the pound. If you pay by the container, examine opportunities for safe and efficient packing procedures that maximizes the amount of waste that each container can hold. One facility cut its waste costs by 30% simply by developing new packing standards. Another facility was able to project a $30,000 annual RMW disposal fee savings merely by requesting nurses to empty IV bags prior to disposal. (IV bags are considered RMW in some states.)

Overall RMW costs will decline when the volume of RMW declines. Hospitals have identified a number of strategies for achieving significant volume reductions, with programs ranging from the simple, informational to the complex, total systems change approaches.
### SAMPLE FLYER

**EISENHOWER MEMORIAL HOSPITAL**  
**WASTE DISPOSAL GUIDELINES**

<table>
<thead>
<tr>
<th><strong>BIOHAZARDOUS WASTE</strong></th>
<th><strong>SOLID WASTE</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Items listed in this column will be placed into the red-lined, black Stericycle container.</td>
<td>Items listed in this column and other trash will go into the solid waste trash cans</td>
</tr>
<tr>
<td>Grossly saturated materials (saturated with blood, cerebrospinal, synovial, pleural, peritoneal, pericardial or amniotic fluids)</td>
<td>Paper and trash</td>
</tr>
<tr>
<td>Fluid-filled containers; pleurovac, suction canister, chest-tube bottles, hemovacs, JP drains</td>
<td>non-bloody diapers and Chux</td>
</tr>
<tr>
<td>Heimlich tubes (chest tube valve)</td>
<td>non-drippy wound dressings</td>
</tr>
<tr>
<td>Any bloody tubing, blood-transfusion bags</td>
<td>disposable patient items; bedpans, water pitchers and glasses, urinals and measuring cups</td>
</tr>
<tr>
<td>Dialysis filters</td>
<td>Empty foley bags and foley catheters</td>
</tr>
<tr>
<td>Specimens, anatomical parts (From Lab only)</td>
<td>Non-bloody IV tubing and IV bags, IV prep kit</td>
</tr>
<tr>
<td>Sharps containers, needles, scalpels, pipettes and stylettes</td>
<td>GLOVES, ISOLATION GOWNS, MASKS, HATS, SHOE COVERS</td>
</tr>
<tr>
<td>Broken glass bottles, vials ampules, slides are treated as sharps</td>
<td>Respiratory therapy equipment</td>
</tr>
<tr>
<td>Microbiology media</td>
<td>Disposable drapes, plastic trays, instruments from procedure kits</td>
</tr>
<tr>
<td>Chux saturate with blood or amniotic fluid</td>
<td>N/G tubing, empty gastric bags, colostomy bags from non-infective patients</td>
</tr>
<tr>
<td>Saturated items from known infective patients</td>
<td></td>
</tr>
</tbody>
</table>

**Questions?**  

**CONTACT INFECTION CONTROL OR HOUSEKEEPING SERVICES**
Mt. Sinai Medical Center, New York City

When Mt. Sinai reviewed its waste programs it identified several opportunities to reduce RMW significantly. The medical center worked toward this goal by providing its nurses and housekeepers with clear information and regular training on distinguishing what items have to be treated as RMW and what materials can be disposed of as solid waste. Mt. Sinai followed up this information and training campaign with the removal of red-bag collection containers from patient rooms, placing centralized collection containers in medication, exam treatment and soiled utility rooms. The removal and centralization of container placement was only possible after the education and training efforts. In the first year after this effort, Mt. Sinai realized a savings of more than 1 million dollars in its waste programs.

Grossmont Hospital, San Diego County, CA

Decision-making for Regulated Medical Waste (RMW) Vendor Selection

Grossmont Hospital took an interesting approach to RMW vendor selection. It strategically involved many different departments in the process and at different points in the process. The hospital's list of who was involved and at what phase of the process is listed below. This clever use of involvement in the selection process inherently garnered support for the system, and awareness of medical-waste disposal processes, costs and issues as an educational bonus. They were able to set up and start their new program with a great deal of institutional support and knowledge already in place.

Management Involvement

Key to organizational participants at different stages of the program (who was involved and at what stage):

1 = problem identification
2 = problem solution
3 = problem development
4 = implementation
5 = follow-up

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<thead>
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<th>1</th>
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<th>4</th>
<th>5</th>
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<tr>
<td>Administration</td>
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<td>Environmental Services</td>
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<td>Safety</td>
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<td>Nursing</td>
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<td>Infection Control</td>
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<tr>
<td>Material Management</td>
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Regulatory Compliance

Regulatory compliance is absolutely essential in all aspects of RMW management. But regulatory compliance with whose standards? State Medical Waste Regulations, OSHA, EPA, DOT? Or all of the above? The truth is that you must comply with all regulations. It helps to understand who regulates what and what are the requirements. Refer to the chart below to gain a better understanding of this.

<table>
<thead>
<tr>
<th>Organization name</th>
<th>What they regulate</th>
</tr>
</thead>
<tbody>
<tr>
<td>OSHA - federal and state</td>
<td>Occupational Safety and Health Administration</td>
</tr>
<tr>
<td>EPA - federal</td>
<td>Environmental Protection Agency</td>
</tr>
<tr>
<td>DOT - federal</td>
<td>Department of Transportation</td>
</tr>
<tr>
<td>CDC</td>
<td>Center for Disease Control and Prevention</td>
</tr>
<tr>
<td>JCAHO</td>
<td>Joint Commission for Accreditation of Healthcare Organizations</td>
</tr>
<tr>
<td>POTW - local</td>
<td>Publicly or privately owned treatment works</td>
</tr>
<tr>
<td>ANR, DNR, DEP - state</td>
<td>State Agency of Natural Resources, State Department of Natural Resources State Department of Environmental Protection</td>
</tr>
<tr>
<td>DPW — local, county</td>
<td>Solid Waste District Solid Waste Authority Department of Public Works</td>
</tr>
<tr>
<td>DOH — state</td>
<td>Department of Health</td>
</tr>
</tbody>
</table>
Compliance with regulations must start from a full understanding of what regulations apply to your institution, and which ones really address waste-disposal practices. RMW is “infectious waste,” and there are very specific definitions regarding what constitutes infectious wastes. To be infectious, a waste must be capable of producing an infectious disease. For a waste to be infectious, it must contain pathogens with sufficient virulence and quantity so that exposure to it by a susceptible host could result in an infectious disease. Materials commonly identified as infectious, or potentially infectious, and so should be treated as RMW include:

- Liquid blood and blood products, and body fluids
- Blood-soaked gauze, bandages, sponges and other materials
- Blood bags and other containers used to hold blood
- Pathological wastes
- Cultures and stocks of etiologic agents
- Sharps
- Isolation wastes
- Experimental animal carcasses and body parts
- Experimental animal bedding and other animal-room wastes

These guidelines are generic, and fairly common in most states. Obtain a full copy of your state’s medical-waste regulations and review them to ensure that you are in compliance. Hospitals must adhere to these basis standards, and then follow additional requirements that may be mandated by more stringent state and local laws. Some of the questions that constantly come up include:

- Is a blood-stained gauze pad RMW?
- Is it dripping with blood?
- Is it contaminated with an infectious or potentially infectious agent?

In many cases, if it is not dripping with blood, or is not from a patient with a known infectious disease, it does not have to be treated as RMW. You will need to work with your infection-control officer to make a determination for your facility.

- Is an IV bag RMW?
  - An IV bag is not a blood bag, although they can be confused by the general public.
  - An IV bag is part of a one-way system that is infrequently contaminated by blood.

In New York, IV bags are considered RMW, while across the border in Vermont they are not. However, IV bags in New York, if segregated for recycling, may be considered a recyclable waste and not RMW.

Developing and answering these types of questions with infection control, risk management, nurses and environmental services is essential to designing and implementing an effective program. These “gray areas” of red-bag waste exist in many employees’ minds. Although a system should always err on the
side of caution in making decisions, a good policy should be in place to help employees know where to draw the line. Use common sense. Remember that household trash is often bloodier than some hospital waste, and it is readily taken to the landfill each day.

**Risk Reduction**

There is risk associated with any task. Risks associated with RMW handling and management exist. Managing and minimizing that risk is achievable. Staff need to be thoroughly educated about the actions they need to take to protect themselves, and be inspired to use Personal Protective Equipment consistently.

- **J Have comfortable Personal Protective Equipment (PPE) readily accessible**
  Include an assortment of gloves, face shields, impervious gowns.

- **✓ Use translucent red bags**
  This allows staff to visualize the contents of the red bag, and be more likely to notice inappropriately discarded sharps or other materials.

- **J Cadmium-free red bags**
  Cadmium is a heavy metal. Specifying cadmium-free red bags will minimize the pollution associated with waste incineration.

- **J Have containers properly labeled**
  Biohazard labels should be readily visualized on all containers. Low-level radioactive wastes and chemotherapy wastes also should be labeled accordingly to alert waste handlers to the type of material they are handling.

- **J Separate and label pathology wastes from other RMW**
  Pathology wastes need to be incinerated for proper treatment. Other RMW can be effectively treated by other means, such as autoclaving, chemical disinfection, microwaving, etc. Even if these options are not open to you at this time, segregation of pathology wastes from non-pathology RMW will enable you to observe how little of your waste actually requires incineration, and it will give you a bench mark for taking advantage of future systems.

- **J Schedule regular in-service programs to educate staff about waste handling**
  Annual or biannual review/refreshers ensures that employees will be reminded and updated about the latest safety guidelines.

- **✓ Train all new staff, and backup staff assigned to collect waste**
  Anyone handling RMW must be thoroughly educated in safe handling, hand-washing, ergonomics, PPE, etc., prior to ever handling the materials.

- **J Hepatitis B immunizations and tetanus shots should be up to date for all staff handling wastes.**
Ensure that staff are aware of the record-keeping and reporting system for needle sticks or other injuries related to waste handling. Forms should be convenient and accessible. Inform staff of the value of record-keeping of this nature. Although waste-related injuries are not pleasant, tracking them can often identify trends, or departments not complying with proper disposal guidelines.

Teach staff what to do with “mystery wastes”
Mystery wastes are those wastes that appear from an unknown source on your trashdock, doorstep, or in your office. Mystery wastes also can refer to those rare, but occasional boxes or containers that may be in a red bag, but which contain unknown substances, or items that should not be in a red bag (glass, mercury, batteries, roses, pizza boxes). Mystery wastes also can include such things as real linen, pillowcases, patient gowns, washcloths or underpads, which should have been sent to the laundry for reprocessing, and that have mistakenly been placed in a red bag. Reusable instruments and equipment can often be found in RMW.

Educate staff about how to properly manage blood spills
It happens. Pleurevacs can dump, bloody suction canisters or bloody tubing can leak. The way your staff cleans up the mess can either increase or decrease the amount of RMW generated. The blood-spill clean-up protocol should be posted and easily accessible, as should the cleaning agents identified for use by your facility.

Educate staff about basic hand-washing
Ensure that sinks are conveniently located in RMW packaging areas for staff to wash their hands before and after handling materials. Even with the use of gloves, proper hand-washing is essential. Plan mock spills so staff can have practice with proper clean up protocols.

Make your system ergonomically safe
Make use of your facilities’ physical therapy/occupational therapy department as “internal consultants” to evaluate current waste-collection containers, dollies, lifts, and other equipment to ensure that staff are not at risk for back injuries, repetitive injuries or any other types of injuries. Have the PT/OT staff evaluate current staff work practices around lifting and handling wastes to ensure they are using optimally safe body mechanics. Encourage teamwork. Educate staff to get help with heavy loads.

Pollution Prevention

Proper RMW management can contribute substantially to your organization’s pollution-prevention efforts. Educating staff and ensuring that such items as batteries and mercury remain out of RMW cannot be overemphasized. There is a movement afoot in Europe and in parts of the United States for health care facilities to become PVC-free. This means eliminating PVC plastic products from the hospital. PVC plastics have been associated with dioxins and other toxic materials when they are incinerated, especially in the presence of heavy metals. If you are interested in keeping PVC out of your regulated medical-
waste stream, the challenge will be immense, since so many health care products and devices are made from PVC (IV bags, patient i.d. bracelets, IV tubings, respiratory tubings, patient i.d. cards and more)

Regulated Medical-Waste Minimization:
Who Says It Can’t Be Reduced?

Strategies To Achieve Reduction

Procurement

Minimizing RMW can begin in purchasing. Product standards committees in some institutions now are adding waste disposal to their list of criteria for evaluating new products and their packaging. A special examination of those products that are most likely to be disposed of as RMW would be valuable, and may help with decisions regarding whether to buy supplies as a component of a kit or as an individual item. Selecting certain products that can be reused rather than disposed of can cause an immediate decrease in RMW. Items such as underpads, amбу bags, ventilator circuits, dishware, surgical gowns, sterilization wrappers, drapes, isolation gowns, bibs, diapers, bedpans, urinals, and other patient care items can be purchased as a single-use disposable or multiple-use reusable product. If your organization requires segregation of any of the above items as RMW, substituting a reusable item will reduce waste generation.

Policy

Review of waste policies can help promote RMW minimization. Carefully review your state’s RMW regulations, infection-control guidelines and consider your organization’s current practices. Wastes from such areas as dialysis units, operating rooms, and clinical-diagnostic areas are often disposed of as red bag. Close review of the contents of those red bags reveals that more than half of the wastes are clean-packaging wastes—which, had they been segregated—could have been disposed of as solid waste or recycled. Because a product has a label on it that looks “medical” is not necessarily a reason for that product to be disposed of in a red bag.

OSHA/BBP

The OSHA blood-borne pathogens rule set standards and guidelines and requirements for labeling and handling of infectious and potentially infectious wastes. Universal precautions refer to workers taking precautions with all materials. It does not mean that all items are contaminated. Many practitioners have interpreted these standards to mean that anything that “touched” a patient is contaminated. Using this definition, pizza boxes, aluminum cans and other items often end up in a red bag. This was not the intent of the rule, nor is it a policy based in good science.

The Society for Hospital Epidemiology of America published a position paper on Medical Waste by Drs. William Rutala and C. Glen Mayhill. This paper is an excellent base for your hospital’s discussion on this topic. That paper is reprinted in An Ounce of Prevention. In addition, the Association of Operating Room Nurses (AORN) convened a collaborative meeting of 13 health care
organizations in 1992 to develop a consensus for a working definition of regulated medical waste. This document—published in the AORN journal, July 1993—is one of the best guidelines for hospitals to date.

**Container placement**

The location of regulated medical-waste collection containers can dramatically affect the volume of RMW generated. Having too many containers in the wrong places will inflate the volumes. Having too few containers, and containers not in the right places, can lead to noncompliance with regulations and under-red bagging of wastes that need to be managed as RMW. Striking the balance is often a challenge. Sharps containers need to be located conveniently in patient-care areas to make sharps disposal readily accessible, and reduce the likelihood of recapping needles and needle sticks associated with transporting unprotected needles for disposal. RMW waste-collection containers for non-sharp RMW present other opportunities. Do you need a container in every patient room, or can you educate your staff to discard RMW in a treatment room, soiled utility area or other designated location? Many hospitals have successfully eliminated red-bag containers from patient rooms and are achieving significant reductions in RMW. If you feel you must have an RMW container in every patient room, be sure it is the smallest possible size container, with clear labeling and a lid on it. Make sure that obvious, well-labelled solid waste (trash) containers also are available.

**Container design**

Having a lid on RMW containers is a very important feature. This will discourage visitors and others from indiscriminately tossing newspaper, magazines, flowers and other solid-waste items in the regulated medical-waste stream. It also prevents children or others from putting their hands in the container, or spilling the contents in the case of a container accidently knocked over.

**Labeling**

Properly labeled waste containers minimizes confusion and ultimately RMW volumes. Labels need to be placed in clearly visible locations, checked periodically and replaced as needed.
Rutland Regional Medical Center, Rutland, VT

What’s In a Dialysis-Unit Waste Stream?

When Rutland Regional Medical Center was contemplating adding a new dialysis unit, one of the first questions that arose was, “What is this going to cost from a waste perspective?” How will this new unit fit into the existing waste-management programs, and what will the dollars and cents impact be? They examined the waste stream of a dialysis unit from another facility to gain the information they needed to develop a dialysis-unit waste profile. This information was useful in communicating that the financial burden from regulated medical-waste generation would be minimal.

Dialysis Unit Waste Profile

Estimates based on visualization of volumes

30% of total waste = Solid waste: (trash)

This category consists of such items as paper cups, Kleenex, plastic wraps, food wastes, product packaging. Similar to household waste.

50% of total waste = Potentially Recyclable wastes:

Paper/fibers: white paper, colored paper, newspaper, magazines, corrugated cardboard, box board, books, low-grade office-waste paper

Plastics: HDPE #2 plastics (like a milk jug ... 150+ containers per day) HDPE #2 plastic (IV ovenwraps), PVC #3 plastic (IV bags), Tyvek plastic packaging, #6 PS plastic packaging, #4 LLDPE stretch wrap, #4 LDPE bags, #5 PP plastic bottles

Steel cans, aluminum cans

Glass: clear and colored from break room

Other: batteries (alkaline and other types), toner cartridges, outdated supplies, florescent fixtures, mercury wastes from monitoring technology

20% of total waste = Infectious wastes (regulated medical waste)***

• Such sharps as syringes wheedles, dialysis needles, lancets, suture materials
• Gauze and pads dripping with blood
• Dialysis tubing containing bloody fluids
• Used Dialyzers
• Bloody dressings
• Waste from isolation patients with known infectious diseases.
• Human Tissue waste from any debridement or other treatment done in treatment room/exam area
• Lab cultures/stocks, blood-clot tubes from bedside testing

*** The only reason that this portion of the waste stream was so high was because of the liquid nature of many of the wastes, which were heavy (e.g. fluid-filled tubing).
Checklist For RMW Management

Identify RMW definition for your institution (infection control)

How do policies and actual practices match up with RMW definitions for your state?
To evaluate this, you need copies of your state RMW definition/regulation, copies of any local RMW definitions/rules, a copy of the OSHA BBP & any state-level OSHA BBP requirements. Review these and check them against your system. Remember OSHA regulates worker safety, and addresses labeling and handling and universal precautions. It does not dictate waste disposal or waste definitions. Waste-disposal requirements can be found in your state’s medical-waste regulations.

Infection control / Risk Management / Safety
Infection Control Officer: ___________________________ Extension: ____________
Risk Manager: ___________________________ Extension: ____________
Safety Officer: ___________________________ Extension: ____________
Meet with these managers to review current policies regarding waste disposal. Are current policies barriers to RMW reduction? (e.g., all waste from surgery shall be red-bagged; all waste from dialysis shall be red-bagged)

Department of nursing
Director of Nursing/Chief Nurse Executive: __________________ Extension: ____________
• Who are the department-level nurse managers?
• Who are the nurse educators for your organization? Include them in your planning around waste disposal.
They can continue to carry the message for you, educating staff about wastes on the unit level on an ongoing basis as they orient new staff.
Develop a plan to meet with nursing to strategize waste minimization. (If you want to take red bags out of patient rooms, it will be vital to have the full support of nursing management, since you are asking nursing staff to take a few extra steps to properly dispose of wastes.)

Department of surgical services (operating room)
Who is the head of surgical services? ___________________________ Extension: ____________
Who is in charge of staff education for surgical services? ____________ Extension: ____________
Does the OR have its own cleaning staff, or are they part of Environmental Services?
☐ own ☐ Environmental services provides
Cleaning Supervisor: ___________________________ Extension: ____________
(If not part of Environmental Services)
Tour the OR area and observe current waste-segregation practices. Follow the waste from the OR to its final storage/disposal area. Does the solid waste remain solid waste, or does it get commingled with RMW later in the system? Who makes that decision?

Evaluate existing RMW management programs
• Who’s in charge of RMW? ___________________________ Extension: ____________
• What department pays for waste disposal?
• Who manages spills?
• Who sets policy?
• Does your facility accept regulated waste from other sources in the community? (e.g., ambulance squads, physician offices, visiting nurses, police and fire departments). If so, who is educating those generators about what is acceptable to place in the containers?
• Does your facility accept regulated medical waste from physician offices? Do you charge them for disposal? Are you educating them about what is acceptable for disposal? (Some facilities do this as a perk for physicians.)

Audit your system
Who audits your RMW system? How often it done?
How are the results communicated to staff?
Developing an RMW Management Plan

When developing a plan to manage RMW, the following need to be incorporated:

✓ Regular audits—a survey of the system either monthly, weekly, or on some regular schedule

✓ Monthly evaluation of waste-disposal bills—correlate waste volume to census data, # of surgical procedures, # of outpatient procedures

✓ A clear policy defining regulated medical waste—one in which infection control, risk management, etc. sign off on

✓ Consistent waste-collection containers and signage

✓ Concise worker-safety policies and procedures, including PPE, guidelines to manage spills, ergonomic evaluation of containers, etc.

✓ Consistent and regular staff-education programs
Audit Guidelines

1. Audit your waste stream and focus solely on waste and waste systems.

2. Enter a department, floor or wing of facility
   Identify function of the department. Is it patient care? Diagnostic testing?
   Identify functional space within the department.

   - ☐ clean utility
   - ☐ soiled utility
   - ☐ staff lounge
   - ☐ nurses station
   - ☐ kitchen/kitchenette
   - ☐ rest rooms
   - ☐ conference rooms
   - ☐ patient care rooms
   - ☐ medication room
   - ☐ treatment room
   - ☐ waiting area/solarium
   - ☐ supply closet

   Identify areas where RMW generation occurs:
   - ☐ treatment rooms
   - ☐ medication room
   - ☐ patient rooms (some, on occasion)
   - ☐ soiled utility areas

3. Evaluate current waste-collection containers:
   - ☐ Check hand-washing sinks. They should have a solid-waste container nearby, not an RMW container.
   - ☐ Check patient rooms. A sharps container is needed in every room (exceptions—psych patients, etc.)

   Evaluate patient population and materials generated in each room. (Most wastes are solid waste).
   RMW generated in patient rooms is usually limited to sharps, bloody dressings, blood bags, lancets, etc.

   - ☐ Locate RMW collection containers to see if they are located in areas that make sense.
     Are they properly labeled? Does the public have access to them?
   - ☐ Take note of location of sharps containers. They should not be on the floor, especially in child accessible areas.
   - ☐ Take note of placement of RMW containers. They should not be not be directly beneath or next to sharps containers.
   - ☐ Container size. Select smallest possible container that will meet needs. Big containers almost invite lots of waste. Solid-waste containers should be much larger than RMW containers. (Exceptions to this would be in isolation areas, large bloody surgeries and other situations where the majority of waste may be RMW.)
     Signage should be clear and multilingual if necessary.

   There are many people who will dispose of waste at your facility who do not understand the difference between waste-collection systems. Indiscriminate disposal of wastes in the most convenient accessible container is what usually happens in patient rooms. For example, visitors do not understand what a red bag is, and may even choose it over a clear bag because its “pretty.”

   Limiting access to and size of RMW containers, will help keep visitors and family members from using RMW containers to dispose of magazines, pizza boxes, flowers and other wastes.

   - ☐ Evaluate location of containers in relationship to other items in room
   - ☐ Red-bag containers should be stand-alone and clearly marked
   - ☐ Solid-waste containers should be by hand-washing areas and publicly accessed spaces.

   Nurses, doctors, laboratory workers and other clinical staff are the ones who tend to generate real RMW. The system needs to be designed to provide convenient access for them, to meet their safety and care needs.
Nurses tend to be on the go, traveling from room to room, supply area, utility area, medication room. Some of the newer facilities have “nurse servers,” which are built-in storage-type cabinets that provide the majority of items a nurse will need to care for a particular patient, including linen, medications and supplies.

**To Conduct Your Audit**

Have an audit form available to collect consistent information from each department.

Examine all containers and their contents. This can simply be a visual inspection. There usually is no need to touch waste. If you do need to handle wastes, it is recommended that the examiner be wearing protective gear and use tongs to examine the waste. Record your findings, container by container.

Compile your findings, department by department, and make recommendations. A picture is indeed worth a thousand words. Bring along a camera and record special issues to be addressed.
Fletcher Allen Health Care: Fanny Allen Campus

Implementing a RMW Waste-Reduction Program For The OR

The Fanny Allen Hospital studied its RMW when it merged with two other institutions to form Fletcher Allen Health Care. In 1994, under their old system they were generating an average of 5,000 pounds of RMW per month. Their infectious waste policy included a provision requiring the disposal of all supplies opened on the “back table” to be disposed of in a red bag, whether or not they were used. An average surgical case would generate one full bag of solid waste and one full red bag. Changing that policy to one more in line with CDC guidelines changed the face of waste generation in the OR. Now, on average, two bags of solid waste and a partially filled red bag are generated in each procedure. On the bigger level, during the first six months of the new policy in 1995, the average red-bag waste dropped to less than 1,200 pounds per month, only 25% of what had been previously generated. This effort was spearheaded by two OR nurses, Kimberly Bullock and Sharon McConnel, with assistance from the waste specialist in Environmental Services.

The success of this project was based on good planning and a generous time line to ensure that all changes would be successful. The steps taken in the process include:

1. Identify current situation for waste management in the operating room areas (flow chart of materials flow indicating who, what, when, where)

2. Identify policy—who collects wastes, what types of waste are collected, what types of containers are in each individual OR suite, who is responsible for moving waste, what color bags are used

3. Identify goals and objectives for Fanny Allen Operating Room Waste Management

4. Discuss current situation (regarding OR waste management) in place at other campuses within the Fletcher Allen Health Care system

5. Identify a plan/program implementation

6. Establish a time line
MONTH 4

Program planning by a steering committee

Members to include:
- Infection control
- OR administrator
- Environmental Services
- OR nursing representative
- Supply distribution staff
- Facilities staff

- area of expertise
  - Policies
  - Administrative support, technical advice
  - Logistics and staging
  - Staff education & buy-in;
    champion for program
  - Logistics
  - Fire code and other issues

✓ Establish Policies and procedures

Project design
- Program logistics
- Education for staff, including nurses, doctors, support staff
- Program materials: buttons, bags, signs, educational reminders

MONTH 3

Planning

MONTH 2

Planning

MONTH 1

Initiate staff education and training programs: video, posters, memos, in-service programs

Select start date

Dry run

WEEK 2

✓ posters posted

WEEK 1

✓ Day of kick-off breakfast: Remove red bags from ORs

✓ Have red bags available as needed. Clear bags in room for trash

IMPLEMENTATION
Regulated Medical Waste

FAH Campus

Pounds of Waste

<table>
<thead>
<tr>
<th>Months</th>
<th>1993</th>
<th>1994</th>
<th>1995</th>
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<td>Jan</td>
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<td>Dec</td>
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Resources


Malloy, Michael G., Medical Waste in ’95. Waste Age Magazine, June 1995, pp. 49-62 (This article provides an overview of the medical-waste business, including some state-by-state analysis of regulations.)

Rutala, Dr. William, C. Glen Mayhall, MD. Medical Waste Position Paper. Society for Hospital Epidemiology of America, 875 Kings Highway, West Deptford, NJ 08095


Chapter 3

Managing Solid Waste

What's The Goal?

When managing solid waste, the goals are to minimize volume through source reduction, recycle as much as possible, and handle the materials safely. Managing solid waste is a task performed daily by millions of individuals in different industries and at their homes. Solid waste also is referred to as rubbish, trash, garbage, refuse, general waste and by many other terms. Managing solid waste in a health care facility is more challenging because you are simultaneously managing at least three other waste streams. The trick is to keep other wastes, such as recyclables, hazardous waste and regulated medical (or infectious waste), out of solid waste. Solid waste usually is significantly cheaper to dispose of than infectious waste. Many facilities pay from 2 to 5 cents per pound for solid-waste disposal, as opposed to 25 to 50 cents per pound for RMW. In addition, you can lower your solid-waste volumes and disposal costs 50% through aggressive recycling, composting and source reduction.

Indicators

To know where you are headed and how you will get there, you need to follow the numbers, either waste volumes (in cubic yards) or weight (in pounds or tons). It is vital to establish a baseline early on in your waste-management program so that you can understand waste-generation rates for your organization. Be sure the numbers are real. How do you get real numbers? Talk to your waste hauler and request weight slips (tare slips) from the landfill. If the landfill does not have a scale, request your hauler to use a commercial road scale periodically, before and after visiting the dump. Be sure to identify how long it took to fill the container, the size of the container, and get an accurate number for the amount of waste in the container.

Next, seek out census data and number of procedures (surgeries) conducted during that time period. You will be able to create a rough sketch of how much waste your facility generates in terms of pounds per bed per day, footnoted with the number of procedures. So many things can affect waste generation.
Do not try to obtain base line waste-generation data over a weekend, since a large percentage of your staff will not be on-site, and the number of surgical procedures is likely to be less than during weekdays.

<table>
<thead>
<tr>
<th>Date</th>
<th>day of week</th>
<th>patient census</th>
<th>number of procedures (OR)</th>
<th>Solid waste generated</th>
</tr>
</thead>
<tbody>
<tr>
<td>8/22</td>
<td>Thursday</td>
<td>456</td>
<td>73</td>
<td>5.6 tons or 11,200</td>
</tr>
<tr>
<td>8/23</td>
<td>Friday</td>
<td>443</td>
<td>69</td>
<td>pounds</td>
</tr>
</tbody>
</table>

The average census for the two days is $456 + 443$ divided by $2 = 449.5$ (round up to 450)

Divide 11,200 pounds by 450. $11,200/450 = 24$ pounds of solid waste per bed per day for the two-day period.

It is more accurate to do this calculation on a monthly basis since there can be a lot of variation in the system. To do a monthly baseline, follow this formula:

- Total solid waste generated for the month:
- Divided by 30
- $= \text{solid waste generated per day}$
- Divided by average monthly census
- Results in pounds of waste per bed per day

It is useful to have this data to track your progress. As you enhance your waste-diversion programs—through recycling, composting, reuse or other programs—you will be able to successfully track your progress and evaluate the true effectiveness of your programs.

It also is useful to keep track of recyclables (see section on recycling) so that you can calculate avoided landfill and hauling fees.
Looking for a way to track trash and recyclables? This chart was submitted by John Roberson of Grossmont Hospital in La Mesa, CA. It can be modified to list the materials recovered by your facility for recycling (e.g., glass, plastics, silver, grease, plastics)

<table>
<thead>
<tr>
<th>YEAR</th>
<th>Quarter</th>
<th>Trash in Tons</th>
<th>OCC in Tons</th>
<th>Mixed Paper in Tons</th>
<th>Commingled Recycled in</th>
<th>Total Recycled</th>
<th>Total Trash and Recycled</th>
<th>% Recycled</th>
</tr>
</thead>
<tbody>
<tr>
<td>95</td>
<td>First</td>
<td></td>
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<td>95</td>
<td>Second</td>
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<td>95</td>
<td>Third</td>
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<td>95</td>
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</tr>
<tr>
<td>96</td>
<td>First</td>
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</tr>
</tbody>
</table>

What Do The Numbers Mean?

Understanding hospital waste-generation rates can be a tricky thing. The numbers by themselves mean little. It is only when you begin to correlate the waste volumes with patient census, number of inpatient and outpatient procedures, and other events that you can understand the relationships between activity and waste generation.

Computers were supposed to make us a paperless society. Study hospital waste generation at facilities that have become computerized and you will note that a substantial amount of their waste stream is paper forms and reports generated by computers. The longer you track the data, the more you will be able to note a trend in the relationship between census, procedures and waste volumes. The higher the census, the more waste. The more procedures, the more waste. Special events—such as an employee picnic, an on-site health fair, or other extravaganza—also can cause a temporary increase in waste. Organizational mergers, which are designed to “cut the waste” in health care delivery systems, can create an initial increase in waste generation as a result of organizational name change, address change or other change that necessitates discarding stationery, envelopes, preprinted forms, business cards, informative pamphlets and other documents with outdated information. (We have heard anecdotal reports that organizations have had to spend over $100,000 to replace stationery, business cards and other forms merely as a result of an area code change instituted by the phone company.) The waste volumes that result from discarding reams of outdated material is substantial and can be costly.

Facilities that rely heavily on disposables, especially for food-service items and patient care items, will have more solid waste than facilities that have integrated reusable products into their work place.

As RMW Decreases, Solid Waste Often Increases

As more and more facilities are strengthening their waste-segregation programs and experiencing a dramatic reduction in regulated medical-waste volumes and costs, they are concurrently experiencing an increase in solid-waste generation and costs. This is an OK phenomenon to experience, and often is short-lived. As more wastes are segregated into the solid-waste stream, the opportunity to crank up recycling efforts and achieve solid-waste reduction presents itself. Common sense will tell you that it is preferable to have greater volumes of waste in a
less expensive category. You can truly optimize your system by shifting solid waste (trash) into recyclable waste (can be cash-generating). As these efforts progress, you will need to be reorganizing your collection personnel, pickup schedules, and size and placement of containers to match new generation rates in different waste streams.

Pay For What You Need, When You Need It

Be sure that waste-collection containers (compactors, roll-off containers, etc) are only picked up when needed. Do not pay for “air space” to be hauled away. Identify how many times per week waste containers are hauled away. Track this over time. As your waste volume decreases through your minimization efforts, the number of hauls should decrease. As the hauls decrease, so should the cost for hauling services. Several devices are available that can monitor container contents indicating container fullness. These include a pressure gauge or a fullness switch. The old-fashioned way is to bang on the sides of the container and listen to the sound. This is analogous to finding a stud in a wall to hang a picture. Knock on the exterior of the container as you walk along beside it. You will notice a “thug” sound where the compactor is full. The sound becomes increasingly hollow when the container is empty. This is not a sure-fire method, but it will give you a clue about how full the box is. Electronic devices to measure fullness are easily available and should be provided to you by your hauler at a minimal charge, or they can be purchased by your department and will easily pay for themselves in a few months.

Features of an Optimal Solid-Waste Management Program

\[\text{Clear bag liners}\]

Clear bags enable waste handlers to conduct a continuous “quality check” on the waste stream. Inappropriately discarded wastes will be more likely to be noticed on-site, before they leave your facility, and dealt with. Clear bags also increase the likelihood of visualizing a needle or sharp if one has been inadvertently discarded. While clear bags can serve the facility well, they may raise concerns at local landfills. Educating landfill operators is an important part of making many of these changes. You will find that landfill operators and city, county and state waste officials really have little idea of what goes into hospital waste. Educating them before “exposing” your waste in clear bags will go a long way toward having a successful program.

\[\text{Readily identifiable waste-collection containers}\]

Trash containers should be clearly designated. Some facilities opt to label solid-waste collection containers as “general trash” or solid waste. Waste-collection containers need to be placed in convenient, accessible locations. Regulated medical waste (red bag) waste-collection containers also should be distinctly labeled and strategically placed. Where different wastes (RMW, SW and Recyclables) are all generated at the same location, appropriate containers need to be placed for quick and easy access for disposal of specific wastes in appropriate containers.
✓ Consistent container placement
Have a rhyme and reason for container placement. Solid-waste collection containers beside hand-washing sinks, beside desks, in waiting-room areas, in eating areas, etc.

J Use containers appropriately
Do not use red-colored containers for solid waste. Do not use red or rose-tinted bags for solid waste.

J Ergonomically friendly containers
Evaluate solid-waste collection containers from an ergonomic perspective. Are the containers easy to service? Can the trash liners be removed without undue lifting and straining? How high is the edge of the container that the bag must be lifted above? Use your physical therapy department as internal consultants to evaluate the safety of the current containers in use. Identify containers that are unsafe and could cause potential injury. What is the average weight load of a bag of solid waste? The weight load may vary from department to department. Waste in food services can be heavy and wet. Waste in diagnostic areas is often lighter due to the composition, which includes a lot of packaging materials. Bags of recyclables tend to be much heavier than bags of trash (except for plastic wastes)

J Collect wastes on a schedule, ensuring that adequate staff are available during peak waste-generation hours. In many facilities, peak waste generation is from the hours of 8:00 am to 5:00 pm. Timing is everything! Evaluate waste-collection schedules to ensure that waste is collected internally housewide in such a manner that waste containers do not get overfull and too heavy. Too much or too little service at the wrong times can give your customer the impression that your department’s operations are unorganized and inefficient.

Solid Waste Collection Systems

Who’s On First, What’s On Second?

Determining staffing needs for waste collection can be a challenging task. It helps to first understand waste generation within your facility. What are the peak generation times? How satisfied are your customers with their waste-collection services? How would you know if they were unhappy?

• Identify hours of operation for your operating room/surgical services department.
  When are surgeries scheduled? When do the last cases of the day tend to “break”?
• What are the hours of operation for the food-service areas?
• What are the hours when the bulk of the administrative staff are on-site?
• When is environmental services scheduled to do routine cleanings of rooms?
• When are the scheduled unit-based waste-collection times?
- When does shipping and receiving uncrate the bulk of incoming supplies?
- When are deliveries made to the different areas, such as CSR, Cardiac Cath Lab, Food Services, Dialysis, Laboratory, and other areas that frequently receive large volumes of supplies? (These deliveries can result in lots of cardboard piling up)
- When are the most people present on-site?

**Waste Generation: Time of Day**

![Graph showing volume of waste collected from departments over a 24-hour period.]

**Volume of Waste Being Collected from Departments**

6 am 12 noon 6 pm 12 midnight

*Note: Peak waste flow times during 11 am until 4 pm. Waste volumes drop when administrative staff/day staff depart. Waste volumes drop again shortly after visiting hours end. Waste volumes remain fairly low except for areas such as critical care and surgical floors. Waste volumes remain very low on most nights, except for evenings when there are major traumas or emergency surgeries being conducted.*

To accurately determine times of peak waste generation, it will take some observation firsthand in different areas. Visiting soiled utility areas at different times of the day and talking to numerous staff members in different departments will help to identify peak waste-generation times. You may need to contact Human Resources to get a sense of schedules and estimate the times when the bulk of employees are present on-site.

Once you determine peak waste-generation times, adjust your staff schedules to ensure that the peak times are covered with adequate staff. Using the traditional days, evenings, and night-shift hours to staff the waste-management function may not be in the best interest of your organization. The daytime hours are the busiest. Competition for elevator access, dock access or access to other needed resources can be fierce during the daytime hours, when meals are being delivered, laundry is being delivered, patients are being transported to and from surgery, tests, and therapies.
Use this tool as a data-gathering instrument to help determine peak waste-generation times.

**Peak Waste-Generation Time Identification Tool**

<table>
<thead>
<tr>
<th>Department</th>
<th>Site</th>
<th>Peak waste generation times</th>
<th>Does current collection system work?</th>
<th>Is there enough space to store the waste until it is collected?</th>
<th>Is the current collection schedule adequate?</th>
<th>When are wastes collected?</th>
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Internal Transportation of Wastes

Moving tons of waste material through a health care facility can be very time consuming. In an optimal system, the goal is to utilize the largest container for moving waste in-house that is safe for the workers. An optimal system will provide for the efficient collection of solid wastes in an aesthetically pleasing manner.

Other items to consider include:

✓ Will the container fit into elevators?
✓ Will the container fit into utility areas?
✓ Will the container be able to be safely dumped into the compactor or other waste-collection container?
✓ What will the effect of the container be on floor finishes?
✓ Will the container be required to traverse carpeted areas?
✓ What will the effect of the container be on walls, corners, and other areas?
✓ How easy will it be to maintain the container?
✓ How aesthetically pleasing is the container? This is especially important for containers used in patient areas.
✓ Will the container have a cover on it or not when it is in use in the hallways?
✓ What elevators will be used for transporting wastes?
✓ How much “wait time” will be spent by staff waiting to access elevators to move wastes?
✓ Is there a waste chute system? Does it work well? How often is the system down?
✓ Is there a motorized cart-collection system in place that automatically transports wastes to a designated area? If so, is it efficient?
✓ Evaluate ramp and dock areas. Are there smooth surfaces?
✓ Are there unit-specific compactors? If so, how are they managed?

Collection Bags

Most facilities use plastic or coated paper bags to collect solid wastes. Bags serve to containerize the waste materials and minimize exposure for waste handlers. Clear bags provide the opportunity for continuous quality inspection of waste materials.

Schedules and Routes

In the ideal system, wastes are collected on a routine schedule basis. The schedule accommodates waste-collection spaces, lifting restrictions, and department-specific waste-generation volumes. Scheduling waste collection keeps the customers happy, since they know that wastes will be promptly removed and not compromise the work flow or aesthetics of their area.
Scheduling waste collection averts additional calls for waste pick-up or requests through a PARS or other computerized work-order request system. It indicates to the customer that their needs are anticipated and accounted for.

Designing waste-collection routes is another tool to maximize efficiency of waste collection. Identifying each department, access to elevators (vertical lift) and creating a schedule of pick-ups ensures that waste will be collected from all areas efficiently. Individuals may differ in their perception of the most efficient collection route. Waste routes can be designed around collecting wastes from a particular wing, or collecting wastes per floor, etc. The optimal collection route will be determined by assessing your individual facility and tracing out the most efficient route. Perhaps the route will include collecting wastes from multiple wings that are on a single floor, and then descending to the subsequent levels. The access to the external solid-waste collection container also must be factored in.

✔ How are wastes collected within your facility?

✔ Is there a route or are wastes randomly collected?

✔ Which group of staff collect wastes? Is it the housekeepers, the maintenance staff or others?

Be Prepared: Plan B

An ideal waste-management program has a contingency plan in place that outlines solid waste management under emergency conditions. Emergency can be defined as any major event that disrupts the day-to-day operations. Examples of emergencies include power failures, vendor failure, sudden increase in waste generation, holidays when landfill is closed, natural disaster, etc.

Contingency planning is essential for all waste-management programs. A hospital cannot function if wastes are piling up on the premises.

*How will wastes be managed in crisis situations at your facility?*

Documentation

The ideal system includes a method for tracking solid-waste volumes on a regular basis. This includes weight/volume records from your solid waste hauler. Costs for hauling, container rental, and disposal fees should be specified. Only with complete and accurate records can you do real planning and budget forecasting for future waste management. In addition, it will be difficult to measure the effectiveness of your other waste reduction and recycling efforts if you do not maintain a baseline of solid waste.

*What Are You Paying For? Who Sets the Pricing?*

It is advisable to learn about how fees are set for solid waste disposal. Where is your waste ultimately disposed of, in a landfill or an incinerator? How are the fee structures set? Does the county set the fees, or is it a privately operated landfill? What are the fees? Is the charge per yard or per ton? Are there on-site scales available to do Tare weights on your waste-collection container?
Keeping Your Waste Management Area Clean

Sample Trash Dock Guidelines

- Keep dock clean and free of debris. Sweep daily and more often if needed.

- Keep area outside dock around and between compactors clean and free of debris. Sweep daily and more often if needed.

- Use personal protective equipment when handling wastes. Keep supply of gloves in glove holder in the dock area.

- Complete data forms for compactors. This information is used to verify billing.

- Report equipment failures, safety hazards or other structural problems to Environmental Services Office immediately upon detecting them. Communicate verbally to a supervisor and/or leave a written note.

- Do not loan out Environmental Services Waste handling equipment to contractors on-site. Refer them to Facilities Management if they require a container. We have exactly enough containers for our function. Loaning out equipment compromises our systems functioning.

- Do not allow ANYONE to smoke in the area of the trash dock. Please refer them to the designated smoking area. Report offenders to Environmental Services office.

- Keep doorways and walkways open and free. Do not store gondolas or toters in those areas. This is a fire code requirement.

- Unauthorized personnel do not belong on the trash dock area. Anyone not directly involved in waste management should be requested to leave. The trash dock is not a hangout area or break area.
Chapter 4

Managing Recyclable Wastes

Refer to An Ounce of Prevention (OOP) for a full guide to recycling in health care facilities. OOP was written to optimize recycling in health care facilities, describing recycling options area-by-area, department-by-department and material-by-material. The book was written to address the concerns and issues specific to health care facilities, covering confidentiality, fire code, and overcoming the perception of hospital waste as “contaminated” material. The text is full of stories from real hospitals struggling to implement and sustain recycling programs.

What’s the Goal?

The goal of any recycling program is to divert as much waste material as possible from landfills and incinerators, and return valuable resources into circulation in the economy. Recycling also can save a hospital money through avoided landfill and hauling and other disposal-related costs. Many recyclable materials can generate revenues of their own. In some cases, the recycling markets are better now than they have been in years, and the costs of recycling have declined and in some cases become “cost-positive,” bringing in income from the sale of materials!

What Does an Optimal Recycling System Look Like?

An optimal recycling program safely diverts the maximum amounts of wastes from landfills and incinerators. The optimal system is easy to use for the customers, ergonomically correct for waste handlers, labeled appropriately, and has internal controls and feedback loops inherent in its design to provide feedback to waste generators. The system will have a good working relationship with the recycling vendor who will collect and market the materials from the hospital. The vendor will be interested in growing the relationship with the hospital and will educate itself with the working of the hospital and the nature of hospital wastes.
Every pound of waste recycled is one less pound of waste to be incinerated or land-filled.
Every pound of waste recycled contributes in some way to resource conservation. Sure, recycling takes energy to accomplish, however, in most cases the net benefit is desirable.

**Indicators**

As with the other waste streams discussed, follow the numbers. Request quantitative data on recyclable waste volumes. If you are able to decrease the number of hauls for solid waste, that is usually a positive indicator that your recycling efforts are paying off. As solid-waste decreases in response to the growth of recycling programs, you will need to build in shifting FTE’s to collect and manage recyclables, storage for recyclables (they take up more room than solid waste), less hauls for solid waste and more pickups for recycling.

**Regulatory Compliance and Cost Incentives**

Thirty-seven states have waste reduction and recycling legislation on the books. Many communities in those states have adopted mandatory recycling ordinances for households and businesses. Hospitals are not exempt from business or commercial recycling ordinances. No one knows exactly how many localities have mandated recycling for the business and commercial sectors. Hospitals located in communities with mandatory recycling need to develop recycling programs to comply with local ordinances, and at the same time often will receive financial benefits in the form of cost reductions on solid-waste disposal. In many cases, they may experience a decrease in regulated medical-waste disposal as well, since many items that may have been indiscriminately discarded as RMW are now being intentionally disposed of as a recyclable material.

Many recyclable wastes are marketable commodities. Some regional markets are better than others. In any case, hospitals generate substantial, consistent volumes of such recyclable items as paper, corrugated cardboard, newspaper, aluminum cans, steel cans and glass. They also generate other recyclables that can have a market value, such as grease, silver, pallets, toner cartridges, tyvek suits and precious metals. Individual departments at many hospitals may have been receiving income for collected materials for years (e.g., silver recovery in radiology, or collection of aluminum cans by food service). If you are going to increase your recycling to the point that your department may generate income from the sale of these materials, you need to set up a system to receive that income. One hospital didn’t realize it was going to get paid for its paper and received a $5,000 check in accounts receivable. Accounting didn’t know what to do about it and it took a while to sort out where the money would go. Income from recycling should not be considered reliable as the recycling materials markets vary greatly. Having plans for using the income to enhance your recycling effort, buy new equipment, underwrite more costly waste-reduction programs (e.g., recycling of batteries or florescent tubes), or rewarding employees with special events, should be thought out ahead of time. And it is also advisable to notify your accounting department of what to expect so they don’t allocate it to something else.

In some states, certain wastes may be classified as a regulated medical waste or a hazardous waste that in other states are recyclable without special handling. IV bags, florescent tubes and batteries are cases in point. However, in some states where these materials are considered special wastes it is sometimes
possible to use recycling as a disposal option at a much lower cost. If the materials are collected and segregated for recycling, the state authority will suspend special handling requirements. Contact your state environmental agency for information on special materials.

How to Maximize Your Facility’s Recyclable Waste Stream?

Pay close attention to what is in the solid-waste stream. It is full of more opportunities waiting to happen. In An Ounce of Prevention, we encourage facilities to go after the biggest volume materials first, such as paper, cardboard, aluminum cans, steel cans and glass. In this text, we hope to encourage facilities that already have established recycling programs to consider recycling other materials, and consider expanding recycling into clinical areas.

80/20 Rule

Be sure that you have recovery programs in place for the 20% of materials responsible for 80% of your hospital’s solid-waste volume. These items include cardboard, paper, steel, aluminum, glass, and construction and demolition wastes.

“Gourmet” Recycling is Graduate School

Although there is a lot of “gourmet” recycling to do (high visibility, “free” offers from vendors, demands from staff), the need is to establish base recycling efforts first to divert 80% of the material in the most cost-effective manner. Once the basic material recovery programs are firmly established, advance to the smaller volume, “gourmet” recycling programs, such as toner cartridges, tyvek suits, tyvek materials, pulse oximeters, exotic plastics, grease, food waste, circuit boards, carpets, and other materials. These programs all are wonderful additions to a strong baseline recycling program, but do not constitute maximized recycling on their own.

Educate

Staff education for recycling is a never-ending task. New staff continually enter the organization through regular staff turnover, volunteers, students, etc. Mergers, acquisitions and consolidations also mean more staffing changes. Recycling programs change, either expanding or shrinking in scope of materials available to recover. Staff benefit from ongoing reinforcers and reminders about recycling. You will need buy-in from employees: If you have 1000 employees, you’ll need 1000 recyclers. Staff buy-in to the program is essential for success. There always will be folks not interested or too lazy to participate. Cultivating champions for the recycling cause in each department can have a very positive effect on the overall programs.

Segregate

Emphasis on segregation of all wastes is the key to successful waste-management programs. Quality segregation will reduce red-bag waste and increase
Barnert, Hospital, Paterson, NJ

New Jersey hospitals were challenged to recycle 40% of their wastes by 1995. Barnert Hospital, a 282-bed community hospital, formed a Waste Reduction Committee and, interestingly enough, named the hospital’s senior buyer in the Purchasing Department as team leader. The first task that the team took on was a thorough evaluation of the waste streams and current wastecollection system. In setting up their recycling program, they met with several area recycling vendors to evaluate different systems. They opted for a commingled collection system for convenience and ease of staff education. The two-container system collected glass, plastic and aluminum cans in one container and mixed papers in another. The mixed-paper category included magazines, newspaper, colored paper and computer paper. In this way, the hospital system was similar to many household collection systems. Areas generating high volumes of computer paper were issued a separate container to keep the computer paper isolated as the recycler offered a higher rebate on the material. Employees were issued their own containers for mixed items (glass, plastic, cans) and mixed paper. The program began in April 1995, recycling 11 tons of material in the first month. In May, the amount rose to over 14 tons. The hospital negotiated with the recycler to get the internal collection receptacles at no initial charge. The recycler would retain the hospital’s rebate on materials until the cost of the containers was recouped. This allowed the hospital to start recycling in a big way without a capital investment. They have gone on to evaluate reusable and disposable products that contribute to the waste stream. Their most recent accomplishment has been to switch to reusable underpads for patient beds, which removed over 22,000 pounds of waste per year from the waste stream and saved the hospital over $70,000. recyclable wastes. Teaching people the value of taking a split second to think before they throw wastes away is an effort that pays off almost immediately.

Recycle Plastics!

Hospital waste streams consist of between 18-33% plastic wastes. In some departments within the facility, plastics make up over 60% of the waste stream. Plastic recycling is a little more complicated than other materials because there are so many different types of plastics. In most cases, the materials must be segregated by resin type. Some haulers are willing to take plastics, glass and cans in a mixed together (commingled) waste stream. Plastics materials easily can be collected from clinical areas via simple segregation systems.

- High-density polyethylene #2 (milk jugs, dialysis bottles) and Polypropylene #5 (solution bottles) are often the dominant recoverable plastic resins in a health care facility.
- Facilities using polystyrene, #5, food service ware may opt to recycle that plastic as well.
- Other commonly found plastics include Polyethylene terphalate (#1) found in bottles and packaging.
- #3 PVC plastic, which is found in many IV bags, and other products,
- Low-density polyethylene #4, which is what trash bags are made from, and
- LLDPE #4 (stretch wrap).

For technical assistance on recycling plastics from health care facilities, contact the American Plastics Council (APC) at (800) 2-help-90 and ask for a copy of the hospital plastics recycling feasibility study. APC also can supply you with lists of the nearest processors (markets) for materials. It maintains a large database of processors and recyclers, and can print out information specific to your area.

Never Say Never: Work With Your Recycling Hauler

Continue to challenge your hauler to help you meet ever increasing waste reduction and recycling goals. If your hauler is not able to offer recycling services for a particular material, push them to try harder. The markets are out there. You may be successful in identifying markets for materials through working with a particular supply vendor or by contacting your state recycling association or one of the industry trade associations, such as the American Plastics Council. Make the commitment to become relentless and persistent. In time, your efforts will pay off.

Bench Mark Other Large Businesses With Diverse Waste Streams

Visit other large businesses in your community or region with diverse waste streams. These may be manufacturing companies, hotels, universities or other large waste generators. Learn from their efforts. Ask lots of questions, they may have solved some problems you haven’t even thought of yet.
Communicate and Network With Other Hospitals

Sometimes your best resource can be from within the health care industry. Contact other hospitals. Contact your state hospital association; several have defined programs in place to assist with waste reduction and recycling initiatives. Hospital associations that have published guide books, newsletters and provided workshops on the topics include: Indiana, Colorado, New Jersey, Vermont and Minnesota. Many group-purchasing organizations also have put together programs, booklets, or technical-assistance articles on waste management. Utilize the professional network within the ASHES organization.

Another newly formed organization whose sole purpose is to highlight the problems of medical waste is the Healthcare Resource Conservation Coalition (HRCC). HRCC is a group of hospitals and health care supply companies that meet annually to share information. The group puts out a newsletter that periodically updates its membership on recycling and waste-reduction activities. For information on HRCC, contact Co-chair Lori Gettlefinger at 615-851-6507.

Outside Sources of Support

Waste Vendors

Contact your current waste hauler and request their assistance with recycling. Waste haulers often are able to provide resources for you to achieve your goals, or can refer you to folks who can assist you. It is in their best interest to assist you in reaching your goals.

Product Vendors

Companies that sell such items as bags, trash cans and other nonmedical products often will be able to provide you with technical assistance for recycling. They may have other clients similar to your facility that are successfully recycling various materials. They may be able to assist you through setting up networking opportunities.

Working With Health Care Supply Vendors

Work with your health care supply vendors for additional assistance with waste reduction and recycling efforts. Many suppliers are offering value-added services, such as waste assessments, technical assistance, booklets, guidelines, and specific information on their products and packaging, which facilitates recycling.

State and Local Waste Agencies

Working closely with your local waste authorities can have many benefits. By contacting them, you are demonstrating that your organization cares about waste and is interested in recycling more items. Second; local and state agency staff will have access to information about what companies are recycling specific materials. They also may know of other companies in neighboring states that can service your needs.

Sample Industry recycling and remanufacturing programs:

- Nellcor
  Offers recycling of Pulse oximeter probes.
  Call 800-NELLCOR for information

- Miller Precision Enterprises
  MPE has a well-documented program for retrieving Tyvek protective suits from industry and hospitals. MPE will provide mailing kits, and pay hospitals for recovered suits. Call (219) 865-3322 for more information.
Trade Associations

Some industry trade associations provide good general assistance that can benefit your program. For example:

American Plastics Council (APC) (Phone: 800-2-HELP-90)
1275 K Street, NW, Suite 400
Washington, DC 20005

APC has proved to be a helpful resource for solving problems in recycling plastics. The council has worked extensively with both hospitals and the health care supply industry. In 1994, the council published a Hospital Plastics Characterization and Recycling Feasibility Study, which is full of useful information. They also have provided seed funding for several pilot programs in the private sector to develop a plastics-recycling infrastructure for hospitals.

National Office Paper Recycling Project (NOPRP) (Phone: 202-223-3088)
U.S. Conference of Mayors
1620 Eye Street, NW, 6th Floor
Washington, DC 20006

NOPRP is a not-for-profit, public/private partnership working to maximize office-paper recycling. The partnership provides an excellent support packet for setting up paper-recycling efforts and other good information.

Steel Recycling Institute (SRI) (Phone: 800-876-SCRI)
Foster Plaza X
680 Andersen Drive
Pittsburgh, PA 15220

SRI has provided excellent technical support for hospitals working to recycle steel cans. From technical assistance with equipment and markets, to promotional materials, to case studies, the institute has an excellent service department, with regional offices nationwide. Be sure to ask about renting ROSCOE, a 6-foot-tall steel can costume.

Portable Rechargeable Battery Association (PRBA) (404-612-8826)
1000 Parkwood Circle, Suite 430
Atlanta, GA 30339

PRBA works with institutions and associations to establish efficient and safe collection programs for small rechargeable nickel-cadmium batteries. The association has developed a recycling manual, and provides assistance on collection systems and markets.

National Electrical Manufacturers Association (NEMA) (202-457-8424)
2101 L Street, NW
Washington, DC 20037

NEMA supplies technical and program assistance in collecting batteries for recycling and proper disposal.
Chapter 5

Source Reduction

Source reduction means essentially using less stuff and creating less waste, or simply put, to not create waste in the first place. Source reduction can be accomplished by true elimination of a product, or substitution of a currently used product for a new product that produces relatively less or no waste. Source reduction differs from recycling. With recycling, a waste is created, collected, processed and made into something new. With reuse, a product is used over and over, rather than using a disposable item, or a product is reused in another setting. With source reduction, waste is significantly decreased or completely eliminated.

Source-reduction opportunities for hospitals abound, both in clinical and nonclinical settings. They can be realized, however, only through building a “waste consciousness” at the institution and, in many cases, changing individual behavior. For managers who worked to implement energy-conservation programs at their institutions, this process will be familiar.

Health Care Supply Companies

Getting to the “source” of waste in most cases will mean going back to the manufacturer or supplier. Many of the choices in packaging or nature of equipment or devices are made outside the hospital setting. They are designed for use without taking into consideration waste disposal. Many manufacturers of health care products have identified a number of ways to reduce waste before it gets to the hospital without sacrificing product quality or integrity. These suppliers often are practicing waste reduction unbeknownst to hospitals. How are they doing it? They are minimizing the layers of packaging — using thinner materials, redesigning packaging, using more flexible packaging and, in some cases, eliminating packaging altogether.

For some companies, these efforts have reduced manufacturing costs while simultaneously helping reduce hospitals’ waste costs. Many of these actions have been stimulated by hospitals questioning the need for certain packaging or requesting assistance in waste reduction. Ask your suppliers what they are doing. Many of them have put together pamphlets or fact sheets on their source-reduction initiatives.
Shore Memorial Hospital, Somers Point, NJ

Debbie Hooper, Director of Materials Management, reports that Shore Memorial recently went to a hotel-type vinyl portfolio patient information book. The information in the patient information book includes patients' rights and responsibilities, information on using the telephones, hospital services, accommodations, going home, etc. Using the hotel-type portfolio will prevent the wastefulness of printing thousands of patient guides, which will end up as trash. It also enables the hospital to keep current information in the patient booklets fairly simply. Instead of printing thousands of patient books, they merely need to print enough new information sheets to post in the portfolios in each room. The information easily can be changed out as needed.

Shore Memorial also decided to institute a program to refurbish rather than buy new furniture or patient-room equipment whenever possible. Office and waiting room furniture was often structurally sound, but it looked worn. The same was true of clinical area equipment, such as exam tables, dialysis chairs and stretchers. Shore Memorial searched out a company, which for only 40% of the cost of buying new furniture, was able to refurbish existing furniture, making it look like new and giving it a second life equivalent to new.

CONEG

What is CONEG? It stands for the Coalition of Northeastern Governors. The group gets together to collectively address regional concerns. Waste is a big concern of the region, so CONEG issued a voluntary packaging reduction challenge to industry to help with waste reduction. The response has been remarkable, and it has not been confined to the Northeastern United States. More than 43 companies have responded with substantive measures. Each company completes a standardized reporting form. Each year CONEG publishes a report of industry progress. Health care companies such as Baxter, Johnson and Johnson, and Bristol Myers Squibb Company are listed in the booklet. It may serve your facility well from a waste minimization perspective to seek out suppliers with active reduction programs. To obtain more information on CONEG, call (202) 624-8450. Ask your supplier if they have met the CONEG challenge. If not, why not? If so, ask for specifics on what they have done, what more they are doing, and how it affects the products you buy.

Front Door Management

Waste management begins at the front door. It begins with each product procured, with administrative support, with strong leadership. Waste-management programs that only are focused at the back door—on collecting items—are called end-of-the-pipe management programs. Using proactive thinking, astute managers can work with their purchasing agents and material managers to develop an eye for waste minimization. The minimization ethic can permeate all contracts, be they for purchasing a medication or intravenous fluid or for renovating a building. Integrating waste prevention into all aspects of the organization, so it is part of the planning process and not an afterthought, will benefit the organization in many ways.

Waste Management as Product Management

Albany Medical Center (AMC) in Albany, NY, has developed a model titled “The product-oriented model for managing the patient care waste stream.” Claude Rounds, Vice President of Plant Management, has been instrumental in the support and development of this program. The program includes a thorough assessment of medical and surgical products used at the facility to identify, classify and evaluate the waste characteristics of the product and its packaging. Rather than wait until waste is generated as it is used, AMC staff conduct audits reviewing supplies as they come into the institution’s warehouse. Here they identify what companies are doing to reduce waste. How many layers of shipping packaging are used? Is a supplier using returnable totes? Are pallets standard size for easy return or reuse? What kind of packaging does each type of product come in? Armed with this knowledge, AMC staff continue their product audits on the floors, reviewing products in storage and in actual use. They monitor how each layer of packaging is shed and where. They review how staff dispose of packaging and are able to interview staff on the spot to solicit ideas for segregation or reduction. AMC staff then takes this information back to its “Cure Waste” committee for consideration in future efforts,
and works closely with its suppliers to provide feedback on product and packaging. By being proactive and persistent, AMC has been able to get suppliers to make a number of changes that have reduced waste coming into their facility.

The Role of Environmental Services in Waste Prevention: The Internal Consultant

Environmental services managers can keep track of waste generation and waste costs and provide that information as feedback to purchasing or material management. This can be especially useful information when calculating the true cost of using a particular product. Some products create excessive amounts of waste because of their packaging or the nature of the product (disposable).

Environmental Services staff can guide and assist purchasing to work collaboratively with suppliers to reduce waste. This can be done effectively by identifying products that generate large amounts of waste. Environmental services staff often has the most familiarity with components of the waste stream, since they are continually exposed to it.

Environmental Services staff can actively support recycling and waste-collection programs, whether internally designed or offered by different vendors. This means shifting staff duties from garbage collection to collecting recyclables/reusables. Environmental Services managers have the opportunity to be environmental watchdogs for their organizations. Specifically, you can educate your staff to understand what are acceptable wastes for disposal as solid, regulated and hazardous waste. Your staff can divert the occasional improperly discarded materials from the solid-waste stream into the appropriate waste stream (if you use clear bags for solid-waste disposal). This can save your organization fines and much public embarrassment. Environmental Services also can develop collection systems and provide staffing to recover such materials as mercury waste, florescent fixtures, batteries and other potentially hazardous materials generated within the facility.

Every Cause Needs a Champion

Waste reduction needs a champion. Who better to serve this role than the individual responsible for paying for waste disposal. It is in the Environmental Services Manager’s best interest to contain costs associated with waste disposal. Educating staff and other department leaders about waste issues will serve the organization well.

Talking to Supply Vendors

Environmental Services departments, which often pay the tab on waste, are in a good position to talk to supply vendors and present “show me” kind of evidence related to products and packaging. In an instant, you can quote your
annual costs for the various waste streams and express your keen desire to see those costs reduced. The supply vendors are in many ways directly responsible for the majority of the waste you have to deal with. It was their “gift” to you as part of the packaging for the health care products your organization uses daily in the process of care. As the competitive market for supplies continues to heat up, suppliers will have to distinguish themselves in ways other than the lowest price. Working cooperatively with their customers to reduce wastes is one way that vendors can provide added benefits to hospitals other than their specific product. Engaging these vendors will be most effective when done in partnership between Environmental Services and Purchasing.

In the future, many supplies most likely will be delivered in some type of reusable shipping container, but that will only occur if health care organizations consistently push for that agenda. This will be a dramatic and important change in managing wastes at our institutions. Cardboard shipping containers account for a very large portion of the waste stream, and create dust and clutter on the floors when used to transport supplies within the facility. They also require a great deal of labor to manage, move and dispose of. Even in times of good recycling markets—like the present when hospitals should not be charged for disposing of cardboard and in many cases should be paid for it, there is still the cost of managing this waste.

**Supply Wastes**

Each day hospitals across the country routinely discard unused medical supplies. Sometimes this happens due to products outdating, other times because items are requested for a procedure, opened and then not used. Sometimes items fall on the floor, rendering them “contaminated” and not suitable for use. In many clinical areas, these items end up in red bags, at a very high cost of disposal for a clean, never-used item. Disposing of unused supplies adds to the cost of waste disposal. This does not have to be the case. It is possible to develop a hospital-wide program to recover unused supplies destined for the landfill or incinerator. The collected supplies can be diverted locally for teaching and demonstration-only purposes at area nursing schools, medical schools, med-tech training programs, respiratory training programs, and EMT training programs. These educational programs generally have limited budgets for supplies and are overjoyed at having access to real supplies that are actually used in hospitals. In addition, animal shelters, local veterinarians and zoos often can make use of supplies that can no longer be used in hospitals, but are fine for animals.

Another possibility is to collect some of the items for use overseas in the developing world. Dr. Will Rosenblatt, of Yale University, has developed a unique and safe program for the collection, decontamination and distribution of such materials in the developing world. He has tested this program at Yale-New Haven Medical Center to determine its impact on hospital budgets and operations.
REMEDY: Recovered Medical Equipment for the Developing World

by Dr. Will Rosenblatt

(thefollowing is a summary of the free REMEDY in-service teaching package, available from REMEDY, Inc. (A not-for-profit organization) TMP-3, 333 Cedar Street, New Haven, CT 06510, (203) 785-2802.

Each year, more than $200,000,000 worth of unused surgical supplies are discarded in operating rooms throughout the United States—often directly from the O.R. scrub table, and typically mistakenly given the label of “regulated” medical waste, thereby posing excessive cost to the hospital. Therefore, a “double cost” to the hospital is created: the commercial loss of these unused supplies and the excessive expense of regulated medical-waste disposal.

These materials, which are discarded because they are prepared for surgery and not used, have the potential of fulfilling the desperate need for medical supplies in the developing world. The critical shortages of medical supplies in many impoverished nations limit the provision of basic health care and may be as demoralizing to physicians and nurses as is their huge workload. In the medical care facilities of the developing world, improvisation and reuse are not the exception, but often the rule for many basic supplies. Items such as foley catheters are rewashed and hung out to dry for reuse; surgical gloves may be resterilized, or if damaged, fashioned into surgical drains. Because some hospitals can not afford to maintain stocks of supplies, patients often are required to arrive at the hospital with pre-purchased sutures, bandages and other items required for their own operations. This is even true for emergency room visits.

The lack of essentials in the developing world is in marked contrast to the typical abundance at home, which tends to result in the discarding of supplies as noted above. Not only are our stock rooms well-inventoried, with a seemingly endless supply of the most state-of-the-art equipment, but because of a sense of immediacy in the interest of optimal surgical management and protection from litigation, more than the requisite supplies typically are opened for a given operation, and then discarded. Although collection and donation of such supplies has been practiced by individual health care workers for many years, such efforts may be erratic and possibly place the individual or institution at legal risk. A widespread, standardized means of material recovery could more effectively address the need for supplies in the developing world.

In an effort to address these issues, REMEDY was created. It consists of a dedicated group of volunteers at the Yale University School of medicine, working in cooperation with the staff of the Yale-New Haven Hospital. A simple, safe and efficient method has been developed for the recovery of gloves, syringes, sutures and many other surgical supplies remaining on the surgical scrub table at the end of a procedure.

The REMEDY recovery method begins when a “case cart” is being prepared for an operative procedure. A bag for collection of recovered materials is included among the other routine supplies. After an operation, the scrub nurse
reviews the scrub table for items whose sterile packaging has been violated—but which have not been used in the surgical procedure for noticeable contamination. Materials with exposed sharps or any visible evidence of contamination or damage are discarded. Items that may have been accidentally contaminated by other reasons than potential contact with the patient (e.g., falling to the floor) can also be recovered, and placed in the REMEDY bag. Immediately following the procedure, the bag is placed with the contaminated surgical instruments, and the case cart is removed to the operating room decontamination area. From this point, until decontamination is complete, the bag is treated as regulated medical waste. It is removed by the hospital personnel handling the contaminated instrument. The bags are placed in clearly marked bins in the decontamination area.

Two or three times each week, the bags are emptied by a designated individual who inspects for unsuitable materials; for example, accidentally recovered open sutures and soiled sponges. This person wears gloves and gowns, taken from the recovered inventory, and never reaches into a bag, but rather “dumps” the container on to an inspection area. Since there is evidence that gas sterilization may damage them, sutures and bottles of solution are separated and will be soaked later in a germicidal soap bath, and allowed to air dry.

The other recovered materials undergo ethylene-oxide sterilization, and aeration. This sterilization protocol is identical to that used for reusable materials at Yale-New Haven Hospital. REMEDY recovered material is processed only when there is surplus space on a sterilization load, thereby incurring no extra cost to the hospital.

It should be noted that standards have not been set for resterilization of single-use items. REMEDY feels that these precautions are necessary to ensure safety during handling in the remote chance that the recovered materials have been contaminated.

After decontamination, all items are again inspected for obvious defects and sorted by trained personnel. In our hospital, this task requires 1 to 2 hours of volunteer work each week. In general, we sort one item per box and the boxes are marked to denote the specific contents. The charitable organizations that we have spoken with express dismay over receiving unmarked and unsorted boxes of material. In this situation, this life-saving material may become a burden, and is often discarded or pushed into the back corner of a storeroom. When full, the boxes are weighed and inventoried on our computer database. Each recovery group is encouraged to maintain such an inventory. (Computer and hard-copy inventory systems are available free of charge from REMEDY.)

More than $800,000 worth of usable supplies were recovered at Yale-New Haven in REMEDY’s first three years of operation! But what did this effort cost? For our hospital, which performs approximately 12,000 procedures a year, the program costs only a little over $200 per year. That’s over a 100,000% return on our cash investment! The real value is absolutely incalculable because much of this lifesaving material would otherwise be unavailable in parts of the developing world.
Recovery has become part of the daily routine in the operating room, and has fostered a sense of pride and cooperative achievement among the various staff. A survey of operating room nurses and technicians has revealed that no significant effort or time is added to the work day.

Even more materials are recoverable. In addition to the daily collections, the nursing staff and supply managers periodically review the operating room inventory for items no longer used because of changes in surgical techniques or expiration. These collections generated an additional $611,000 worth of material.

In addition, the REMEDY program also has identified areas of unnecessary waste and reduced red-bag disposal at the hospital by 5 tons. Since this “regulated waste” would require special handling, the savings to the hospital is over six times greater than the minor costs of the program. Several nurses also reported that they use the program as a teaching tool when instructing students on efficient procedures and universal precautions.

In order to investigate the potential of REMEDY to identify the commercial loss of supplies in the OR, an impact study was undertaken during two three-month periods in 1992 and 1994. Case-by-case assessments of recovered materials were undertaken. Between the two study periods, cost-efficiency protocols were implemented in the OR. These included: 1) exposure of the OR nurse and technician to case-specific recovered items, with an emphasis on which materials were prepared in excess in the OR; 2) stocking of in-OR supplies in a standardized fashion familiar to all personnel, so that needed materials could be found; avoided excessive over-preparedness; 3) updating and computerization of pick lists; 4) implementation of a computerized OR scheduling system, which allowed more efficient tracking of room changes and canceled cases before materials were opened; 5) examination and reeducation based upon AORN standards of event-related sterility. With voluntary compliance with the program, a 27% savings was realized between the 1992 and 1994 studies. A significant reduction in the discarding of staplers, sutures and gloves accounted for most of this reduction.

A start-up recovery program will begin to recover boxes of material in a short time, and nothing is liable to bring a program to a dead halt faster than the lack of storage space. Identifying a legitimate charity should therefore be one of the first tasks of a hospital recovery program group, which should investigate local university, religious and other groups that have the experience and facilities to transport materials to the developing world. Available from REMEDY is a list of nearly 300 charities involved in international medical relief aid.

**Guidelines for Collecting Unused Supplies**

Any facility can begin a collection program for unused supplies. The REMEDY program is one example of how to do it. Other facilities have collection boxes located in various departments to collect unused materials. Be sure to get your facilities risk management and/or legal group involved to limit the liability of such programs. Infection control also should be involved to ensure that appropriate guidelines are followed.
Nursing schools and veterinarians/spay and neuter clinics can absorb a great many supplies. Utilize the local network in your area as a first line of diversion for unused supplies. Contact local nursing schools, medical schools or other allied-health educational facilities and offer them the items for their student-learning labs. Whenever you send materials out, make sure that you maintain a general catalogue of what items go where, and weigh them for your waste-diversion records. Having recipients sign for supplies, accepting them “as is” also is a good idea and should be run by Risk Management. Make sure people take only what they can use. If it ends up in the city trash, it will probably be traced back to you! Create a system for handing out materials that you can control; using hospital volunteers to catalogue and organize materials can be very effective.

**Inventory Control to Prevent Wastage**

Much unnecessary waste can be prevented by inventory control and rotating stock. Places where items often expire include crash carts, emergency carts and back of shelves. Encourage your materials management department to implement a program to minimize this type of waste.

Recovery and cataloguing unused supplies is an accurate way of examining how materials are used—and wasted—in your facility. As Yale-New Haven found, such programs can provide valuable information to Purchasing in evaluating ongoing or new product purchases.

**Reuse**

Another waste-reduction strategy that is being used more and more is reuse. It may have a familiar ring to it for those who have been in the health care field for more than 25 years. Years ago, the reuse of products and supplies was commonplace in health care. Disposables came into heavy use in the last two decades and have in many cases served the health care field well, but an overuse of some disposable supplies can be curtailed with significant waste-reduction results. A return to reusables in some situations is beginning to make sense again, and many facilities are adopting reuse as a waste and cost-reduction strategy.

Each hospital must evaluate the use of reusable clinical supplies and products. Each situation will be somewhat unique. Substantial savings from switching to reusables under certain circumstances has been achieved and documented at a number of facilities around the country. Reusable items include respiratory therapy products, underpads, gowns, dishware, mattresses with built-in egg crates, and refillable containers for cleaning products. There literally are hundreds of opportunities to be investigated.

In the chapter on ReUse in *An Ounce of Prevention*, we detail many of the opportunities that are available. Because the issues surrounding the decision to use reusables are so variable state to state and facility to facility, we can only suggest that waste-disposal costs be used as an important factor when an institution evaluates the option for reusables.
Unusual Reuse Efforts

Johnson City Medical Center in Johnson City, TN, diverts worn-out linens and towels to the local humane society for bedding in kennels, thus avoiding disposal costs and “doing good” at the same time. JCMC, in a more unusual effort, reports on their systematic reuse of trees and shrubs during a construction project. Forty-eight trees and 175 shrubs were moved and replanted. Similar soil reuse/conservation projects take place during construction projects. Topsoil from areas is removed and stockpiled for future use in areas that are to be seeded or landscaped. The soil stockpile area was seeded with wildflowers to temporarily prevent soil erosion as well as to provide the natural beauty of the flowers in bloom.

OPERATION REUSE, a Colorado hospital project, works to get sterile plastic bottles out of the waste stream and into productive reuse. A nurse at Denver’s Saint Joseph Hospital cuts off the tops and stores his small tools in these handy containers. Bottles collected for reuse by Vail Valley Medical Center not only serve to carry water for hiking and biking, but also store rice, beans, and other dry foods in kitchens. Earth Day 1995 saw bottles given away at environmental fairs by employees at Mercy Medical Center in Durango, and at Saint Joseph and University Hospitals in Denver. Kids at Englewood Recreation Center think the water bottles they get from Swedish Medical Center are “cool.” Young hikers at a day camp, who are also supplied with bottles by Swedish, agree. The Girl Scouts use more than 4,000 bottles from University Hospital a year. Arrowhead Lodge, the visitors center of the Roosevelt National Forest in Poudre Canyon, CO, has given away hundreds of bottles to unprepared hikers. Several hospitals keep a supply of empty bottles available next to their cafeterias and parking facilities for pick-up and reuse by employees and visitors. As you can see, the possibilities are endless.

AMERICA’S HOLIDAY TREE PROJECT—The state of Vermont was selected in 1994 to donate a Christmas tree for the White House lawn. The tree was accompanied by more than 6,000 ornaments fashioned from recycled materials. They were made by Vermont school children. The project was coordinated by Connie-Leach Bisson, Executive Director of the Restore, a community reuse store. Ornaments had to be able to withstand four weeks of Washington, D.C., winter weather. When Connie was looking for a source for clean plastic scrap from which to make ornaments, she contacted the Medical Center Hospital of Vermont Campus of Fletcher Allen Health Care for clean plastic-packaging waste. Lovely, durable ornaments—including angels, stars, snowflakes and icicles—were created by school children and were on display on the White House lawn for the holiday season. They were made, in many cases, from rigid and flexible packaging collected for recycling by the hospital.
Resources


Health Care Resource Conservation Coalition (HRCC)
The HRCC was established in 1994 when a group of hospital waste-management officials got together with a group of health care supply industry representatives. The group met to discuss ways to reduce medical waste. The group has had two conferences to discuss issues related to medical waste, and hopes to foster relationships between hospitals and the supply industry to reduce medical-waste generation. HRCC supported the video, No Time To Waste: Resource Conservation for Hospitals, and has put out several newsletters. For information, contact Terry Hornseth at the Mayo Hospital, Rochester, MN, (507) 284-1912.

Refer to An Ounce of Prevention for additional reuse options.
Chapter 6

Pollution Prevention Planning & Program Implementation Guidelines

In the last decade, federal and state regulations have stimulated activity at hospitals and health care organizations to develop plans to manage and, in many cases, minimize the use and disposal of hazardous wastes. Hazardous wastes are the most dangerous to handle, the most regulated, and the most costly in terms of storage, packaging and disposal. Hazardous Waste Management also requires special worker training, safety equipment and procedures, as well as considerations for greater risk and liability. Recognizing this, the Joint Commission for the Accreditation of Healthcare Organizations (JCAHO) has established new standards for Management of the Environment of Care which requires that health care organizations have a documented management plan that considers hazardous materials and wastes.

Hospitals, clinics, ambulatory care centers, long-term care facilities, and physicians offices all potentially generate hazardous wastes that require special handling and disposal. Rates of generation and quantities obviously will vary from facility to facility. There can be great variation of hazardous waste generation depending on size and mission (teaching and research hospitals will tend to be on the high generation rate side of the spectrum). All facilities, however, should take action to ensure that these materials are managed responsibly.

Responsible management of hazardous materials and wastes is a three step process:

I. Identification of established standards and regulations (federal, state, local, JCAHO) governing hazardous wastes

II. Conduct facility-wide assessment of hazardous material use and disposal practices

III. Development and implementation of a Hazardous Waste Management Plan to guide your organization in establishing and maintaining standards for safety, environmental protection and cost-containment

Planning, when done correctly, will enable any institution to address the real costs of waste management. These real costs include:

- Purchase cost of chemicals and other hazardous substances for use
- Administrative and management costs of record-keeping, regulatory reporting, employee training, emergency-response training and equipment, MSDS management, Hazard Communication Plan
- Cleanup and disposal costs for spills or other improperly handled materials
- Waste-disposal costs (on-site labor, safe and legal storage, off-site collection and disposal)
- Hospital-liability costs (cleanup, employee exposure, community image, legal fees, insurance)

Planning and implementing a plan to minimize hazardous wastes will help facilities to reduce these costs significantly, and it will potentially reap a number of other benefits, such as:

- Increase worker safety
- Decrease facility liability
- Reduce purchase costs of toxic and hazardous materials
- Reduce disposal costs
- Decrease the need for emergency-response equipment and cleanup services
- Decrease the administrative costs of properly managing these materials and their disposal

These costs can be significant, and in an era of cost-containment mandates, hazardous-waste minimization can be an easy and effective cost-reduction program.
## The Hazardous Waste Stream

Specific waste streams that any hospital or health care facility must examine in its assessment and planning process include:

<table>
<thead>
<tr>
<th>Hazardous Material</th>
<th>Point of Generation</th>
<th>Point of Use and Disposal</th>
<th>Common Disposal (common current practices found in many hospitals—NOT necessarily “best” practices)</th>
<th>Environmental Practices (examples only—see resources at the end of this section for a more comprehensive listing)</th>
</tr>
</thead>
</table>
| Chemotherapy and intineoplastic chemicals | Prepared in central clinic or pharmacy | • Patient Care areas  
• Pharmacy  
• Special Clinics | • Incineration as RMW | • Strict segregation of wastes—volume reduction  
• Purchase drug volumes according to need  
• Incinerate waste |
| Formaldehyde  
Formalin | | • Pathology  
• Autopsy  
• Dialysis  
• Embalming  
• Nursing Units | • Diluted and flushed down sanitary sewer  
• Disposal as Hazardous Waste | • Minimize use of formaldehyde solutions  
• Install Reverse Osmosis (RO) water supply equipment in dialysis  
• Recycle and Reuse waste solutions  
• Disposal of wastes as a hazardous waste |
| Photographic Chemicals | • Radiology  
• Satellite Clinics offering radiology services | • Radiology  
• Satellite Clinics offering radiology services | • Silver recovery  
• Developer and Fixer is often flushed down sanitary sewer  
• X-ray film is disposed of as solid waste | • Proper storage of chemicals to extend life  
• Extend life of fixing baths with additives  
• Use countercurrent washing  
• Recover silver |
| Solvents | • Pathology  
• Histology  
• Facilities Services  
• Embalming  
• Laboratories | • Pathology  
• Histology  
• Facilities Services  
• Embalming  
• Laboratories | • Evaporation  
• Discharged to Sanitary sewer  
• Lab packed for special handling as HW | • Material substitution for a less hazardous solvent  
• Improved Lab techniques to replace solvents  
• Recycling and Reuse of solvents  
• Use of microchemistry kits |
<table>
<thead>
<tr>
<th>Hazardous Material</th>
<th>Point of Generation</th>
<th>Point of Use and Disposal</th>
<th>Common Disposal</th>
<th>Environmental Practices</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mercury</td>
<td>Throughout all clinical areas in thermometers, blood pressure monitoring devices, cantor tubes, etc.</td>
<td>Clinical areas, Laboratories</td>
<td>Broken thermometers are often disposed in sharps containers. If no spill kits are available, mercury is often incorrectly disposed of as RMV (in sharps container; as broken thermometers) or SW</td>
<td>Eliminate mercury based equipment and tools from the hospital environment. Establish mercury collection program facility-wide; provide spill kits; staff training.</td>
</tr>
<tr>
<td>Anesthetic Gases</td>
<td>OR</td>
<td>OR</td>
<td>Waste gases are often direct vented by vacuum lines to the outside or recovered by using scavenging systems</td>
<td>Use of low-leakage equipment and efficient scavenging systems. Proper routine maintenance. Daily testing of equipment.</td>
</tr>
<tr>
<td>Ethylene Oxide</td>
<td>Central Sterile Reprocessing, Respiratory Therapy</td>
<td>Central Sterile Reprocessing, Respiratory Therapy</td>
<td>Dedicated vent to exhaust gas to the outside</td>
<td>Proper maintenance, frequent inspection. Explore new technologies (e.g., plasma sterilizers) as substitute.</td>
</tr>
<tr>
<td>Radionuclides</td>
<td>Radiation Oncology</td>
<td>Radiation Oncology</td>
<td>Storage in secure area for natural decay then disposal as SW</td>
<td>Use of less hazardous isotopes.</td>
</tr>
<tr>
<td>Disinfectingleaning Solutions</td>
<td>Hospital-wide: Environmental Services, Facilities Management, OR</td>
<td>Diagnostic Areas, OR, Environmental Services, Facilities Management</td>
<td>Disposal in sanitary sewer</td>
<td>Substitute nontoxic cleaners where appropriate. Train staff to use only proper amount of disinfecting agents.</td>
</tr>
<tr>
<td>Maintenance: Waste Oil leaning solvents, leftover Paints, spent Florescent Lamps, degreasers, paint Thinner, Gasoline</td>
<td>Maintenance</td>
<td>Maintenance</td>
<td>Special HW handling, Solid Waste</td>
<td>Recycling of many of these wastes is now viable.</td>
</tr>
</tbody>
</table>
Every facility will generate some of these materials. It is important to work with your state department of environmental protection to determine what materials and standards the state has set for hazardous waste management. In some states, infectious or regulated medical waste is classified as a hazardous waste, and therefore must be managed as a hazardous waste. Depending on what materials you generate and the quantities that are generated, you will be classified in one of three categories of hazardous waste generators. How you are categorized will determine your legal responsibility for management and disposal.

Category I

**Conditionally Exempt Small Quantity Generator (CESQG)**
- Facility generates less than 100kg (220 pounds) in any calendar month
- Facility accumulates no more than 1000kg (2200 pounds)
- Track types and amounts of each hazardous waste category generate
- Use EPA-permitted waste transporters for off-site disposal
- Ship wastes with a Uniform Hazardous Waste Manifest

Category II

**Small-Quantity Generator (SQG)**
- Facility generates between 100kg (220 pounds) and 1000kg (2200 pounds)
  in any calendar month
- Accumulates no more than 6000kg (13,200 pounds or 30 55 gal. Drums)
- Track types and amounts of each hazardous waste category generate
- Have an EPA Identification Number
- Properly label all hazardous waste containers
- Use EPA permitted waste transporters for off-site disposal
- Ship wastes with a Uniform Hazardous Waste Manifest
- Have a designated emergency-response coordinator
- Have an emergency-response procedure

Category III

**Large Quantity Generator (LQG)**
- Generates more than 1000kg (2200 pounds) in any calendar month
- Track types and amounts of each hazardous waste category generate
- Have an EPA Identification Number
- Properly label all hazardous-waste containers
- Use EPA-permitted waste transporters for off-site disposal
- Ship wastes with a Uniform Hazardous Waste Manifest
- Obtain a permit for storage longer than 90 days
- Have a designated emergency-response coordinator
- Have an emergency-response procedure
- Prepare a “Hazardous Waste Emergency Contingency Plan”
- Provide training for personnel on handling hazardous-waste emergencies
- Document training of staff

(For a full determination of your status as a hazardous-waste generator, and for a full accounting of your responsibilities, you must contact your state Division of Hazardous Waste Management. Additional responsibilities may be required,
including waste-minimization planning, fees, etc., by your state. Each state has different requirements.)

**Conducting a Hazardous Waste Minimization Assessment**

A hazardous-waste minimization assessment will identify hazardous materials purchased, used and disposed of by your organization. The assessment is the first step in developing a comprehensive minimization plan for your facility. Remember that all materials purchased for use at your facility must be disposed. However, trying to evaluate your use of hazardous materials simply by looking at various waste streams will not give you a comprehensive picture. As noted in the chart above, many wastes currently can be legally discharged into the sanitary sewer or vented into the air after their use. Other materials still can be disposed of as solid waste. Many hazardous materials might be disposed of improperly if strict standards are not enforced at a facility. Materials that are sent for off-site disposal or treatment as a hazardous waste must be manifested, so those materials will have very accurate records concerning quantity and generation rates.

Given the variable in identifying wastes at the back door, an assessment also should look at those departments and individuals that order hazardous materials for use. Both the procurement and the disposal information can be combined to generate a snapshot picture of hazardous material use and waste disposal for your facility. Collecting information on materials generated in your facility can be done either material by material or area by area. Work sheet PP1 provides a sample data-collection form that you can use. Tracking down the information on this work sheet will help you to determine the flow of materials that will need to be managed, and who is responsible for that management.

**Creating a Pollution-Prevention Plan for Toxics Use Reduction and Hazardous Waste Minimization**

**Key Components in a Plan:**

I. Scope
   A. GOAL: What will the hospital accomplish by developing the plan?
   B. WHO: Who is involved? Who will provide leadership? Who will manage the program?
   C. WHAT: What materials and what wastes will the plan address?
   D. CURRENT SITUATION: What are the current generation rates and disposal practices? (Chart PP1).
   E. COMMITMENT: A firm policy commitment from top administration that they understand that a policy on hazardous-waste reduction has been created and that the hospital is committed to following it, and reducing hazardous waste.

II. Specific Objectives
   A. BASE LINE: Creation of a base-line index—What are the current
generation rates of specific hazardous wastes and what is the percentage of hazardous-waste generation compared to the overall waste generation? This measure can be an effective way of measuring the decline of hazardous waste as an overall percentage of the waste stream as one measure of progress.

B. FINAL GOAL: Create specific goals for each hazardous-waste stream (% decrease or total elimination), and an overall goal for total system management of hazardous materials.

C. TIME LINE: Set specific dates by which individual and collective goals will be achieved, with individual benchmarks along the way.

III. Strategies for Implementation

A. ASSESSMENT Describe the means by which you will monitor and document progress toward the established goals.

B. RESOURCES: What resources (money, equipment, personnel) will be needed to accomplish the goals, and how will these resources be secured and allocated?

C. APPROACHES: Identify specific approaches (e.g., product substitution, process changes) for each material.

D. TRAINING AND EDUCATION: Specify what steps will be taken to train staff to safely handle hazardous materials and wastes, and what policies and procedures will be in place to handle emergency spills or disposal problems. What general education will be made available to all organizational staff on hazardous-substance minimization efforts? Demonstrate an ongoing commitment to education and investigation of alternatives.

E. RESPONSIBILITY Who will be responsible for implementation? What are the credentials of the person(s) in charge of managing hazardous wastes.

It is important to note that a plan is not a static document. Since procedures and materials will change over time, a plan will need constant updating to keep up with new developments and new regulations. It also is important for the planners to remember that plans do not implement themselves. Many good plans are written. All too many of them end up collecting dust on shelves. Before the planning process begins, the organization must make a full commitment to implementing the plan.

Pollution-Prevention Strategies

Waste minimization can be achieved through a variety of techniques, with some as simple as product substitution and others as complicated as a total process change requiring new training and equipment. Each material and each department will have to make a full analysis of the options and then select the best approach to meet its goals. The approach may change over time as resources are allocated, or new options become available. For example, a facility-wide procedure of rigorous segregation may be a first step, followed up by specific changes in procurement and process.
Pollution prevention focuses on Source Reduction as the preferred method. Source reduction can be accomplished by one of a number of methodologies: change in procurement practices to reduce waste, substitution of a nonhazardous or less hazardous material, process change, improving inventory control, staff training to reduce waste, or maintenance of equipment and materials. The goal of source reduction is to eliminate the use of materials that create wastes in the first place. This is the fastest way to achieve cost savings, and meet minimization goals.

Not all hazardous wastes will be able to be eliminated at the source. Certain processes will continue to require the use of materials that will produce hazardous wastes. The second approach must therefore be the Recovery and Reuse or Recycling of wastes. Industries around the country now routinely recapture wastes and reprocess them for reuse or recycle them. There are some opportunities with hospital wastes (e.g., xylene, ethanol, oil and batteries) for the wastes to be recovered and reprocessed (e.g., distillation, reuse, recycling).

When recovery for reuse or recycling is not feasible, the next step is Treatment of the wastes to render them nonhazardous. This can be done through neutralizing or diluting the waste. Currently, this is the first choice for many wastes, where options for source reduction and recycling have not yet been considered.

The final option is of course Disposal. Disposal of hazardous wastes must be through permitted haulers and waste-management companies. Hazardous materials cannot legally be disposed of in municipal landfills or incinerators.

Although many materials discussed thus far are legally designated as “hazardous” with specific handling and disposal regulations, some materials are not, despite their hazardous nature. One example of this is fluorescent lamps. Fluorescent lamps contain mercury in high enough quantities to be banned from landfill disposal in some states. Many hospitals and other institutions still dispose of spent lamps as solid waste. An individual institution may send thousands of spent lamps to a landfill during a facility wide relamping program. This can create a major problem for the landfill, and, if on-site crushing of the lamps is practiced as a volume-reduction method, this can mean serious health risks for employees. The option of recycling these lamps has emerged in the last several years, and options now are available to most facilities anywhere in the country. Although the federal E.P.A. has not declared these lamps a hazardous waste, it has left that option open for individual states to do so, and several have already done that. Hospitals need to be proactive and anticipate these changes. Often, simply doing the “right thing,” whether it is required or not at the time, will prepare a hospital to meet future challenges in a timely and less costly manner, then if left to force of regulation.

Minimization Strategies for Hazardous Wastes:

The hazardous waste stream at hospitals will vary greatly depending on the type of facility and its activities (teaching and research facilities will have higher levels); hazardous wastes can be as much as 5% of the total waste stream (solid, hazardous and infectious) and for many facilities, less than 1%, depending on practices and state definitions and regulations. A plan to manage
these wastes is key to any hospital’s efforts to minimize costs, increase safety and environmental compliance, and to meet JCAHO standards. Differences in quantities of materials generated will vary widely between types of hospitals. It will depend on size, types of procedures and tests conducted, and whether there is a research or teaching component involved.

Although many hazardous substances are used in health care facilities, only a few are used in enough quantity to create identifiable waste streams. Most are used and disposed of in quantities too small to manage individually. Establishing a HAZMAT committee with the necessary expertise and authority to evaluate materials, practices and new strategies is the most effective first step that a facility can take. This group can assist individual departments to evaluate such steps as product substitution, and evaluate staff training needs.

The following strategies are offered as a few of the suggested approaches to putting together a minimization plan for your hospital. They are by no means exhaustive. Any approaches will need to be customized to fit your particular situation. A more complete listing is recorded in the EPA booklet, *Selected Hospital Waste Streams*, and the University of Tennessee Hospital guide, *Writing a Waste Reduction Plan*, cited at the end of this section.

Specific Strategies to be employed:
- Procurement Guidelines
- Inventory Control
- Product Substitutions
- Segregation
- Recovery and Recycling
- Process Change
- Regular Inspection Program

**Procurement Guidelines**

Any hazardous waste-minimization program must begin with an examination of an organization’s purchasing program. Purchasing programs that are less than optimally managed can contribute significantly to the generation of hazardous wastes through:
- Duplication of ordering
- Purchasing in small quantities when bulk purchasing could be used (the opposite also can be true of some materials that are purchased in quantities far exceeding their usage—in these cases, small units would make the most sense)
- Not tracking current stocks and expiration date
- Continuing purchasing of materials no longer in use
- Not coordinating requests for materials from multiple departments
- Research labs often have independent funding that covers purchase of materials but not disposal
Procurement guidelines can be established to overcome many of these problems and lead to significant savings in both purchasing and disposal.

- Centralize purchasing of chemicals and hazardous materials, even for research labs
- Monitor usage with requesting departments to establish real quantity needs
- Make use of a “just-in-time” inventory system where appropriate
- Work with suppliers to explore the return of unused or expired chemicals
- Work with suppliers to provide smaller quantities quickly on demand
- Require departments using hazardous materials to conduct regular inventory of supplies

**Inventory Control**

Good management of inventory will benefit both the purchaser and the user. The user requires that materials be in stock when needed. To ensure this, and meet the need for cost containment and waste reduction, the user will need to form a partnership with purchasing to manage inventory together. Inventory control measures may include:

- Centralized distribution of hazardous materials
- Coordination of users requiring the same materials
- Accurate tracking of expiration dates of in-stock materials
- Use materials in first-in, first-out order
- Inventory procedures for all departments stocking chemicals
- Ensure clear labels of all chemical containers, and storage cabinets and areas
- Train personnel in material handling and usage to ensure safe use, spill prevention and minimal wastage

**Product Substitutions**

There are reliable alternatives for some of the hazardous chemicals and substances used in hospitals that should be considered as part of a hazardous waste-minimization effort. Not all substitutes are effective in all situations, but much more can be done by hospitals to evaluate alternatives. A continuous process of researching alternatives should be incorporated into the procurement process for hazardous chemicals. Some examples of product substitution include:

- **Xylene**: Xylene is a solvent that actually was introduced into laboratory usage as a less toxic substitute for Benzene. There now are a number of xylene substitutes on the market, including citrus-based substitutes that can be researched.

- **Formaldehyde**: Formaldehyde is used (as formalin) to disinfect dialysis machines and dialyzers. Some machines now are designed to use alternative disinfectants, such as bleach or peracetic acid. Check with your machine vendor for information.

- **Mercury**: Mercury primarily is found in thermometers and blood-pressure
instruments. The easiest way to address mercury is a total substitution of the equipment by electronic sensing devices. These devices have a higher initial cost, but they eliminate the costly cleanups and hazards from glass breakage and spills that plague hospitals using mercury-based technology. Evaluate the continued use of Cantor Tubes, which contain significant amounts of mercury. Look at substitutes for mercury fixatives. (Zinc fixatives can substitute in some but not all cases).

- **Leftover Paint:** Hospitals can reduce the toxicity of their paint waste stream by replacing oil-based paints with water-based paints.

### Segregation

All materials designated for special handling should be strictly segregated from other wastes. Wastes need to be treated in a fashion consistent with the most hazardous component in them. Well-labeled waste containers need to be placed in every area where wastes are generated. Alternative containers, clearly labeled for solid wastes, need to be present as well. In many cases, an area might have only one waste container, therefore all wastes generated—including paper and packaging—will have to be treated as hazardous waste if it is mixed together, thus greatly increasing waste-disposal costs. Training of staff is a key component in ensuring effective and reliable waste segregation. Although segregation should be a facility-wide program to maximize wastes in recycling and solid-waste streams, it also is an important component of minimizing RMW and hazardous wastes. An example of a specific case for segregation includes:

- Chemotherapy wastes need to be carefully segregated from other wastes. Staff training and well-labeled and placed containers in chemotherapy drug-handling areas is essential. Disposable protective garments may be disposed of as solid waste if no chemotherapy agents were spilled during handling. Gloves, however, should be assumed to be contaminated.

One approach that can spur on rigorous segregation, as well as make departments evaluate minimization approaches, is the allocation of waste handling and disposal costs to the departments that generate wastes.

### Recovery & Recycling

Some hazardous materials used in hospitals can be recovered for reprocessing and reuse within the hospital environment. These include such materials as xylene, toluene, ethanol and formalin. Others can be recovered for recycling by an industrial processor. These include silver from x-ray film and developing solutions, mercury, and fluorescent lamp bulbs and ballasts.

For example, xylene recovery offers an excellent opportunity to minimize hazardous waste generation in hospital histology labs. Cost-effective distillation technology is available, which can produce a distilled xylene product that often exceeds virgin xylene quality. Hospitals can evaluate whether this method would not only eliminate the need for disposal of xylene as a
hazardous waste, but also would have a substantial impact on the procurement of xylene. In evaluating this option, labs should make sure that they take into account all necessary safety and fire precautions to have this “industrial” equipment in the lab.

Silver reprocessing and recycling is an example of a process that can be partially accomplished in house, but needs to employ a recycler to maximize the gain. Silver can be removed from the fixing bath through two common methods: metallic replacement or electrolytic replacement. This recovered material can be sold directly to a metals recycler. X-ray film also has recoverable amounts of silver, which can be removed by a recycler. Once silver is removed, the remaining X-ray film is a recyclable polyester.

**Process Change**

Changing the process by which one conducts a procedure or uses a material has the potential to greatly reduce material wastage, and the generation of hazardous wastes. In its simplest form, this involves staff training in safety and efficiency to avoid spills, and to know the right amount of material to use at the right time. Improved and regular staff training often can have a major impact on waste production.

Making specific changes in a process also can minimize usage of a substance and waste:

- Formalin, if used as a disinfectant for machines (e.g., dialyzers), does not have to be in concentrations any greater than 4 percent. Concentrations above that are wasteful.

- Mercury can be greatly reduced by switching to electronic sensing devices.

- The life of photo-processing chemicals can be greatly enhanced by storing them under conditions cited on the labels. The life of fixing baths can be extended by adding ammonium thiosulfate, using an acid stop bath prior to the fixing bath, or adding acetic acid to the fixing bath as needed to keep the pH low. These solutions can be neutralized and then disposed of to a sanitary sewer.

- Photo-processing chemical life spans also can be extended by mechanical means, such as using squeegees in nonautomated processing systems to wipe the excess liquid from the film and paper, thus reducing chemical carryover from one process bath to the next by up to 50%. In photographic processors, countercurrent washing can replace the commonly used parallel-tank system to reduce the amount of waste water generated.

- Use of solvents in laboratories for extractions and fixation can be greatly reduced, or in many cases eliminated, through the use of monoclonal antibodies, radioisotope-labeled immunoassays, and ultra-sensitive analytical devices. Calibrated solvent dispensers or unitized test kit use also can reduce solvent wastes.

- Waste-anesthetic gases can be better controlled through the use of low-leakage anesthetic equipment and scavenging equipment, combined with a
regular maintenance routine and testing of equipment before usage.

- Finally, the segregation of wastes after generation offers more opportunities for proper and inexpensive disposal or recycling. Mixing such wastes as formaline, alcohol, xylene and chromic acid to consolidate liquid wastes not only is possibly dangerous if the substances are not compatible, but actually can create a more expensive hazardous waste liability.

**Inspection Program**

A good inspection program can expose problems and new issues in managing wastes, as well as be an opportunity to conduct on-the-spot staff education. Once a plan is in place and use of hazardous materials in all departments is clearly documented, a regular program of inspection and review, department by department, can be established over the course of each year.

**The Cost and Payback**

The development and implementation of a plan for the reduction of hazardous material use and generation of hazardous waste has costs associated with it. New equipment, testing of alternative products, segregation and storage of materials, staff training, establishment of a recycling infrastructure all cost a facility in terms of time, space and money. These costs should be determined upfront and not minimized. Taking steps in pollution prevention should be considered an investment by the institution. Some of those investments will have an immediate monetary payback for the institution. Other steps will be costly, especially the proper disposal of hazardous materials. But in all cases, these investments can be viewed in the same light as the industry views health maintenance and prevention. If a facility launches an aggressive pollution-prevention plan, it may never be able to accurately or fully document the savings achieved through preventing future problems in worker health, institutional liability or compliance. Pollution prevention, however, must be pursued with the same vigor and intent that health care organizations are developing health promotion programs.
Resources

*Guides to Pollution Prevention: Selected Hospital Waste Streams*
U.S. Environmental Protection Agency, Center for Environmental Research Information EPA/625/7-90/009. Contact your regional EPA office for a copy.

*Writing a Waste Reduction Plan for a Health Care Organization.*
By Keith Ridley, University of Tennessee Center for Industrial Services. 1995, University of Tennessee, Nashville. Contact Albert Tieche, (615) 532-4926.

*The Case Against Mercury: Diagnosis, Treatment, Alternatives.*

*A Guide for Dentists: How to Prevent Pollution From Your Dental Practice.*
Indiana Department of Environmental Management, Gary, IN, 1995. Call David Lawrence for information on ordering a copy, (219) 881-6712.

*Infectious and Medical Waste Management.*


### Chart PP1

**HAZARDOUS WASTE MINIMIZATION ASSESSMENT DATA FORM**

<table>
<thead>
<tr>
<th>Material/Waste</th>
<th>Area/Department</th>
<th>Est. Quantity On Hand</th>
<th>Est. Quantity Purchased (per month)</th>
<th>Individual in charge of procurement</th>
<th>Est. Quantity requiring disposal (per month)</th>
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## HAZARDOUS WASTE MINIMIZATION ASSESSMENT DATA FORM (page 2)

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Chapter 7

Managing People to Manage Waste

People management can make or break waste-management systems. The best designed system can fail miserably if people management is not taken into account.

Organizing the Department by Function

In a large facility, waste often is collected by many people; housekeepers, facilities staff, janitors, custodians and others assigned to the maintenance function. Cleaners can be assigned to remove waste as they clean, or do all the cleaning and leave the wastebaskets for someone else to dump. There are many different styles of cleaning, such as team cleaning, which will have an impact on how trash and recycling collection can be integrated into the cleaning process. Waste collection seems like a simple task, and it is in many environments. However, in hospitals, waste collection presents unique challenges. Some facilities isolate the task of collecting sharps waste as a specific job titled “needle collector.” Other facilities completely eliminate managing this waste stream by contracting for external turnkey sharps management services. Since hospital waste is so complex, the level of training required for staff to responsibly manage the waste exceeds that of most other institutions.

Staff can be organized in such a way as to minimize risks, reduce costs and increase regulatory compliance. To accomplish these goals, it often is effective to provide specialized waste-management training to a discreet group within the department, and to assign duties to the group that focus solely on waste-management activities for all of the waste streams.

Specialized Roles

Waste Team
This is a sub-team within an environmental services department, whose sole function is to collect and transport wastes. This specialization can increase your accountability for waste management and decrease confusion around waste for the housekeeping staff, who no longer are directly responsible for all aspects of collection and disposal of waste. Members of a waste team are
cross-trained in regulated medical-waste handling and packaging, solid-waste collection, recycling, select hazardous waste collection and cleanup, and compostable waste collection. Team members are trained to drive a truck, operate a forklift, operate scales, wear personal protective equipment, and understand irregularities in disposal to avert the wrong waste ending up in the wrong place. Their training is regular and on going.

One of the responsibilities of the waste-team workers can include quality-checking the waste as it is collected to ensure proper disposal. They can further serve as internal experts on recycling, segregation and answer questions for clinical staff. This group can take responsibility to help the organization remain in full compliance with waste regulations.

Other specialized roles to consider:

**Needle Box Collectors**
Staff may be assigned to change out sharps boxes throughout the facility. One person has responsibility to constantly circulate on set routes throughout the facility to maintain good control over sharps-collection containers. One hospital that was audited was disposing of hundreds of sharps containers each month that were empty or less than half full, because they had chosen a system to switch out containers on a daily schedule whether they needed it or not.

**Regulated Medical Waste Packers**
Some facilities opt to dedicate staff to collect, package and document RMW. These staff can be trained in optimal techniques to efficiently and safely package RMW to minimize costs. Specialization allows workers to develop expertise in working around potentially hazardous materials, which minimizes risk inherent in the system.

**Recycling Technician**
Some facilities dedicate one or more staff members solely to recycling duties. Once a recycling system is in place, there will be a significant shift in waste volumes, from solid wastes to recyclable wastes. When recyclable wastes are source-separated for collection, they become a potentially marketable commodity, distinctly different than trash. A container of office paper or a bucket of glass is much heavier than a trash bag. Workers collecting recycling must not only be aware of issues such as contamination, but must receive special training in the ergonomics of waste management.

These are waste-collection functions, some of which might be combined within a single FTE and others that might stand alone as a single job, depending on the size of your facility. Cross training in waste handling should be widespread enough to ensure that there is sufficient backup within the team.

**Getting Help From Other Departments**
Waste is created by every department in the facility. Some departments generate as many as five or six different waste streams. Environmental services departments often have many responsibilities beyond cleaning floors and patient rooms, vacuuming, mopping, cleaning bathrooms and dusting. Some
Managing People to Manage Waste

departments are responsible for audiovisual equipment, conference room scheduling, laundry services, external grounds, OR cleaning, CSR cleaning, and other aspects of facility management. Waste is just one facet of an Environmental Services manager’s task load.

Seeking assistance from generators of waste is necessary and very appropriate. When units are aware of the wastes they generate, they tend to be more conscientious about those wastes and may even generate less, once they understand the environmental, financial and labor costs associated with the safe management of waste. In areas such as radiology and the laboratory, there often is a safety liaison or officer responsible for ensuring that wastes are managed properly. These people have specialized training in the materials they generate.

Any time other departments have a role in waste management it is important to understand where the lines of responsibility are.

How other departments can help:

- Kitchen staff can segregate food waste (heavy and wet) from regular trash. They can collect grease for recycling.
- Building and maintenance carpenters can collect and transport construction and demo wastes to designated areas.
- Facilities management often is responsible for changing out fluorescent fixtures. This may be done as a major project rather than one bulb at a time. Proper disposal of fluorescent tubes is desirable. Fluorescent fixtures are regulated in some states as a universal waste.
- Construction and demolition waste is an ever present material at most health care facilities. Usually several departments contribute to the C&D waste stream. These can be environmental services, facilities, and any of the on-site maintenance shops, including paint shop, electric shop, plumbing shop and carpenter shop. C&D waste generation varies according to renovation project or number of projects consecutively going on at one time. Having a designated container available for such wastes allows each department to have access to appropriate disposal options. Some facilities use environmental services staff to collect such wastes from different areas. It is ideal to encourage the generator of the waste to accept as much responsibility for the waste as possible. When outside contractors are engaged, as part of the contract they can be made responsible for managing the C&D waste and required to deposit it at a C&D recycling facility.
- X-ray film use and disposal often is confined to radiology departments. Collection, storage and recycling of spent film and developer is best managed by the radiology staff, who are familiar with the material.
- Xylene is a solvent used primarily in the laboratory setting. Laboratory staff easily can manage their own xylene distillation units without involving environmental services. Labs that opt to recycle xylene will save money both on procurement of new solvent and on disposal of a hazardous waste.
- Confidential documents from the entire facility, but especially in areas such as accounting, medical records, psychiatric floors and human resources departments, need to be managed properly. Your information security officer should set standards and guidelines around confidential document disposal.
Shredding confidential documents can be a time-consuming process. Many shredders only are designed to handle 10- or 11 sheets of paper at a time. Requesting the generators to be responsible for their own shredding needs can put some of the labor burden on the generator. A less time-consuming alternative can be to install locked cabinets for the collection of confidential documents. The collected materials can either be shredded on or off-site by a certifiable paper-shredding company or on-site with the facility’s own shredder. Shredding takes time and contributes to an increase in particulates in the air. If lots of shredding is necessary, it is best done in a well-ventilated area.

- Batteries are generated house-wide. Staff can be made aware of unit-based depot locations for proper disposal of batteries.

- Chemotherapy wastes from oncology units and patient care areas—Oncology nurses and other staff can assist in the segregation of these materials by participating in programs designed to include their help. Staff administering chemotherapeutic agents, or cleaning up spills of chemotherapeutic liquids, can be instructed to dispose of those items in designated containers. When the containers are full, they can notify Environmental Services for a pickup.

- Waste from chemical spills such as mercury—Mercury is present house-wide in most health care facilities. It is found in blood pressure-monitoring devices, temperature-monitoring devices, cantor and miller abbot tubes and other medical devices. When mercury is spilled onto floors, beds or other surfaces, proper clean-up is essential. Many health care workers in the past have cleaned up mercury, which is usually associated with broken glass of some type, as a “sharp” and placed the waste in a “sharps container.” It is essential to have mercury spill clean-up kits available and clinical staff trained to use them properly. Facilities that continue to use glass mercury-based thermometers will experience frequent need for cleaning up mercury every time they drop a thermometer and it breaks. Using mercury-based technologies for patient care in carpeted areas means that extra precautions are necessary in cleaning up mercury wastes.

**Training for Staff Who Handle Wastes**

Investing in proper training for staff who are expected to handle wastes is necessary. It will provide your organization with a team of individuals prepared to respond to spills, minimize noncompliance episodes, and provide a safe work environment.

The following areas of training should, at a minimum, be part of training staff to handle wastes:

- Appreciation of and training in the use of equipment
  Staff handling wastes likely will use a variety of different types of equipment, including personal protective equipment, compactors, balers, scales, pallet jacks, forklifts, beepers, telephones, emergency-response equipment and other items. It is essential to ensure that every worker using an item has been trained in the proper use of that item, and that the training is documented. For some types of equipment use, OSHA has additional training requirements, which may include annual training by qualified individuals. For balers and other types of equipment, lock out-tag out programs are necessary.
• Basic training in the different types of wastes generated at the facility and how to distinguish between them.

• Training in OSHA blood-borne pathogens rule and infection-control issues. Staff need to be taught about basic hand-washing, use of personal protective equipment, and general principles of disease transmission.

• Ergonomic safety—Staff need to be instructed in proper lifting, pushing and pulling techniques to provide for a safe working environment that is free of injury. Setting lifting limits, requiring assistance with heavier loads, providing assistive equipment—such as dollies, lifts or other devices—will improve the ergonomics in the workplace.

• Equipment safety—Every worker is responsible for identifying equipment failures and malfunctions. Instruct every worker to report problems with all equipment when it first occurs or when they begin to notice less than optimal performance. Preventive maintenance programs will do a lot to preserve and prolong the life of various types of equipment. However, a savvy staff member can detect equipment failure in the early phases and help your facility avert crisis situations.

• Confidentiality—Waste handlers need specialized training in the area of confidentiality. Although most workers are responsible for maintaining confidentiality in their work areas, waste handlers often are exposed to the most confidential items from throughout the facility. Although discarded items may appear to have little value and are “for the taking,” this is not the case when it comes to confidential materials. Any items with a staff or patient name or medical record number on them can be considered confidential, depending on your facility’s specific policy. Waste handlers need the extra reminder of the duty and responsibility they have. One piece of confidential paper blowing off a trash dock could lead to a breach in confidentiality and a lawsuit for your organization.

• Sherlock Holmes Status—A well-educated waste-management team can serve as the Sherlock Holmes squad for your organization. Quite often, facilities lose items—from surgical instruments to computer manuals to patient records. Educating your waste team to be vigilant and on the lookout for “the unusual” in the course of their waste-collection duties can pay off.

• One hospital reported losing a patient record. The waste team staff found that patient chart in amongst the recycling that had been collected the previous day.

• Another hospital reported having lost a very expensive surgical device, which had been left outside an operating room. The waste team found the device in the trash during a waste-collection run later that day. Taking time to educate waste handlers to recognize mercury waste, infectious waste and other items can save your facility the embarrassment of noncompliance by having a regulator find the error at the landfill.

• One hospital reported finding a wedding dress that a nurse had been crocheting during her lunch breaks at work. (She stored it in a red bag to keep it clean.) A housekeeper had collected the bag during the usual collection, thinking it was infectious waste.

• Yet another hospital reported that red bags were being taken home by doctors. It was only after one of the doctors mentioned that no one would
collect his leaf and yard trimmings in the red bags at the curb that this practice was confirmed and stopped. (The bags had the name of the facility and the words “infectious waste” printed on them)

- Waste team workers at one facility found two one-pound jars of liquid mercury in with recycled materials. Recognizing that “something was wrong with this picture,” the staff promptly reported the event to their supervisor who handled the situation.

Managing in an Environment of Downsizing and Mergers

The epidemic of mergers, consolidations and downsizing that is sweeping the country is having effects on everyone employed in the health care industry. Managing people can be especially challenging in such times. The boundaries of the former organization are blurred, and the cast of characters to do the work often is in flux or undefined. Many of the layoffs and job eliminations that result through downsizing, mergers and outsourcing affect middle and upper management. What happens to the individuals in charge of managing waste? Who will stay the course of growing and sustaining waste-management systems?

Of great loss to organizations is the knowledge base and expertise that often exits when seasoned staff “take the buy-out” or seek employment in a more stable environment. Capturing the knowledge base and learning as much as you can about the nuances of each organization and it’s systems before the crisis hits is a time well-spent. Often in the acute phases of mergers and downsizing, everyone is a bit on edge, mistrustful and fearful of their job security. Information-sharing may not be something everyone is ready to do. Nonetheless, using common sense and respectfulness, you can strategically garner much of the necessary information and piece together data to help in decision-making. Waiting to “see what happens” or “hoping” for a situation puts you in a compromised position. It is best to be proactive and develop what you think will be optimal plans for the organization, despite the turmoil around you. Although those plans may change, at least you have developed a vision and a starting point for seeing the whole picture.

Cross Training in Waste Streams

Preparing your staff for maximum versatility in the management of wastes provides them with enhanced job skills, increased range and scope of duties, and a professional challenge. It provides you, the Environmental Services manager, with increased flexibility, increased ability to respond to your customers, and the knowledge that you are creating a career ladder and job advancement for your staff. Environmental services staff often are the lowest paid and least appreciated within the organization. Enhancing job skills and expertise is one way to let your staff know that you believe in them and provide opportunities for their growth and advancement. A worker with an array of skills, professional licenses (forklift, cdl, hazwopr certification), and experience dealing with multiple task management is more marketable than an employee with a uni-skilled background.

Cross Training in Geography of Multiple Facilities
When facilities in the same town or city merge, there often is a flow of staff back and forth between facilities. Often this is limited to physician staff and other administrators; however, you can effectively orient your staff to function and perform their job duties in multiple sites. This is another way of expanding skill and creating a professional career ladder within environmental services. Staff able to function in multiple sites should be compensated for that ability. It usually involves learning multiple systems, multiple landscapes and the ability to be flexible and work with a variety of people. Cross training staff to work in multiple sites provides the environmental services manager with additional flexibility to cover vacations, holidays and call outs.

Creating Teams of Waste Experts to Meet the Needs of an Ever Growing Customer Base

As your facility grows and changes, having a skilled team of staff able to respond to the growing demands of new customers around waste issues is valuable. Often times, newly acquired sites within the system may or may not have been participating in pollution-prevention activities or recycling programs. Sites may or may not know how to clean up a mercury or blood spill. Being prepared to respond in expert fashion demonstrates the preparedness, expertise and sense of appreciation for environmental services staff amongst their customers.

Managing in an Environment of Transitory Workers

Transitory workers — such as traveling nurses, respiratory therapists or “rent a docs” — or other staff — such as volunteers or clergy, who periodically work within your facility — present many challenges from a waste perspective. Essentially, these staff members can be on site, within your facility creating waste for eight hours or more and be totally unaware of the waste-management systems you have established. One person can contaminate an entire load of wastes. It is vital to build in an orientation to waste in the hospital orientation program. Either as a new employee-orientation program or a pamphlet, somehow the guidelines for your facility’s waste programs need to be easily accessible and readily explainable to any new players who work at your facility.

Transitory workers need to be oriented to recycling programs, hazardous waste-management programs, regulated medical-waste programs and solid waste programs. This orientation can be left up to the individual unit managers, or unit educators, or incorporated into the orientation promulgated by the organization, which includes fire safety, chemical right to know, CPR, and other fundamental training programs. If waste is not included, you can expect to have ongoing problems with your systems. Every worker creates waste. Depending on the job function they perform, they can create multiple types of wastes. It is guaranteed that most health care workers don’t think of waste management as their job. Nonetheless, it is a part of their job, and a part of the fabric of every health care organization. It is no more or no less important than parking, dress code, CPR or fire safety.

When in Rome, Do as the Romans Do
On-site contractors and sales representatives are temporary waste generators. Educating contractors about the rules of conduct—from everything including smoking to waste disposal—is a very important task. Many organizations overlook this irritating source of contamination for their waste stream and ever present source of cigarette butts for the grounds people to clean up. Contractors need some type of guidebook or handbook outlining codes of behavior when on-site in a health care facility. Waste disposal, smoking, dress code, use of hospital-owned equipment, hours of cafeteria operation, and how to behave during a plan red (fire drill) or plan blue (patient emergency) or other situations provides clear guidelines and can eliminate many hassles and frustrations. Having contractors sign a form, after they have been briefed on all of the above, also is a valuable thing to do. It symbolizes that the contractor is to be held accountable for abiding by the above.

The General Public

Many hospitals with quality recycling programs seem to put a great deal of effort into hiding this fact from visitors and patients. There are no recycling containers in patient rooms or public areas, and no information about the hospital’s efforts or mission. Americans for the most part are used to recycling at home. Giving them the opportunity to do so in the hospital will not only assist in your waste-management efforts it also will send a message to the public that your facility cares about the environment and the community in which it is located.
Chapter 8

Assuring Quality, Compliance and Cost Containment

Accountability

Quality assurance is key for any waste-reduction program to succeed. You need to set up clear and positive feedback systems to provide information for the ongoing management and improvement of your efforts. You need to have clearly stated objectives and goals, and clear indicators to tell you when you achieve them or why you have not. You need clear lines of communication and accountability throughout your system to be able to meet the minimum requirements of safety, compliance and cost containment.

A key feature of a comprehensive waste-management system includes clear lines of communication and accountability for waste-management operations. The National Naval Medical Center (NNMC), in Bethesda, MD, has divvied up the responsibilities around waste management among seven key individuals. The facility also has an Environmental Compliance Board that meets every other month to ensure that other facilities within the system remain current with regulations.

The chart below is a partial listing of how aspects of environmental management, including waste management, are shared at NNMC. Each block represents the job responsibilities for a designated individual. The administrative assistant for the department head explained that, while each person has designated responsibilities, there are many areas of overlap when different staff members work together.
Why is Accountability Important?

It is necessary to publish information for the organization denoting who is in charge of what. This information should be readily available to everyone within the organization so that in the event of an emergency, the appropriate parties will be contacted. In day-to-day operations, it also is valuable to have the point person listed to respond to inquiries and other routine items that arise.

If staff are clear on their mission and responsibilities, it is more likely that real coordination will occur. This eliminates duplication of efforts and provides opportunities for collaboration in areas of overlap.

Feedback

Quality systems have built in feedback mechanisms. Peter Senge, in his recent book (Fifth Discipline) describes general facts about systems, systems archetypes and characterizes healthy functional systems. In waste systems, as in all systems, it is vital to provide feedback to customers (input source). Consider ways of providing feedback to your customers. What would that look like? One hospital reported issuing it’s housekeepers mini-ticket booklets, which the housekeepers would give to staff who had recyclables in their trash cans. The tickets said, “Ooops, perhaps you forgot—at XXX, we’re serious about recycling. Please place recyclables in the designated container.” On the second violation, the offender would receive a ticket, an empty trash bag and a map to the hospital’s dumpster, asking the offender to dispose of his/her own waste. On the third offense, the offender received a visit from the Recycling Committee chairperson. Other facilities report providing feedback to their users by hand-carrying inappropriately discarded materials back to the unit of origin, for review by the unit manager. Still other facilities report giving phone calls to department managers, informing them of errors in disposal and requesting that they share that information most appropriately with their staff.

Whatever option you choose, be sure to have some type of feedback mechanism in place to report the negative and celebrate the positive outcomes of your waste programs. Waste can be something to cheer about, especially if you have achieved substantial reductions in waste volumes, saved your organization money, or received some type of recognition. In An Ounce of Prevention, there are several hallmark stories of facilities that have literally saved a million dollars by optimizing waste-management programs.

Compliance

How do you get hundreds or thousands of people to acquire new waste-disposal habits and consciousness? How do you get them to consistently take the time to participate? What’s in it for them? Different hospitals have
taken different approaches to this. Some of these include:
- Scheduling regular monthly waste audits and assessments to assess compliance, department by department
- Recognizing outstanding recyclers in the hospital newsletter
- Educating staff on a regular basis about waste programs
- Keeping waste-management programs fun and upbeat
- Be an opportunist! Take full advantage of hospital events to give the recycling message to everyone, be it at picnics, orientations, holiday time, etc.

**Keeping Current on Changing Regulations and Standards**

Keeping current on waste regulations, latest technologies, recommended guidelines, and standards for all aspects of waste management, including disposal, worker safety, environmental impact, etc. is critical to a quality program. What are the best ways to keep current? Read journals, attend workshops, read professional literature in the field, subscribe to magazines, network with colleagues, read federal documents (*Federal Register*). These are just a few suggestions for keeping current.

What professional organizations provide technical assistance on waste management to members?
- ASHE-American Society for Healthcare Engineers
- ASHES-American Society for Healthcare Environmental Services
- APIC-Association of Practitioners in Infection Control
- NRC-National Recycling Coalition
- HRCC-Healthcare Resource Conservation Coalition
- Your state recycling association

Optimize your “peer networking” circle, meet with:
- Environmental Services colleagues at other hospitals, nursing homes or health care facilities
- Waste managers at universities and colleges
- Waste managers at large area businesses
- State hospital associations
- Some state hospital associations have specialized programs to address waste issues. These include: Colorado, New Jersey, Vermont, North Carolina, Tennessee, Maryland, Massachusetts, Maine, Indiana
- Purchasing groups
  - Some purchasing groups have taken on waste reduction and waste management as member-service technical assistance projects. The following two GPOs have put together resources for their clients:
    - Voluntary Hospitals of America
    - Purchase Connection

If you are a member of a purchasing group, ask your representative what it is doing to support your efforts in this field.

What should you be reading?
- Biocycle Magazine
- Waste Age
- Waste Dynamics
- Resource Recycling
- Medical Waste News
- Infectious Waste News
- Compliance Magazine
- Recycling Times

(Your local solid-waste authority or state environmental protection agency probably has copies of these journals.)
Confidentiality

Confidentiality is an issue that must be addressed in hospitals’ waste-management programs. This cannot be emphasized enough. Nothing will kill a program quicker than a violation of patient confidentiality though improper waste handling. Although many facilities have confidentiality policies addressing information in general, few facilities have specific policies around destruction/handling of hard copy confidential documents. What is a confidential document? Is it anything with a patient’s name on it? If so, that includes food menus! Is it anything with a medical records number? Whatever your organization determines, confidentiality will need to be a built-in feature of your waste programs.

With the advent of recycling, confidential documents that may have been discarded as trash, now are segregated into containers and sent off for recycling. In fact, recycling offers a real opportunity to beef up a confidential paper program, because for the first time papers will be segregated and can be easily secured since they are no longer mixed in with general trash. Some facilities opt to shred all confidential documents on-site, others contract for shredding or confidential document-destruction services. Other facilities use a bonded hauler for waste paper, requiring dated proof of destruction of documents. In any case, it is vital to have some type of program in place under the auspices of either your information security officer or risk management or the facility’s legal counsel.

Be sure and audit your hauler or vendor dealing with your confidential documents. A site visit is well worth the time. You can perform due-diligence by regularly scheduled and unannounced visits to your vendor’s processing plant to ensure that documents truly are being managed as they are specified to be. This also is a good practice in general for all waste streams.

Segregation is the Key

Segregation probably is one of the most important aspects of a good waste-management program. Segregation ensures that wastes will be disposed of in the appropriate waste stream. Educating staff on segregation techniques is an ongoing necessity for successful waste management. Recyclable wastes will have greater value if they are well-segregated and sorted by material type or resin. Hazardous wastes, when properly sorted, sometimes can be recycled rather than disposed of. In any case, they can be more easily and cheaply disposed of. Reducing regulated medical waste relies almost entirely on your segregation practices. As you have been able to observe throughout this book, great opportunities can be realized through instituting new practices and policies: These are not pie-in-the-sky ideas, but well-tested efforts that are being employed by hospitals nationwide.

Working with Consultants and Vendors

Keeping current on waste systems and reduction opportunities is part of the job for Environmental Services managers. One way to do that is to take
advantage of offerings provided by vendors and consultants. However, it is essential to remain grounded in your own systems, and not be swayed or lulled into major change with quick fixes or black-box technologies. Nonetheless, it is equally important to keep an open mind and learn about new approaches, new technologies and new ways of solving problems. Review information provided by vendors independently. Just because a system worked like a charm for a neighboring facility, it does not mean the same will be true for your site. Ask questions and be demanding of vendors and consultants offering products and programs. If the information you get is not useful to your situation, set it aside.

Consider the credentials of consultants. Are they hospital-oriented? How much of their background applies directly to the unique environment of health care? Might their diverse background bring a new approach or set of considerations to the problem-solving arena? In any event, your facility waste-management programs are your responsibility and you must make sure that choices you make are in the best interests of your organization. Sustainability is key when considering new systems or technologies. The consultant and vendors will be gone shortly and you will be left to manage on your own. Do what you can to get the most out of these resources and seek to have access to them for trouble-shooting and follow up in the future.

The Value of Fresh Eyes

Having someone come in fresh from the outside, and review your systems can be a very enlightening experience. They may ask questions about the obvious, about why things are done a certain way, located in a certain place. They may inquire why you are not doing something or why you are doing something. If the person is from another health care facility or other business, they may be able to share some of the things they are doing with you, and that may spark new ideas and approaches for you to consider.

Several organizations offer walk-through waste assessments; some are free of charge, others can be done for a fee. In New England, a program titled WasteCap offered free waste assessments conducted by trained teams of industry volunteers. The assessments were free and confidential (funded by an EPA program). Some vendors offer waste assessments. Be sure you understand exactly what the intent of the assessment is. Is it a regulatory compliance check up? Is it a reduction assessment? Do the assessors have any knowledge of clinical settings? Remember, you often get what you pay for. WasteCap’s efforts have been beneficial to hospitals because coordinators and volunteers sought out special training. In other cases, “free” audits and services for hospitals provided by supply vendors or waste companies have been superficial at best and pure sales pitches at worst.
Notes
Chapter 9

Practicing Proactive Waste Management

Hospitals and the health care industry have been notoriously reactive when it comes to waste-management activities. They have come late to the table to make changes in their current practices and in acknowledging waste reduction as a viable strategy in meeting their obligation to protect workers, the environment and in saving health care dollars. In the last five years, however, great strides have been taken by the industry as a whole, with many institutions developing model programs that have won awards and gained widespread recognition for innovative and progressive institutional waste-reduction efforts.

A hospital that declines to recycle now is seen by the public as a liability as that community seeks to size new disposal capacity for their needs. A hospital defending an existing in-house incinerator is seen by the public as defending a “right to pollute” the local community. Hospitals need to expand their mission of meeting the health care needs of the community to cover all aspects of their operation, including waste management.

Proactive waste management is not simply a ploy to stay ahead of public opinion. It is responsible business management, anticipating cost increases and regulatory action, and designing systems to stay ahead of both. Actually, reducing the amount of wastes generated in the first place is the most proactive action that any facility can take. If you do not produce the waste, you do not have to design and maintain systems to manage it. Proactive waste management starts with product management. Many product suppliers have recognized this and have programs designed to assist their customers.

Proactive waste management means planning. Designing a plan to reduce and manage waste is a continuous process. You need to establish a base line, determine indicators, monitor your progress, put someone in charge, and make an institutional commitment to succeed. The plan is an organic construct that will change and grow over time.

Proactive waste management means integrating new waste-minimization practices into policy and the organizational culture. This can be done in a
number of ways:

- Make waste minimization and adherence to waste-management procedures a stated policy of the organization, listed in the employee handbook, and part of new employee orientation.

- Top management should visibly and fully comply with waste-segregation practices.

- Internal news and information vehicles in the facility should carry regular features on waste-reduction efforts.

- Employee suggestions for waste-reduction initiatives should be solicited and rewarded.

- Special days should be observed where facilities’ waste-reduction efforts are recognized, celebrated and staff are re-educated (Earth Day, Arbor Day, Summer Picnic)

Proactive waste management, above all, means getting started, taking some step—however small—and then building on it. Whatever you chose to do, someone else at another facility has probably had to do it too, and in many cases, had a harder time in doing it than you will.

Get started.

Getting Started with Waste Management

What Can You Do Tomorrow?

- Share information learned about waste with your organization, i.e. Purchasing, Environmental Services, Nurse Managers, Management Team

- Identify infrastructures for communicating information at your organization — newsletter, video channel, memos

- Have a cup of coffee with your Purchasing Director to share source reduction concepts/ideas

- Calculate your facility’s waste base line

- Review your waste bills and contract. Do you really know how much waste you are paying for to be disposed of? Work with your hauler to obtain real numbers.

- Talk to some nurses in various clinical areas about source reduction.

- Talk to waste handlers in your facility. They know trash.

What Can You Do Next Week?

- Organize an interdepartmental waste-management team.

- Set waste-reduction goals for your organization.

- Plan hospital-wide education and training for waste management. (It’s as important as CPR & Fire Safety!)

- Contact your hauler and request their assistance in increasing recycling and keeping wastes segregated.
Evaluate current contract reviews with waste vendors.

✓ Assess staffing assigned to waste. Does it match time the of day that waste is generated?
✓ Do a walk-through waste assessment of some key departments; examine all waste containers—Are red bags full of paper, pizza boxes and soda cans? Just observe and take notes.

What Can You Do in the Next Six Months?

✓ Document and evaluate your current waste-management systems:
  How much red-bag waste do you currently generate?
  How much solid waste?
  How much recyclable waste?

✓ Conduct a series of regular waste assessment walk-through visits in different departments to observe waste disposal practices.

✓ Identify strengths and weaknesses of current program.

✓ Look for opportunities to renegotiate contracts with waste vendors to include assistance with waste reduction and recycling activities.

✓ Contact key supply representatives and ask them about programs sponsored by their companies to assist hospitals in waste-reduction efforts.

✓ Review infection-control practices and regulations with the Infection Control Nurse and Safety Manager. Make sure that disposal practices are not confused with worker safety rules. Based on your observations during assessments, start to determine what changes can be made in Staff RMW disposal practices.

✓ Contact your state hospital association to see if it is providing assistance to hospitals on waste reduction and recycling.

✓ Join the Healthcare Resource Conservation Coalition, and network with hospitals and health care supply companies from around the country that are working on these issues.
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