

## Hospitals prescribe P2 measures for the environment

The mission of hospitals across the country is to protect public health.

This protection of public health extends to protection of the environment as well. According to Dr. Anthony Cortese of Tufts University, "Protection of the environment is the most fundamental form of primary prevention of disease and illness" (Shaner 2).

### Prevent pollution

Pollution prevention includes use of materials, processes or practices that reduce or eliminate the quantity and toxicity of wastes at the source of generation.

Not generating wastes is the most desirable method of waste management. Other options, listed in order of preference, include segregation of infectious waste from non-infectious waste, reuse, recycling, treatment, and disposal.

### Count the benefits

Pollution prevention is often cost-effective because it reduces raw material losses, conserves energy and water, and reduces the potential liability associated with waste generation. Source reduction decreases reliance on expensive "end-of-pipe" treatment technologies and disposal practices and the responsibilities which accompany these methods.

Additionally, indirect benefits such as avoiding waste disposal fees, better public relations, and better employee health are often results of pollution prevention.

### Assess your waste

Performing a waste assessment is a key component of implementing pollution prevention practices.

The goal of a pollution prevention waste assessment is to identify, quantify, and characterize the make-up of each waste stream in order to recognize potential sites for source reduction. Each waste stream should be described in terms of the process and work practices that causes waste generation and conditions that impact the amount of waste created.

Once this has been done, the facility may begin identifying pollution prevention and waste reduction opportunities.

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"American hospitals generate approximately 1 percent of all the municipal solid waste generated in the U.S. .... Hospitals alone are sending almost 2 million tons of waste to landfills and incinerators each year. Of this, U.S. hospitals currently classify approximately 15 percent of this waste as infectious waste, which must be treated differently from [municipal solid waste]."

(Leach-Bisson, McRae and Gusky-Shaner 1)

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The Veterans Affairs Medical Center in Knoxville, Iowa, discovered pollution prevention opportunities when considering its food waste stream. The facility was able to cut food waste by 10 percent and food costs by \$33,000 per year by implementing a computer program that automated recipes and calculated ingredient amounts. This program also calculated future food product requirements by tracking actual food consumption (Wilson and Gibson 95-4).

### Monitor your success

Before and after implementing pollution prevention techniques, waste streams should be monitored.

Document decreases or increases in the following factors to help evaluate areas where pollution prevention practices need to be altered: mass of wastes, disposal, treatment and storage costs, raw material costs.

Documentation will help determine success of the methods that were implemented and ensure continuing enthusiasm for source reduction at your medical facility.

### Segregate waste

Waste segregation is especially important for hospi-

#### Case study

### Changing procedures makes a difference

Des Moines General Hospital, Des Moines, Iowa, investigated its incinerator loading procedures and discovered an opportunity for pollution prevention.

The incinerator was being loaded at irregular intervals and with little effort exerted to maximize the quantities being loaded. The facility implemented use of a log sheet to track loading of the incinerator that ensured a consistent amount of weight was being loaded every 15 minutes.

This increased the effective operating efficiency to almost 100 percent. The amount of time the incinerator was in use decreased by 50 percent. The hospital has saved \$4,830 per year on natural gas costs (Nelson and Gibson 95-10).

#### Case study

### Look for pollution prevention opportunities

The staff at Pleasant View Care Center in Monona County, Iowa, was able to economically implement source reduction in the area of housekeeping. It saved \$13,000 per year and minimized exposure to harsh and hazardous chemicals by controlling the amount of product it used for cleaning and reducing the variety of products available.

It made changes in the following areas:

Laundry area — switched from powdered to liquid laundry detergent due to easier measurement; installed a metering dispensing system.

Housekeeping — implemented a metering dispensing system for chemical solutions and reduced the number of different solutions used to four (Nelson and Gibson 95-7).

tals due to the red bag waste created in operating rooms.

According to Hollie Shaner, president of CGH Environmental Strategies, Inc., 6 percent to 8 percent (Shaner 11) of waste in some hospitals was found to be hazardous, although typically 15 percent is disposed of as hazardous waste (Leach-Bisson, McRae and Gusky-Shaner 1).

Some hospitals have reduced the volume of their red bag wastes tremendously by placing alternative receptacles in their operating rooms. These contain non-infectious waste such as packaging which is created in operating rooms.

### Incinerate properly

Incinerators can be a source of mercury, hydrochloric acid, and dioxin air pollution. Dioxins can be formed in the incinerator from incomplete combustion of PVC plastics.

Proper operation of incinerators is essential to reduce dioxin formation.

Limit potential dioxin generated by reducing the amount of PVC in the waste stream.

### Pollution Prevention Ideas

The following items are pollution prevention ideas that have been employed by hospitals.

- ❑ Increase the amount of reusable dishes used in the hospital cafeteria, break rooms, and patient services.
- ❑ Wash disposable patients' slippers and reuse three to five times.
- ❑ Use reusable cloth gowns and drapes.
- ❑ Reduce the impact of housekeeping chemicals or laundry detergents by cutting the number of different chemicals used. A dispensing system will monitor quantities. (Liquids may be more easily dispensed than powders.) Investigate alternative chemicals to ensure you use the least toxic options.
- ❑ Maintain equipment around the facility, such as anesthetic equipment or the oxygen distribution system, to avoid leaks.
- ❑ Cover containers of solvents and photographic chemicals to decrease evaporation. Use squeegees to decrease dragout. For analytical tests, collect and distill solvents.
- ❑ Replace xylene with something else when possible. Terpene alternatives are available. If xylene is necessary, recover to minimize waste.
- ❑ Standardize formaldehyde solutions in order to ensure the minimum strength is used. Use reverse osmosis water treatment to reduce dialysis cleaning demands. Investigate reuse of formaldehyde in pathology and autopsy labs.
- ❑ Eliminate mercury by substituting electronic sensing devices for those containing mercury. In some instances, zinc fixatives may be used to reduce use of mercury chloride precipitates. Provide mercury spill cleanup kits and train personnel.
- ❑ Use rechargeable batteries. Medical facilities use batteries in many different forms for beepers, pumps, and diagnostic devices.
- ❑ Use cadmium-free red bags. Cadmium may be used as colorant in some red bags. During incineration, cadmium is released to the air.

### Case study

#### Reduce raw materials

The Medical Center Hospital of Vermont looked at its respiratory care department and found a way to reduce wastes and costs. On average, 12 cases of resuscitation bags were being used per week, costing the hospital \$59,900 each year.

The department bought 80 reusable bags for \$11,000. These bags were used in only two parts of the hospital, including the emergency room. This purchase decreased the need for disposable bags to only four cases per week and resulted in a \$40,000 savings per year (Leech-Bisson, McRae and Gusky-Shaner 160).

### References

Leach-Bisson, Connie, Glenn McRae, and Hollie Gusky Shaner, R.N. *An Ounce of Prevention: Waste Reduction Strategies for Health Care Facilities*. American Society for Healthcare Environmental Services, Chicago, Ill.: 1993.

Nelson, Julie A., and Larry Gibson. *Pollution Prevention Works for Iowa: Health Care Case Summaries*. Iowa Department of Natural Resources, Des Moines, Iowa: 1996.

Shaner, Hollie. *Pollution Prevention for Health Care Facilities*. CGH Environmental Strategies, Inc., Burlington, Vt.

### Additional Information

The following materials are sources of more information about medical facility pollution prevention.

#### *An Ounce of Prevention: Waste Reduction*

*Strategies for Health Care Facilities*. American Society for Healthcare Environmental Services. 210 p. 1993. Available through Ordering Services Department of American Hospital Association, 800-AHA-2626. Order number: 057007. Cost: \$75.

This material covers topics of waste reduction, waste assessments, education programs, and recycling.

#### *Guides to Pollution Prevention: Selected Hospital*

*Waste Streams*. Environmental Protection Agency. 1990. 43 p. Available through the Great Lakes Pollution Prevention Information Clearinghouse (GLPPIC) at 217-244-8989.

This guide covers wastes involved with solvents, chemotherapy, photographic chemicals, formaldehyde, radioactive waste, mercury and other toxics and corrosives.

#### *Waste Reduction: A Hospital Case Study – Itasca*

*Medical Center*. Minnesota Office of Waste Management. 1992. 16 p. Available through the Waste Reduction Resource Center at 800-476-8686. Order number: SW 0891.

Calculations are performed for different source reduction opportunities to analyze volume and weight of waste avoided, and the savings involved.

#### *Project Summary: Hospital Pollution Prevention*

*Case Study*. Environmental Protection Agency. 1991. 5 p. Available through the Waste Reduction Resource Center at 800-476-8686. Order number: MISC 0165.

This material discusses waste streams produced by different departments of a Department of Veteran's Affairs' facility and the large

quantity of disposable items which are used in such facilities.

*Pollution Prevention Works for Iowa: Health Care Case Summaries*. Iowa Department of Natural Resources. 1996. To order: 515-281-8927.

This is a collection of eleven waste minimization case studies which includes the practice which was modified, how it was modified, and the subsequent savings and waste reduced.

*Pollution Prevention for Hospitals and Medical Facilities and Best Management Practices for Hospitals and Medical Facilities*. Palo Alto Water Quality Plant. To order: 650-329-2421.

These resources identify waste streams throughout the hospital and discuss waste minimization strategies which may be implemented.

### Case study

#### Model Waste Reduction Program

Butterworth Hospital in Grand Rapids, Michigan, implemented a successful source reduction program known as BEAT (Butterworth Environmental Action Team).

Through its recycling and reduction efforts, it reduced the amount of solid waste by one third. The following are examples of its pollution prevention techniques and the savings involved:

- Using durable, pressure-relief mattresses has eliminated the need for disposable egg-crate pads. Savings per year: \$40,000.
- Sending toner cartridges out for remanufacturing rather than buying new ones. Savings per year: \$3,954.
- Washing and reusing disposable slippers until they wear out. Savings per year: \$5,000.
- Installing a distillation unit for reclaiming xylene and alcohol in the laboratory. Savings per year: \$1,700 (Leech-Bisson, McRae and Gusky-Shaner 159).



The Small Business Environmental Assistance Program's (SBEAP) mission is to help Kansas small businesses comply with clean air regulations. SBEAP operates through a consortium of the University of Kansas, Kansas State University and Wichita State University. This fact sheet was published by Kansas State University's Pollution Prevention Institute. For more information, call 800-578-8898 or send e-mail to SBEAP@ksu.edu. The University of Kansas, Kansas State University and Wichita State University are EEO/AA providers.