

Lead by Example Project Case Study:

Formalin Recycler at HCMC

Formalin; a mixture of formaldehyde, methanol and water; is used as a fixative to preserve tissue samples in health care laboratories. It is typically diluted with water to 10 percent. The Hennepin County Medical Center Clinical Laboratory, in conjunction with the Hennepin County Medical Examiner's Office, purchased and installed a distillation formalin recycler in 2004.

As a result, they have seen a dramatic decrease in the amount of formalin waste generated annually, as well as a corresponding drop in expenditures for purchasing formalin for the two institutions. The formalin recycler enabled HCMC to recycle more than 1,000 gallons of formalin per year, saving more than \$8,000 a year in the purchase of formalin.

Formalin Disposal Options

As part of this project, HCMC, researched various disposal methods and recycler units to determine the best method of disposal. They decided to recycle the formalin rather than go to the expense of chemically neutralizing it prior to sewer disposal, or having it manifested and destroyed as a hazardous waste (~\$5600 annually). The recycling approach was chosen based on the financial benefit and the environmental impact of reducing sewer disposal of formalin waste.

Operation of the formalin recycler adds process time to the laboratory workflow, but this is outweighed by the significant cost savings from not purchasing ~568 gallons of new formalin annually and subsequent disposal of formalin, as well as the significant environmental impact of sewer disposal of formalin waste.

Project Plan

1. Evaluated four different distillation processes available, including two filtration systems and two distillation systems.
2. Selected a site for the approved unit and modified a room, sharing costs for the room modifications with the medical examiner's office.
3. Developed policies and procedures for safe transporting, recycling, and storage of formalin.
4. Developed initial and on-going training for employees.



HCMC, Minnesota's third largest hospital, implemented a formalin recycling program to reduce wastes and expenses.



The formalin recycling unit program is a cost-effective alternative to hazardous waste disposal of used formalin or chemically neutralizing formalin prior to sewer disposal.

Quick Snapshot

Who

Hennepin County Medical Center, Laboratory Services Department

What

Purchased a formalin recycler and provide training to staff.

Benefits

- Reduced formalin purchases
- Reduced sewer disposal
- Reduced hazardous waste
- Reduced annual operating and maintenance expenses

Grant Amount

\$25,000.00



- Continues on back-

Project Costs and Benefits

Before Formalin Recycler

Labor: Transport of waste formalin:
50 hours @ \$25.00/hr = \$1,250

Materials purchased: quantity and costs:
710 gallons/yr formalin @ \$10.15/gallon = \$7206.50

Equipment: Not applicable

Disposal: Potential cost of chemical neutralization and disposal of formalin waste: \$5618.59/yr (this was the alternative to formalin recycling)

Education Efforts: Not applicable

Other: Not applicable

Yearly Operations and Maintenance Total:
\$14,075.09

\$14,075.09 - \$9,191.30 = \$4,833.79 savings/year

**\$27,942.20/\$4,833.79 = 5.78 years until payoff
of One-time Education and Equipment Expenses**

After Formalin Recycler

Labor: Recycler operation: ~200 hours/yr
Maintenance: ~50 hours/yr
Transport of waste & recycled formalin: ~50 hours/yr
300 hours @ \$25.00/hr = \$7,500

Materials purchased: quantity and costs: 142 gallons/yr formalin @ \$10.15/gallon = \$1441.30

Equipment: type and costs: Distillation formalin recycler:
\$15,942.20 (one-time expense)

Disposal: Not applicable

Education Efforts: Initial staff training: 200 hours @ \$25.00/hr = \$5,000 (one-time expense)
Annual training: 10 hours/yr @ \$25.00/hr = \$250.00/yr

Other: Design, demolition, and construction of the installation site: ~\$7,000 (one-time expense)

Yearly Operations and Maintenance Total: \$9,191.30

One-time Education/Equipment Expenses: \$27,942.20



Used formalin in transport containers prior to being recycled and new formalin in dispensers waits to be used.

Recycler Performance

"With the exception of one spill event that was later determined to be caused by user error, the recycling unit has operated perfectly."

Nathan Kendrick
Laboratory Safety Officer, Hennepin County Medical Center

About HCMC

Hennepin County Medical Center is Minnesota's premier Level 1 Trauma Center with many nationally recognized programs and specialties. It is the third largest hospital in Minnesota, based on operating revenue. Hennepin is an essential teaching hospital for doctors who go on to practice throughout the state. It is a safety net hospital providing care for low-income, the uninsured and vulnerable populations.

Online Resource

B/R Instrument Corp. (Distillation Equipment)

www.brinstrument.com

Minnesota Technical Assistance Program (MnTAP)

www.mntap.umn.edu/health/20-Formalin.htm (Formalin Recovery Page)

For more information on Hennepin County's Environmentally Preferable Purchasing Program or the Lead by Example Incentive Fund, please contact:

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Hennepin County Medical Center