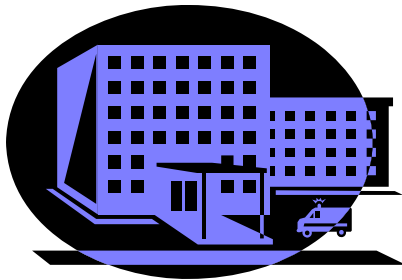


Hazardous Waste in Healthcare Operations



**Environmental Compliance Assistance
Workshop**

**for Mississippi Hospitals & Healthcare
Facilities**

July 30, 2008

Topics

- What is a hazardous waste?
- What are hazardous waste requirements?
- What are typical hazardous wastes in healthcare facilities?



What is a hazardous waste?

What is a hazardous waste?

A solid waste that is specifically listed in regulations or possesses a hazardous waste characteristic.

Hazardous Waste

EPA six-step determination process:

- Is it a solid waste?
- Is it excluded?
- Is it listed?
- Is it characteristic?
- Is it a mixture?
- Is it derived from a hazardous waste?

Is it a Solid Waste?

*“Any garbage, refuse, sludge from a waste treatment plant, water supply treatment plant, or air pollution control facility and **OTHER DISCARDED MATERIAL** including solid, liquid, semisolid or contained gaseous material.”*

Is it excluded?

- **Solid Waste exclusion**
 - *Most likely not related to healthcare facilities*
- **Solid Waste variance**
- **Hazardous Waste exclusion**
 - Household waste
 - Used Freon
 - Samples collected for studies
- **Recycling**

Is it listed?

There are four hazardous waste lists:

- F-List
- P-List
- U-List
- K-List

Hospital wastes generally fall under P & U;
may have some F-list

Is it a characteristic HW?

- Ignitable (D001)
- Corrosive (D002)
- Reactive (D003)
- Toxic (D004-D0043)

Ignitable

- Liquids with a flashpoint less than 140⁰F
- Spontaneously combustible materials
- Strong oxidizers
- Ignitable compressed gases

Corrosive

- Aqueous solution of pH < 2 or >12.5
- Liquid that corrodes steel at specified rate (e.g. sulfuric acid)

Reactive

- Normally unstable or explosive
- Reacts violently with water
- May release a toxic gas on contact with water (e.g. certain cyanide or sulfide-containing compounds)

Toxic

Exceeds concentration limits for specified organic and inorganic contaminants when sample is analyzed using Toxicity Characteristic Leaching Procedure (TCLP); examples include:

- Lead (5 mg/L)
- Benzene (0.5 mg/L)
- Mercury (0.2 mg/L)
- Silver (5 mg/L)

Is it a mixture?

- Mixing a listed waste with another material causes the entire mixture to be classed as hazardous
- Mixing a characteristic waste causes the mixture to be hazardous only if the mixture exhibits the characteristic

Is it derived from a hazardous waste?

- Wastes derived from listed or characteristic hazardous waste as residues from waste treatment processes

Generally does not apply to health care facilities



What are hazardous waste requirements?

Requirements

- Facility should make a waste determination for all waste streams
- Facility should determine generator status & obtain EPA ID number
- Facility should manage waste according to generator requirements

Hazardous Waste Generator Status

- **Large Quantity Generator (LQG)**
 - Less than 2200 pounds/month or 2.2 pounds/month of acutely hazardous
- **Small Quantity Generator (SQG)**
 - Between 220-2200 pounds/month
- **Conditionally-Exempt SQG (CESQG)**
 - Less than 220 pounds/month

Generator Requirements

Include:

- Accumulation Units and Time Limits
- Labeling
- Emergency Procedures/Contingency Plans
- Training
- Shipping
- Reporting

What are Typical Hazardous Wastes at Hospitals?

- Silver-related wastes from x-ray
- Maintenance related wastes
- Lab Solvents
- **Pharmaceuticals**

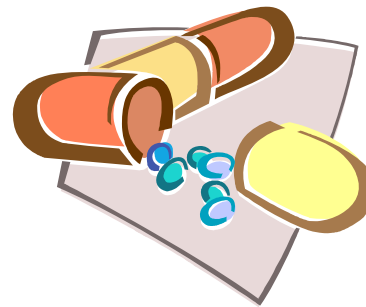
What are typical hazardous wastes at hospitals?

Typical Hazardous Wastes at Hospitals

- Epinephrine P042
- Arsenic trioxide P012
- Lindane U129
- Chloral Hydrate U034
- Acetic Acid D001, D002

Pharmaceutical Waste

Surveys have shown that regulatory requirements for pharmaceutical wastes are generally not well understood



Pharmaceutical Waste Issues

- Hospitals can become a LQG of hazardous waste by P-list wastes (acutely hazardous)
- Management of chemo drugs
- Ten of the forty Toxicity Characteristic (TC) chemicals and heavy metals are found in drug formulations

Listed Hazardous Wastes

- F-List
 - Solvents used in a range of operations
- P-List
 - About 239 “acutely toxic” substances
- U-List

F-List Examples

Acetone

Pathology Laboratory

Methanol

Histology Laboratory

Toluene

Pharmacy

Xylene

Morgue

Methylene Chloride

Maintenance Shops

P-List Examples

| | | |
|------|------------------|-----------------------|
| P012 | Arsenic Trioxide | Chemotherapy |
| P030 | Cyanide Salts | Laboratory |
| P042 | Epinephrine | Emergency, Surgery |
| P075 | Nicotine | Smoking Cessation |
| P081 | Nitroglycerin | Angina Treatment |
| P105 | Sodium Azide | Chemical Preservative |

U-List Examples

| | | |
|------|-----------------|-----------------------------|
| U002 | Acetone | Pharmaceutical formulation |
| U006 | Acetyl Chloride | Cholesterol testing |
| U034 | Chloral Hydrate | Cough syrup, sleeping pills |
| U035 | Chlorambucil | Chemotherapy |
| U044 | Chloroform | Anesthetic |

Common Hazardous Waste Violations found at Hospitals

- Failure to perform HW determinations
- Improper disposal of chemotherapy drugs
- Throwing HW down the drain
- Improper management of expired pharmaceuticals, paints, etc.

Common Violations, Cont.

- Improper or no labeling of HW
- Open containers of HW
- No or inadequate HW manifests
- Lack of or inadequate HW training of employees
- Failure to conduct inspections
- Improper consolidation of wastes from nearby facilities

Universal Waste

“Streamlined management of otherwise hazardous waste”

Universal Waste Generators

- Small Quantity Handlers (SQHUW)
 - Accumulate less than 11,000 pounds at any one time
- Large Quantity Handlers (LQHUW)
 - Accumulate 11,000 pounds or more

Universal Waste Categories

- Batteries
- Mercury-containing Equipment
- Bulbs (Lamps)
- Pesticides

Universal Waste in Hospitals

- Batteries

- pacemakers, defibrillators, fetal monitors, heart monitors, pagers, telemetry devices, temperature alarms and blood analyzers, pumps, diagnostic equipment, otoscopes, ophthalmoscopes,
- dictation machines
- portable generators
- ...and many other devices

Universal Waste in Hospitals

- **Mercury-Containing Equipment**
 - Thermometers
 - Sphygmomanometers
 - Esophageal dilators; Cantor, Miller Abbott, and feeding tubes
 - Dental amalgam
 - Batteries
 - Fluorescent lamps
 - Thermostats and electrical switches

Universal Waste in Hospitals

- Lamps

- fluorescent
- high intensity discharge
- neon
- mercury vapor
- high-pressure sodium
- metal halide

For more information:

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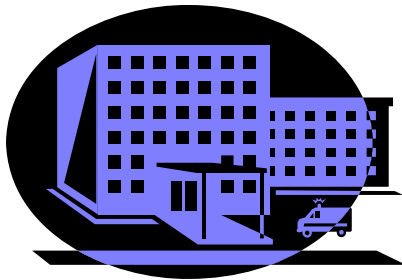
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