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 140^0F
- 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)
- Mercury (0.2 mg/L)
- Benzene (0.5 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**

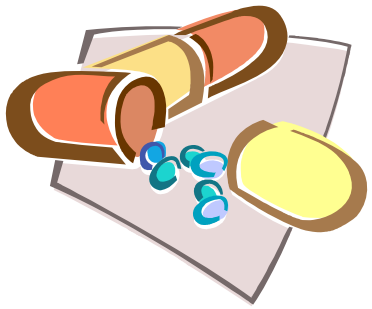
What are typical hazardous wastes at hospitals?

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 Hosptials

- 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, opthalmoscopes,
  - 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

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