



Group 5

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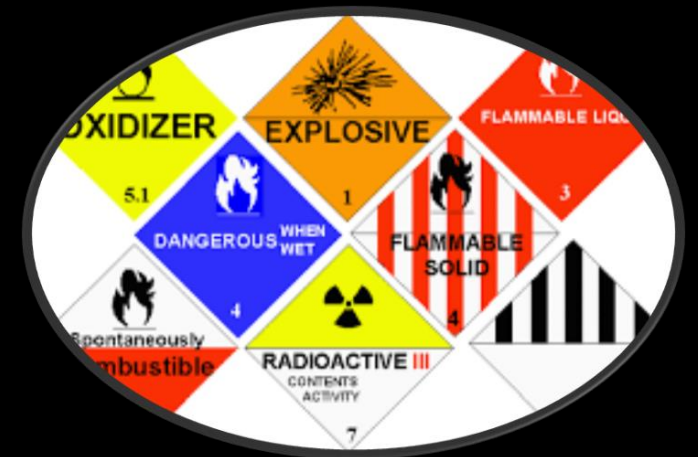


Plan for this presentation

- **Defining** hazardous material
- **5 objective elements**
 - identifying
 - sorting, labelling, handling, storage, transporting, disposal
 - radioactive materials
 - managing spills
 - training staff

Definition of Hazardous material

- item or agent (biological, chemical, radiological, physical)
- **potential harm to humans, animals, environment**
- either by itself or through interaction



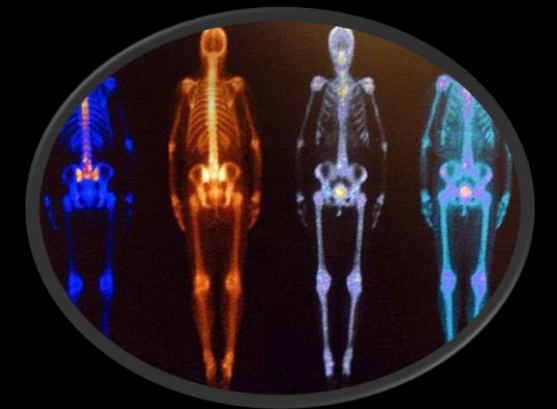


Objective A

Ensure patient, staff remain safe from Hazardous material

HAZARDOUS MATERIAL IDENTIFICATION GUIDE									
TYPE OF HAZARD	◆ HEALTH	◆ FLAMMABILITY	◆ INSTABILITY	◆ PROTECTIVE EQUIPMENT	DEGREE		4 EXTREME	3 SERIOUS	2 MODERATE
				1 SLIGHT			0 MINIMAL		
HAZARD RATING	HEALTH	FLAMMABILITY	INSTABILITY						
	4 - EXTREME - MATERIALS THAT ON VERY BRIEF EXPOSURE COULD CAUSE DEATH OR MAJOR REVERSIBLE INJURY. 3 - SERIOUS - MATERIALS THAT ON BRIEF EXPOSURE COULD CAUSE SERIOUS TEMPORARY OR REVERSIBLE INJURY. 2 - MODERATE - MATERIALS THAT ON INTERMEDIATE EXPOSURE COULD CAUSE TEMPORARY INCAPACITATION OR POSSIBLE REVERSIBLE INJURY. 1 - SLIGHT - MATERIALS THAT ON EXPOSURE WOULD CAUSE IRRITATION BUT ONLY A MINOR REVERSIBLE INJURY. 0 - MINIMAL - MATERIALS THAT ON EXPOSURE WOULD CAUSE IRRITATION THAT WOULD OVER EXHAUSTIVE HANDLING THAT OF ORDINARY COMBUSTIBLE MATERIAL.	4 - EXTREME - MATERIALS THAT WILL BURN OR COMPLETELY VAPORIZE AT A PRESSURE AND NORMAL AMBIENT TEMPERATURE, OR THAT ARE LIQUIDS OR SOLIDS IN AQUEOUS SOLUTION THAT WILL BURN HEAVILY. 3 - SERIOUS - LIQUIDS AND SOLIDS THAT CAN BE IGNITED UNDER ALMOST ALL AMBIENT TEMPERATURE CONDITIONS. 2 - MODERATE - MATERIALS THAT MUST BE ACCIDENTALLY HEATED OR EXPOSED TO RELATIVELY HIGH AMBIENT TEMPERATURES BEFORE IGNITION CAN OCCUR. 1 - SLIGHT - MATERIALS THAT MUST BE PREHEATED BEFORE IGNITION CAN OCCUR. 0 - MINIMAL - MATERIALS THAT WILL NOT BURN.	4 - EXTREME - MATERIALS THAT IN THEMSELVES ARE HEAVILY CAPABLE OF DETONATION OR OF EXPLOSIVE DECOMPOSITION OR REACTION AT NORMAL TEMPERATURES AND PRESSURES. 3 - SERIOUS - MATERIALS THAT IN THEMSELVES ARE CAPABLE OF DETONATION OR OF EXPLOSIVE DECOMPOSITION OR REACTION BUT REQUIRE A STRONG INITIATING SOURCE OR WHICH MUST BE HEATED UNDER CONFINEMENT BEFORE INITIATION ON WHICH REACT EXPLOSIVELY WITH WATER. 2 - MODERATE - MATERIALS THAT REACT UNDESIRABLY OR REACT VIOLENTLY WITH WATER OR WHICH MAY FORM EXPLOSIVE MIXTURES WITH WATER. 1 - SLIGHT - MATERIALS THAT IN THEMSELVES ARE NORMALLY STABLE BUT WHICH CAN BECOME UNSTABLE AT ELEVATED TEMPERATURES AND PRESSURES OR WHICH REACT VIOLENTLY WITH WATER OR WHICH MAY FORM EXPLOSIVE MIXTURES WITH WATER. 0 - MINIMAL - MATERIALS THAT IN THEMSELVES ARE NORMALLY STABLE, EVEN UNDER FINE EXPOSURE CONDITIONS, AND WHICH ARE NOT REACTIVE WITH WATER.						
	A	E	I						
	B	F	J						
PROTECTIVE EQUIP.	C	G	K						
	D	H	X	Ask your supervisor for special handling instructions.					

Identify the hazardous material in the organisation



Evidences

- SDS
- Staff training



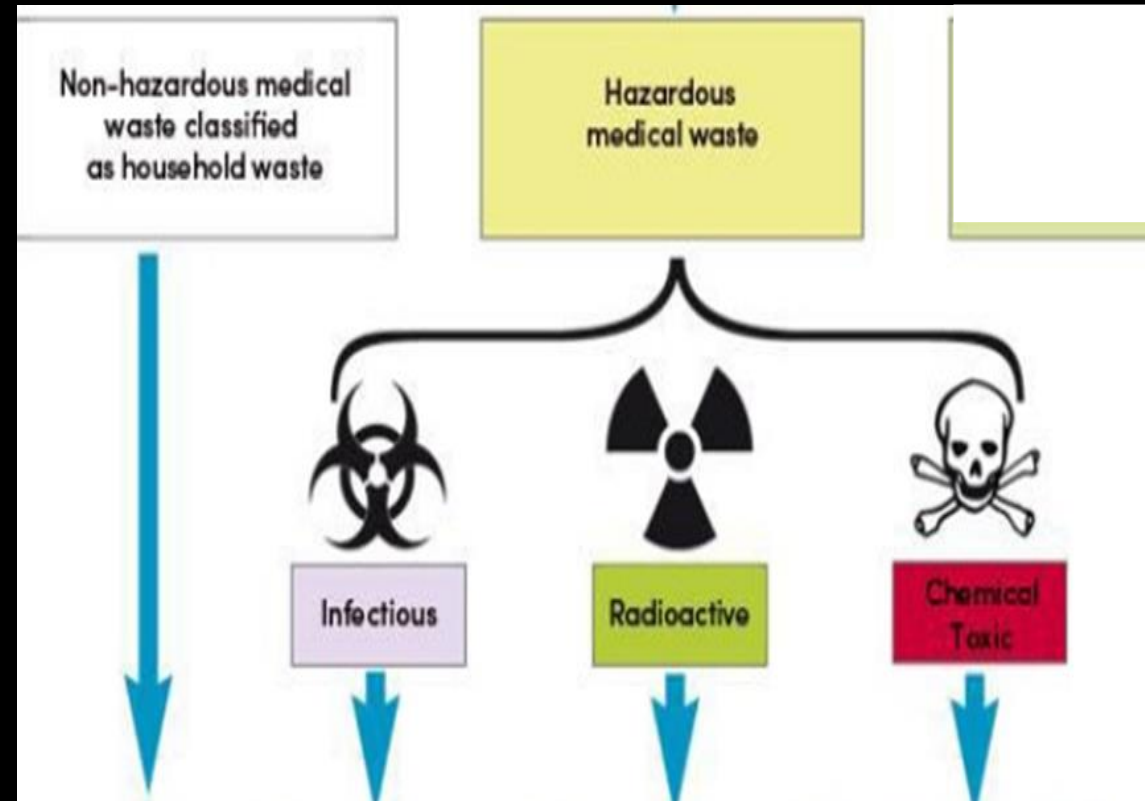
Objective B

Implements process for sorting, labelling, handling, storage, transport & disposal of hazardous material

Requirements

- organisation shall conduct an exercise of **hazard identification and risk analysis (HIRA)** associated with handling of hazardous materials
- necessary steps to eliminate or reduce such hazards and associated risks

Sorting



Labelling

Understanding Hazardous Materials Labeling System

The numbers corresponding to the colored backgrounds indicate the severity of each hazard. The white panel is reserved for a specific hazardous condition or for specific information.

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Carcinogens: A substance that has been found to cause cancer.

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Corrosive: It claimed that excess acidic destruction of an insulating aluminium air frame failed.

Cutaneous Hazards: Chemicals that affect the dermal layer of the body.

Eye Hazards: Chemicals that affect the eyes are listed on the label.

Hepatotoxicity: Chemicals that affect the liver.

Highly Toxic: a chemical of which a lethal dose is less than 10 mg per kg of body weight when taken orally, or 100 mg

get by if they, in turn, are administered by continuous control in a 24-hour period.

(irritant): a chemical, not corrosive, that causes a reversible inflammatory effect on living tissue.

Neurotoxins (chemicals that affect the nervous system).

Reproductive Toxins: Chemicals that hinder reproductive capabilities.

Sensitizer: a chemical that causes a substantial proportion of exposed people to develop an allergic reaction after

Toxicity: A chemical with a lethal dose that falls between 50 and 100 mg/kg is considered moderately toxic.

and 300 mg per kg of body weight when taken orally or between 200 mg and 1,000 mg per kg of body weight when administered

By continuous contract to a 24-hour period.

Eye Protection	Respiratory Protection	Foot Protection	Hand Protection	Protective Clothing
NO HOT WORK CONTACT WITH COMBUSTIBLES 		NO OPENING COMBUSTIBLES 		
NO OPENING COMBUSTIBLES 		NO OPENING COMBUSTIBLES 		
NO OPENING COMBUSTIBLES 		NO OPENING COMBUSTIBLES 		

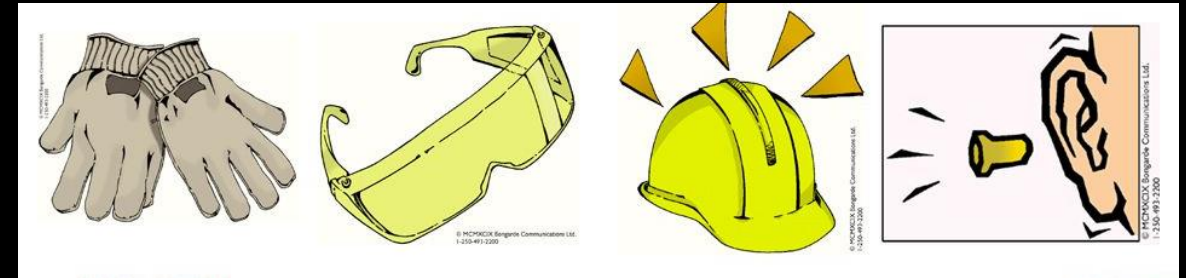
LABEL GUIDE TO HAZARDOUS CHEMICALS USED IN THIS AREA

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LABEL TYPE	HEALTH HAZARD	FIRE HAZARD	REACTIVITY	SPECIFIC HAZARD	EXAMPLE
	4 — Deadly 3 — Extreme Danger 2 — Hazardous 1 — Slightly Hazardous 0 — Normal Material	Flash Points 4 — Below 73°F 3 — Below 100°F 2 — Below 200°F 1 — Above 200°F 0 — Will Not Burn	4 — May Detonate 3 — Shock and Heat May Detonate 2 — Violent Chemical Change 1 — Unstable if Heated 0 — Stable	OXY — Oxidizer ACID — Acid ALK — Alkali COR — Corrosive W — Use NO WATER ☢ — Radiation Hazard	

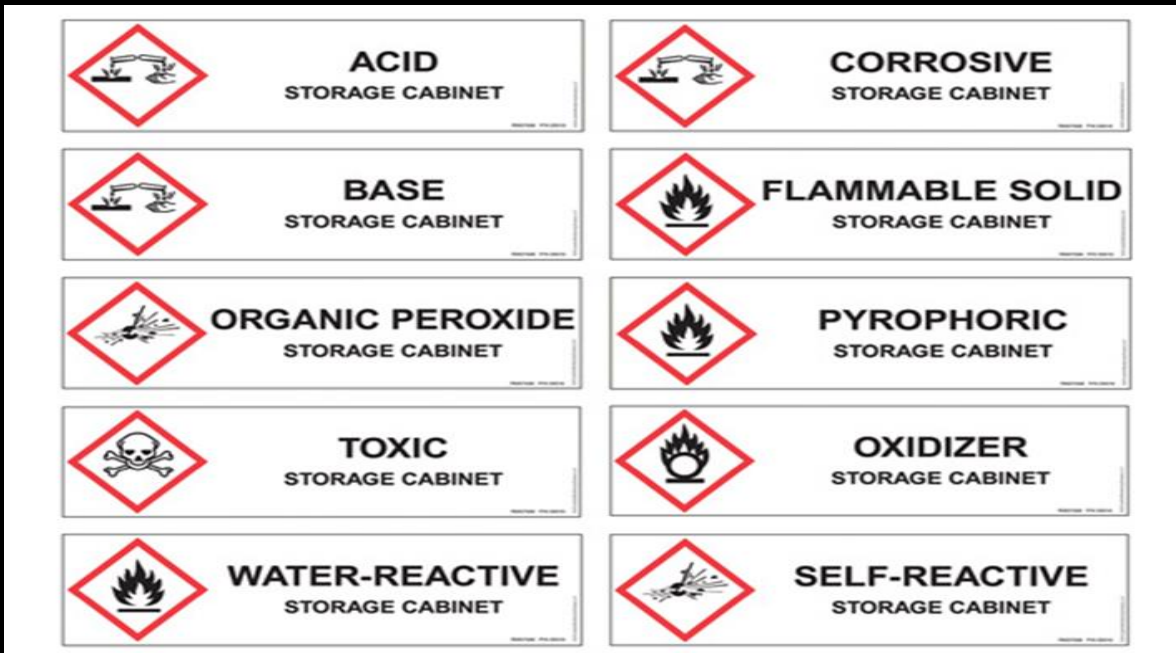
Handling

HAZARDOUS WASTE	
FEDERAL LAW PROHIBITS IMPROPER DISPOSAL. IF FOUND, CONTACT THE NEAREST POLICE OR PUBLIC SAFETY AUTHORITY OR THE U.S. ENVIRONMENTAL PROTECTION AGENCY.	
GENERATOR'S INFORMATION:	
NAME _____	
ADDRESS _____	PHONE _____
CITY _____	STATE _____ ZIP _____
EPA / MANIFEST	
ID NO. / TRACKING NO. _____	
ACCUMULATION _____	EPA _____
START DATE _____	WASTE NO. _____
HAZARDOUS WASTE, SOLID, N.O.S.	
NA3077	
(U.S.T. PROPER SHIPPING NAME AND UN OR NA NO. WITH PREFIX)	
HANDLE WITH CARE!	





Storing



WHAT IS AN MSDS?

material safety data sheet (or MSDS)

*a document that provides workers
with procedures for safely
handling or working with a
particular substance*



MATERIAL SAFETY DATA SHEET - 9 SECTIONS

SECTION 1 - PRODUCT INFORMATION

Product Name	WHMIS Classification (optional)
Product Use	
Manufacturer's Name	Supplier's Name
Physical and Mailing Address	Physical and Mailing Address
Emergency Contact Phone Number	Emergency Contact Phone Number

SECTION 2 - HAZARDOUS INGREDIENTS

Hazardous Ingredients (very specific)

SECTION 3 - PHYSICAL DATA

Physical State (What does it look like? Is it a liquid, gas, or solid?)
What happens to it under a variety of circumstances? (i.e. heat, freezing, dropping, etc.)
Flammability and how to extinguish. Includes a wide variety of details concerning how easily this product

SECTION 4 - FIRE AND EXPLOSION DATA

will ignite / explode and how to deal with it. How stable is this product?	How it reacts under various conditions.
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SECTION 5 - REACTIVITY DATA

Incompatibility with other substances. Information about how the product affects and enters the body.	Hazardous Decomposition Products Immediate affect. Long term toxic affect.
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SECTION 6 - TOXICOLOGICAL PROPERTIES

Exposure limits. In summary, immediate and long term affects to the human body.

SECTION 7 - PREVENTIVE MEASURES

Personal Protective Gear; ventilation, etc.; leak and spill info; waste disposal; handling and storage; special shipping instructions

SECTION 8 - FIRST AID MEASURES

Information for immediate first aid treatment. Usually always ends with "contact a Doctor"

SECTION 9 - PREPARATION INFORMATION / Who prepared this and contact info



Health	1
Fire	1
Reactivity	0
Personal Protection	C

Material Safety Data Sheet Ethylene glycol MSDS

Section 1: Chemical Product and Company Identification

Product Name: Ethylene glycol	Contact Information:
Catalog Codes: SLE1072	ScienceLab.com, Inc.
CAS#: 107-21-1	14025 Smith Rd.
RTECS: KW2975000	Houston, Texas 77396
TSCA: TSCA 8(b) Inventory: Ethylene glycol	US Sales: 1-800-901-7247
CHE: Not available.	International Sales: 1-281-441-4400
Synonyms: 1,2-Dihydroxyethane; 1,2-Ethanediol; 1,2-Ethandiol; Ethylene dihydrate; Glycol alcohol; Monoethylene glycol; Tescol	Order Online: ScienceLab.com
Chemical Name: Ethylene Glycol	CHEMTREC (24HR Emergency Telephone), call: 1-800-424-9300
Chemical Formula: HOCH ₂ CH ₂ OH	International CHEMTREC, call: 1-703-527-3887
	For non-emergency assistance, call: 1-281-441-4400

Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Ethylene glycol	107-21-1	100

Toxicological Data on Ingredients: Ethylene glycol: ORAL (LD50): Acute: 4700 mg/kg [Rat], 5500 mg/kg [Mouse], 6610 mg/kg [Guinea pig]. VAPOR (LC50): Acute: >200 mg/m 4 hours [Rat].

Section 3: Hazards Identification

Potential Acute Health Effects:

Hazardous in case of ingestion. Slightly hazardous in case of skin contact (irritant, permeator), of eye contact (irritant), of inhalation. Severe over-exposure can result in death.

Potential Chronic Health Effects:

CARCINOGENIC EFFECTS: A4 (Not classifiable for human or animal.) by ACGIH. MUTAGENIC EFFECTS: Mutagenic for mammalian somatic cells. Non-mutagenic for bacteria and/or yeast. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance may be toxic to kidneys, liver, central nervous system (CNS). Repeated or prolonged exposure to the substance can produce target organs damage. Repeated exposure to a highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.

Section 4: First Aid Measures

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MATERIAL SAFETY DATA SHEET MSDS FOR HOT MIX ASPHALT

DATE REVISED: June 11, 2009



SECTION 1 - MANUFACTURER'S INFORMATION

Manufacturer:	Information Telephone:
Pike Industries, Inc.	(603) 527-5100
3 Eastgate Park Road	24 Hour Emergency Phone Number:
Belmont, NH 03220	Chemtrec 1-800-424-9300
Product Trade Name and Synonyms: HOT MIX ASPHALT (Asphalt Concrete, Black top, Bituminous Concrete)	Signature of Preparer:
Date Prepared: December 1, 2000	

SECTION 2 - INGREDIENTS/IDENTITY INFORMATION

Ingredient: Asphalt (Petroleum) PG 64-22 PG 58-28 PG 64-28
Percent: <4 - 7%
CAS Number: 8052-42-4
OSHA PEL: N/A
ACGIH TLV: 5 MG/M3 (Fume)
Ingredient: Aggregate (Crushed Stone, Sand, Gravel)
Percent: >93 - 96%
CAS Number: N/A
OSHA PEL: 15 MG/M3 TDUST (MFR)
ACGIH TLV: 10 MG/M3 (MFR)

SECTION 3 - PHYSICAL /CHEMICAL CHARACTERISTICS

SOLUBILITY IN WATER: N/A	% VOLATILE (By Volume) AT 68° F: N/A
EVAPORATION RATE: N/A	SPECIFIC GRAVITY: 2.275 - 2.5000
APPEARANCE AND ODOR: Black - Brown Sand and Stone Mixture with Petroleum (Asphaltic) Odor.	

SECTION 4 - FIRE AND EXPLOSION HAZARD DATA

FLASHPOINT: (Method Used)	> 450°F Minimum	COC
FLAMMABLE LIMITS:	LEL: N/A	UEL: N/A
EXTINGUISHING MEDIA:	CO ₂ , Dry Chemical, Foam	
SPECIAL FIRE FIGHTING PROCEDURES: Wear NIOSH/MSHA approved SCBA & Full Protective Equipment (FP N)		
Unusual Fire and Explosive Hazards: Do not heat above flash point.		

Transporting

- Avoid patient/crowded areas
- Avoid using lifts meant for patients and/or movement of sterile equipment
- Selection of time important-Select time of minimum movement (Not while doctors are on rounds; Not during visiting hour)
- Preferably use the hospital ramp
- Ergonomics to be taken into consideration: avoid lifting, prefer trolleys
- Waste bags should be sealed or tied properly
- Hazardous and non-hazardous waste should be carried in separate vehicles

Table. 8.3

Colour code	Hazardous Substance (Number index)
Orange	Explosives, Compressed gas (1)
Green	Non flammable (2)
Red	Flammable
White	Poisonous
White and Red strips	Flammable solid
Yellow	Peroxides
White	Peroxides
Yellow and magenta	Infections
White and Black	Corrosive



Transporting



PESTICIDES

such as rinse material from containers and spray equipment, and leftovers



RADIOACTIVE WASTES

produced from nuclear power generation and technology



BIOMEDICAL WASTE

generated in labs and hospitals

Containers Used To Transport Hazardous Waste

Containers must be made of, or lined with, materials that will not react with the hazardous waste to be stored.



METAL AND PLASTIC DRUMS



AMBER BOTTLES

(lab/hospital chemicals)



PLASTIC BUCKETS

such as for sharp scalpels and syringes



INTERMEDIATE BULK CONTAINERS (IBC)

(aka totes or tanks)
used to store and transport fluids and other bulk materials



MEDICAL WASTE SEGREGATION CHART

SHARPS

Red Sharps Container

- ✓ Needles
- ✓ Ampules
- ✓ Broken Glass
- ✓ Blades
- ✓ Razors
- ✓ Staples
- ✓ Trocars
- ✓ Guide Wires
- ✓ Other Sharps



BIOHAZARD

Red Container or Red
Liner in Container

- ✓ Infectious Waste
- ✓ Blood Products (albumin, etc)
- ✓ Contaminated Personal
Protective Equipment (PPE)
- ✓ IV Tubing
- ✓ Cultures, Stocks



TRACE CHEMO

Yellow Container

- ✓ Empty vials, ampules
- ✓ Empty Syringes, Needles
- ✓ Empty IVs
- ✓ Gowns
- ✓ Gloves
- ✓ Tubing
- ✓ Aprons
- ✓ Wipes
- ✓ Packaging



RCRA HAZARD

Black Container

- ✓ Hazardous meds (RCRA)
- ✓ Half/Partial doses (RCRA)
- ✓ Hazardous bulk meds
- ✓ P-listed drugs, packaging
- ✓ Bulk chemo
- ✓ Pathological Waste (Incineration Only)



PHARMACEUTICAL

Blue Container

- ✓ Pills
- ✓ Injectables
- ✓ Antibiotics



RADIOACTIVE

Shielded Containers with
Radioactive Symbol

- ✓ Fluorine-18 (F-18). 110 minutes half-life.
- ✓ Technetium-99 (T-99m). 6 hours half-life.
- ✓ Iodine-131 (I-131). 8 days half-life.
- ✓ Strontium-89 (Sr-89). 52 days half-life.
- ✓ Iridium-192 (Ir-192). 74 days half-life.
- ✓ Cobalt-60 (Co-60). 53 years half-life.



BIO MEDICAL
WASTE SOLUTIONS

Download this Printable Chart At
www.BioMedicalWasteSolutions.com/Medical-Waste-Disposal/

Disposal



HOW IS HAZARDOUS WASTE DISPOSED?		
 FUELS BLENDING Hazardous and non-hazardous wastes are blended into a fuel source in cement kilns, other manufacturers, or power plants.	 SOLIDIFICATION The waste is mixed with cement to immobilize contaminants.	 MICRO-ENCAPSULATION The waste is mixed with the encasing material before solidification occurs.
 INCINERATION Performed properly, incineration destroys the toxic organic constituents and reduces	 LANDFILL Prepared sites where non-liquid hazardous waste are deposited for	 MACRO-ENCAPSULATION An encasing material is poured over and around a larger mass of waste, enclosing it

Improper disposal -can lead to dangerous situations:

- Hospital staff- risk of infections
- Immunocompromised patients-HIV, hepatitis B, C.
- Persons handling wastes.
- Poor waste management - unscrupulous persons will recycle materials from waste.
- Organic portion ferments, fly breeding.
- Development of resistant strains by microorganisms.

Evidences

- SDS, HIRA, staff training

Objective C

- Awareness about **rules and regulations** such as the Atomic Energy Act
- **Norms issued** by Atomic Energy Regulatory Board (AERB) and the directives from the Health Physics Division of Bhaba Atomic Research Centre (BARC).
- **<http://aerb.gov.in>**

Evidence

- Licence

Objective D

- Organisation could have a HAZMAT kit(s) as part of PPE for handling spills.

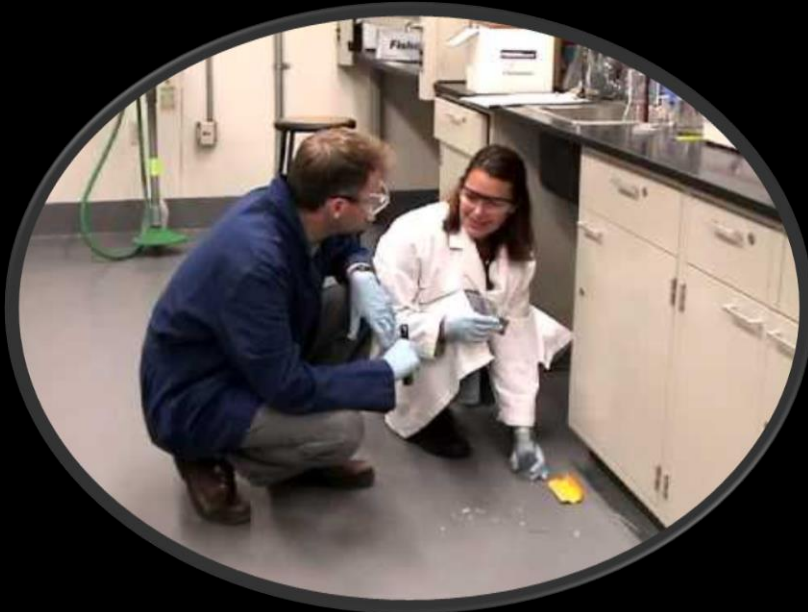


Evidence

- Availability of Hazmat kits, PPES
- Staff training

Objective E

- Staff are educated and trained for handling of hazardous materials



- Evidence: staff training

- The end



6th Advanced Program to train CPQIH