Carolinas HealthCare System

CHS WASTE DISPOSAL GUIDE

CHS Waste Disposal Guide

TABLE OF CONTENTS

INTRODUCTION

Hospitals and healthcare facilities generate multiple types of waste streams. Proper classification, segregation and disposal of these different wastes is required to meet various local, state and federal regulations.

This guide was developed by Carolinas HealthCare System (CHS) Corporate Safety to offer direction in the appropriate handling, storage and disposal of the various waste streams generated at CHS facilities. This document summarizes best management practices for dealing with wastes based on prevailing environmental regulations and the CHS Waste Management Policy (CHS 5.11). Corporate Safety encourages all CHS facilities to use this document and CHS 5.11 to establish consistent waste management practices and enhance regulatory compliance across the organization.

CHS Corporate Safety has conducted a thorough review of waste streams and management practices at various CHS facilities. This guide has been revised based on that review and reflects improvements implemented within CHS, particularly, in the collection and management of certain pharmaceutical wastes, solvents, mixed alcohols, ethanol, universal wastes and Electronic-"E"-wastes.

This guide is designed to address the major waste streams identified in the CHS network to date. This document and CHS 5.11 are periodically updated to reflect changes in environmental regulations, advances in waste management practices and emerging waste streams in the healthcare industry.

RED BAG ABUSE

In addition to meeting regulations, proper waste segregation also allows better management of disposal costs. Significant cost savings can be achieved by reducing *red bag abuse*. High disposal costs can be attributed to lack of training, poor practices and short cuts that cause excessive and unnecessary items to be discarded into red bags. Disposal of red bags costs about 5-6 times more than solid waste or "non-regulated waste". Please review and follow this guide to help reduce *red bag abuse*.

This guide was developed by Corporate Safety. Please send any comments or suggestions to CHS Corporate Safety at (704) 512-7283 or email: CRPSF@carolinashealthcare.org.

Thanks for your help in making this important CHS environmental management program successful.

TYPES OF WASTE CONTAINERS

Biohazard Bags and Bins:	**Use only for the disposal of biohazardous, infectious, and pathological waste, as well as items which have been contaminated with such materials.** ***NOTE: – pathological waste always requires an additional label on the biohazard bin which says that the waste must be incinerated.***
Biohazard Sharps Containers:	**Use only for the disposal of sharp or potentially sharp/dangerous waste items which have been contaminated with biohazardous/infectious material.**
Yellow Bags and Bins:	**Use only for the disposal of chemotherapeutic, cytotoxic, oncologic, NIOSH listed, hazardous pharmaceutical wastes that are NON-RCRA, as well as items which have been contaminated with such materials.**
Yellow Sharps Containers:	**Use only for the disposal of sharp or potentially sharp items which have been contaminated with chemotherapeutic, cytotoxic, or oncologic material.**
Black Bins	**Use for collection of RCRA hazardous wastes, including certain waste pharmaceuticals (list attached to bin).**
Opaque Plastic Bags:	**Use for disposal of solid waste or "non-regulated waste".**
Clear Plastic Bags:	Use only for collection of materials which are intended for recycling.
Recycling Bins:	Use only for collection of materials which are intended for recycling.
Closed Top Steel Drums:	Use for collecting larger quantities of xylene and alcohol solvents from laboratory operations and used oil.
Plastic Containers:	Use for collecting smaller quantities of solvents (1 gallon or less in closeable top container). Solvents include xylene, methanol, ethanol, etc. Closeable plastic containers can be used for collecting used lamps, broken lamps, batteries, ballasts and disposable gas cylinders.

CHS Waste Segregation Guidelines

Waste Category	Solid Waste	Hazardous Waste *Black Bins* & waste compatible containers	Universal Waste & Used Oil	E-Waste (electronic waste)	Yellow Bag / Bin & Sharps Container	Regulated Medical Waste - Sharps Container	Regulated Medical Waste - Red Bag / Bin	Pathological Waste - Designated Bin with yellow pathological label	Other / Special Instructions
Gloves, masks, PPE, bandages, items not saturated w/ blood/OPIM	X								
Catheters & drainage devices Suction canisters Ventilator tubing	X								Use PPE, empty in sewer. If grossly contaminated with blood, use solidifier and place in red bag/bin.
IV bags & tubing	X								Use PPE & empty into designated sink
Tracheal tubes	X								
Urine dipsticks, glucose test strips	X								
Throat swabs	X								
Packaging & wrappings	X								
Solid waste or "non-regulated waste"	X								
Disposable diapers and non-linen materials soiled with urine & feces	X				Only if on chemo				Cover container
Alkaline & Zinc Carbon (Heavy Duty) Batteries	X								
Aerosol cans (fully empty – at zero pressure)	X								
Aerosol Cans (not fully empty)		X							
Pressurized Gas Cylinders (anesthesia and blood gas calibration cylinders, nitrous oxide, MAP & propane gas cylinders, etc.)		Package separately from other wastes to ensure proper disposal **Do Not place into black bins**							Gas Cylinders can returned to manufacturer for recycling in most cases. See page 21 of this Guide for more info on disposal.
Used Chloraprep Containers & alcohol wipes	X								
Used Nicotine Patches	X								
Nicotine Patch Wrappers		X							
RCRA Listed Hazardous Waste (see Pharmaceutical Waste section)		X							

Waste Category	Solid Waste	Hazardous Waste *Black Bins* & waste compatible containers	Universal Waste & Used Oil	E-Waste (electronic waste)	Yellow Bag / Bin & Sharps Container	Regulated Medical Waste - Sharps Container	Regulated Medical Waste - Red Bag / Bin	Pathological Waste - Designated Bin with yellow pathological label	Other / Special Instructions
Pharmaceutical Waste (not on the RCRA List) Chemotherapy, oncologic, cytotoxic wastes, NIOSH listed - See Chemotherapy/Hazardous Agents - CHS 5.12 policy for more information.					X X				
Linen and Materials soiled w/urine, feces from **chemo patients** (linen with chemo is segregated, specially bagged and washed separately)					**X Orange Bag & Clear Bag**				
Glass (contaminated culture bottles, blood tubes, broken glass, broken ampoules)						X			**OK in red bag if inside labeled, puncture resistant container**
Syringes, with or without sharps						X			
Suture needles / Surgical blades, staples and staplers						X			
Disposable Cautery Pens (ONLY after snapping off cooled heating element with hemostat AND placing cap back on to lock switch to prevent accidental activation)	X								
Sharp disposable instruments						X			
Items *saturated* w/ blood or OPIM							X		
Blood/product bags with IV tubing							X		
Hemodialysis blood & artificial kidney tubing							X		
Tissues, organs, body parts and animal carcasses. (pathogenic wastes)								X	
DEA Controlled Substances (Pharmaceutical Waste) General (non-regulated)									Flush with generous amounts of water, follow DEA as required
Urine & feces									Sanitary sewer – see nursing policy if patient on chemo
Linen (wet or dry – NOT from Chemo patients)									Impervious soiled linen bag
Fluorescent lamps, compact fluorescents, U-tubes, projector lamps, UV light lamps, any lamp with the "Hg" (mercury symbol) on lamp		Broken lamps are a hazardous waste!	X						

CHS Waste Segregation Guidelines

Waste Category	Solid Waste	Hazardous Waste Black Bins & waste compatible containers	Universal Waste & Used Oil	E-Waste (electronic waste)	Yellow Bag / Bin & Sharps Container	Regulated Medical Waste - Sharps Container	Regulated Medical Waste - Red Bag / Bin	Pathological Waste - Designated Bin with yellow pathological label	Other / Special Instructions
Chemicals (examples)									
Mixed Alcohol solutions > 24 %		X							
Formaldehyde solutions > 37%		X							
Solvents - Flash point < 140 F		X							
pH less than 2, or greater than 12.5		X							
Certain expired, unused chemicals		X							
Specific spent or used chemicals		X							
Ethanol (95-100%) from laboratories		X							Recyclable Material - See page 22 of this guide for more information
Lead lined vests and shielding		X							
Cidex, Cidex OPA (new or used)									Sanitary Sewer
Tissue Samples - Formalin 37% or less in tissue sample containers								Follow the *Wet Tissue Disposal using Vermiculite Procedure* per Carolinas Laboratory Network	
Formalin Solutions – 10% concentration or less									Sanitary Sewer
Formalin / Formaldehyde Solutions – 37% or greater concentration - used or unused		X							

CHS Waste Segregation Guidelines

Waste Category	Solid Waste	Hazardous Waste *Black Bins* & waste compatible containers	Universal Waste & Used Oil	E-Waste (electronic waste)	Yellow Bag / Bin & Sharps Container	Regulated Medical Waste - Sharps Container	Regulated Medical Waste - Red Bag / Bin	Pathological Waste - Designated Bin with yellow pathological label	Other / Special Instructions
High pressure sodium vapor, mercury vapor, metal halide lamps		Broken lamps are a hazardous waste!	X						DO NOT break lamps. Keep whole to prevent hazardous waste classification
Ballasts (magnetic type) pre -1978 containing PCB's		X							
Ballasts (magnetic type) after - 1978 - NO PCB's			X						
Ballasts (electronic type) - fluorescent lights				X					
Ballasts - HID Lighting (transformer and capacitor)				Recycle with scrap metals					
Lead Acid, NiCad, NiMH, Lithium, Mercury Batteries			X						
Mercury-containing devices (gauges, manometers, thermometers, switches, etc)*			X						
Used Oil (including chiller oil)			X						
Used Oil contaminated with solvents, cleaners, etc.		X							
Computers, monitors, keyboards, servers, etc.				All Donated to Heinemann Foundation					
Electronic Circuit Boards, Capacitors, Computer internal parts				X					
Radiological Waste (Radioactive Materials - RAM) including patient care materials.									Follow radioactive waste disposal procedures, pages 35-37 of this guide.
Radiological Wastes mixed with Hazardous Waste or Regulated Medical Waste		X					X		**Avoid waste mixtures** - segregate waste streams - follow radioactive waste disposal, pages 35-37 of this guide
Radiological Wastes mixed with biological materials/medical waste									Follow radioactive waste disposal, pages 35-37 of this guide.

* Container Management Quick Reference 2014 *

Carolinas HealthCare System

Place Items in the appropriate containers as listed below - Contact Corporate Safety if you have any additional questions - crpsf@carolinashealthcare.org - 704-512-7283

Hazardous Waste	Regulated Medical Waste	Sharps Waste	Oncologic/Chemo Waste	Trash	Sewer
					
Pharmaceuticals/Chemicals on the RCRA List (see FSO if you don't have list)	Items Saturated with Blood or OPIM	Glass - contaminated culture bottles, blood tubes, broken glass, broken ampoules	Chemotherapy, oncologic, cytotoxic and NIOSH pharmaceuticals that are NOT ON THE RCRA LIST	Gloves, masks, PPE, bandages, items NOT Saturated with blood or OPIM	Urine
Coumadin items and wrappers	Blood/product bags with IV tubing	Syringes, with or without sharps	*See CHS Chemo/Hazardous Agent Policy 5.12 for more information on hazardous pharmaceutical handling & disposal*	Catheters and drainage devices (Empty)	Blood
Nicotine items and Wrappers	Hemodialysis blood and artificial kidney tubing	Surgical staples and staplers		Suction canisters (Empty)	Feces
Xylene in bottles	Suction canisters, chest tubes, etc containing bodily fluids (add solidfier when >25ml liquid in container)	Suture needles	Material Soiled with urine, feces from chemo patients – must go into orange chemo linen bag	IV Bags and tubing	Formalin at 10% solution
Formaldehyde solutions > 37% in bottles		Surgical blades		Chest tubes (Empty)	Cidex/Cidex OPA (new/used)
Solvents with flash point <140 F in bottles	Pathologic Waste (Tissues, organs, body parts and animal carcasses) - red bin with yellow pathologic waste label	Sharp disposable instruments		Urine dipsticks	
Liquids with a pH <2 or > 12.5 in containers				Glucose test strips	
Hydrogen Peroxide solution in bottles				Throat swabs	
Ethanol in bottles				Solid waste/Non-regulated waste	
Aerosol cans (NOT fully empty/at zero pressure)				Aerosol Cans - Fully empty	
Chloroprep (unused)				Used Chloroprep	
Alcohol solutions > 24% in bottles				Alcohol wipes	
				Alkaline Batteries	
Compressed calibration gas cylinders, place into plastic container, keep separate from other hazardous waste (see CHS Waste Guide for more info)					

CHS Corporate Safety | Container Management Quick Reference 2014 | Revision 2.0

EMPTY GLASS, METAL & PLASTIC CONTAINERS

I. Examples

- ✓ Metal drums
- ✓ Plastic bottles, buckets and jugs
- ✓ Glass bottles, jars and jugs

II. Instructions

A. General

1. Container must be completely empty and have no waste residuals.
2. Remove original label.
3. If label cannot easily be removed, use a permanent marker to draw an "X" across the original manufacturer's label on the container, and then draw a line through name of the material.
4. Dispose of glass in puncture resistant general waste receptacle.
5. Dispose of metal and plastic in general waste receptacle.

DISPOSABLE SHARPS

I. Definitions

A. Disposable sharps – Any disposable object that has the potential to penetrate the skin and cause puncture wounds or cuts.

B. Reusable sharps – Non-disposable sharps which, after use, are cleaned, sterilized, and packaged for reuse. Reusable sharps contaminated with blood or other potentially infectious material (OPIM) must be stored, until properly reprocessed, in a manner that does not require an employee to reach into the container or risk injury due to unnecessary handling of the items.

C. Sharps containers - Designated containers that are sealable, puncture resistant, leak proof, and labeled or color-coded.

II. Examples

- ✓ Needles
- ✓ Syringes with or without sharps
- ✓ Scalpel blades
- ✓ Surgical wire
- ✓ Utility or razor blades
- ✓ Blood collection tubes
- ✓ Capillary tubes
- ✓ Slides and cover slips
- ✓ All glass and rigid plastic pipettes
- ✓ Broken glass or plastic

Note: DO NOT PUT BROKEN MERCURY THERMOMETERS IN SHARPS BOXES. See hazardous waste section of this guide for more information.

III. Instructions

A. General

1. Immediately place used sharps in a sharps container before continuing with any other procedure.
2. Never put any type of sharp into the solid waste or "non-regulated waste", RCRA Black Bin/hazardous waste container or recycling containers.

B. Sharps Container

1. Close the lid securely when the sharps container is approximately 2/3 full, no further additions will be made to the container.
2. Place the full sharps container beside a red biohazard bin that is ready for pick-up.
3. Replace the full container with a new container from department supply stock.

For more information about Sharps safety, click on this link to CHS 7.01 Exposure Control Plan for Bloodborne Pathogens.

SOLID WASTE OR "NON-REGULATED WASTE"

I. Definition

Solid Waste ("Non-Regulated Waste") - Any trash, garbage, refuse, debris and other discarded material (solid, liquid, semisolid, or contained gaseous material) that is NOT otherwise recognized as regulated medical waste, RCRA hazardous waste, radioactive waste, mixed waste or multi-hazard waste.

Solid wastes are to be discarded in proper trash receptacles and managed by CHS facilities in a manner that does not create a physical or environmental hazard inside or outside the facility.

II. Examples

- ✓ Gloves, masks, gowns, other disposable personal protective equipment (PPE), etc. that are **NOT** saturated with blood or other potentially infectious materials (OPIM) or regulated chemicals.
- ✓ Bandages, dressings, gauze, etc. that are **NOT** saturated with blood or OPIM.
- ✓ Disposable Cautery Pens ***(only after heating element removal and switch deactivation by recapping)***
- ✓ Paper, packaging, wrappings, etc. from labs, patient rooms, clinics, ORs, etc.
- ✓ Alkaline and Heavy Duty (Carbon Zinc) Batteries
- ✓ Office waste, including disposable cloth, plastic, and paper.
- ✓ Unbroken laboratory materials that are not grossly contaminated with blood or OPIM or regulated chemicals.
- ✓ Medical, pharmaceutical and certain laboratory glassware that does **NOT** contain blood, OPIM or regulated chemicals.

III. Instructions

A. **Gloves, Masks, Gowns, other PPE**

These items and many others should be placed in the solid waste (trash) container, unless they are contaminated with regulated chemicals or saturated with blood or OPIM.

B. **Bandages, Dressings, Gauze**

Place items in the general waste, unless saturated with blood or OPIM.

C. **Paper, Packaging, Wrappings, and Office Waste**

Place in a wastebasket lined with a regular opaque plastic bag for pickup by Environmental Services. Refer to "HIPAA Protected Health Information", if appropriate.

D. **Batteries [Disposable Alkaline & Heavy Duty (Carbon Zinc)]**

1. Size category A, AA, AAA, C, D and 9 volt batteries may be disposed of in the regular trash with other solid waste items. Currently there are very few recyclers of alkaline and carbon zinc "heavy duty" batteries, the price for recycling is expensive and recycling practices questionable. *9 volt batteries must have the terminals "taped" to prevent short circuiting in transport. The other batteries listed above do not require taping.*
2. **DO NOT place Alkaline and Heavy Duty batteries in sharps containers, red bin waste, yellow bin, black bin hazardous waste or paper recycling "shred-it" containers.**
3. Please contact Corporate Safety at 704-512-7283 if you have any questions about the proper disposal of these batteries. Departments may look at recycling programs for alkaline and heavy duty batteries through the CHS Sustainability Office.

E. **Labware - Other Than Glass and Sharps**

Place in a waste basket lined with a regular opaque plastic bag for pickup by Environmental Services.

F. **Non-Recyclable Glass**

1. Dispose of small pieces of broken or unbroken glass in a sharps container. Place larger quantities of uncontaminated glass into an empty cardboard box of appropriate size and lined with a regular opaque plastic bag.
2. Wrap wet uncontaminated broken glass in absorbent paper before placing in the lined cardboard box.
3. Close the box and secure it with tape.
4. Write "Glass for Disposal" on top of the box with a felt-tipped pen.
5. Place the box beside your wastebasket for pickup by Environmental Services. In patient care areas, place the box in the Soiled Utility Room.

G. **Disposable Cautery (Bovie) Pens**

1. Remove heating wire from the pen with a hemostat. Heating wire can be placed in sharps container after adequate cooling.
2. Place cover cap back on the pen to prevent switch activation.
3. Place cautery pen in the regular trash container for disposal.

H. **Recyclable Material**

1. Place in the appropriate recycling container.
2. Temporarily store recyclable material containers in an adequate location that does not create a hazard or nuisance.
3. Coordinate collection of recyclable material with an approved vendor.

REGULATED MEDICAL WASTE

I. Definitions

Regulated Waste [per the Occupational Safety and Health Agency (OSHA)] --

- Liquid or semi-liquid blood or other potentially infectious materials (OPIM);
- Items that would release liquid or semi-liquid blood or OPIM if compressed;
- Items caked with dried blood/OPIM capable of releasing materials during handling;
- Contaminated sharps;
- Microbiological wastes containing blood or OPIM.
- Pathological waste - human tissues, organs and body parts; and the carcasses of animals that were ***known*** to have been exposed to pathogens ***or that died*** of a ***known*** or ***suspected*** disease transmissible to humans.

Other Potentially Infectious Materials (OPIM) –

- Semen, vaginal secretions, cerebrospinal fluid, synovial fluid, pleural fluid, pericardial fluid, peritoneal fluid, amniotic fluid, saliva in dental procedures, any body fluid that is visibly contaminated with blood, and all body fluids in situations where it is difficult or impossible to differentiate between body fluids.
- Any unfixed tissue or organ, other than intact skin, from a human, living or dead.
- HIV or other select agent-containing cell or tissue cultures, organ cultures, and HIV- or HBV-containing culture medium or other solutions; and blood, organs, or other tissues from experimental animals infected with HIV or HBV.

Select Agents -- biological agent or toxin listed in the HHS and USDA Select Agents and Toxins List.

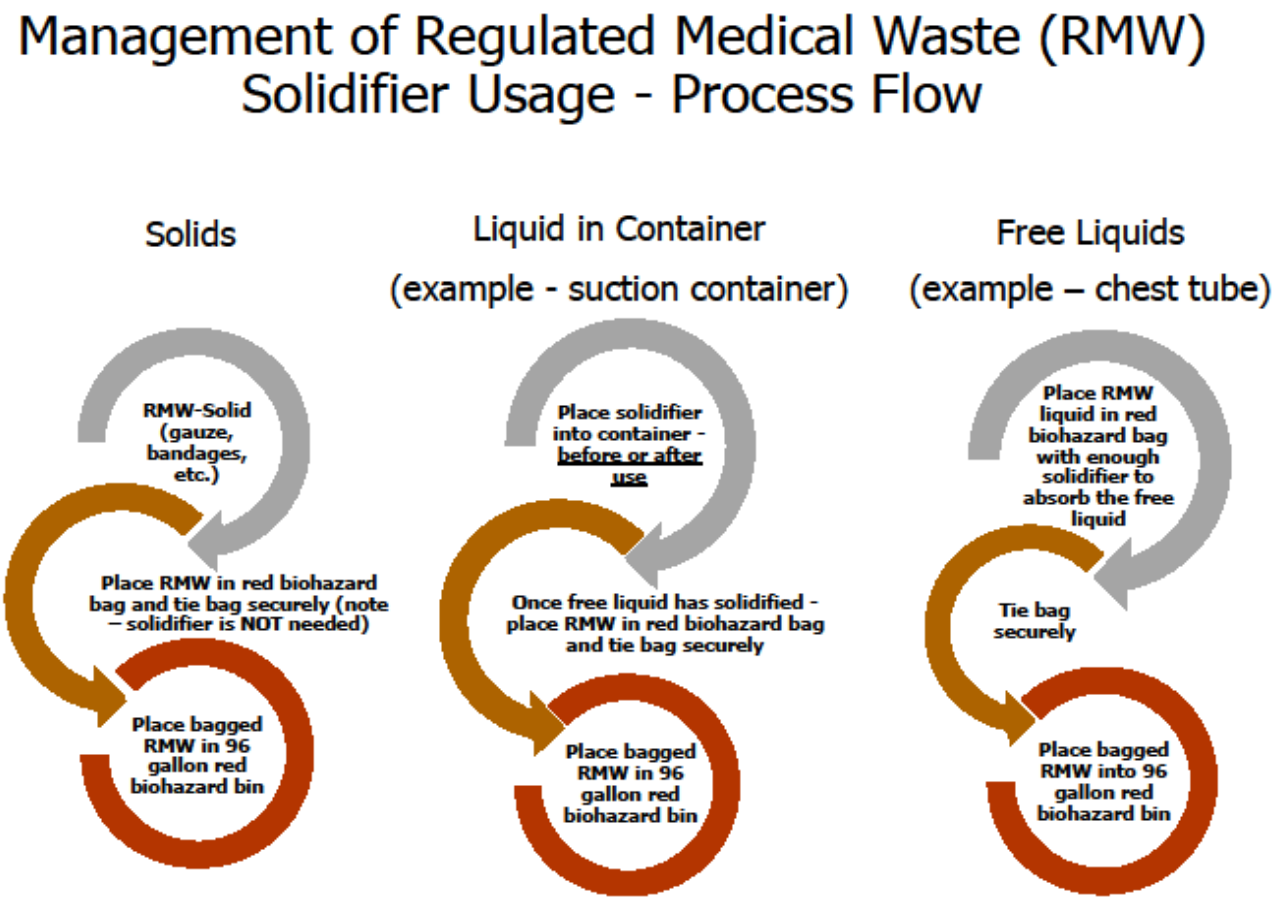
II. Examples

- ✓ Human blood, animal blood, and blood products
- ✓ Used sharps that have been in contact with blood or OPIM
- ✓ Cultures and stocks of etiologic agents
- ✓ Potentially infectious animal carcasses and tissues
- ✓ Isolation waste from Class IV etiologic agents
- ✓ Pathological Waste and human tissues
- ✓ Blood transfusion bags
- ✓ Dialysate and items contaminated with human blood during hemodialysis
- ✓ Contaminated glassware

III. Instructions

A. General

1. Regulated Medical Waste (RMW) bags and containers are color-coded red, or labeled with a fluorescent orange-red "BIOHAZARD" label or symbol.
2. RMW with free liquids must be placed in sturdy leak proof containers which are highly resistant to breakage prior to being placed within red bags. Solidifier must be added to any medical waste that has free liquids (greater than 25ml) that could spill out of the bag during transport.
3. See diagram below detailing the usage of solidifier for various regulated medical wastes.



4. Red bags must never be overfilled and must be closed according to the closing procedure below. The resulting seal must be leak proof and prevent the bag from leaking in any position. Red bags bearing visible damage and/or evidence of leakage must be over packed within an intact red bag

Regulated Medical Waste (Red Bag) Closure Procedure

STEP 1

Place all biomedical waste into appropriately marked bag. Do not fill the bag more than three quarters full.

STEP 2

Gather and twist the top of the red bag.

STEP 3

Twist bag closed with tie or single hand knot.

STEP 4

Place properly closed bag into biomedical waste container located in the soiled utility room.

Things to Remember:

- Always close bags properly before placing in Biomedical Waste container.
- No rabbit ear tieing.

5. Sharps material must never be placed directly into red bags: all sharps materials shall be packaged within securely closeable, leak-proof, puncture resistant containers prior to placing in red bag/incineration box for disposal.
6. Once filled, place bags into a departmental biohazard bin for pick up.

B. **Used Sharps**

1. Follow instructions in Disposable Sharps section.

C. Human or Animal Blood or Body Fluids

1. Don appropriate PPE and discard human or animal blood or body fluids down the drain (sanitary sewer).

D. Cultures and Stock Media

1. Dispose of tubes in red biohazard bags, unless broken. Place broken tubes in sharps containers.
2. Dispose of plates in red biohazard bags.

E. Pathological Waste

1. Pathological waste MUST be segregated from other regulated medical waste because incineration is required for its destruction.
2. Place Pathological Waste into a separate designated biohazard bin.
3. Obtain Pathological Waste stickers from Environmental Services.
4. Apply Pathological Waste sticker to outside of biohazard bin.
5. If the waste is tissue fixed in formalin preservative, follow the Pathology Wet Tissue Disposal using Vermiculite Procedure – Carolinas Laboratory Network.

F. **Laboratory Animal Carcasses (Pathological Waste)**

1. Don appropriate PPE and pour animal blood or body fluids down the drain (sanitary sewer).
2. Animal carcasses and animal tissue samples which may have been infected with a known human pathogen, or may be infected with agents that have zoonotic potential, must be double-bagged in red biohazard bags. Knot the bags securely Regulated Medical Waste procedure. Label the outer bag with your name, department, and phone number.
3. Place double-bagged carcasses in the red bin inside the Vivarium cold storage room.
4. Obtain and apply Pathological Waste sticker (see above) to outside of red bin.
5. Note: If carcasses are radioactive, refer to Radioactive Infectious Animal Carcasses in Radioactive Waste section.

G. **Select Agents**

1. Before destruction, fully contain and secure the select agent or toxin to prevent theft, loss, or release to the environment.
2. Autoclave cultures.
3. Document autoclave operation and conditions on Autoclave Log Sheet.

4. Complete APHIS/CDC Form 4.
5. In addition to reporting the identification of a select agent or toxin contained in a specimen presented for diagnosis or verification using the APHIS/CDC Form 4, the following select agents and toxins are required to be **immediately** (i.e. within 24 hours) reported to Federal Select Agent Program (e.g., via telephone, fax, or email):
    - *Bacillus anthracis*
    - Botulinum neurotoxins
    - Botulinum neurotoxin producing species of Clostridium
    - *Burkholderia mallei*
    - *Burkholderia pseudomallei*
    - Ebola virus
    - Foot-and-mouth disease virus
    - *Francisella tularensis*
    - Marburg virus
    - Rinderpest virus
    - Variola major virus (Smallpox virus)
    - Variola minor virus (Alastrim)
    - *Yersinia pestis*
6. Place fully autoclaved waste into the regulated medical waste (red bag/bin).

H. Contaminated Glassware

1. Dispose of small pieces of broken or unbroken glass in a sharps container.
2. Place larger glass items in a cardboard box.
3. Close box and secure with tape.
4. Place box inside a red biohazard bag and place in a red bin.

I. Radioactive Infectious Waste and Animal Carcasses

1. See Radioactive Infectious Animal Carcasses under Radioactive Waste section.

J. Other Regulated Waste Not Defined as Sharps

1. Place into containers lined with red biohazard bags.

HAZARDOUS CHEMICAL WASTE

I. Definition

Hazardous Chemical Waste – Waste chemicals that are listed by the EPA, state or local government as hazardous wastes or exhibit EPA-defined characteristics of a hazardous waste (flammability, corrosiveness, reactivity, or toxicity).

II. Examples

- ✓ X-ray/photographic fixer solutions, X-ray film
- ✓ Alcohol solutions (> 24%)
- ✓ Formaldehyde solutions (> 37%)
- ✓ Ignitable materials (Flash Point < 140 F)
- ✓ Corrosive materials (pH < 2, or pH > 12.5)
- ✓ Certain expired or unused laboratory chemicals
- ✓ Specific spent or used laboratory chemicals
- ✓ Certain paints and solvent-based cleaning products
- ✓ Aerosol cans that are not completely empty
- ✓ Gas Cylinders (calibration gas, propane gas, MAP gas, etc)
- ✓ Certain pharmaceutical drugs (see Pharmaceutical Waste section)
- ✓ Lead aprons and shielding, if not recycled
- ✓ Broken mercury-containing items *(see Universal Waste for intact (no free liquid mercury) disposal*

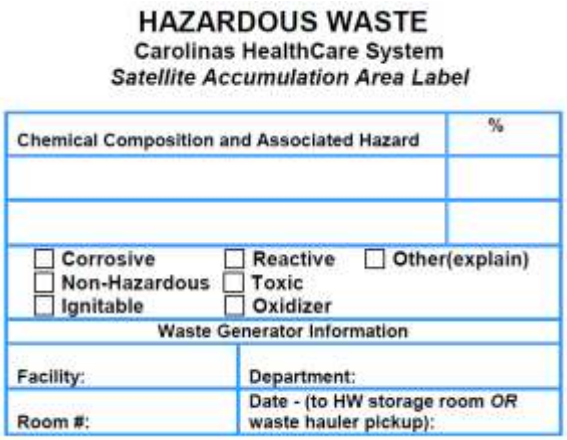
III. Instructions

A. Hazardous Waste Determinations

1. Review the Safety Data Sheet (SDS) for information regarding contents and composition of the material to determine if there are any listed Hazardous Waste chemicals.
2. Review chemical and physical properties using SDS.
3. Is Flash Point less than 140F? If so, the material is a Hazardous Waste.
4. Is alcohol content greater than or equal to 24%? If so, the material is a Hazardous Waste.
5. Is pH less than 2, or greater than 12.5? If so, the material is a Hazardous Waste.
6. Other properties may mean the chemical is considered a Hazardous Waste. If you are unsure, please contact your Facility Hazardous Materials Coordinator or Corporate Safety.

B. General

1. **Do not mix hazardous waste with non-hazardous materials or other wastes**. This will increase the volume and cost of disposal and may cause a dangerous chemical reaction.
2. Secure the waste in a compatible leak-proof container following any SDS instructions. When possible, and if appropriate, use the original container.
3. Remove, deface, or mark out the existing product label on the container if the container does not have a hazardous waste label OR the existing hazardous waste label is not readable. As needed, apply a new hazardous waste label to the container, see label example in 5.e. below.
4. Place chemically contaminated waste (e.g. paper, absorbent towels, gloves, beakers, pipettes, etc.) in a regular colorless, opaque plastic bag. Label the bag with the chemical name on a hazardous waste label. If the chemically contaminated waste includes glass, place the bag in a cardboard box, seal the box with tape and label with hazardous waste label.
5. Hazardous Waste Labeling & Handling Process:
    a) ***Label indicates "Hazardous Waste" and includes a description of the waste contents, such as "pharmaceutical waste" or "solvent waste"***
    b) ***Label indicates the facility, department and location where the hazardous waste container is located.***
    c) ***Satellite Accumulation Areas - Complete Chemical Pickup Request - eForm when a satellite waste container is full. Satellite accumulation waste containers are to be dated ONLY when they are moved to the designated facility hazardous waste storage area OR picked up by the hazardous waste disposal contractor.***
    d) ***Designated Hazardous Waste Storage Area – active collection containers located in the waste storage area must be labeled and dated before waste is placed into them. Also, satellite accumulation area containers transferred to the storage area must be dated as described in c. above.***
    e) ***Labeling Example - CHS Hazardous Waste Label -- Avery 5164***



HAZARDOUS WASTE
Carolinas HealthCare System
Satellite Accumulation Area Label

Chemical Composition and Associated Hazard	%
☐ Corrosive ☐ Reactive ☐ Other(explain) ☐ Non-Hazardous ☐ Toxic ☐ Ignitable ☐ Oxidizer	
Waste Generator Information	
Facility:	Department:
Room #:	Date - (to HW storage room *OR* waste hauler pickup):

C. Aerosol Cans (non-stick oil, PAM, paint, cleaners, adhesives, degreasers, oil, disinfectants, etc.)

1. *Aerosol cans are NOT considered to be gas cylinders as described in Section D below.*
2. Aerosol cans must be fully empty and at zero propellant pressure before disposal in regular trash.
3. Aerosols cans that have residual propellant pressure or contain hazardous material residual must be managed as hazardous waste.
4. Remove push button from the spray valve or snap on the can cap to prevent accidental spraying while inside the collection container.
5. Hazardous waste aerosol cans should be placed in a designated collection container that is labeled as described in paragraph B.5 above.

D. Gas Cylinders (calibration gases, propane gas, MAP gas, etc)

1. Gas cylinders are usually pressurized from 100 to 2,500 psig. A cylinder under pressure, if broken or punctured, can propel itself at great speeds. Even the smallest cylinder can cause serious injury and property damage. Cylinders should always be treated with great care.
2. Gases are often invisible and tasteless. However, some are very toxic, and some can form an explosive mixture with air. Treat these gases as chemicals; avoid exposures and prevent leaks. Some inert gases are heavier than air and can displace it. Release of a gas in a poorly ventilated room can cause asphyxiation.
3. **Do NOT place cylinders with other wastes**. Cylinders **must be kept separate** from other wastes so that they are properly managed during disposal. Place cylinders in a bin, box or other suitable container that is used exclusively for waste cylinders.
4. Some gas cylinder manufacturers provide the service that allows used cylinders to be returned to the manufacturer for recycling credit. Contact your gas cylinder provider to see if this service is offered**. Used gas cylinders that have residual pressure in them (not fully emptied and at atmospheric pressure) are subject to Department of Transportation shipping regulations and must be packaged and shipped correctly.** Contact the cylinder manufacturer to determine proper shipping methods.
5. If the gas cylinder cannot be taken back by the manufacturer, mark the container with a hazardous waste label indicating department, location and

cylinder contents. Store the container where it is not subject to heat, puncture or pressure. Complete Chemical Pickup Request - eForm to schedule a pickup of the cylinders by the hazardous waste disposal company.

E. Used Rags and Wipes

1. Rags and wipes used with some hazardous materials are considered Hazardous Waste and must be collected.
2. Contact your Facility Hazardous Materials Coordinator or Corporate Safety for help in determining the types of rags and wipes that should be collected.
3. Place used rags and wipes in a designated collection drum labeled as described in paragraph B.5 above.

F. Laboratories

1. The hazardous wastes detailed below are produced by most medical laboratory operations. Examples of laboratories included are clinical, pathology, immunology and research laboratories.
2. The following types of materials are considered Hazardous Waste and must be collected *if not completely used* for its intended purpose:

    - Acids & chemicals with a pH of 2.0 or less (examples - acetic, phosphoric, hydrochloric, muriatic, sulfuric, hydrofluoric acids)
    - Alcohols (Non-Ethanol) and Stain Solutions containing mixed alcohols at concentrations of 24% or more (all used methanol, isopropanol, alcoholic stains, etc. considered to be a waste and no longer part of the lab process). *Ethanol (Ethyl Alcohol) is a recyclable commodity that can be handled as a non-RCRA waste material if it is not mixed with other types of alcohol. Contact Corporate Safety at 704-512-7283 for more information on the requirements of the ethanol recycling program.*
    - Xylene (used xylene that is considered to be a waste and is no longer part of the lab process)
    - Caustics (bases) & chemicals with a pH of 12.5 or higher (examples - sodium hydroxide, potassium hydroxide)
    - Flammable Liquids with Flash Point 140F or less
    - Oxidizers & Reactives (chemicals that promote / enhance combustion OR are reactive) (examples - hydrogen peroxide, sodium hypochlorite, bleach, permanganate)
    - Acetone
    - Methyl Ethyl Ketone
    - Mercury *(broken thermometers/equipment with 'free liquid" mercury)*

G. Operating Rooms, Nursing and Clinics

1. Refer to the Pharmaceutical Waste section for information about waste drugs.

    The following types of materials are considered Hazardous Waste and must be collected *if not completely used* for its intended purpose:

- Alcohols (ethanol, methanol, isopropanol, and others in concentrations 24% or greater)
- Methyl Methacrylate (if not solidified)
- Hydrogen Peroxide
- Chloroprep (if ampoule not broken)
- Collodiam
- Anesthesia Calibration Gas Cylinders
- Anesthesia Liquids/Gases
- Acetone
- Phosphoric, Nitric, Sulfuric and Acetic Acids
- Chloroform
- Formaldehyde (in concentrations of 37% or greater)
- Mercury *(broken thermometers/equipment with 'free liquid" mercury)*

2. Collect unused or leftover product and label as directed in paragraph B.5 above.

H. Radiology

1. The following material is considered to be a Hazardous Waste:

    - Barium Sulfate: any out of date, expired material <u>that cannot be returned through EXP (reverse distribution)</u>. *Note: empty barium sulfate containers are disposed of in the regular trash.*

    - Barium Sulfate: any dosed portion that **<u>does not</u>** come into contact with patient is a hazardous waste. If the barium touches the patient *in any way* (i.e. partial dose ingested), the remaining dose can be wasted to the toilet or sink with plenty of flush water. If sink is used, run water for 30-60 seconds after wasting to flush barium through sink trap.

I. Environmental Services

1. The following types of materials are considered Hazardous Waste and must be collected *if not completely used* for its intended purpose:

    - Power Strip
    - Baseboard Remover
    - Jet Rinse
    - Solvoil with Citrus
    - Gum Remover
    - Wall Glide Plus
    - Graffiti Remover

    Note that the formulation and/or contents of these brand name products may change or new products used under a modified purchasing agreement. The Safety Data Sheet (SDS) should be reviewed to determine hazardous composition each time the products are purchased. ***Efforts should be made to find suitable alternative products or chemical substitutes that do not contain hazardous substances***.

2. Collect unused product and label as directed in paragraph B.3 above.

J. Hazardous Waste Generator Requirements

1. **Conditionally Exempt Small Quantity Generators (CESQGs):**
   a. Generation is limited to ≤100 kg/month hazardous waste, and ≤1 kg/month of acute hazardous waste.
   b. Onsite waste accumulation volume is limited to ≤1000 kg hazardous waste, and ≤1 kg acute hazardous waste.
   c. There are no waste accumulation time limits.

2. **Small Quantity Generators (SQGs):**
   a. Generation is limited to 100 - 1000 kg/month.
   b. Onsite waste accumulation volume is limited to ≤1000 kg.
   c. Storage time is limited to 180 days after waste accumulation has stopped.

3. **Large Quantity Generators (LQGs):**
   a. Generate ≥1000 kg/month hazardous waste and ≥1 kg/month of acute hazardous waste.
   b. Onsite waste accumulation volume is unlimited.
   c. Storage time is limited to 90 days after waste accumulation has stopped.

K. Satellite Accumulation Area(s)

1. Accumulated waste volume cannot exceed 55 gallons of hazardous waste.
2. Accumulated waste volume cannot exceed one quart/2.2 pounds of acute hazardous waste.
3. Hazardous Waste must be in containers at or near the point of generation.
4. Hazardous Waste is under the control of the operator of the process generating the waste.
5. Hazardous Waste containers must be labeled “Hazardous Waste”.
6. Containers must be labeled with the department/location generating the waste, such as “CMC Mercy” “Nursing Unit 3C”
7. Satellite collection waste container labels are dated when they are moved to the designated facility hazardous waste storage area OR picked up by the hazardous waste disposal contractor.

L. Facility Hazardous Waste Storage Area

1. All hazardous waste containers must be properly labeled with the words "Hazardous Waste" and the contents of each container noted.
2. Satellite accumulation area waste containers transferred into a designated waste storage area for holding until pickup must be dated immediately upon arrival into the area.
3. Storage area bulk collection containers (drummed xylene, ethanol, clear-rite, etc.) must be labeled immediately upon placement in the storage area and dated when the first waste is placed into them.
4. Drummed liquid waste storage must have secondary containment. Drum funnels must be closed and latched at all times unless waste is being added to the drum.
5. Electrical grounding is required for flammable or volatile liquids drum storage.
6. An emergency procedure must be posted in or near the HW storage area and revised when conditions/personnel change.
7. The storage area must be inspected weekly (every 7 days) and the results recorded on the inspection sheet.
8. A method of communication (telephone, radio, intercom, cell phone) must be readily available to all person/s working in the storage area.
9. Spill response equipment needs to be readily available for use in the storage area.
10. Storage area aisles must be kept clear to allow easy egress in emergency situations
8. Small quantity generators are permitted to store waste for 180 days maximum. Large quantity generators are permitted to store waste for 90 days maximum.

M. Additional Information

Hazardous Waste Storage, Waste Generator Categories and Recordkeeping Requirements can be found on the EPA hazardous waste site.

USED OIL AND FILTERS

I. Definition

Oil drained or removed from equipment and machinery.

II. Examples

- ✓ Motor oil
- ✓ Compressor oil
- ✓ Chiller oil
- ✓ Gear oil
- ✓ Vacuum Pump oil
- ✓ Lubricating oil
- ✓ Hydraulic oil

III. Instructions

A. Used Oil

1. Used oil must be kept in closed, leak-proof containers
2. Used oil should be stored indoors whenever possible
3. Used oil can be stored outdoors provided it is under cover with secondary containment
4. DO NOT mix hazardous waste, such as solvents, brake cleaner, etc. with used oil.
5. DO NOT mix chiller or refrigerant oil with other used oils, keep these waste streams separate.
6. Clearly label the container: **"USED OIL" (not Waste Oil)**.
7. Complete a chemical pickup form in PeopleConnect eForm to begin the waste pickup process. Chemical Pickup Request - eForm

B. Filters

1. Remove as much oil as possible using one of these gravity hot-draining methods:
   a. Puncture anti-drain back valve and hot-drain,
   b. Puncture filter dome end and hot-drain,
   c. Hot-drain and crush, or
   d. Dismantle and hot-drain.
2. Filters may be recycled or discarded as solid waste or "non-regulated waste" after being drained of oil using one of the above methods.

UNIVERSAL WASTE & ELECTRONIC ('E') WASTE

I. Definitions

Universal Waste - Hazardous waste that is subject to the "universal waste" rules of EPA regulations per 40 CFR 273. This includes general categories of widely generated ("universal") hazardous wastes and is intended to encourage environmentally sound recycling to keep them out of landfills. Categories include mercury-containing equipment, hazardous waste lamps, and certain types of batteries.

Note that consumer-grade alkaline batteries are not considered universal waste and may be recycled or disposed of as solid waste.

Electronic "E" Waste - "Electronic waste" may be defined as discarded computers, office electronic equipment, entertainment device electronics, mobile phones, television sets, and refrigerators. This definition includes used electronics which are destined for reuse, resale, salvage, recycling, or disposal.

Examples of each waste type

A. Mercury-Containing Equipment

1. Medical Equipment

- ✓ Thermometers
- ✓ Sphygmomanometers
- ✓ Maloney or Hurst bougies (esophageal dilators)
- ✓ Cantor tubes
- ✓ Miller Abbot tubes
- ✓ Dennis tubes

2. Building Equipment

- ✓ Fluorescent Lamps (Tubes, T8, T12, CFL's and U-Bends)
- ✓ Projector Lamps – computer projectors
- ✓ Fluorescent lamps from LCD displays
- ✓ High intensity discharge (HID) lamps
- ✓ Thermostats
- ✓ Mercury switches, mechanical/tilt switches, reed switches, float switches
- ✓ Flow meters
- ✓ Boiler gauge controls
- ✓ Gas regulators & meters

B. Universal Waste Batteries – Common types listed below:

1. Lead acid
2. Nickel cadmium (NiCad)
3. Nickel metal hydride (NiMH)
4. Lithium
5. Mercury Cells

B. Electronic "E" Waste:

1. Computers
2. Monitors
3. Printers
4. Servers
5. Scanners
6. LCD, LED and "picture tube" type televisions

II. Instructions

A. Mercury-Containing Devices (thermostats, thermometers, gauges, etc)

1. Manage all intact mercury-containing devices as Universal Waste. ***Broken mercury-containing devices, where mercury is no longer contained, must be managed as Hazardous Waste (see hazardous waste section of Waste Guide).***

2. Locations using mercury-containing devices MUST maintain several mercury spill kits (available from the Distribution Center) in the department and employees must be trained to use them.
3. Thermostats and other mercury containing equipment are to be labeled "*Universal Waste – Mercury Containing Equipment"* and placed in an appropriate container to minimize risk of mercury loss in the event of breakage.
4. Label the appropriate accumulation start date when the mercury containing equipment is placed into the waste container and the name and address of the facility.
5. Complete a chemical pickup form in PeopleConnect eForm to begin the waste pickup process. Chemical Pickup Request - eForm
6. Contact your Supervisor or Facility Hazardous Materials Coordinator for disposal.

B. Fluorescent Lamps (Compact Fluorescents, U-bend, T8 and T12 tube lamps, etc.)

1. Lamps are to be stored in adequate, structurally sound containers that are labeled properly with the words "*Universal Waste*" and "*Used Lamps"* with the appropriate accumulation start date (when the first lamp is placed in the collection container) and the name and address of the facility. Containers are to be kept closed at all times unless lamps are being placed in the collection container.
2. Complete a chemical pickup form in PeopleConnect eForm to begin the waste pickup process. Chemical Pickup Request - eForm
3. Broken lamps or lamps can NOT be recycled as Universal Waste, but must be labeled and handled as a "Hazardous Waste".
4. Place broken lamps in metal or plastic drum and label as "Waste Broken Lamps, Containing Mercury". The container is dated when it is full and no further broken lamp additions will be made to the container.
5. Complete a chemical pickup form in PeopleConnect eForm to begin the waste pickup process.
6. Transfer full drum with broken lamps to Hazardous Waste Storage area.

C. Universal Waste Batteries [Nickel Cadmium (NiCad), Nickel Metal Hydride (NiMH), Lithium, Lead-Acid, Mercury]

1. Store in adequate, closed, structurally sound container labeled properly with "Waste Batteries", accumulation start date, and the name and address of the facility. Tape exposed Positive and Negative battery terminals to prevent short circuiting of batteries while in storage and transport.

2. Battery Pickups – *facilities are given the option of either using Heritage Environmental or Interstate Battery for battery disposal.*

   - Heritage Environmental - a Chemical Pickup Request - eForm needs to be completed to schedule the pickup if the department uses Heritage Environmental for battery disposal. The PeopleConnect form provides a log sheet of batteries to be picked up.

   - Interstate Battery - the closest branch store of Interstate Battery is contacted directly by the department to schedule the pickup. The PeopleConnect form is not required to be completed when Interstate is used for battery pickups but a Used Battery Log Sheet is required to be maintained with information on each pickup. Here is a link to the Interstate Battery recycling website.

E. E-Waste - Computer Equipment (computers, printers, modems, laptops, monitors, TVs, cell phones, etc.)

1. Computer equipment definition– Any desktop computer, notebook computer, monitor or video display unit for a computer system, and the keyboard, mice,

other peripheral equipment, and a printing device such as a printer, a scanner, a combination print-scanner-fax machine, or other device designed to produce hard paper copies from a computer.

2. In most instances, CHS Information Technology donates used computer equipment to the Heineman Foundation as charitable donations for re-use in underdeveloped countries and in particular, medical clinics and hospitals.

3. The Heineman Foundation works with eCycleSecure Charlotte **(**704-376-1116) to recycle those items that cannot be reused and must be recycled or scraped. eCycleSecure provides recycling and repurposing of end of life and out of use equipment.

4. eCycleSecure provides certified and compliant secure computer disposal, data destruction and electronics recycling for all classes of equipment, including technology, telecommunications, medical and non-electronic equipment.

5. Admin Policy IS.PHI 600.06 (click on link) discusses how computer equipment must have information erased prior to reuse, recycling or disposal of equipment.

F. E-Waste – Printed Circuit Boards and Components

1. This category includes Liquid Crystal Displays (LCDs), whole and partial printed circuit boards, process logic controllers (PLCs), memory chips / memory cards, etc.
2. Store in adequate, closed, structurally sound container labeled properly with "E-Waste", accumulation start date, and the name and address of the facility.
3. Complete a chemical pickup form in PeopleConnect eForm to begin the waste pickup process. Chemical Pickup Request - eForm

G. Ballasts (Magnetic Type for Fluorescent Lamps)

1. Magnetic Ballasts were the primary electrical component of fluorescent light fixtures in the past. Ballasts manufactured before 1978 may contain Polychlorinated Bi-Phenyls (PCBs).
2. EPA banned the manufacture of PCBs in 1979. All magnetic lamp ballasts manufactured after 1978 are marked "NO PCBs" on the label by the ballast manufacturer. For ballasts manufactured prior to 1979, or for those that do not contain a statement regarding PCB content, assume that they contain PCBs.

3. Mark the container as "Universal Waste – Used Lamp Ballasts"

4. Leaking magnetic ballasts (may contain PCBs unless marked NON-PCB) must be handled separately (place in drum / container) from other ballasts. Mark the containers as Used Ballasts containing PCBs. For all types of magnetic ballasts - complete a chemical pickup form in PeopleConnect eForm to begin the waste pickup process. Chemical Pickup Request - eForm

H. Ballasts (High Intensity Discharge / Sodium Halide Lamps)

1. The ballast for these units consists of a transformer and a capacitor. The transformer should always be recycled with metal scrap from your facility.

2. The capacitor can be placed into solid waste as long as it has a no lead (NO Pb) designation on the capacitor case.

I. Ballasts (Electronic Type for Fluorescent Lamps)

1. Electronic lamp ballasts use solid state electronic circuits to provide the proper starting condition to power one or more fluorescent lamps. Electronic ballasts are labeled with the words "Electronic Ballast" on the ballast case.

2. Electronic ballasts should be disposed of as electronic wastes. The preferable method is to recycle all metals within the ballast if possible. For example, there are copper windings in transformers.

3. For all types of electronic ballasts - complete a chemical pickup form in PeopleConnect eForm to begin the waste pickup process. Chemical Pickup Request

PHARMACEUTICAL WASTE

I. Definitions

Pharmaceutical Waste - Any waste which contains or is contaminated with drugs or pharmaceutical materials. Pharmaceutical waste categories may include:

- RCRA Hazardous Drugs – approximately 17 specific drugs listed by the EPA and regulated as Hazardous Waste or Black Bin waste.
- Chemotherapy/Toxic Drugs – also known as chemotherapeutic, oncologic, cytotoxic, chemo, NIOSH listed or Yellow Bin waste.
- Controlled Substances – certain drugs regulated by the Drug Enforcement Agency (DEA), including disposal.
- General – waste drugs/medications which are not regulated, non-chemo and not NIOSH toxic.

II. Examples

- ✓ Expired or unused medications that are not returned to the manufacturer
- ✓ Containers with partially used medications
- ✓ Empty containers of some medications
- ✓ Expired and/or partial IV bags, tubing, gloves, and alcohol swabs used in the preparation or administration of these agents
- ✓ Waste residue from cutting tablets; compounding

III. Instructions

A. RCRA Hazardous Drug List and Procedures

RCRA DRUG LIST - TABLE #1		
Nicotine[1] *	Cyclosphosphamide[3]	** Includes packaging*
Physostigmine[3] *	Daunomycin[3]	*1 - Nicorette® gum, Habitrol® and Nicorette® patches*
Warfarin (Coumadin®) *	Melphalan[3]	*2 - Head and Shoulders®, Danorex®, Selsun Blue® shampoo/lotion*
Chloral Hydrate	Mitomycin C[3]	*3 - Indicates a chemotherapy drug which is a RCRA U-Listed hazardous chemical, manage as hazardous waste and place in Black Bins for disposal. All other chemotherapy drugs to be managed as Yellow Bin waste*
Amyl Nitrate	Streptozotocin[3]	
Selenium Sulfide[2]	Arsenic Trioxide	
Lindane	Idarubicin[3]	
Chlorambucil[3]	Carmustin[3]	
Nitrogen Mustard		

1. Black Bin / hazardous waste containers must be labeled with the facility, department and floor/location of the black bin for tracking purposes.
2. Empty containers/packaging for Nicotine, Physostigmine, and Warfarin (Coumadin) is a RCRA Hazardous Waste and is placed into Black Bins.
3. Partially administered chemo bags, tubing, and vials for RCRA listed chemotherapy drugs is placed into Black Bins (see Hazardous Waste section).
4. Do NOT pour free liquids into the Black Bins or other Hazardous Waste receptacles. Small volumes of liquid hazardous wastes must be placed in a properly labeled leak-proof container before being discarded into a Black Bin.
5. Do NOT place needles into Black Bins or other Hazardous Waste receptacles. **Place needles in Sharps container**.
6. Black Bins and other Hazardous Waste receptacles must be kept closed and secure when not in use.
7. When Black Bin is **approximately three-fourths (¾) full**, Complete a chemical pickup eForm to begin the waste pickup process. Chemical Pickup Request - eForm

B. Chemotherapy & Non-RCRA Toxic Pharmaceuticals (chemo, oncologic, cytotoxic, NIOSH listed or otherwise hazardous)

1. Use of Chemotherapy/Hazardous Agents - CHS 5.12 policy provides extensive information on hazardous drug handling and disposal.
2. Yellow Bin / chemo waste containers should be labeled with the facility, department and floor/location for container tracking purposes. Yellow Bins or other cytotoxic waste receptacles must be kept closed and secure when not in use.
3. *NOTE: drugs in this category are hazardous but are not on the EPA RCRA list. RCRA U-Listed drugs are to be managed as Hazardous Waste (see table #1).*
4. All waste used in preparation or administration of these agents must be disposed in yellow, puncture-resistant chemotherapy waste containers. Contact Environmental Services for pickup when Yellow Bins are full.

C. Controlled Substances Procedures

1. Disposal of controlled substances requires hardcopy signatures or electronic confirmation by two witnesses.
2. Discard controlled substances down the drain with plenty of water.

D. General Pharmaceutical Procedures (non-regulated drugs)

1. Unopened, unused, or expired medications must be returned to the Pharmacy.
2. Partially used medications or opened medications which have expired should be discarded down the drain with plenty of water.
3. Expired or unused vendor medication samples should be returned to the appropriate vendor through supplier reverse distribution if unopened. Otherwise, they should be discarded down the drain with plenty of water.
4. Personnel should consult their departmental practice manual or contact the Pharmacy for further information.

RADIOACTIVE WASTE

I. Definitions

Radioactive Material (RAM) - RAM is material that contains unstable radioactive atoms that give off various forms of radiation (depending on the isotope) as they age (decay).
Radioactive Waste - Radioactive waste is defined as RAM that is no longer required to be kept and has no further useful purposes by the facility.

II. Examples

- ✓ Research or clean-up materials contaminated with RAM
- ✓ Liquid scintillation fluids and vials contaminated with RAM
- ✓ Animal carcasses, excreta, and bedding contaminated with RAM
- ✓ Patient care materials, contaminated during radiological procedures or radio-iodine therapy treatments
- ✓ Refrigerators, incubators, fraction collectors, and other equipment used with RAM and/or may be contaminated

III. Instructions

A. Radioactive Materials - Handling

1. Wear appropriate gloves while handling materials potentially contaminated with RAM.
2. Dispose of sharps contaminated with RAM in a radio-labeled sharps box.
3. Review disposal procedures with **Radiation Safety (704-355-5370)** in the planning stages of your experimental design, or before generating waste from a new or modified protocol.
4. Separate liquid RAM waste from dry RAM waste.
5. Segregate waste by isotope, if your lab has been so instructed.
6. Separate tissues and blood from non-biological liquid and dry RAM waste.
7. Fill out Waste Record forms as waste is generated, or label containers with "Caution - Radioactive Material" tape, listing the radionuclide(s), activity, and date. Waste Record cards and "Caution - Radioactive Material" tape are available from Radiation Safety.
8. Inactivate all infectious agents before giving radioactive waste to Radiation Safety.
9. Call Radiation Safety to arrange for pick-up of waste before the waste container becomes full. Waste containers cannot be accepted unless a Waste Record card has been completed.
10. Keep lids on all radioactive waste containers when not in use.

B. Dry solid (non-biological) Radioactive Waste

1. Obtain yellow radio-labeled solid waste cans for dry solid radioactive waste from Radiation Safety.
2. Place dry gloves, pads, empty tubes, etc. into these containers.
3. Place sharps (needles, empty syringes, blades, pipettes, etc.) into a sharps box labeled with "Caution - Radioactive Material" tape. **Do not recap needles.**
4. Absorb any residual liquids with paper towels or absorbent pads.
5. Do NOT place radioisotope stock vials into a yellow solid radioactive waste can. Return these vials directly to Radiation Safety.

C. Aqueous Radioactive Waste

1. Obtain aqueous radioactive waste receptacles from Radiation Safety.
2. Do NOT add organic solvents, including liquid scintillation fluids, or other hazardous chemicals to aqueous radioactive waste containers.
3. Restrict high activity waste to small volume plastic jugs. Call Radiation Safety for special arrangements if you do not routinely generate high activity waste.
4. Do NOT add EPA-listed hazardous chemicals to containers intended for radioactive wastes. Radiation Safety will not accept radioactive waste which also contains an EPA-listed hazardous chemical. Review all protocols with Radiation Safety to ensure that all wastes generated can be disposed according to radioactive waste regulations.

D. Liquid Scintillation Vials

1. Tightly cap scintillation vials prior to disposal.
2. Store used vials in their original shipping tray ("flat") or in plastic bags, in quantities of 100 or less.
3. Label each tray with the name of the isotope(s), the estimated maximum activity per tray, the brand of scintillation vial, facility, department, your name and date.

E. Radioactive Non-Infectious Animal Carcasses and Tissues

1. Place sharps in a sharps box labeled with "Caution –Radioactive Material" tape.
2. Wrap animal carcasses, tissues, and blood-stained items in an absorbent pad.
3. Place the pad/carcass/tissues/etc. in a double red biohazard bag and seal securely. **Make sure all sharps are contained in a puncture resistant container before placing in red biohazard bags with other waste!**

4. Label the outer bag with your name, department, and phone number.
5. Deposit the tagged plastic bags in an approved, radio-labeled cold storage room or freezer.
6. Class of isotope
    a. Short half-life isotopes: Once carcasses/tissues are no longer radioactive (below threshold), they are to be placed in the approved Vivarium cold storage room for disposal.
    b. Long half-life isotopes: Consult with Radiation Safety prior to use of the isotope regarding disposal.

F. Radioactive Patient Care Materials

1. Call Radiation Safety for specific handling or disposal instructions for potentially contaminated patient material, including blood or body fluids.
2. Place soiled diapers or gowns from patients who have had Nuclear Medicine studies in a pail lined with a plastic bag. Label the pail well with radio-label tape or a sign stating "RADIOACTIVE - HOLD FOR RADIATION SAFETY". Call Radiation Safety for disposal.
3. Do NOT remove any items from the room of a radioiodine thyroid therapy patient without first consulting Radiation Safety.

G. Radioactive Waste Mixed with Infectious Materials

1. ***Prior to generating such waste***, consult with Radiation Safety about methods which may be used to inactivate infectious agents present in radioactive waste or radioactive animal carcasses.
2. See Multi-Hazard and Mixed Waste section of this guidance.
3. Radiation Safety will not accept infectious radioactive waste for disposal.

H. Radioactive Infectious Animal Carcasses

1. Decontamination of the carcass may be required prior to disposal, as determined by the Institutional Animal Care & Use Committees (IACUC).
2. After decontamination, dispose of radioactive infectious animal carcasses in the same manner as radioactive non-infectious animal carcasses.
    a. For short half-life isotopes, minimal storage time for radioactive decay is appropriate.
    b. For long half-life isotopes, coordinate with IACUC, Comparative Medicine, and Radiation Safety.

MULTI-HAZARD AND MIXED WASTE

I. Definition

Multi-hazard Waste - Contains regulated medical waste contaminated with radioactive waste or hazardous waste.

Mixed Waste - Contains hazardous waste and radioactive waste.

II. Examples

A. Multi-hazard Waste

- ✓ Patient care materials with body fluid residues contaminated by Nuclear Medicine studies or radio-iodine therapy treatments
- ✓ Radioactive animal carcasses that are infectious
- ✓ Hazardous chemical waste with infectious agents

B. Mixed Waste

- ✓ Radioactive waste contaminated with hazardous chemicals

III. Instructions

A. General

1. **Avoid generating multi-hazard or mixed waste**.
2. If you cannot avoid generating multi-hazard waste or mixed, review all protocols in advance with Corporate Safety (704-512-7283).
3. Practice waste-minimization measures.
4. Do not mix aqueous and organic wastes, or liquid and solid wastes.
5. Segregate radioactive waste with different half-lives.
6. Identify all components of the waste.

B. Mixed Waste - Radioactive and Hazardous Chemicals

Radiation Safety (704-355-5370) cannot dispose of radioactive waste which also contains an EPA-listed hazardous chemical. Review all protocols with Radiation Safety and Corporate Safety to ensure that all waste generated is disposed according to federal, state, and local regulations.

C. Multi-hazard - Radioactive and Infectious Waste

Inactivate the infectious component(s) of the waste and follow the procedures for disposing radioactive waste.

D. Multi-hazard - Radioactive Waste and Animal Carcasses

Inactivate the infectious component(s) of the waste and follow the procedures for disposing radioactive animal carcasses.

E. Multi-hazard - Hazardous Chemical and Infectious Waste

Inactivate the infectious component(s) of the waste and follow the procedures for handling and disposing hazardous chemical wastes.