

# Pollution Prevention for Hospitals

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# What is Pollution Prevention?

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- **Intentional selection of processes and products that minimize or eliminate harmful pollution**

# Pollution Prevention In Healthcare: Key Opportunities

- **Laboratory**
- **Facilities Shops**
- **Pharmacy**
- **Radiology**
- **Oncology**
- **General Areas**

Large quantities of hazardous wastes OR small quantities of diverse substances that are highly toxic.

# Getting your arms around P2



# Material Specific P2

## Opportunities

- **Mercury**
  - Phase out of mercury containing products & devices
    - Thermometers
    - Sphygmomanometers
    - Dilators
    - Lab chemicals
    - Thermostats
    - Batteries

# Material Specific P2

## Opportunities

- **PVC**

- Phase out of PVC containing products and packaging
- Manufacture & disposal of PVC plastic is linked to creation of dioxin
- 25% of healthcare products contain PVC

IV bags, IV tubing, Respiratory therapy tubings, blood bags, blood tubing, fluid collection devices, endotracheal tubes, nasogastric tubes



Pvc products

# P2 in Purchasing

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- **Apply Environmental Criteria to Purchasing decisions**
  - H.C.E.P.T.
  - Screens healthcare products for persistent bio-accumulative toxic substances

FOR MORE INFO...

[www.ashrmm.org/hcept](http://www.ashrmm.org/hcept)

# P2 in Purchasing

## Purchasing Options for Alternative Products

Non-mercury

Non-PVC

Alternatives to Glutaraldehyde

Less Toxic Cleaners

FOR MORE INFO...

[www.sustainablehospitals.org](http://www.sustainablehospitals.org)

# Hazardous Materials Use in Healthcare

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- Batteries
- Chemicals
- Pharmaceuticals
- Facility  
Maintenance  
Products
- Diagnostic tools

# Hazardous Materials/Hazardous Wastes

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- Cytotoxic agents
- Solvents
- Alcohols
- Radioactive substances
- Hazardous chemicals
- Cleaning agents

# Laboratory

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- **Solvents**  
xylene, toluene
- **Formalin**
- **Alcohol**
- **Misc. Chemicals**

# Laboratory: Technology Applications

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- **Formalin Filtration**  
collect and reuse formalin
- **Solvent Distillation**  
recover and distill solvents for reuse
- **Alcohol Distillation**  
recover and distill alcohol

# Laboratory: Inventory Management

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- **Hazardous chemicals**
  - **Compatible storage**
  - **Purchasing**
    - **Minimum quantities**
  - **Product substitution**
  - **Spill prevention**
  - **Spill readiness**
    - **Hands on experience**

# Laboratory: Inventory Management

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- **Hazardous chemicals**
  - Current MSDS sheets
  - NFPA Fire code

# Laboratory: Histology

- **Mixed Waste**
  - Formalin & tissue disposal
    - Decant formalin
    - Segregate tissue for disposal
- **P2 Strategy**
  - Minimize amount of formalin used
  - Diversify specimen container sizes
    - 5 ml to ½ gallon

# Pharmacy

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- **Manage hazardous pharmaceuticals**
  - P listed
  - U listed
  - Characteristic wastes
    - Cytotoxics ( non-listed)
- **Commonplace medications such as nitroglycerine, coumadin, epinephrine are listed hazardous wastes**

# Pharmacy

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- **Reverse Distribution**
  - Return expired and unused medications
  - Return partially used medications
  - Returned hazardous pharmaceuticals do not become 'hazardous wastes' on site

# Pharmacy

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- **Vendor Selection**

- **Accepts expired, unused, partial, and DEA controlled substances for disposal**
- **Carefully check credentials, permits, and references**

# Pharmacy

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- **Act as central point internally for collection and return of hazardous pharmaceuticals and cytotoxic agents**

# Pharmacy

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- **Storage area for hazardous pharmaceuticals and flammable substances ( alcohol, ether)**
- **Spill prevention & readiness**
  - Hazardous chemical spills

# Radiology

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- Lead ( shields)
- Silver ( fixer/developer)
- Silver ( spent film)
  
- P2 opportunities
  - Recycling lead and silver
  - Digital imaging process

# Oncology

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- **Proper segregation and disposal of chemotherapy wastes**
  - Trace contaminated
  - Bulk chemo
  - Expired chemo
- **Hazardous Pharmaceuticals**
  - Segregate for proper disposal as hazardous chemical wastes

# Oncology

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- **Review waste acceptance protocols from biohazard waste vendors**
  - Define “trace” contamination
  - Review labeling requirements
    - “For incinerate only”
  - Chemo sharps containers
    - Define “ trace”

# Oncology

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- **Review PPE**

- **Use of?**

- **Gloves, gowns, face shields, shoe covers, goggles**

- **Disposal of?**

- **If not contaminated, don't dispose of it in red or yellow bag**

# Patient Care Areas

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- **Elimination of mercury containing products and devices**
  - Sphygmomanometers
  - Thermometers
  - Esophageal dilators
  - Thermostats

# Patient Care Areas

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- **Segregation of used batteries**
  - **Collect for recycling and hazardous waste disposal**
    - **NiCd**
    - **Lithium**
    - **Lead Acid**
    - **Mercuric Oxide**

# Patient Care Areas

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- **Glutaraldehyde – minimize use**
  - Proper use, storage and disposal
  - Evaluate Alternatives
- **Chemical use and storage**
  - Minimize inventory
  - Evaluate alternatives
  - Spill prevention and clean up

# Central Sterile Reprocessing

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- **EtO phase out/elimination**
- **Glutaraldehyde – minimize use**
  - Proper use and disposal
- **Drain clean outs**
  - If unit has history of cleaning mercury containing products & devices

# Facilities Shops

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- **Fluorescent light tubes**
- **Waste oils, cutting oils**
- **Paint thinners, paints**
- **Water treatment chemicals**
- **Freon**

# Facilities Shops

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- **Fluorescent light tubes**
- **U-Bulbs**
  - **Recover and recycle as a universal waste**

# Facilities Shops

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- **Waste oils, cutting oils**
  - Determine hazard characterization
  - Collect and dispose of properly
- **Used rags**
  - Collect and dispose of properly

# Facilities Shops

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- **Paint thinners, paints**
  - **Collect and dispose of properly**
  - **Careful use and practice can minimize the amount of wastes generated**
  - **Paint booths (filters), spray guns**
  - **Cleaning of equipment**

# Facilities Shops

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- **Water treatment chemicals**
  - **Store properly, dispose of properly**
  - **Spill prevention = pollution prevention**
  - **Secondary containment**

# Facilities Shops

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- **Freon**
  - Recover and recycle
  - Seek out alternatives
    - Hcfc's, non-cfc coolants

# Facilities Shops

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- **Print Shop- Printing Press**
  - Grease
  - Cleaning solutions
    - Collect grease soaked pigs for proper disposal
    - Collect used solutions for proper disposal
      - Containers, rags

# Grounds and Interiorscapes

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- **Pesticides---PBT issue**
  - **Integrated Pest Management**
    - **In house**
    - **Vendor**

# Grounds and Interiorscapes

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- **Equipment Maintenance**
  - Proper storage, use and disposal of oils, fuels, grease, hydraulic fluids
  
- **Herbicides, Fungicides, Fertilizers**
  - Proper storage, use and disposal

# General Areas Within Facility

- **Housekeeping products**
  - Cleaners, degreasers, laundry chemicals
- **Food service**
  - Drain cleaners, pest control

Special note: Housekeeping and Food Service functions may be vendored out and have separate equipment, chemical inventories and operations procedures.

# Resources for Success

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- **Create a Pollution Prevention (P2) plan**
  - **Identify a Pollution Prevention Coordinator**
    - Point Person for Information collection and program coordination
  - **Include department specific liaisons or contact name/phone for P2 in each areas**
    - Pharmacy, Lab, Radiology, Oncology, Facilities, Nursing
  - **Budget**
    - Allocate resources for training, storage, collection, disposal, equipment replacement
    - Contingency \$\$ for spill clean up

# In closing

