

Chemical Safety in the Healthcare Workplace

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Learning Objectives

- Review the Hazard Communication Standard (HCS)
- 2. Examine NFPA (National Fire Protection Association) ratings and labels
- 3. Explain the sections of the Safety Data Sheet (SDS)
- 4. Identify the process for cleaning up a chemical spill



OCCUPATIONAL HEALTH & SAFETY ADMINISTRATION (OSHA)

• Was created in 1970 to ensure a safe and healthy work environment for all employees.

 Contact with hazardous chemicals and the possible effects of such contact fall under OSHA's jurisdiction.



In 2012...

Hazard Communication Standard (HCS)

- OSHA mandates employees be better informed about hazardous chemicals
- Safe handling and use
- Avoid illnesses and injuries caused by chemical exposure

Revised (RHCS)

- Aligns OSHA standards with the Globally Harmonized System of Classification and Labeling of Chemicals (GHS)
- GHS international system to standardize chemical hazard classification and communication

In 2025...

Occupational Exposure & Hazardous Communication

- Protects employees from exposure to chemicals and other harmful substances
- Requires employers provide employees with:
- Written Chemical Safety Policies
- Identification of Potentially Hazardous Chemicals



The RHCS (Standard Number 1910.1200):

- Wholly enforceable in 2015
- Overrides state and municipal regulations
- Applies to all employees who handle, use, store, or transport chemicals
- Makes chemical manufacturers more accountable for user safety



The Revised HCS (RHCS) Requires:

- ➤ Manufacturers classify potential hazards of chemicals they produce, distribute, or import
- ➤ Employers communicate information to employees about hazards inherent in exposure to the products
- ➤ **Employers** communicate how to protect oneself when using them in the workplace



Chemicals Commonly Found in the Healthcare Office



Chemicals Commonly Found in the Healthcare Office

 Using the chat box, enter stored items in your office that you think are chemicals.

We will take 60-90 seconds to collect some ideas.

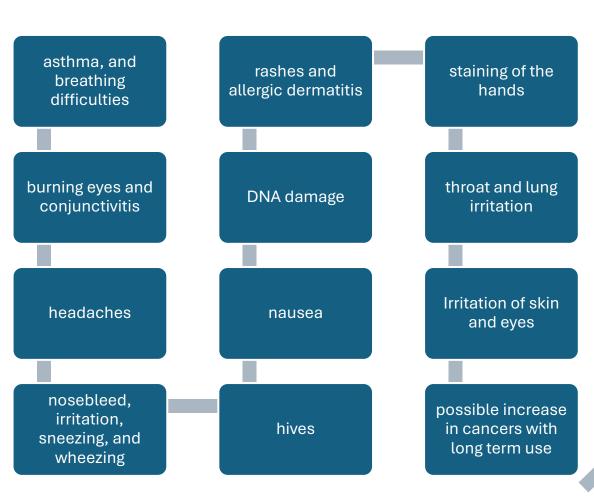


Chemicals Commonly Found in the Healthcare Office

- Iodine, Betadine
- Glutaraldehyde and other disinfectants (SaniCloths, Wavicide and similar products)
- ➤ Isopropyl Alcohol
- Hydrogen Peroxide
- Sodium Hypochlorite (Bleach)

- Mercury (in older blood pressure devices and some thermometers)
- Laboratory chemicals
- Cleaning Supplies
- Pharmaceuticals (in select healthcare settings)





Common Health Problems Caused by Exposure Chemicals

risk of damage to organs and organ systems



The RHCS Addresses Four Areas:

- 1. Hazard Classification
- 2. Labels and Labeling
- 3. Safety Data Sheets (SDS)
- 4. Information and Communication

 The healthcare practice is responsible for only #4. The first three are the responsibility of the chemical manufacturer.



Information and Communication: Healthcare Employer's Responsibilities include having:

A Hazardous Communication Plan on site at all times

- Hazardous chemicals in the workplace
- The procedures and policies that are used to protect employees
- The PPE to use when handling chemicals
- How to recognize hazardous chemicals
- Procedures to follow if there is an accidental exposure in the healthcare setting

Labels on Chemicals

- Employers must maintain the labels on the chemical containers.
- Labels must remain legible with pertinent information readily visible.
- The employer must relabel items if the labels are removed or defaced.
- If newly-identified hazards become known, the employer must ensure that the workers are aware of the hazards by identifying them on the label.

Safety Data Sheets

- Manufacturer- created SDS for every chemical stored or used
- Obtain the up-to-date SDS when chemical or manufacturer changes
- Ensure that SDSs are always readily accessible
- Inventory of chemicals and SDS must be reviewed annually

Information and Training

- Employers are required to train workers on the new labels and SDS format
- Training should be upon employment and at least once a year
- Training should be documented, and documentation should be readily available in case of inspection



Hazardous Communication Plan



Policies on protective measures

Evaluates potential chemical hazards –

Safety Audits

Training and Education –

New hire and recurrent training

Policies and procedures –

Special, unique safety procedures



Policies on protective measures (cont.)

Accident investigation -

Follow if an exposure to a chemical occur

Measurement -

Effective safety management program

Executive Management Commitment –

Key component of a company's overall business plan.



National Fire Protection Agency (NFPA)



National Fire Protection Agency (NFPA Labels)

Blue – Health Hazard

Rate 0-4

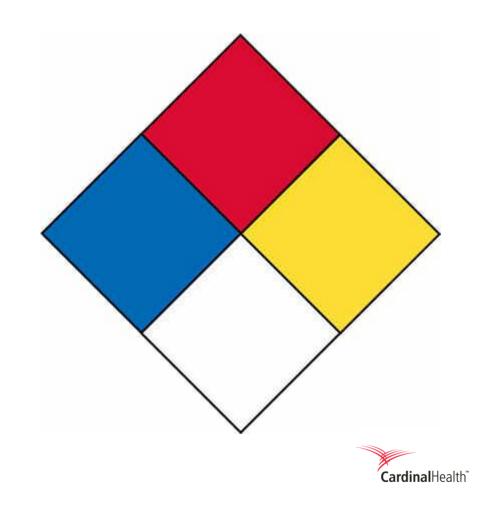
Red - Fire Hazard

Rate 0-4

Yellow – Instability Hazard

Rate 0-4

White – Other Hazards



NFPA Labels

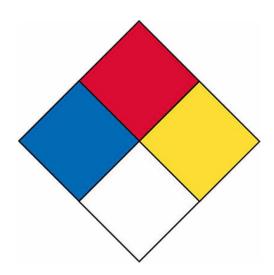
- Transferred from an original (labeled) container to a secondary (portable) container
- NOTE: If intended for immediate use by the employee who performs the transfer, no labels are required for the portable container.
- NFPA Labels consistent with the Hazard Communication Standard.
- An employer using NFPA labeling must, through training, ensure that its employees are fully aware of the hazards of the chemicals used.



How to Label and Read NFPA Labels:

Blue – Health Hazard Rate 0-4

- O Poses no health hazard, no precautions necessary
- 1 Can cause significant irritation
- 2 Can cause temporary incapacitation or residual injury
- 3 Can cause serious or permanent injury
- 4 Can be lethal





Red – Fire Hazard

Rate 0-4

- O Will not burn under typical fire conditions; Example: carbon tetrachloride
- 1 Requires considerable preheating, under all ambient temperature conditions, before ignition and combustion can occur
- 2 Must be moderately heated or exposed to relatively high ambient temperature before ignition can occur
- 3 Liquids and solids that can be ignited under almost all ambient temperature conditions
- 4 Will rapidly or completely vaporize at atmospheric pressure and normal ambient temperature, or is readily dispersed in air and burns easily



Yellow – Instability Hazard

Rate 0-4

- O Normally stable, even under fire conditions, and not reactive with water
- 1 Normally stable, but can become unstable at elevated temperature or pressure
- 2 Undergoes violent chemical change at elevated temperature or pressure, and reacts violently or may form explosive mixture with water
- 3 Capable of detonation or explosive decomposition but requires a strong initiating source, must be heated under confinement before initiation, reacts explosively with water or will detonate if severely shocked
- 4 Readily capable of detonation or explosive decomposition at normal temperatures and pressures



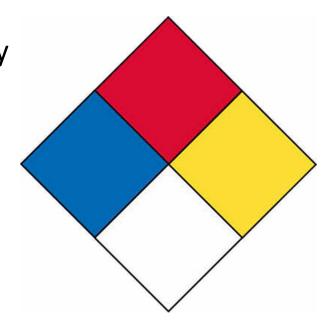
White - Other Hazard

Write in what additional hazard is posed: Some examples are:

OX – Oxidizer, allows chemicals to burn without an air supply

W – Reacts with water in an unusual or dangerous manner

SA – Simple asphyxiant gas (e.g., neon).

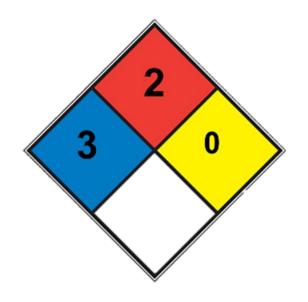




NFPA Label with Numbers

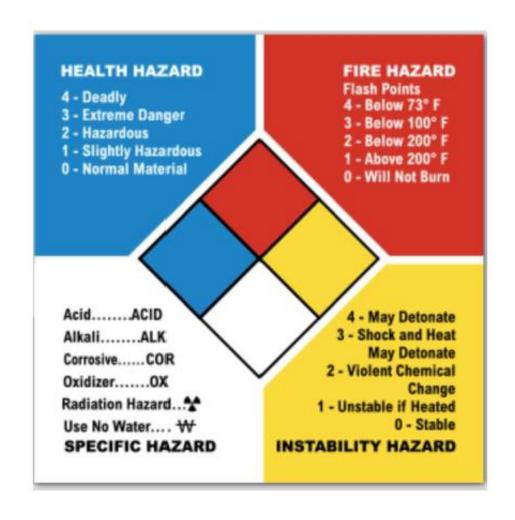
 Employers (healthcare practices) may create their own workplace labels, if the labels provide information about the hazards of the chemicals.

 Workplace labels must be in English. Other languages might be added to labels if needed.





NATIONAL FIRE PROTECTION AGENCY (NFPA) RATING



IF YOU USE NFPA LABELS, **YOU ARE REQUIRED TO HAVE AN ACCESSIBLE** NFPA GUIDE IN THE **OFFICE**



Labels (Cont.)

Employers May Use Pictograms to Warn Employees of Possible Hazards There are many pictograms; these are some samples.



Additional instructional symbols that are not included in OSHA's HCS pictograms on the workplace labels are permitted. Including both types of pictograms on workplace labels is acceptable.

Safety Data Sheet (SDS)



Safety Data Sheet (SDS)

- Manufacturer created SDS for every chemical or product that contains a hazardous chemical used in the workplace
- Offices are responsible for obtaining the up-to-date SDS for each product or chemical used in the office.
- Obtain the SDS from the chemical's manufacturer, distributor or Website.
- Employers must ensure that SDSs are always readily accessible to employees.
- All SDS follow the same 16 –section format.
- An inventory of SDS must be in a documented review annually, SDS may be kept electronically, as long as they are easily accessible to employees.

Section 1—Identification: Product identifier, manufacturer or distributor name, address, phone number, emergency phone number, recommended use, and restrictions on use.

Section 2—Hazard(s) identification: All hazards regarding the chemical and required label elements.

Section 3—Composition/Information on ingredients: Information on chemical ingredients and trade secret claims.

Section 4—First-aid measures: Required first aid treatment for exposure to a chemical and the symptoms (immediate or delayed) of exposure.

Section 5—Fire-fighting measures: The techniques and equipment recommended for extinguishing a fire involving the chemical and hazards that may be created during combustion.



Section 6—Accidental release measures: Steps to take in the event of a spill or release involving the chemical. Includes: emergency procedures, protective equipment and proper methods of containment and cleanup.

Section 7—Handling and storage: Precautions for safe handling and storage, including incompatibilities.

Section 8—Exposure controls/Personal protection: OSHA's permissible exposure limits (PELs), threshold limit values (TLVs), appropriate engineering controls, and personal protective equipment (PPE).

Section 9—Physical and chemical properties: The chemical's characteristics.

Section 10—Stability and reactivity: Chemical stability and possible hazardous reactions.



Section 11—Toxicological information: Routes of exposure (inhalation, ingestion, or absorption contact), symptoms, acute and chronic effects, and numerical measures of toxicity.

Section 12—Ecological information: How the chemical might affect the environment and the duration of the effect.

Section 13—Disposal considerations—describes safe handling of wastes and methods of disposal, including the disposal of any contaminated packaging.

Section 14—Transportation information—includes packing, marking, and labeling requirements for hazardous chemical shipments.

Section 15—Regulatory information—indicates regulations that apply to chemical.

Section 16—Other information—includes date of preparation or last revision.



Super Sani-Cloth Germicidal Wipe



SAFETY DATA SHEET

Issuing Date Revision date 18-Feb-2019 Revision Number 3

1. Identification

Product identifier

Product Name Super Sani-Cloth Germicidal Wipe

Other means of identification

SDS Number/Formula SDS 0020-00/4FQ51801

Synonyms None

Registration Number(s) 9480-4

Recommended use of the chemical and restrictions on use

Recommended useUse as a disinfectant on hard, non-porous surfaces.

Restrictions on use Read and understand the entire label before using. Use only according to label directions. It

is a violation of Federal law to use this product in a manner inconsistent to label directions.

Details of the supplier of the safety data sheet

Manufacturer Address

PDI, Inc. Two Nice-Pak Park Orangeburg, NY 10962-1376 1-845-365-1700

Emergency telephone number

Emergency Telephone PERS: 1-800-633-8253 (Domestic/Canada)

1-801-629-0667 (International)



Super Sani-Cloth Germicidal Wipe

2. Hazard(s) identification

Classification

Serious eye damage/eye irritation	Category 2A
Flammable liquids	Category 1

Appearance Colorless to slightly yellow liquid saturated on a wipe

Physical state Pre-moistened wipe

Odor Alcohol

Label elements

Danger

Hazard statements

Causes serious eye irritation Flammable liquid



Precautionary Statements - Prevention

Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking Wash face, hands and any exposed skin thoroughly after handling Wear protective gloves/protective clothing/eye protection/face protection Avoid breathing dust/fume/gas/mist/vapors/spray Use only outdoors or in a well-ventilated area



Super Sani-Cloth Germicidal Wipe

3. Composition/information on ingredients

Substance

Not applicable.

Mixture

Chemical name	CAS No.	Weight-%	Hazardous Material Information Review Act registry number (HMIRA registry #)	Date HMIRA filed and date exemption granted (if applicable)
Isopropyl alcohol	67-63-0	55.5	-	-
Quaternary ammonium compounds, C12-18-alkyl [(ethylphenyl) methyl] dimethyl, chlorides	68956-79-6	0.25	-	-
n-Alkyl dimethyl Benzyl ammonium chloride	68391-01-5	0.25	-	-

4. First-aid measures

Description of first aid measures

General advice IF exposed or concerned: Get medical advice/attention. Show this safety data sheet to the

doctor in attendance.

Inhalation Remove to fresh air. IF exposed or concerned: Get medical advice/attention. Not a typical

route of exposure.

Eye contact Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes.

Remove contact lenses, if present and easy to do. Continue rinsing. Keep eyes wide open

while rinsing. Do not rub affected area. Get medical attention if irritation develops and

persists.

Skin contact Wash skin with soap and water.



Information and Training:



Information and Training:

- Employers are required to train workers on the new labels and SDS format to protect workers by facilitating hazard recognition and understanding
- Training should be upon employment and at least once a year.
- Training should be documented, and documentation should be readily available in case of inspection.



Manufacturer, Distributor and Importer Responsibilities Under the RHCS:

- Evaluation: Chemical manufacturers, distributors, and importers must evaluate their chemicals and prepare labels that inform their customers about the hazards of their products.
- Labels: All labels are required to have pictograms, a signal word, such as "danger" or "flammable," hazard and precautionary statements, the product identifier, and supplier identification. Supplemental information can also be provided on the label as needed.
- > **SDS**: An SDS must be created for each hazardous chemical that is manufactured, distributed, or imported.



How to Clean Up a Chemical Spill

- Wear PPE wear gloves and other PPE if needed.
- Use approved absorbent neutralizing material or chemical spill kit.
- Pick up broken glass carefully. Dispose of in proper container.
- Disinfect area after cleaning and then allow it to air dry.
- > Evacuate area if chemical is toxic or gives off strong fumes.





Sample Spill Kit



Make Your Own Spill Kit

MAKE YOUR OWN SPILL KIT

The following is acceptable for small quantity spills of "low" danger chemicals and potentially infectious body fluids. Keep in a handy place, accessible to all. If you have the potential for a mercury spill, you will need to purchase a special mercury spill kit. They are available from a variety of medical supply sources.

- 1-Gallon zip lock food storage bag. Label with marker or stick on label SPILL KIT
- 2. 1-pair of heavy duty kitchen gloves kind you use to wash dishes
- Small dust pan or sand shovel available at most "dollar" stores. Throw out the brush.
- . 4. Piece of cardboard from the back of a tablet. You will use this to scoop up any broken glass onto the dust pan.
- Tongs to pick up broken glass.
- Something to absorb up spill a stack of paper towels and/or a sandwich bag full of kitty
- Disposable clothing cover (optional)
- Hospital grade disinfectant to clean area (do not include in kit)

After cleaning up a spill - replace cardboard, paper towels, kitty litter. You can disinfect the gloves and dust pan and use again. If you have the potential for a large quantity spill, you may want to have a 10 lb. bag of kitty litter handy.

^{**} If you have mercury in your laboratory or office you will need to purchase a special spill kit for a mercury clean up from a safety supply company! Available from Lab Safety Supply, Grainger, or

^{**}You have just saved almost \$25.00 per kit compared to the commercially prepared kits available.

Conclusion



Conclusion

Chemical use should be taken seriously

- Observed precautions at all times
- Read and understand labels
- Follow the manufacturer's directions for storage, use and disposal
- Read and understand SDS
- Wear the proper PPE when using, storing or disposing of chemicals
- Educate workers about chemical safety



For more information about the Hazard Communication Standard call

1-800-CDC-INFO (1-800-232-4636) or go online to

https://www.osha.gov.



Annual Safety Checklist

ANNUAL SAFETY CHECKLIST

ATE:	CHECKED BY:	
Standard	Criteria	Observation
Gloves	Worn when handling body fluids or hazardous material, not worn when leaving lab or using phone or calculator	
Lab coats (if splashing or splattering is expected)	Worn all times in lab by personnel (if applicable), not worn when leaving lab or in rest room or lunchroom	
Eyewash stations Biohazard hoods	Functioning properly, conveniently located	
Spill löt	Appropriate and available for use	1
Food and drink	None permitted in lab	4
Safety glasses, goggles, work shields	Used when handling hazardous material or when there is a potential for splashing of body fluids	
Unauthorized personnel in lab	No children (unless patient) in lab, all patients registered at front desk	
Employee accidents	Reported immediately, get prompt medical attention, if needed, get blood drawn for baseline. Follow facility procedures for accidents/exposures.	
Safety in-service training	Sessions held for new employees. Mandatory annual attendance for all personnel with potential exposure.	, j
Hazardous chemicals and reagents	Stored & handled properly, SDS available	
Fire drills	Held annually	
Fire extinguishers	Properly located, inspection current	
Waste disposal	Proper containers used, disposal documented according to State law	

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SDS - CHEMICAL INVENTORY LOG USING NFPA LABELING SYSTEM

5-20 SDS - CHEMICAL INVENTORY LOG USING NFPA LABELING SYSTEM Prepared by: Product Name Catalog # Quantity Physical Hazard Class* Manufacturer's Comments (optional) Stored State Name н R Monthly (optional) (optional) (H) Health (F) Fire Hazard (R) Reactivity (P) Protection 0 Minimal 0 Will not burn 0 Minimal A Goggles 1 Slight (if heated) B Goggles/Gloves 1 Slight 1 Slight C Goggles/Gloves/Apron 2 Moderate 2 Moderate (combustible) 2 Moderate 3 Serious 3 Serious 3 Serious D Face Shield/Gloves/Apron 4 Extreme 4 Extreme 4 Extreme E Goggles/Gloves/Mask F Goggles/Gloves/Apron/Mask X Gloves Use this log to document chemicals labeled with NFPA labels. Refer to the section on labeling for more detailed information on above codes. EAST COAST CLINICAL CONSULTANTS, LLC 977 Reed Ave., Franklinville, NJ 08322 856-981-0061

GHS Pictograms

OSHA Hazardous Chemical Labeling GHS Pictograms



Oxidizers



Acute Toxicity



Corrosives



Flammables Self Reactives Pyrophorics Self-Heating Emits Flammable Gas Organic Peroxides



Dermal Sensitizer
Acute Toxicity (Harmful)
Narcotic Effects
Respiratory Tract Infection



Carcinogen
Resperitory Sensitizer
Reproductive Toxicity
Target Organ Toxicity
Mutagenicity
Aspiration Toxicity



Gases Under Pressure



Explosives Self Reactives Organic Peroxides



Environmental Toxicity

NOTE: Apprendix C, Sociam C.2.3.1 of 29 CFR 1910.1200 seates the following: Pictograms shall be used in the shape of a square, set at a point said shall include a black bassed speaked on the background with a med frame entitionity wide to be givenly visable. A square and frame set at a point without a hunterly symbol in not a pictograms used to our premitted on the label.

Cleaning Up a Mercury Spill

CLEANING UP A MERCURY SPILL

Items Needed to Clean Up a Small Mercury Spill:

- 1. Zip locking plastic bags (4 to 5 as needed)
- 2. Trash bags (2 to 6 mils thick)
- 3. Rubber, nitrile, or latex gloves
- 4. Papertowels
- 5. Cardboard or squeegee
- Eyedropper
- 7. Duct tape or shaving cream, and small paint brush
- 8. Flashlight or small task light
- 9. Optional: Powdered sulfur
 - . Do not worry if you don't have this available.
 - The sulfur binds to the mercury and makes clean-up easier. It is sometimes found in the gardening departments at hardware stores, near the fertilizer, or with garden pesticides and funcicides. Pharmacists may also have it.

Mercury Spill Clean Up Instructions

- Put on gloves.
- If there are any broken pieces of glass or sharp objects, pick them up with care. Place all broken objects on a paper towel. Fold the paper towel and place in a zip locking bag. Secure the bag and label it as directed by your local health or fire department.
- Locate visible mercury beads. Use a squeegee or cardboard to gather mercury beads into small mercury balls. Use slow sweeping motions to keep mercury from becoming uncontrollable. Take a flashlight, hold it at a low angle close to the floor in a darkened room and look for additional glatening beads of mercury that may be sticking to the surface or in small cracked areas of the surface.

Note: Mercury can move surprising distances on hard-flat surfaces, so be sure to inspect the entire room, including any cracks in the floor, when searching.

- Use the eyedropper to collect or draw up the mercury beads. Slowly and carefully squeeze
 mercury onto a damp paper towel. Alternatively, use two pieces of cardboard paper to roll the
 mercury beads onto the paper towel or into the bag. Place the paper towel in a zip locking bag
 and secure. Make sure to label the bag as directed by your local health or fire department.
- After you remove larger beads, put shawing cream on top of small paint brush and gently "dot" the affected area to pick up smaller hard-to-see beads. Alternatively, use sticky tape, such as duct tape, to pick up any remaining small glass fragments (peel the tape very slowly from

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CLEANING UP A MERCURY SPILL

the floor to keep the mercury beads stuck to the tape). Place the paint brush or duct tape in a zip locking bag and secure. Make sure to label the bag as directed by your local health or fire department.

- OPTIONAL STEP: It is OPTIONAL to use commercially available powdered sulfur to absorb the beads that are too small to see. The sulfur does two things:
 - It makes the mercury easier to see since there may be a color change from yellow to brown; and
 - It binds the mercury so that it can be easily removed and suppresses the vapor of any missing mercury.

Where to get powdered sulfur? It is sometimes found in the gardening departments at hardware stores, near the fertilizer, or with garden pesticides and fungicides. Pharmacists may also have it.

Note: Powdered sulfur may stain fabrics a dark color. When using powdered sulfur, do not breathe in the powder as it can be moderately toxic. Additionally, users should read and understand product information before use.

- Place all materials used with the cleanup, including gloves, in a trash bag. Place all mercury beads and objects into the trash bag. Place the trash bag outside in a secured area and label it as directed by your local health of fire department.
- Contact your local health department, municipal waste authority, or your local fire
 department to find out how to conduct proper disposal in accordance with local, state and
 federal laws.
- After cleanup:
 - Remember to keep the area well-ventilated to the outside (i.e., windows open and fans in exterior windows running) for at least 24 hours after your successful cleanup. You may want to request the services of a contractor who has monitoring equipment to screen for mercury vapors. Consult your local environmental or health agency to inquire about contractors in your area.
 - o Continue to keep pets and children out of cleanup area.
 - If sickness occurs, seek medical attention immediately. View information on health effects related to exposures to vapors, from metallic mercury, for additional information on health effects, the Agency for Toxic Substances and Disease Registry (ATSDR) provides a <u>Public Health Statement on Mercury</u> that also presents information on health effects related to exposures to vapors from metallic mercury.

If you have further questions, then please call your local poison control center at $\,$

1 (800) 222-1222

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Laboratory Safety Labeling and Transfer of Chemicals





References

"Brady NFPA 704 Hazard Diamond Labeling Guide" https://www.bradyid.com/resources/nfpa704-diamond-labeling-guide

"Chemical Hazards for Healthcare Workers". Centers for Disease Control. National Institute of Occupational Safety and Health. https://www.cdc.gov/niosh/topics/healthcare/chemical.html

"Hazard Communication" https://www.osha.gov/hazcom

"Hazard Communication Safety Data Sheet" https://www.osha.gov/sites/default/files/publications/OSHA3493QuickCardSafetyDataSheet.pdf

"OSHA Brief: Hazard Communication Labels and Pictograms" https://www.osha.gov/sites/default/files/publications/OSHA3636.pdf

OSHA (2012). Hazard Communication Standard. (1910.1200).



Learning Objectives

- 1. Understand the Hazard Communication Standard (HCS)
- 2. Understand NFPA (National Fire Protection Association) ratings and labels
- 3. Explain the sections of the Safety Data Sheet (SDS)
- 4. Know the process for cleaning up a chemical spill

How did we do?



Thank you



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