

Wisconsin Veterinary
Diagnostic Laboratory
UNIVERSITY OF WISCONSIN-MADISON

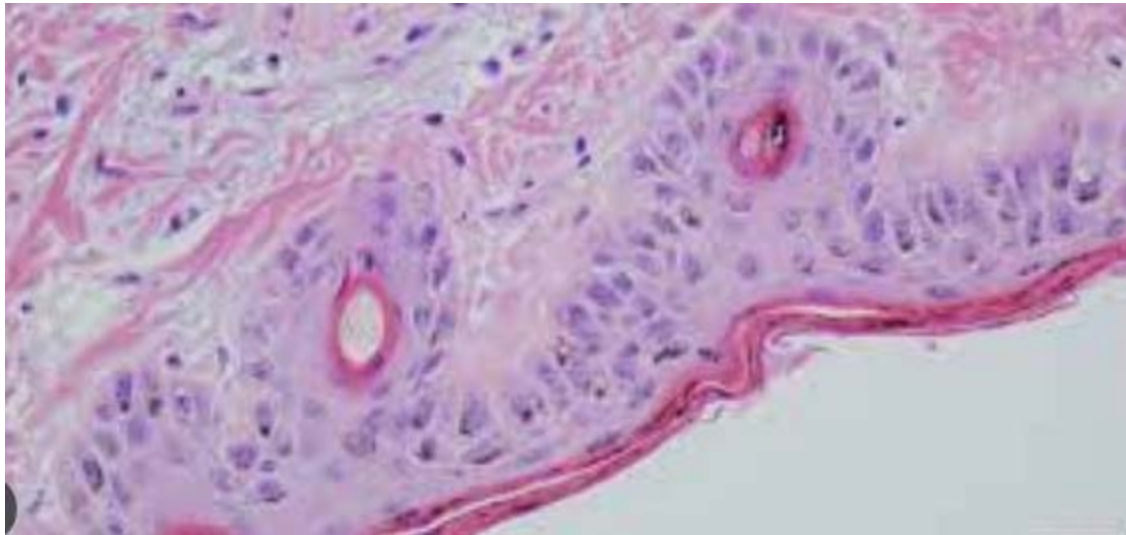
Health and Safety in the Laboratory

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Objectives

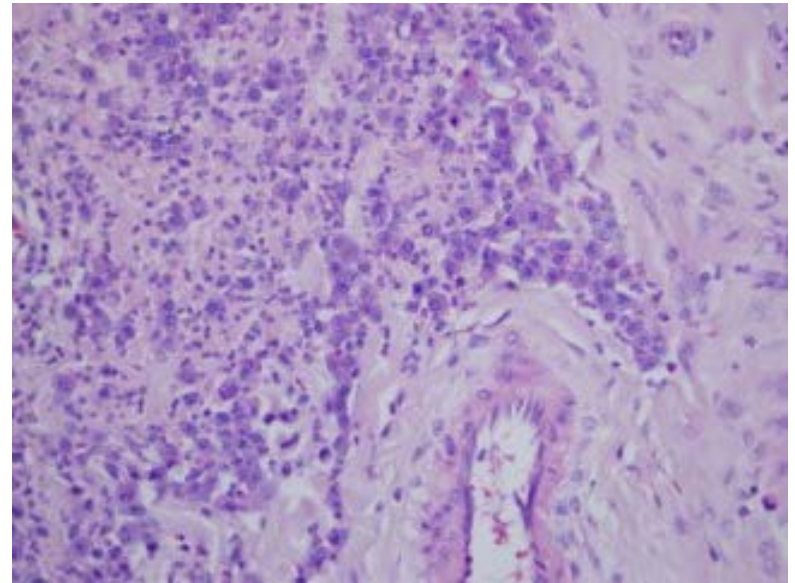
1. Recognize elements of safe practices in the laboratory
2. Identify spill response procedures
3. Describe the proper post-exposure procedures



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Elements of Safe Practices

1. Responsibilities of Employer and Employees
2. Hazard Identification and Assessment
3. Hazard Prevention and Control
4. Health and Safety Training
5. Evaluation and Improvement
6. Management of People



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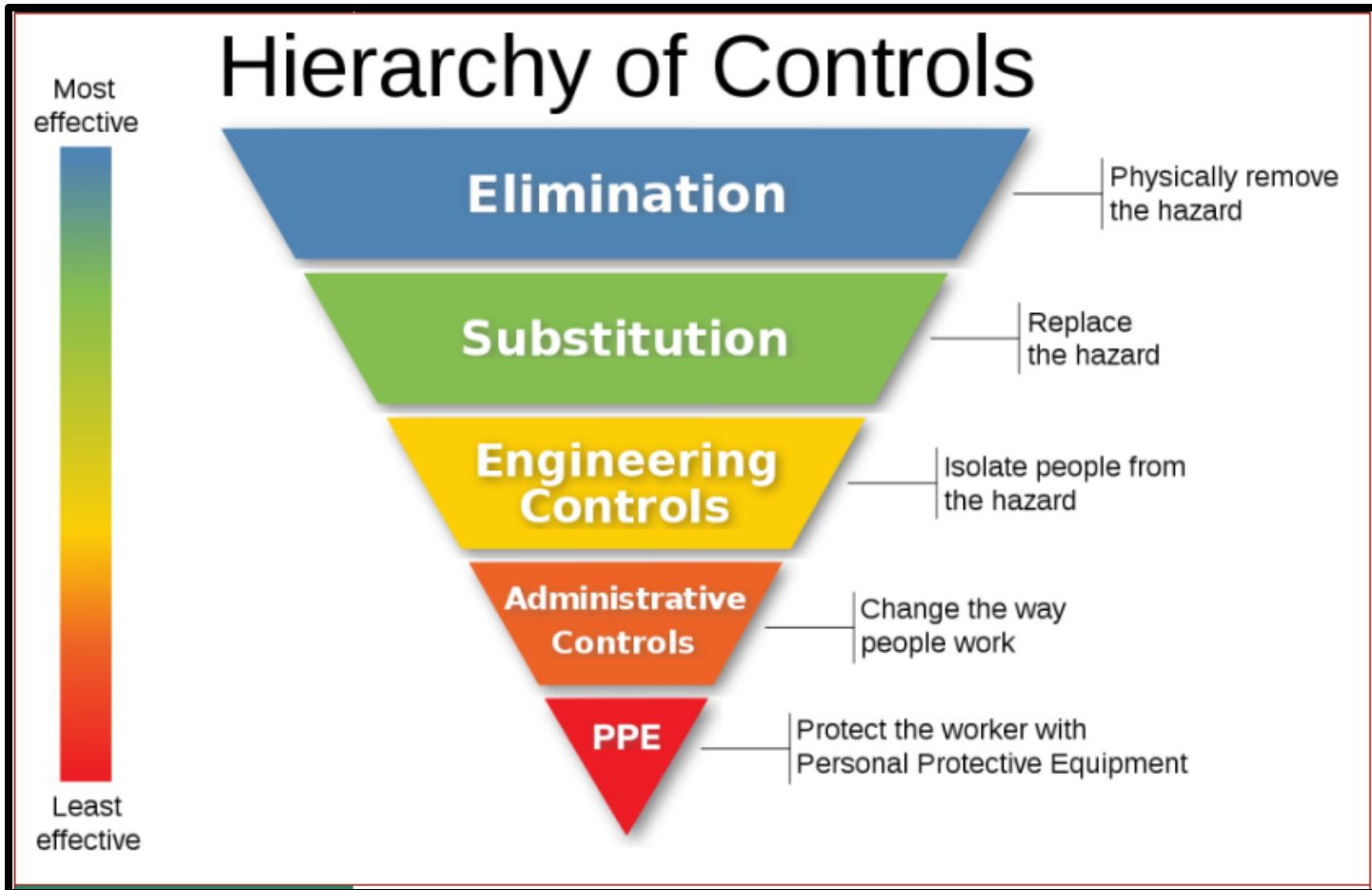
Responsibilities

- Employer
 - Provide a safe work environment
 - Safety should be the core part of their management leadership and lead by example (Safety Culture and Safety Conscious)
 - Apprise staff of hazards
 - Open to process improvement/Program Review
- Employee
 - Understand the hazards that may be present
 - Follow policies, SOPs, etc.
 - Report unsafe practices, injuries, near misses
 - Participate in process improvement

Hazard Identification and Assessment

- Structured process to evaluate potential hazards and risk factors (Root Cause Analysis)
 - Identify
 - Assess
 - Control
 - Record findings
 - Review and Follow Up
- Internal or External Assessments
 - Short Self-Audits (SSA)
 - CAPAs
 - Office of Biological Safety (OBS), Chemical Safety, Fire and Life, Fire/Police Dept.

Hazard Prevention and Control



www.cdc/niosh

Health and Safety Training

- Education
 - New Employee Orientation (HR, HS, Section)
 - Online, In-Person
 - Policies, Standard Operation Procedures
- Personal Protection Equipment Policy
- Respiratory Protection Program
- Immunization Program
- Job-Specific Training – hands-on, sampling specific
- Proficiency Evaluation - 3mo, 6mo, annual
- Refresher Training – Annual, 3-5yr renewal
- Continuous Education Opportunities – online, local college

Evaluation and Improvement

- There's always room for improvement!
- Best practices in place → Better practices in the workspace

Management of People

- Safety practices apply to everyone in the building!
 - Employees
 - Vendors
 - Visitors

Hazardous Communication (HAZCOM)

29 CFR 1910.1450 - Occupational Exposure to Hazardous Chemicals in Laboratories

- Chemical Hygiene Plan – written program that outlines the practices and procedures to be followed by employees, students, visitors, and other personnel working in each laboratory to protect them from potential hazards presented by chemicals and to eliminate or keep chemical exposures below specified limits
 - Chemical Hygiene Officer
 - Chemical Storage
 - Chemical Exposure Limits
 - Safety Data Sheets (SDS)
 - Chemical labeling

Safety Data Sheets (SDS)

- A Safety Data Sheet is a detailed informational document prepared by the manufacturer of a hazardous chemical.
- The SDS describes the physical and chemical properties of the product.
- 16 Sections
- Purpose of an SDS is to inform users what the hazards of the product are:
 - how to use the product safely
 - what to expect if the recommendations are not followed
 - how to recognize symptoms of exposure
 - what to do if emergencies occur
- Accessible





Chemical Labels

- Every chemical must have a label from the manufacturer
- Label includes:
 - Product identifier
 - Supplier Information
 - Signal word
 - Hazard statements
 - Precautionary statements
 - Pictograms
- Secondary containers must:
 - Contents
 - Date opened/prepared (if critical to quality or expiration)
 - Prepared by - initials
 - Hazards - (pictograms)
 - Do not pour back into primary container.

If label is missing: don't accept it, don't open it. Report it!

Global Harmonized System

- Health
- Physical
- Environmental
- Place on Secondary containers

GHS - Hazard Pictograms and Related Hazard Classes		
		
Expanding Bomb <ul style="list-style-type: none"> • Explosive • Self-reactives • Organic Peroxides 	Corrosion <ul style="list-style-type: none"> • Skin corrosion/burns • Eye damage • Corrosive to metals 	Flame Over Circle <ul style="list-style-type: none"> • Oxidizing gases • Oxidizing liquids • Oxidizing solids
		
Gas Cylinder <ul style="list-style-type: none"> • Gases under pressure 	Environment <ul style="list-style-type: none"> • Aquatic toxicity 	Skull & Crossbones <ul style="list-style-type: none"> • Acute toxicity (fatal or toxic)
		
Exclamation Mark <ul style="list-style-type: none"> • Irritant (eye & skin) • Skin sensitizer • Acute toxicity • Narcotic effects • Respiratory tract irritant • Hazardous to ozone layer (non-mandatory) 	Health Hazard <ul style="list-style-type: none"> • Carcinogen • Mutagenicity • Reproductive toxicity • Respiratory sensitizer • Target organ toxicity • Aspiration toxicity 	Flame <ul style="list-style-type: none"> • Flammables • Pyrophorics • Self-heating • Emits flammable gas • Self-reactives • Organic peroxides

Biological Hazards

Laboratory Acquired Infections (LAIs)

- Acquired in the lab or from lab-related activities
- Pathogens: bacteria, viruses, fungi, prions, parasites
 - Unknown exposure (>80%)
 - # organism present (infection control measures)
 - Route of entry into body (behavior – hand hygiene, reporting)



Bloodborne Pathogens (BBP)

29 OSHA 1910.1030 Bloodborne Pathogens

- Bloodborne pathogens (BBP) - pathogenic microorganisms that are present in human blood and may cause disease in humans
- Bloodborne pathogens of most concern are:
 - Human Immunodeficiency Virus (HIV)
 - Hepatitis B Virus (HBV)
 - Hepatitis C Virus (HCV)
 - HCV is the most common BBP in the US, with over 2 million people infected, many without symptoms
- Bloodborne Pathogen Exposure Plan
 - Universal Precautions
 - Annual Training



Sharps Safety

- Needles
 - Alternatives (blunt, micropipette)
 - Self-sheathing/Retractable
 - One-hand recap
 - “SHARPS!”
- Scalpels
 - On/Off w/forceps
- Blades
 - Forceps
 - Mark dull side
 - Guarding



Spill Response

- If the nature of the spill presents a situation that may be immediately dangerous to life or health (IDLH) to building occupants, significant fire risk, and you cannot safely or quickly alert all others to leave the area, then activate a fire alarm, evacuate the area, and wait for emergency response to arrive.
- Assess the size of the spill
 - Large – require emergency response
 - Highly toxic, volatile, or flammable
 - Small - managed within the lab
 - Low toxicity, not a significant inhalation or fire hazard
- Procedures inside containment vs. outside containment
- If you have any questions about handling spill, or you are unable to safely cleanup of a spill, ASK FOR HELP!
- Any spills released into the environment must be immediately reported to Leadership/Chemical Safety.

S.W.I.M.S

S.W.I.M.S. acronym to remember the steps when responding to spills

S = Stop the spill. Encircle to prevent spreading and cover with absorbent material.

W = Warn other people. Alert others in the immediate area.

I = Isolate the spill and secure area. Place sign(s) on door(s) and close if necessary.

M = Minimize exposure by wearing appropriate PPE, avoid exposure, vacate, hygiene.

S = Standby to clean up and/or assist others clean up spill.

Chemical Spill Response



- Chemical Spill Kit

- Absorbent material (granules, sock, pads)
- Signage for doors, area
- Tongs
- Broom and dust pan to clean up broken glass
- Padded envelope for sharp materials (glass)

- Clean Up

- Encircle spill to prevent spread
- Notify others that share lab space
- Place signage on all lab doors to keep others out
- Don appropriate PPE (often already wearing)
- Clean up or stand by to help others
- Report it!

Biological Spill Response



- Biological Spill Kit
 - Absorbent material (sock, pads)
 - Signage for doors, area
 - Tongs
 - Shoe covers
 - Broom and dust pan to clean up broken glass
 - Padded envelope for sharp materials (glass)
- Clean Up
 - Encircle spill to prevent spread
 - Notify others that share lab space
 - Place signage on all lab doors to keep others out
 - Don appropriate PPE (often already wearing)
 - Clean up or stand by to help others
 - Report it!

Post-Exposure Response

An exposure includes both chemical and biological incidents. An exposure occurs anytime a chemical or a biohazardous material from an animal, human, or other potentially infectious material (OPIM) goes beyond the barrier of the skin. Response is required regardless if pathogen is a zoonotic or infectious.

The post-exposure procedure shall be followed when an exposure occurs. You should stop what you are doing, remain calm.

Scrub with mild soap or flush with water for a minimum of **15 minutes**.

Routes of Exposures:

- Topical (e.g., cut, puncture, scrape, previous wound not covered and sealed), absorption (e.g., DMSO, formaldehyde)
- Mucosal (e.g., eyes, mouth, nose)
- Ingestion
- Inhalation

- Call 911 if there is an IDLH or immediate medical attention is necessary/requested.
- Wisconsin Poison Center at 1-800-222-1222, 24/7

Chemical Post - Exposure Procedure

Topical	<ul style="list-style-type: none"> • Remove PPE and/or clothing that is in contact with your skin that could impede thorough flushing with water. • Small body area (e.g., hand or wrist): go to nearest sink and rinse/flush thoroughly with water. (Use drench shower if desired). • Large body area (e.g., legs/lap, torso, etc.): go to nearest drench shower, pull handle and remain in water flow.
Mucosal	<ul style="list-style-type: none"> • Eyes: go to nearest eyewash station, engage actuator for the hands-free water flow, rinse hands well (remove contacts), hold open both eyes your hands, place eyes in water flow. • Mouth: go to sink and swish and spit repeatedly. Be sure not to swallow. • Nose: flush and blow out ensuring you don't inhale nor swallow.
Ingestion	<ul style="list-style-type: none"> • If you accidentally swallow a chemical, refer to SDS immediately for instructions. • You may call Wisconsin Poison Center at 1-800-222-1222, 24/7. Some chemicals do not recommend vomiting as it may cause more damage.
Inhalation	<ul style="list-style-type: none"> • Immediately exit the area for fresh air, refer to SDS for instructions. • You may call Wisconsin Poison Center at 1-800-222-1222, 24/7.

Biological Post-Exposure Procedure

Post-exposure procedures shall be followed for all known or unknown pathogens, regardless of zoonotic status (spread between animals and humans).

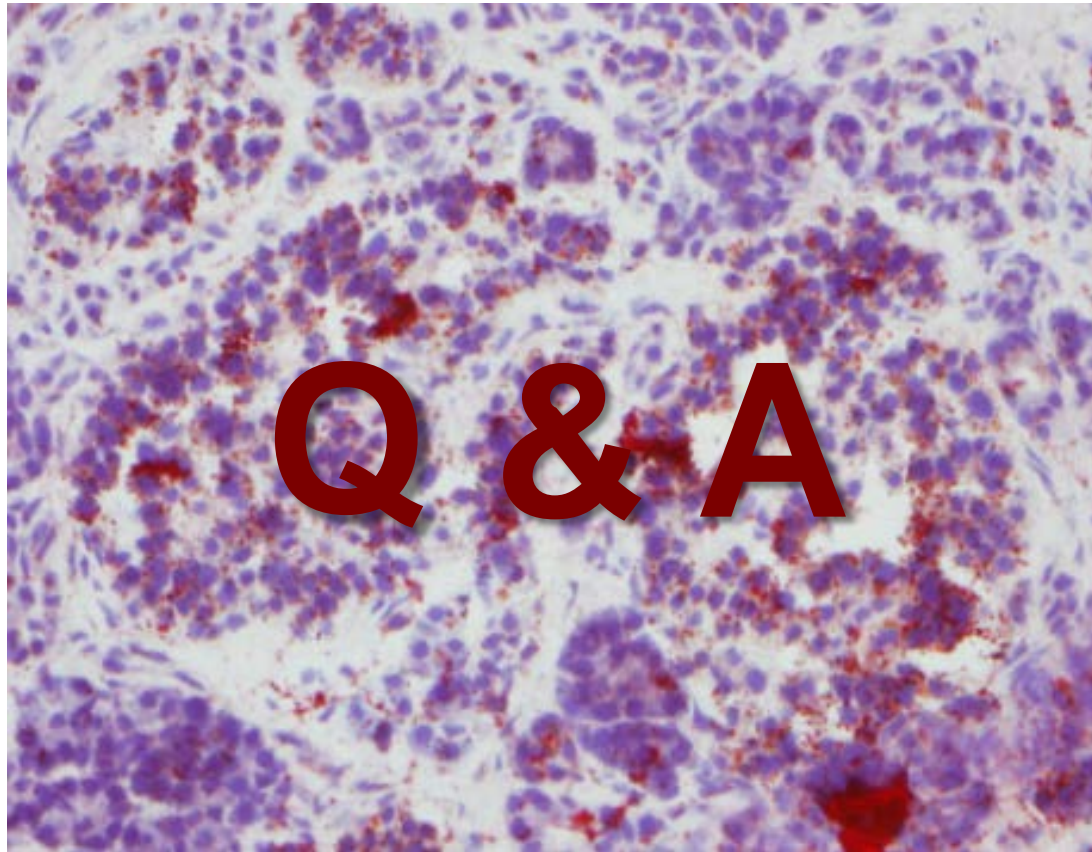
For immediate medical attention call 911 or go to the Emergency Dept. or Urgent Care.

<p style="text-align: center;">Topical (cut, puncture, scrape, previous wound not covered/sealed)</p>	<ul style="list-style-type: none"> ● Got to sink, turn on water, and clean with mild soap.
<p style="text-align: center;">Mucosal</p>	<ul style="list-style-type: none"> ● Eyes: go to nearest eyewash station, engage actuator for hands-free water flow, rinse hands well, (remove contact) hold open both eyes your hands, place eyes in water flow. ● Mouth: go to sink and swish and spit repeatedly. Be sure not to swallow. ● Nose: flush and snort out ensuring you don't inhale nor swallow.

Report All Injuries

- Within 24 hours you **MUST** provide to Human Resources
 - Submit an Employee's Work Injury and Illness Report
 - Supervisor will fill out Supervisor's Incident Analysis and Prevention Report
- Seek medical attention, if necessary
 - First Aid → Urgent Care → Emergency Department
- Investigate the incident
 - Mitigate risk
 - Reduce likelihood of co-worker being injured

Thank you!



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