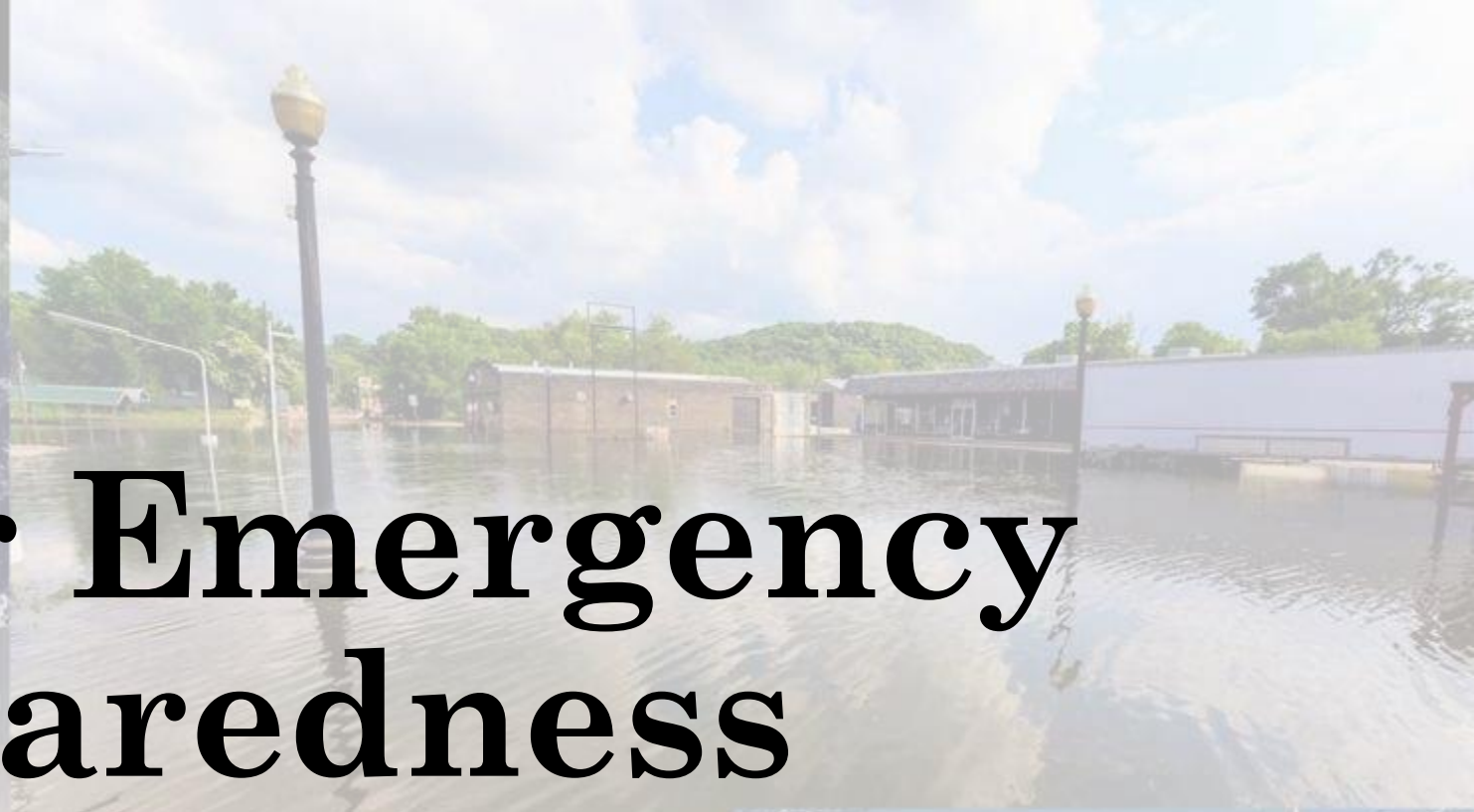




Disaster Emergency Preparedness for FlaWARN

Presented by: Cindy Mercado, MS, ASP

Objective

- The purpose of this session is to provide the FLA WARN an overview of Disaster Emergency Preparedness.

Specific objectives include:

- Define common terminology using during an emergency.
- Describe actions for emergency responders during pre-deployment, deployment, and post-deployment.
- Identify common hazards encounter during a response and how those hazards affect health and safety
- Discuss different type of Personal Protective Equipment (PPE) and their use.

Agenda

Topic 1

Definitions

Topic 2

Anatomy of a Disaster

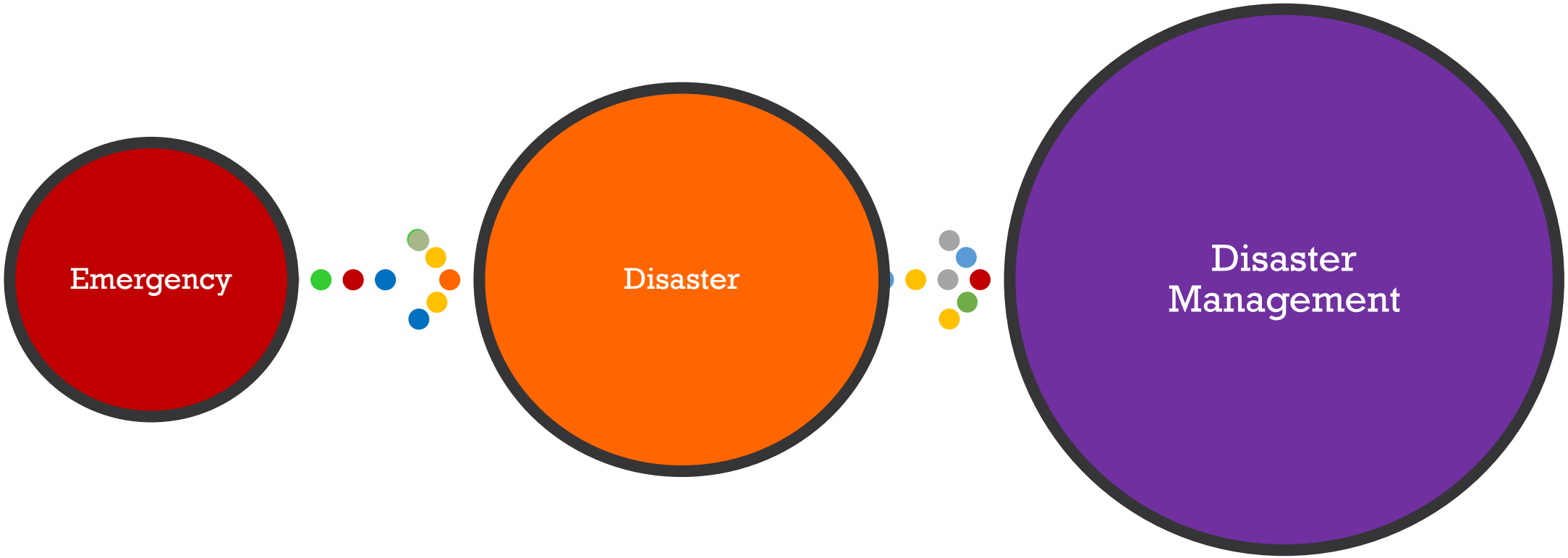
Topic 3

Responder Stages

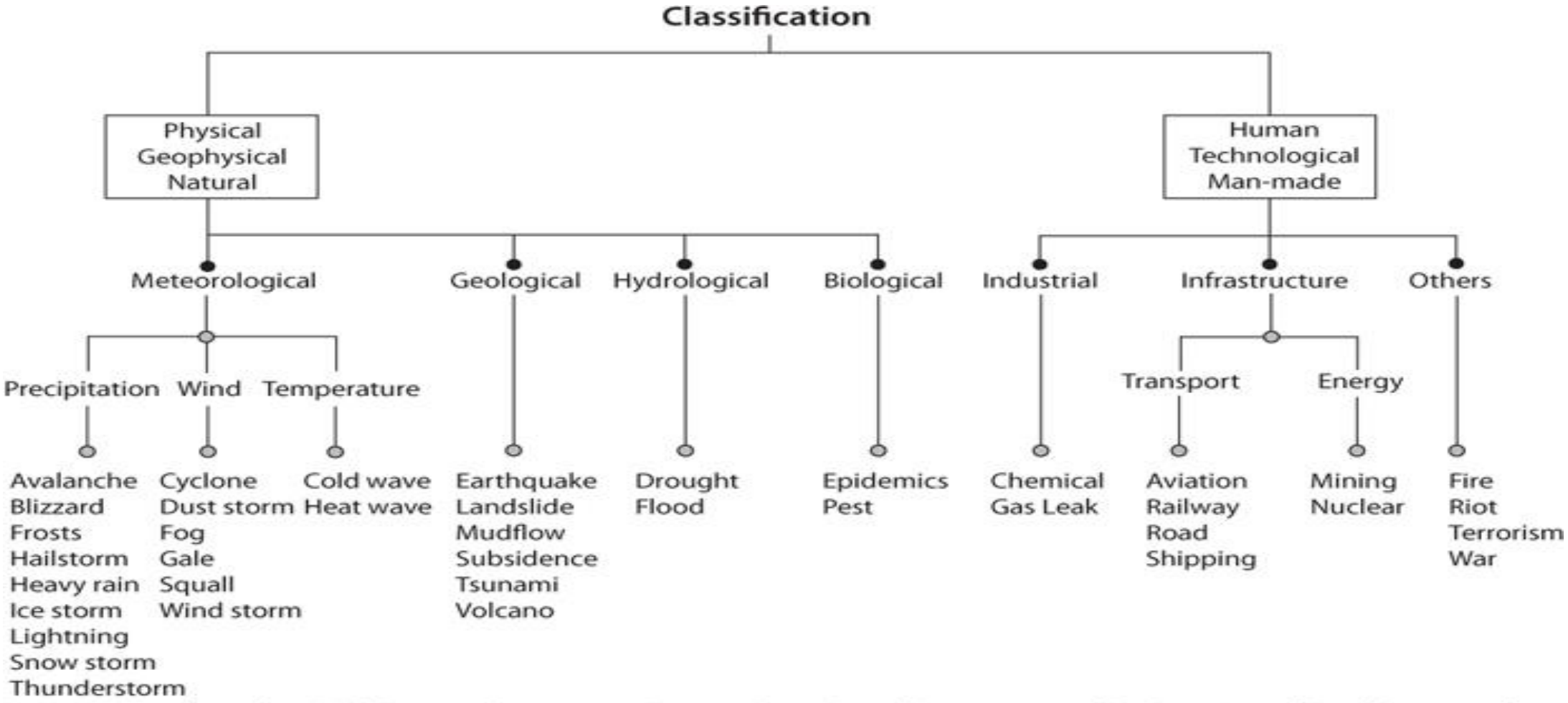
Topic 4

Responder Safety and Health

Definitions

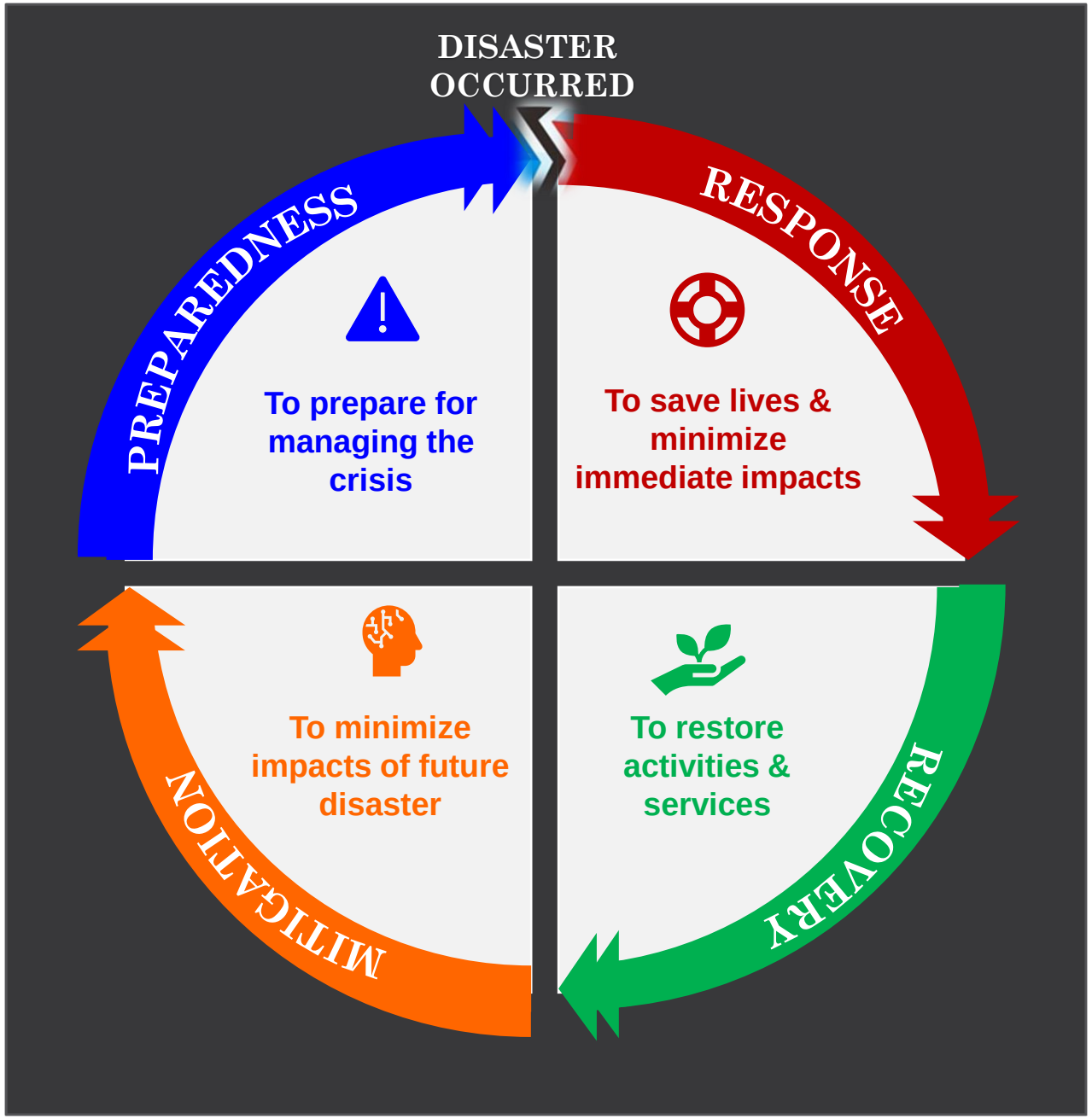


Types of Disaster



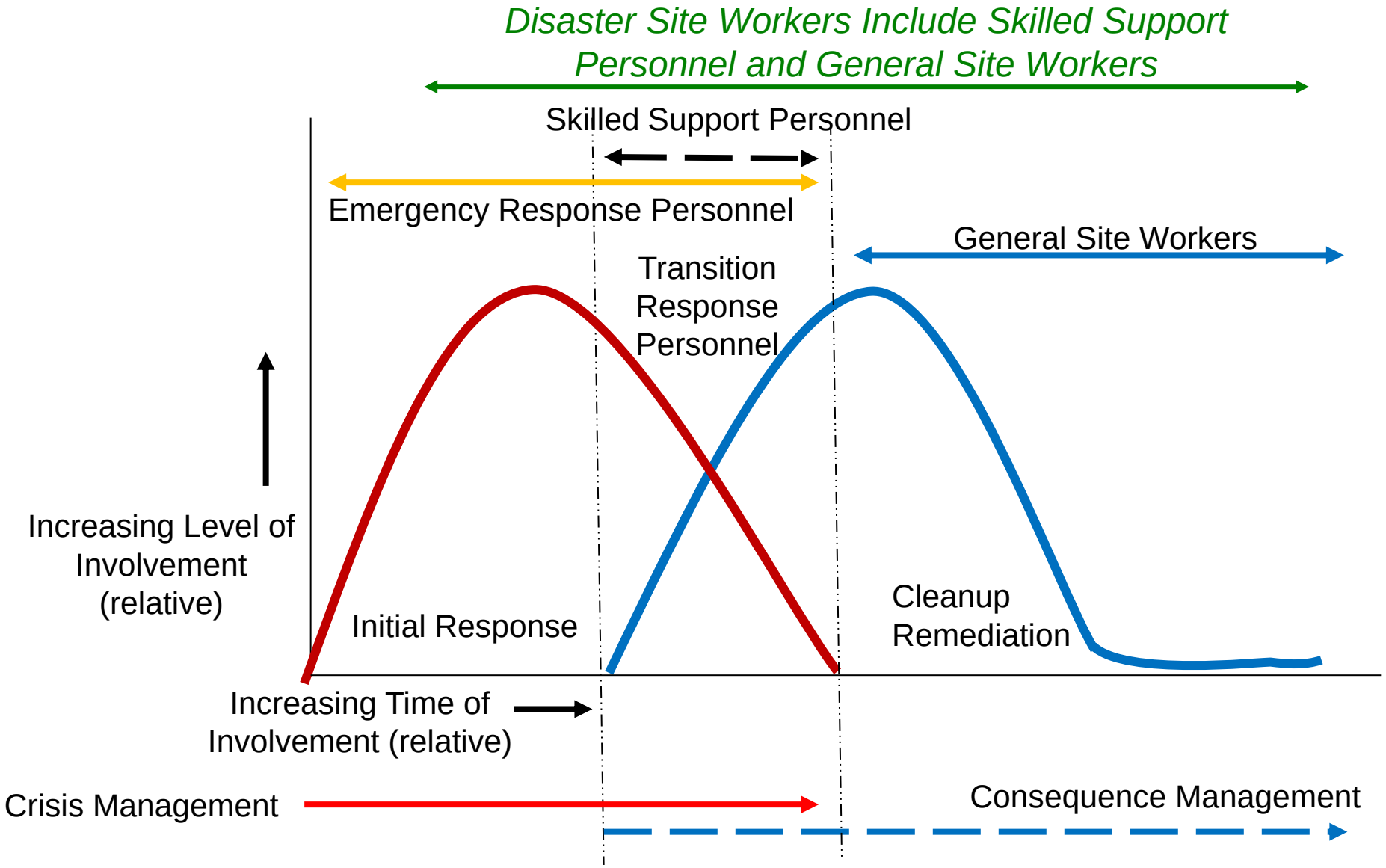
Source: Based on the High Power Committee Report (2001) and International Federation of Red Cross and Red Crescent Society (2001).

Anatomy of a Disaster



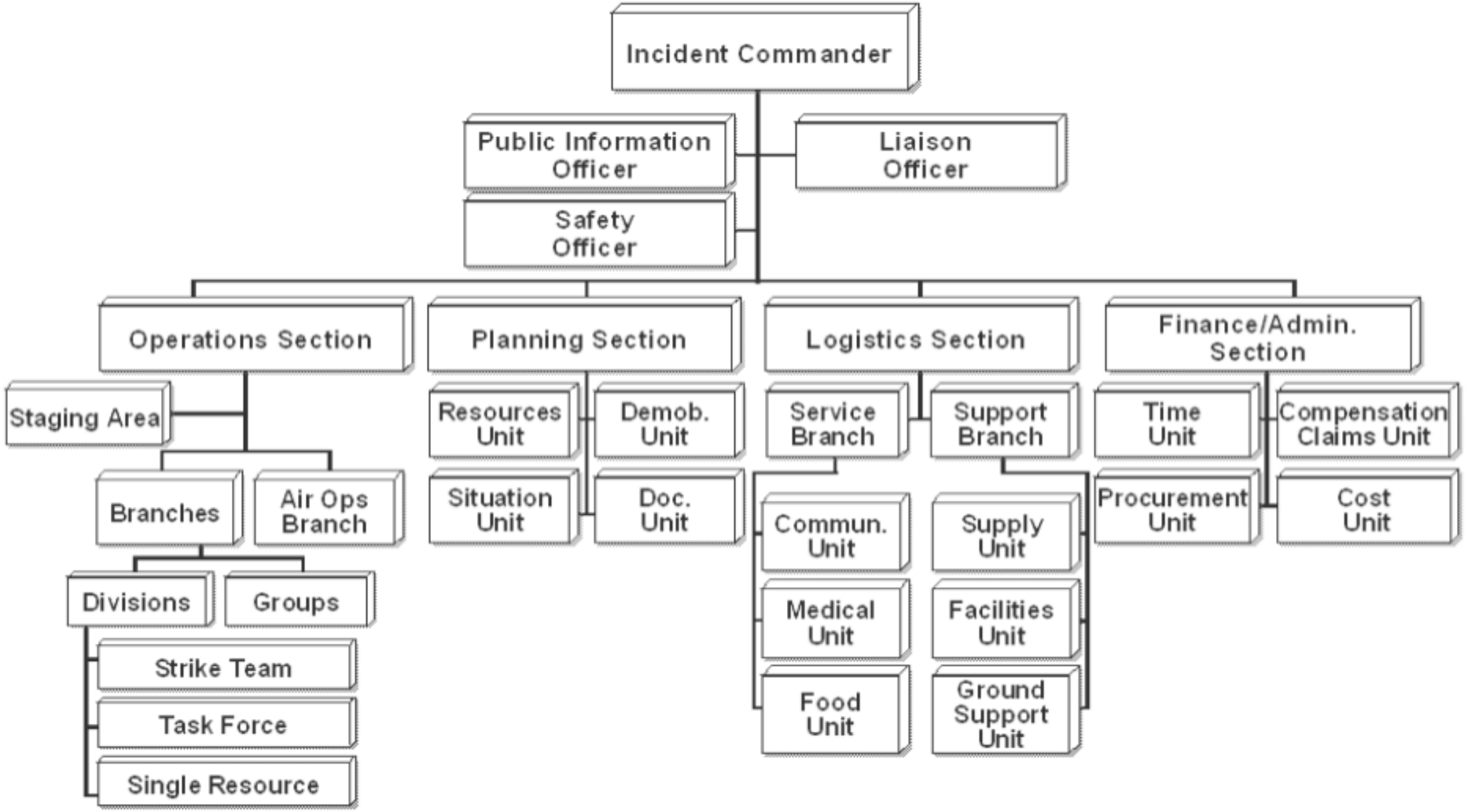
Disaster Management Cycle

Disaster Event



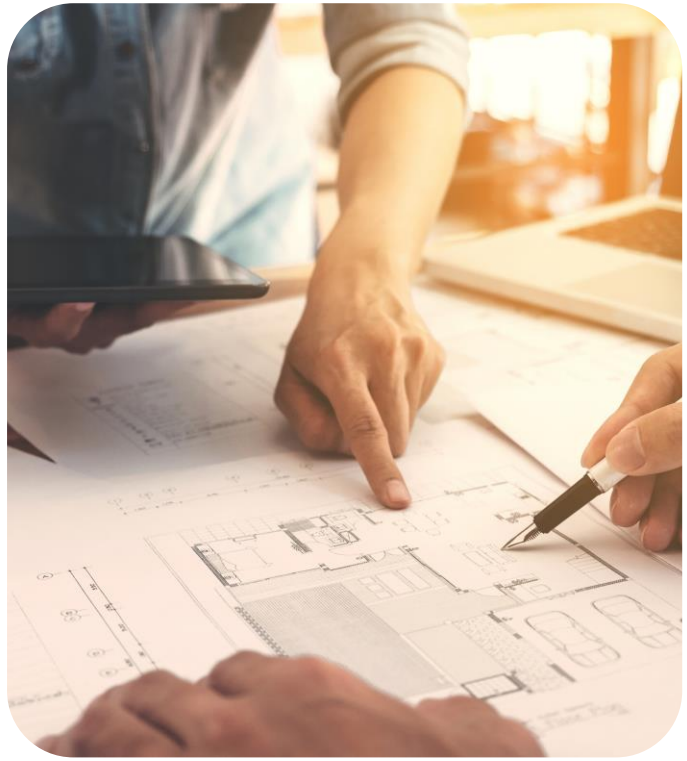
Responder Categories

Incident Command System



Responder Stages

Responder Stages



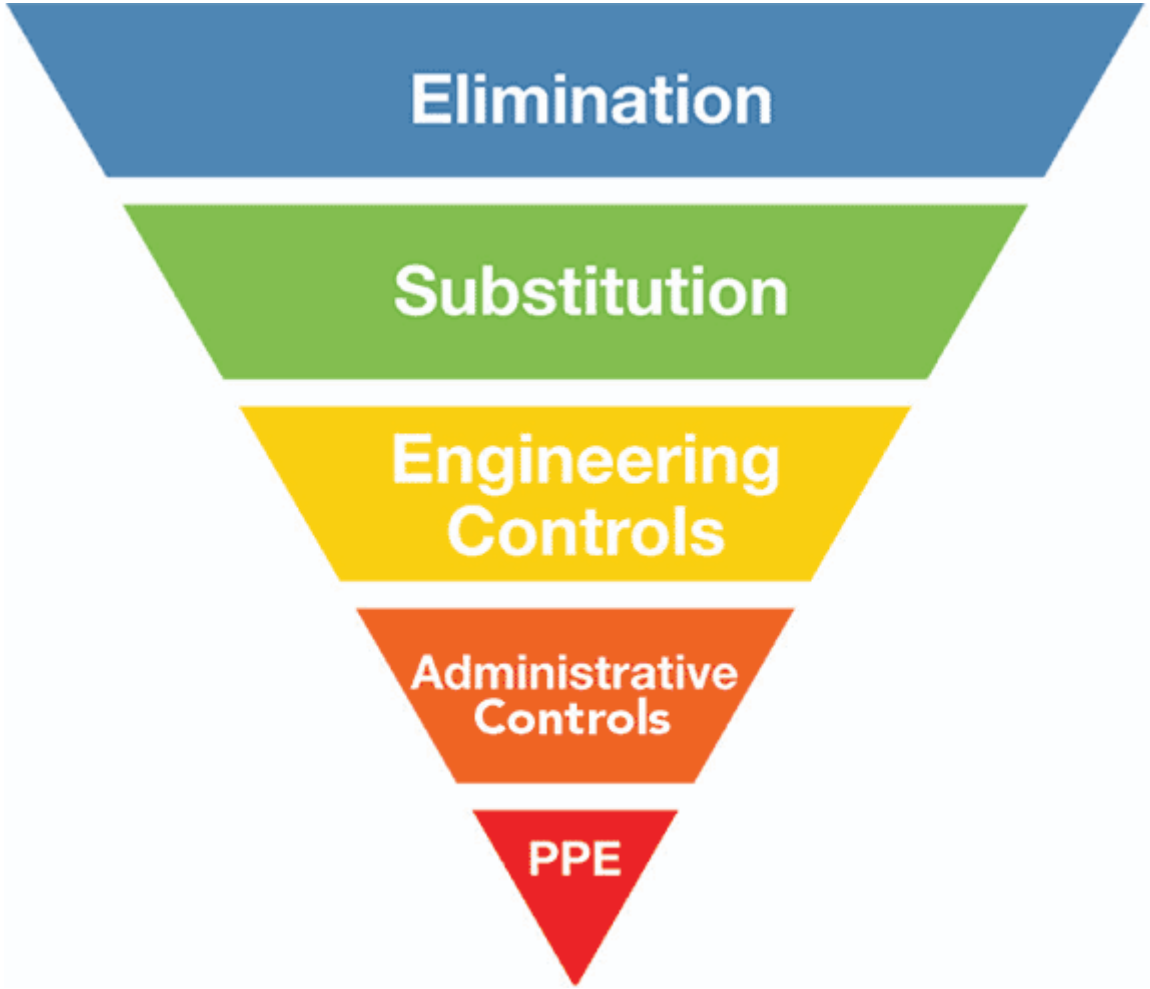
Pre-deployment

Deployment

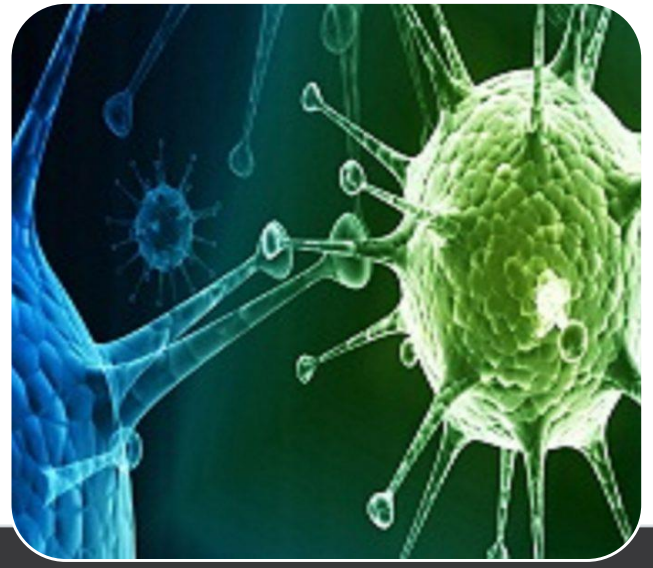
Post-deployment

Responder Safety and Health

Hierarchy of Hazard Control



Common Health Hazards



Chemical

Physical

Biological

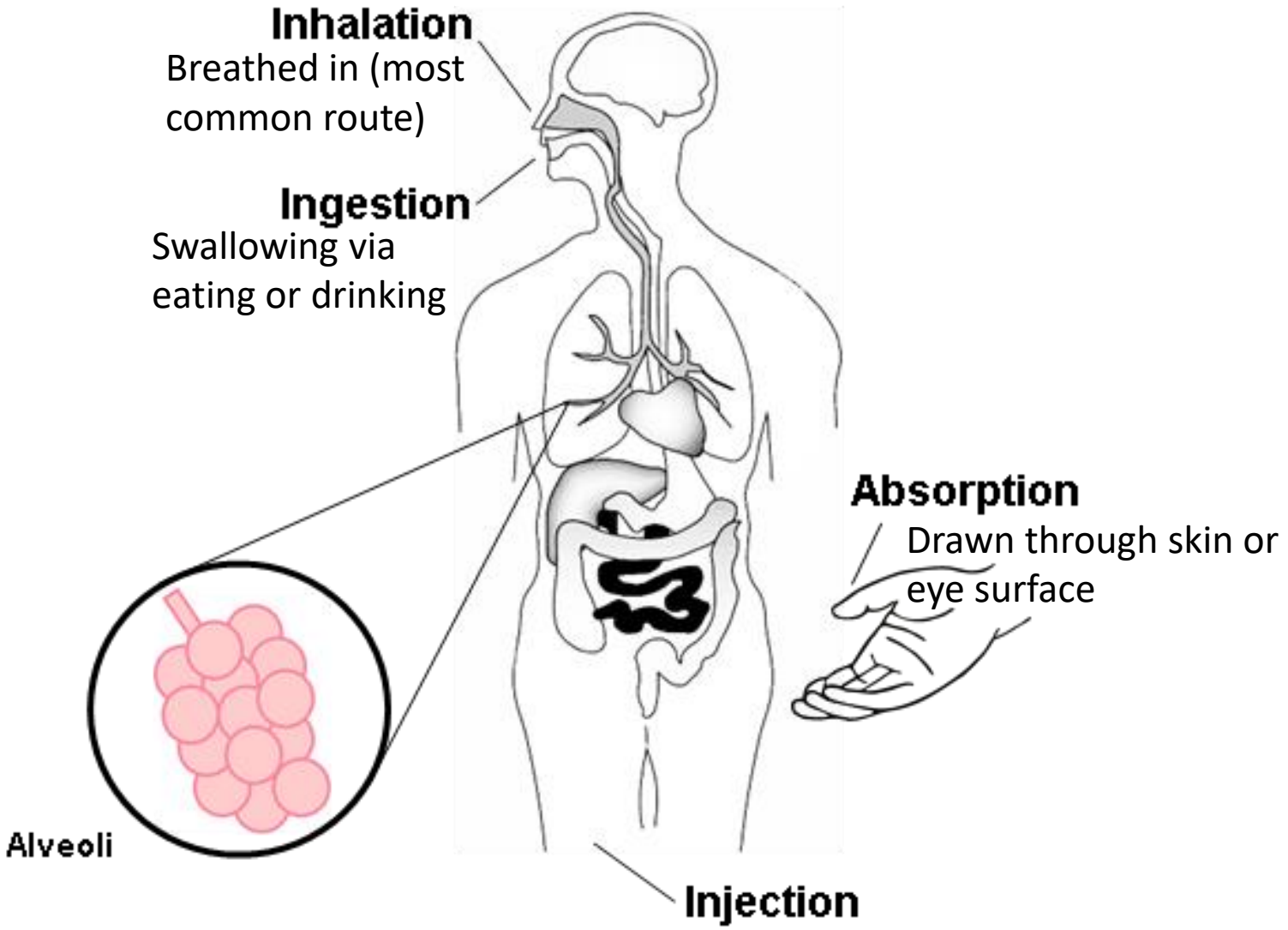
Chemical Hazards

Chemical

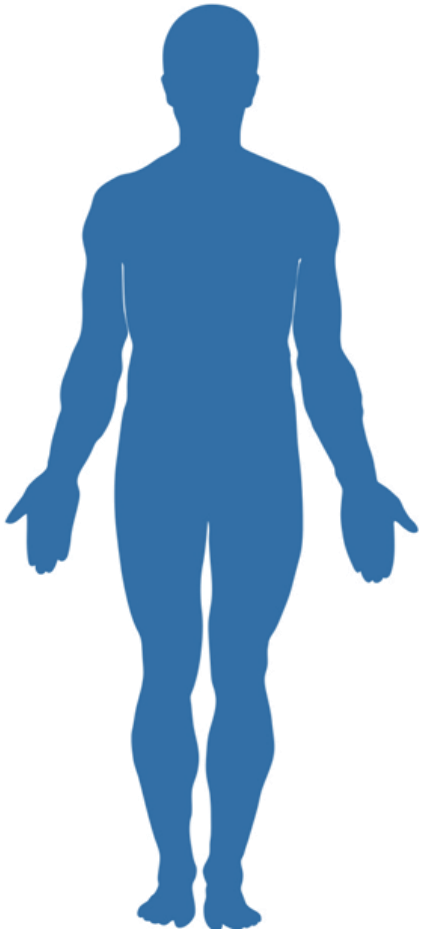
Examples:

- Liquids like cleaning products, paints, acids, solvents – especially if chemicals are in an unlabeled container!
- Vapors and fumes that come from welding or exposure to solvents
- Gases like acetylene, propane, carbon monoxide and helium
- Flammable materials like gasoline, solvents, and explosive chemicals.
- Pesticides

Routes of Entry



Health Effects



Exposure Condition	Exposure	Example
ACUTE	Immediate	Short-term, high concentration	H_2S exposure within a confined space
CHRONIC	Delayed; generally, for years	Continuous; for long periods of time	Asbestosis

Protection against Chemical Hazards

Avoid direct contact with chemicals or hazardous atmospheres.

Stay aware of wind direction.

Wear PPE if needed.

Injury from Dust and Flying Debris

- Be alert to the hazards from nearby workers, machinery, and falling/shifting debris.
- Wear safety glasses with side shields.
- Wear goggles for protection against dust particles or for use over prescription glasses.
- Wear hard hats, safety shoes, and work gloves

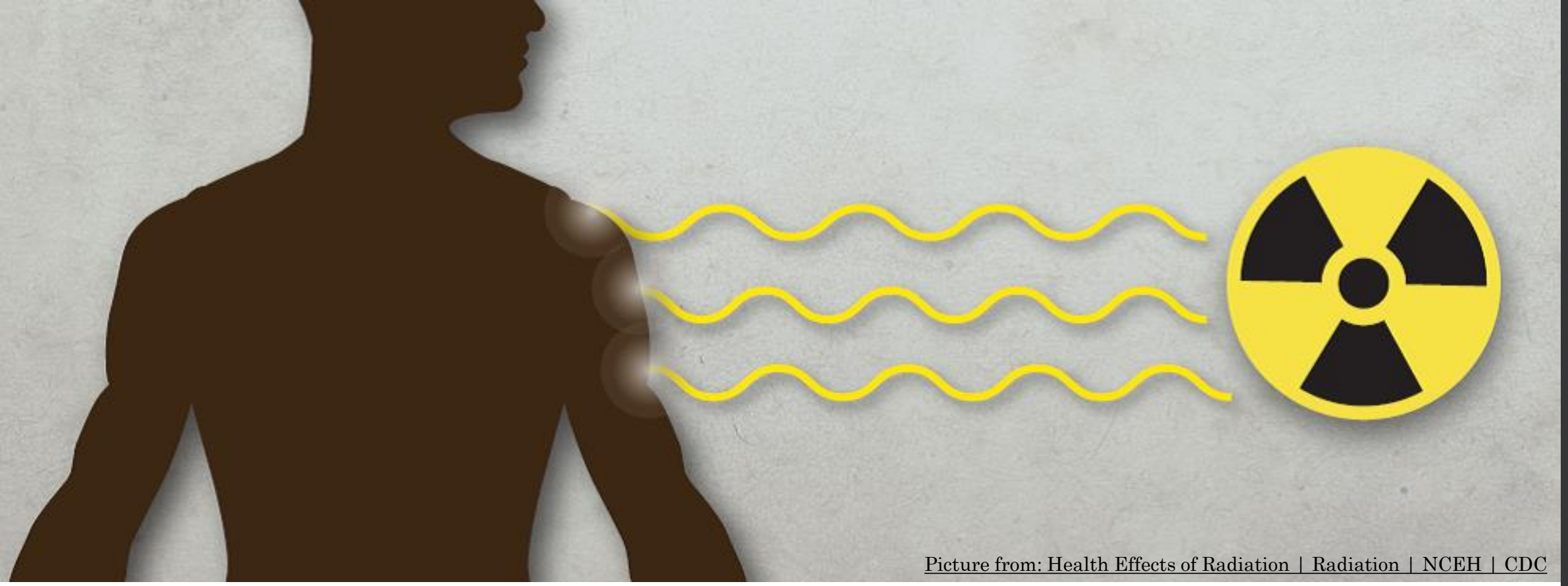
Inhalation of Dust Containing Asbestos, Silica, and Other Particulates

- Dust may contain hazardous materials.
- Avoid dust-generating activities.
- Follow PPE recommendations by supervisor

Carbon Monoxide

- Symptoms: headache, dizziness, drowsiness, or nausea; progressing to vomiting, loss of consciousness; and collapse, coma, or death under prolonged or high exposures.
- Areas affected by gasoline or propane-powered generators or heavy machinery:
  - Vicinity of operating equipment
  - Vicinity of temporary generators
  - All fires and temporary space heaters
  - Debris reduction sites
  - Burning and compacting

Picture from: Carbon Monoxide Poisoning | CDC

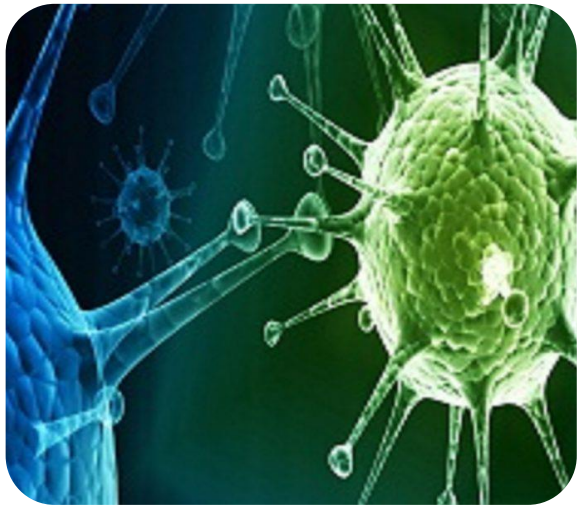


Picture from: Health Effects of Radiation | Radiation | NCEH | CDC

Radiation Exposure

- Follow time, distance, and shielding precautions.
- Wear personal dosimeter when entering contaminated areas.
- Follow PPE, personal hygiene and decontamination precautions.

Biological Hazards



Biological

- Associated with working with animals, people, or infectious plant materials.

Potential areas of exposure:

- Blood and other body fluids
- Fungi/mold
- Bacteria and viruses
- Plants
- Insect bites
- Animal and bird droppings

Effects of Exposure to Biological Hazards

Mild	Serious	Chronic/Terminal
• Allergic reaction	• Tetanus • Swine Flu • SARS • Avian Flu • West Nile • Lyme Disease	• Anthrax, • Avian flu • Bloodborne pathogens (HIV, Hepatitis B & C) • Legionnaires disease • Mold • SARS • Hemorrhagic fevers

Protection against Biological Hazards

- Proper ventilation
- Universal precaution with blood or other bodily fluids
- Personal hygiene
- Proper first aid attention to cuts/scratches
- Current/updated vaccinations
- Insect repellent and clothing to ward off pathogen-carrying insects
- Alert for animals in or under materials or debris piles
- Proper PPE

Mold

- Symptoms include sneezing, nasal, eye and skin irritation, and asthma like symptoms.
- Use NIOSH-approved particulate respirators, gloves and goggles when working with moldy or damp materials.
- Additional protection may be needed for high-contamination areas or when activities generate substantial dust.

Bloodborne Pathogens

- Infected blood can enter your system through mucous membranes open sores, cuts, abrasions, and/or any sort of damaged or broken skin
- Adopt universal precautions- assume blood or bodily fluids potentially contaminated with blood are infectious.
- Wear PPE- gloves, eye protection.
- Consider receiving the Hepatitis B series vaccination.

Animal Bites and Stings

- Use insect repellent.
- Be aware of displaced wildlife and pets in the areas.
- Inspect areas before entering.
- Be cautious about where you place your hands and feet.
- Wear proper foot gear and leather gloves when handling materials where nests may be present.

Waterborne Disease

- Remember it is not just rainwater.
- Contact with contaminated or disease-carrying soil, water, feces, animals.
- Failed wastewater treatment plants, backed up, overflowing sewer lines, flood water pollution of wells.
- Drink from bottled water sources until water supplies are safely treated.

Contact with Poisonous Plants

- Learn to recognize poisonous plants or harmful plants.
  - Poison ivy, poison oak, poison sumac
  - Thorn-bearing plants
- Use gloves and wear long pants.
- Rubbing alcohol may remove the oily resin causing the reaction.

Physical Hazards

Physical

- Factors within the environment that can harm the body without necessarily touching it.
  - Radiation: including ionizing, non-ionizing
  - High exposure to sunlight/ultraviolet rays
  - Temperature extremes – hot and cold
  - Constant loud noise

Effects of Exposure to Physical Hazards

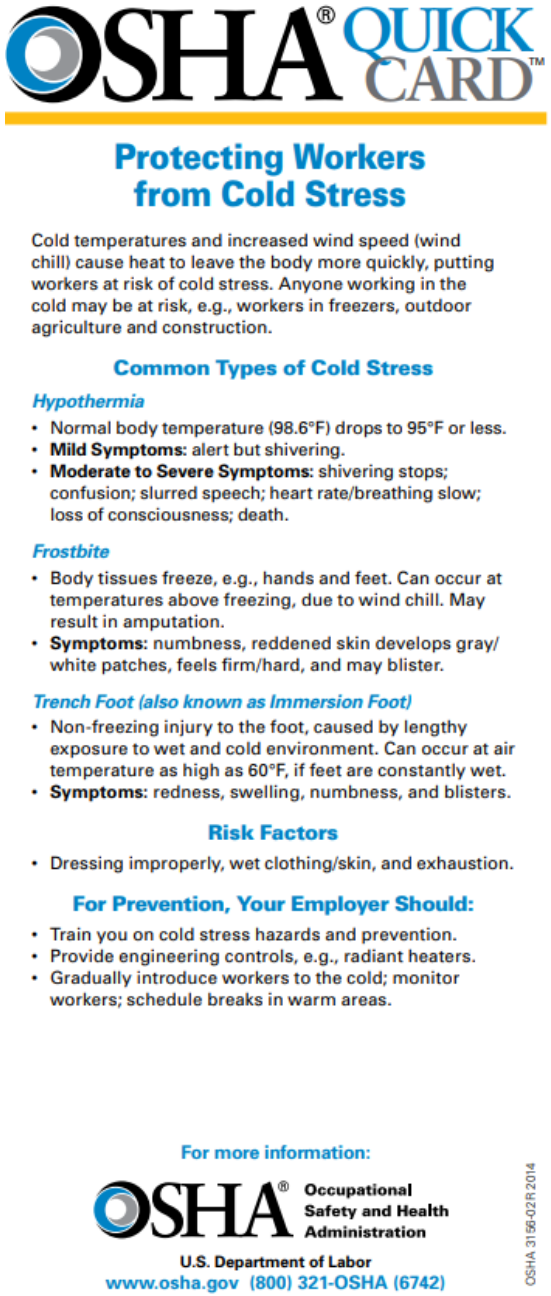
Temperature	Radiation	Vibration	Noise
Rash; Cramps	Burns	Fatigue	Interferences
Exhaustion	Sickness	Strains	Stress
Stroke	Aging	Carpal tunnel	Tinnitus
Hypothermia	Cancer	HAVS	Headaches
Frostbite	DNA mutations	Raynaud’s	Hearing loss

Protection against Physical Hazards

Hazard	Engineering Controls	Administrative Controls	PPE
Temperature	Heaters; AC; windshields; ventilation	Water; Rest; Shade	Hoods; cooling vests; hard hat liners
Vibration	Vibration reduction equipment	Train not to grip too tightly; Job rotation	Anti-vibration gloves
Noise	Silencers; mufflers; enclosures; sound barriers	Increase distance between source and worker	Ear plugs; muffs

Cold Stress

- Contributing conditions: Cold air temperatures, high velocity air movement, dampness of the air, contact with cold water or surfaces
- Cold-related disorders- hypothermia, frostbite
- Cold Stress Prevention
- Wear appropriate clothing- 3 layers of clothing
- Stay hydrated
- Take frequent breaks in warm areas



OSHA® QUICK CARD™

Protecting Workers from Cold Stress

Cold temperatures and increased wind speed (wind chill) cause heat to leave the body more quickly, putting workers at risk of cold stress. Anyone working in the cold may be at risk, e.g., workers in freezers, outdoor agriculture and construction.

Common Types of Cold Stress

Hypothermia

- Normal body temperature (98.6°F) drops to 95°F or less.
- **Mild Symptoms:** alert but shivering.
- **Moderate to Severe Symptoms:** shivering stops; confusion; slurred speech; heart rate/breathing slow; loss of consciousness; death.

Frostbite

- Body tissues freeze, e.g., hands and feet. Can occur at temperatures above freezing, due to wind chill. May result in amputation.
- **Symptoms:** numbness, reddened skin develops gray/white patches, feels firm/hard, and may blister.

Trench Foot (also known as Immersion Foot)

- Non-freezing injury to the foot, caused by lengthy exposure to wet and cold environment. Can occur at air temperature as high as 60°F, if feet are constantly wet.
- **Symptoms:** redness, swelling, numbness, and blisters.

Risk Factors

- Dressing improperly, wet clothing/skin, and exhaustion.

For Prevention, Your Employer Should:

- Train you on cold stress hazards and prevention.
- Provide engineering controls, e.g., radiant heaters.
- Gradually introduce workers to the cold; monitor workers; schedule breaks in warm areas.

For more information:

OSHA® Occupational Safety and Health Administration

U.S. Department of Labor

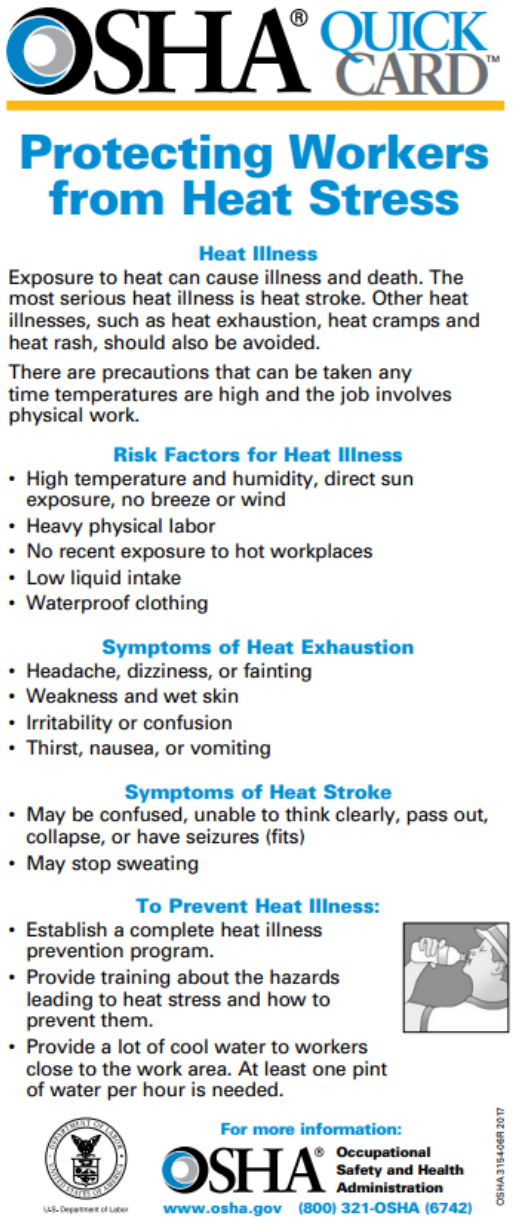
www.osha.gov (800) 321-OSHA (6742)

OSHA 3156-02R 2014

Picture from OSHA3156.pdf

Heat Stress

- Contributing conditions: High temperature and humidity, direct sun or heat exposure, physical exertion, clothing (e.g., PPE), poor physical condition.
- Heat-related disorders- Heat rash, fainting, heat cramps, heat exhaustion, heat stroke
- Heat Stress Prevention- Stay hydrated (1 cup water/sports drink every 20 min)
- Watch for signs and symptoms of heat- related illness.
- Reduce workload/adjust work schedule.
- Take frequent breaks in cool areas.
- Wear lightweight, light colored, loose-fitting clothes.
- Avoid caffeinated drinks.



OSHA® QUICK CARD™

Protecting Workers from Heat Stress

Heat Illness

Exposure to heat can cause illness and death. The most serious heat illness is heat stroke. Other heat illnesses, such as heat exhaustion, heat cramps and heat rash, should also be avoided.

There are precautions that can be taken any time temperatures are high and the job involves physical work.

Risk Factors for Heat Illness

- High temperature and humidity, direct sun exposure, no breeze or wind
- Heavy physical labor
- No recent exposure to hot workplaces
- Low liquid intake
- Waterproof clothing

Symptoms of Heat Exhaustion

- Headache, dizziness, or fainting
- Weakness and wet skin
- Irritability or confusion
- Thirst, nausea, or vomiting

Symptoms of Heat Stroke

- May be confused, unable to think clearly, pass out, collapse, or have seizures (fits)
- May stop sweating

To Prevent Heat Illness:

- Establish a complete heat illness prevention program.
- Provide training about the hazards leading to heat stress and how to prevent them.
- Provide a lot of cool water to workers close to the work area. At least one pint of water per hour is needed.

For more information:

OSHA® Occupational Safety and Health Administration

www.osha.gov (800) 321-OSHA (6742)

OSHA 3154-06R 2017

Picture from: Protective Protecting Workers from Heat Stress (osha.gov)

Exposure to High Noise Levels

- High noise levels are generated from gas-powered saws, pneumatic tools, and heavy construction equipment.
- Wear appropriate hearing protection in noisy work environments.

Picture from: Noise level monitoring system flashes alerts in real time - Pulsar Instruments

Picture from: The Role of Volunteers in All-Hazards Planning and Disaster Management (galaxydigital.com)

Other Hazards

Unsafe conditions that can cause injury, illness and death. Example:

- Heavy Equipment
- Debris Piles/Unstable work surfaces
- Poor structural integrity
- Working from heights
- Electrical hazards
- Confined spaces
- Machinery-related hazards

Heavy Equipment

- Stay aware of all moving machinery and motor vehicles.
- Do not walk under or through areas where cranes and other heavy equipment are lifting objects.
- Do not climb onto or ride loads being lifted or moved.
- Do not ride on equipment or in bucket.

Picture from Rebuilding After a Disaster: Do You Stay or Leave? | BigRentz

Debris Piles/Unstable Work Surfaces

- Only walk on surfaces you know are stable.
- Watch for sharp edges and points.
- Avoid temporary trench edges.
- Wear protective equipment (safety shoes with slip-resistant soles) and leather gloves.

Picture from: Crews spend 5th day atop shaky pile of collapsed concrete - ABC News (go.com)

Structural Integrity

- Do not enter questionable structures until they are evaluated and rendered safe.
- Conduct all necessary activities from outside damaged structures.
- Ensure structures are evaluated by a competent person.

Picture from: Surfside Towers Broke Building Code From the Beginning (curbed.com)

Power Lines

- Treat all power lines and cables as energized until proven otherwise.
- Stay clear of downed electrical lines.

Picture from Protect Yourself from Electrical Hazards | Natural Disasters and Severe Weather (cdc.gov)

Confined Spaces Hazards

- Oxygen Deficiency
- Toxic Material
  - Carbon Monoxide
  - Hydrogen Sulfide
  - Welding Fumes
  - Corrosives
- Attendant monitoring from outside.
- No motor operated machines running inside.
- PPE-Respirators and harnesses worn by entrant.

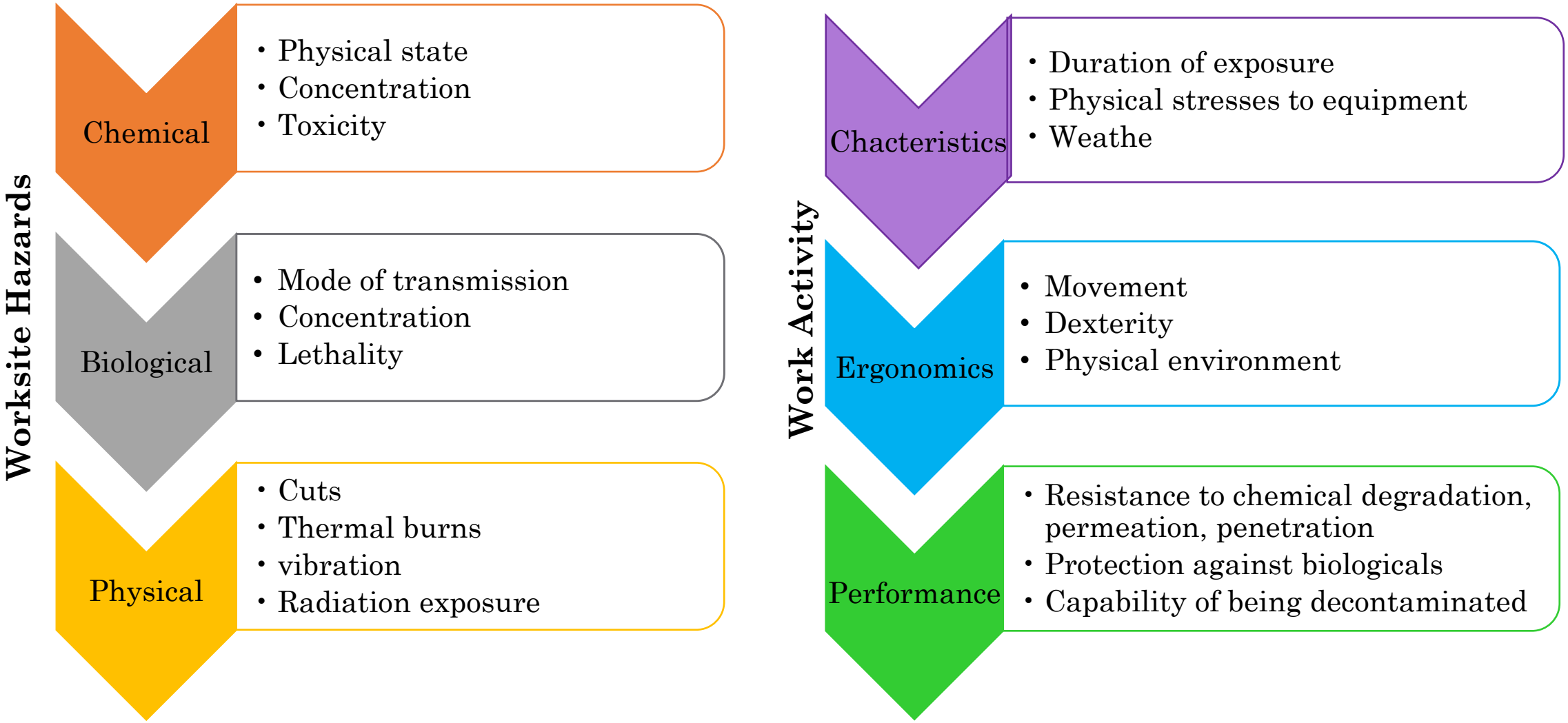
Picture from:Confined Spaces - Overview | Occupational Safety and Health Administration (osha.gov)

Driving in Disaster Areas

- Use seat belt at all times.
- Avoid distractions.
- Stay alert to situations requiring quick action.
- Watch for other drivers and flaggers.

Personal Protective Equipment (PPE)

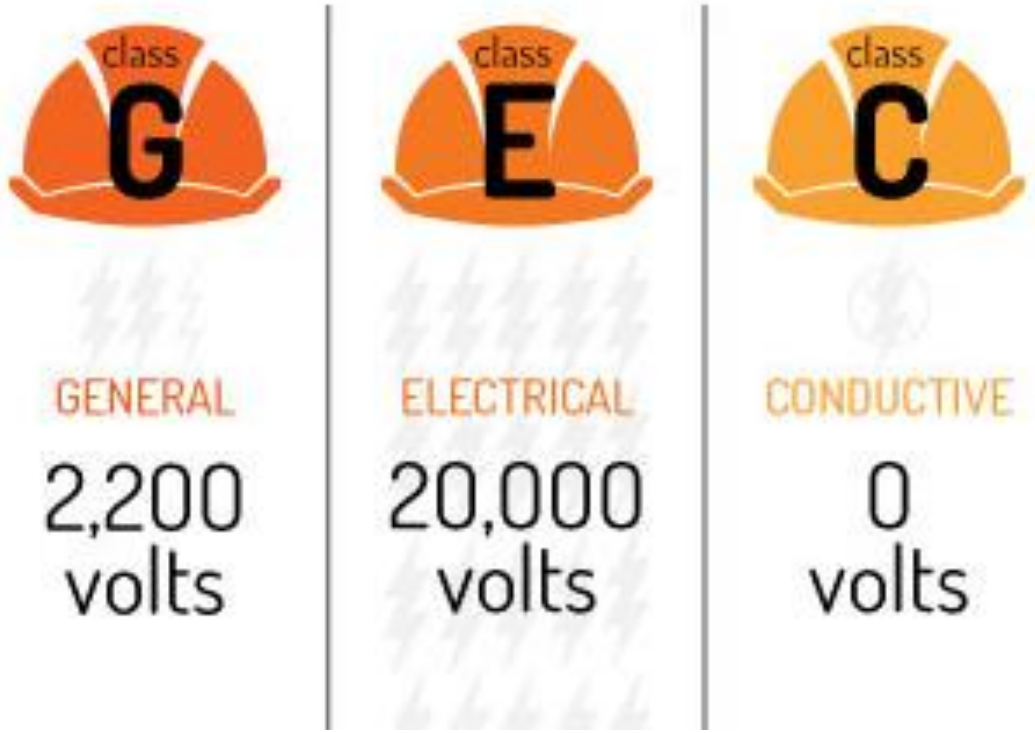
PPE-Selection Factors for Protective Clothing



Head Protection

Hard hats

- **Class A-** for general service
- **Class B-** for electrical work
- **Class C-** “bump caps”, limited protection only



Picture from: Hard Hat Requirements | OSHA Approved Hard Hats | Graphic Products

Eye & Face Protection

- **Safety glasses-** impact protection, no protection from dusts, limited for splashes
- **Safety goggles-** impact protection, protection from chemical splashes and mists, limited protection from dusts
- **Face shields-** used in addition to safety goggles or glasses, impact and splash protection
- **Welding helmets-** specific light filtering lenses

Hand Protection

Gloves

- Chemical protection-natural latex or rubber, neoprene, nitrile rubber
- Cuts and heat-leather
- General contamination-fabric

Picture from: Gilbane Building Co on Twitter: "Awesome idea! RT @jtocci2: Glove board in Athens, GA.

Respiratory Protection

AIR-PURIFYING RESPIRATORS (APR)

N-95

Half-mask

R-95

Full-face

P-95

SUPPLIED-AIR RESPIRATORS

Self-contained breathing apparatus (SCBA)

Self-contained breathing apparatus (SCBA)

Foot and Leg Protection

- Foot guards-worn over usual work shoes
- Safety shoes or boots-steel toes, metal insoles, metatarsal guards
- Chemical over boots or over booties-protection from chemicals and
  contamination
- Leggings-protection against molten metal or welding sparks

OSHA emphasis program to focus on hazardous noise in Midwest manufacturing | 2021-06-22 | Safety+Health (safetyandhealthmagazine.com)

Hearing Protection

OSHA requires employers to determine if workers are exposed to excessive noise in the workplace.

If so, the employers must implement feasible engineering or administrative controls to eliminate or reduce hazardous levels of noise. Where controls are not sufficient, employers must implement an effective hearing conservation program."

- Exposure to over 85 dB can cause hearing loss
- Hearing protection required at 90 dB

- Hearing Protection Devices
  - Foam plugs
  - Pre-molded, reusable plugs
  - Canal caps
  - Earmuffs

Body Protection

- There are many varieties of protective clothing available for specific hazards.
- Workers must wear personal protective equipment only for the parts of the body exposed to possible injury.
- Examples of body protection include laboratory coats, coveralls, vests, jackets, aprons, surgical gowns and full body suits.

Decontamination

The process of removing or neutralizing contaminants that have accumulated on personnel and equipment.

Decontamination protects:

- Workers from hazardous substances
- Site personnel by minimizing the transfer of harmful materials into clean area
- Mixing of incompatible chemicals
- Prevent uncontrolled transportation of contaminants from the site in the community

Summary

- Emergency managers think of disasters as recurring events with four phases: Mitigation, Preparedness, Response, and Recovery.
- Establishing and maintaining effective communication is vital to a successful disaster response.
- During pre deployment, deployment and post deployment their activities, training, and administrative actions necessary to prepare for respond.
- As a responder is vital to: Identify and prioritize safety and health hazards, complete specific training, know the PPE or other protective actions, behaviors, or activities required to execute potential response assignments.

References

- Emergency Response Guidebook

Online guidebook for first responders to help identify specific or generic classifications of materials involved in hazmat incidents and how to protect themselves and the public during the initial response.

- EMS.gov

Website sponsored by the National Highway Traffic Safety Administration (NHTSA) with information on federal agencies, the EMS system, training and news.

- National Model EMS Clinical Guidelines

Developed by Assoc. of State EMS Officials, the guidelines are intended to "help state EMS systems ensure a more standardized approach to the practice of prehospital patient care..."

References

- Occupational Safety & Health Administration Emergency Preparedness and Response

Features links to OSHA standards and regulations, guidance documents, safety and health guides and other resources for first responders.

- SAMHSA First Responders and Disaster Responders Resource Portal

Mental health resources for disaster responders.

- Ready Responder

Information for first responders about how to plan for an emergency. Also has a "ready responder toolkit" and templates for press releases, media information and flyers.