Learning Objectives

• Identify common hazards you may encounter during a response and how those hazards affect your health and safety

• Describe the health and safety precautions that should be taken during a response to protect yourself

Safety Awareness for Environmental Health Practitioners

PROTECT YOURSELF!

The Safety Officer

• Key role within ICS Command Staff
• Assures personnel safety
• Monitors hazardous/unsafe situations
• Prepares site-specific safety and health plan
• Environmental health must support and provide input into “safety”

Federal Response

• OSHA is responsible for
  – Setting safety and health standards for emergency responders
    ➢ Hazardous Waste Operations and Emergency Response (HAZWOPER) standard of 29 CFR 1910.120 (q)
  – Coordinating federal safety and health assets
• Worker Safety and Health Annex to the National Response Framework (NRF)

Employer Responsibilities

• State and local governments are responsible for worker safety and health including
  – Allocating sufficient resources for safety and health programs
  – Training and educating staff
  – Purchasing personal protective equipment
  – Vaccinations
  – Correcting unsafe or unsanitary conditions
**Responder Responsibilities**

- Follow all safety and health rules
- Wear/use all required gear or equipment
- Follow safe work practices for your job
- Report hazardous conditions to your team leader, supervisor, Safety Officer, or appropriate authorities
- Correct unsafe or unsanitary conditions
- Protect your family at home from exposures

**Physical and Mental Fitness for Duty**

- You are responsible for
  - Being prepared to do your job
  - Following good personal health habits
  - Assessing whether you are well enough to work
  - Assessing appropriate work schedule and adequate staffing levels
  - Coping with role ambiguity

**Recommended Personal Gear**

- Copy of personal records and ID
- Weather-appropriate gear (e.g., rain)
- Changes of clothing
- Toiletries
- Alcohol-based hand sanitizer
- Flashlight with spare batteries
- Prescription/OTC medicines
- Sunscreen and lip balm
- Insect repellent
- Hat or cap
- Sunglasses & extra pair of glasses/contacts
- Cell phone and charger

**Emergencies in the Field**

- Notify your supervisor, Safety Officer, or other appropriate personnel about all injuries sustained at your site
- For minor injuries
  - Apply buddy-care/first aid
  - Seek a first aid station or clinic
- For serious injuries
  - Go to the local hospital
  - Call emergency services/911 (know your exact location)

**Potential Hazards**

- Stress
- Physical
- Biological
- Chemical
- Thermal
- Radiation
- Violence

**Safety and Health Hazards are Dynamic**

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<th>Hazard Control Response Time Line</th>
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Fatigue and Stress

• Pace yourself
• Take frequent rest breaks
• Watch out for each other
• Be conscious of those around you
• Stay hydrated
• Attend mental health debriefings

Debris Piles/Unstable Surfaces

• Only walk on surfaces you know are stable
• Watch for sharp edges and points
• Wear protective equipment (e.g., safety shoes with slip-resistant soles, hard hat, leather gloves)
• Beware of trench collapses and cave-ins

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

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

Injury from Dust & Flying Debris

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

Utilities Hazards

• Treat all power lines and cables as energized until proven otherwise
• Stay clear of downed electrical lines
• Gas lines, water pipes, sewer lines, and other utilities may also be compromised
Exposure to High Noise Levels

- A worksite is considered noisy if you have to shout to be heard
- High noise levels are generated from gas-powered saws, pneumatic tools, and heavy construction equipment
- Wear appropriate hearing protection in noisy work environments

Hearing Protection Devices

- Foam plugs
- Pre-molded, reusable plugs
- Canal caps
- Earmuffs

Slips, Trips, and Falls

- Can be caused by
  - Wet or slippery surfaces
  - Improper footwear
  - Poor lighting
  - Obstacles in pathway
  - Ladders
  - Changes in elevation or uneven surfaces (curbs, cracks, ramps, single steps, stairs)
  - Personal factors (gait, physical condition, eyesight, perception)
- Take protective or corrective actions
- Avoid back injuries!

Driving in Disaster Areas

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

Confined Spaces

- What is a confined space?
  - Space with limited access
  - Large enough for bodily entry
  - Not designed for occupancy
  - Examples: sewers, wells, storm drains, tanks, vats, boilers, silos, pits, tunnels
- What are the hazards?
  - Hazardous atmosphere
  - Flammable/explosive gases, vapors, or mists
  - Toxic substances
  - Oxygen deficiency or surplus
  - Entrapment
  - Engulfment
- AVOID CONFINED SPACES!

Bloodborne Pathogens

- Bloodborne pathogens: microorganisms such as viruses or bacteria that are carried in blood and can cause disease in people
- Infected blood can enter your system through
  - Open sores
  - Cuts
  - Abrasions
  - Acne
  - Any sort of damaged or broken skin such as sunburn or blisters
  - Mucous membranes (eyes, nose, mouth)
**Bloodborne Pathogens**

- Adopt Universal Precautions
- Assume blood or bodily fluids potentially contaminated with blood are infectious
- Wear gloves
- Wear eye protection such as goggles or face shield if needed
- Consider receiving the Hepatitis B series vaccination

**Handling Human Remains**

- For personnel exposed to blood and body fluids
  - Use gloves when handling bodies or fluids
  - Use eye protection, gowns, and masks when large quantities or splashes are anticipated
  - Wash hands frequently
  - Properly disinfect/dispose of soiled items
- CDC Interim Health Recommendations for Workers who Handle Human Remains After a Disaster
- Precautions also apply to animal remains

**Mold**

- Flooded buildings promote mold growth
- Symptoms include sneezing, coughing, nasal/eye/skin irritation, and asthma-like symptoms
- When working with small areas of moldy or damp materials, use
  - NIOSH-approved particulate respirators
  - Gloves
  - Goggles
- Additional protection may be needed for high-contamination areas or when activities generate substantial dust

**Foodborne Disease**

- Practice hand hygiene before eating
- Assure that your food is from a safe source
- Identify and throw away any food that may not be safe to eat
- Store food safely
- Only drink from potable water sources proven to be safe

**Waterborne Disease**

- Remember, it is not just rain water!
  - Failed wastewater treatment plants
  - Backed up, overflowing sewer lines
  - Chemical spillage and wash off
  - Flood water pollution of wells
- Drink from bottled water sources until water supplies are safely treated

**Chemical/Hazmat Exposures**

- You may be exposed via the following routes:
  - Inhalation
  - Skin absorption
  - Ingestion
  - Injection (e.g., "sharps")
- Sources
  - Industrial/commercial
  - Households
  - Responder use (e.g., pesticides and disinfectants)
**Chemical/Hazmat Exposures**

- Follow all safety recommendations issued by appropriate authorities
- Avoid hazardous sites
- Avoid contact with chemicals
- Wear appropriate PPE
- Stay aware of wind directions
- Alert local emergency authorities

**Carbon Monoxide Poisoning**

- Colorless, odorless, toxic gas
- Combustion fumes from:
  - Cars, trucks, heavy machinery
  - Small gasoline-powered engines
  - Burning wood or charcoal
  - Temporary space heaters
  - Gas ranges, stoves & heating systems
- Symptoms vary from headache, dizziness, drowsiness, nausea, and vomiting to loss of consciousness, collapse, coma, or death under prolonged or high exposures

**Inhalation of Dust Containing Asbestos, Silica, and Other Particulates**

- Dust may contain hazardous materials
- Avoid dust-generating activities
- Follow PPE recommendations by supervisor, safety officer, or other appropriate authorities
  - NIOSH-approved respirators may be recommended if potential for exposure to asbestos, silica, or high levels of particulates

**Smoke Inhalation**

- Hazardous decomposition products
  - Carbon monoxide
  - Particulate matter
  - Chemicals
  - Other compounds
- Avoid smoky areas
- Wear PPE if must work in smoky areas
- Call Emergency Services
Personal Protective Equipment

Level A – Maximum skin, respiratory, and eye protection
Level B – Maximum respiratory, but lower skin protection
Level C – Respiratory protection for known substances
Level D – Lowest protection, classified as work uniform

Respirator Care and Use

- Used in context with OSHA approved program
  - Medical evaluation, fit testing, training, maintenance, and safe storage
- Wear NIOSH-approved respirators
- Replace when filter material is wet or visually soiled

Video Presentation

Use of Facemasks and Respirators

Cold Stress

- Contributing conditions
  - Cold air temperatures
  - High velocity air movement
  - Air dampness/humidity
  - Contact with cold water or surfaces
- Cold-related disorders
  - Hypothermia
  - Frostbite
  - Chilblains
  - Immersion/trench foot

Cold Stress Prevention

- Wear appropriate clothing
  - Layers (usually 3)
  - Hats
  - Boots
  - Gloves
- Stay hydrated
- Take frequent breaks in warm areas

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 or sports drink every 20 minutes)
- Watch for signs and symptoms of heat-related illness
- Reduce work load/adjust work schedule
- Take frequent breaks in cool areas
- Wear lightweight, light colored, loose-fitting clothes
- Avoid alcohol, caffeinated drinks, or heavy meals

Sun Exposure
- Prevent overexposing skin and eyes to sunlight and wind in all seasons
- Use sunscreen and lip balm
- Use protective eyewear
- Limit exposure

Radiation Exposure
- Follow time, distance & shielding precautions
- Wear personal dosimeter if entering contaminated areas
- Female workers should declare pregnancies
- Follow PPE, personal hygiene and decontamination precautions

Animal/Insect Bites, Stings, and Aggressive Behavior
- Use insect repellent containing DEET, picaridin, OLE, PMD, or IR3535
- Take other protective measures
  - Avoid peak exposure times/places
  - Wear appropriate clothing
  - Bed nets
  - Treat clothing, bed nets, and gear with permethrin

Animal/Insect Bites, Stings, and Aggressive Behavior
- Be aware of displaced wildlife, pets, and other animals
- Inspect areas before entering
- Be cautious about where you place your hands and feet
- Wear proper foot gear and leather gloves when working in suspect areas

Contact with Poisonous Plants
- Learn to recognize poisonous plants
- Use gloves and wear appropriate clothing (e.g., long pants)
- Wash affected area with soap or detergent
- Rubbing alcohol may remove oily resin causing the reaction
Social Unrest and Violence

- People may be severely stressed under disaster conditions
- Report unlawful activities to appropriate authorities
- Avoid travel into hostile areas without a security escort and means of reliable communication
- When in doubt, do not enter these areas!

Remember

- The hazards are dynamic and require vigilance and flexibility
- The key to a safe response is attention to the health and safety issues of your work environment
  - Physical hazards are similar to any construction or demolition site
  - Health hazards include those associated with the environment (e.g., food, water, chemicals, vectors)
  - Social impacts include the hazards associated with psychological/behavioral stress and violence

How to Approach Worker Safety and Health

- Prevention is the key!
- Prevent exposures, illnesses, and injuries through the occupational health hierarchy of controls:
  - Elimination
  - Substitution
  - Engineering controls
  - Administrative controls
  - Personal protective equipment

NIOSH Emergency Responder Health Monitoring and Surveillance (ERHMS)

- Framework/system for ensuring responder safety and health
- Developed due to concerns after large-scale, complex emergencies and disasters
- Monitoring and surveillance of responder safety and health during pre-deployment, deployment, and post-deployment
- Currently being finalized and will soon be released.

Activity

Scenario:
You are a member of an environmental health strike team in your state following a severe snow/ice storm caused by a nor’easter in January. You have been asked by your team leader to provide a team safety briefing before deploying to assess retail restaurants for possible re-opening.

What types of potential safety and health hazards would you mention in your team briefing?
Optional Video Presentation #1

Worker Safety & Health During the Exxon Valdez Oil Spill

Optional Video Presentation #2

Response Worker Health & Safety During the Deepwater Horizon Oil Spill

Optional Video Presentation #3

Proper Safety Gear for Working with Dispersants and the Oil Spill (Deepwater Horizon Oil Spill)

Questions