Personal Protective Equipment
Safety

The use of personal protective equipment (PPE) during an animal health emergency is critical for responder protection. However, there are several safety issues to be aware of when wearing PPE. This Just-In-Time handout overviews several physical, psychological, environmental, and biological safety concerns and provides precautions to take to minimize risks while wearing PPE.

Physical Challenges While Wearing PPE

Wearing PPE will impact your ability to perform tasks and can increase the risk of injury.

- **Restricted movement and limited mobility:** The addition of protective layers – coveralls and boots- will restrict movement, limit mobility, and add weight and bulk. This increases energy expenditure for even the simplest tasks and can lead to rapid fatigue.
- **Reduced dexterity:** Gloves reduce dexterity and the ability to grip objects making the handling of items or equipment difficult and potentially dangerous if dropped.
- **Sensory perception:** Hoods limit the ability to hear. Goggles or masks will reduce the line of vision; these items can also become easily fogged or scratched, further decreasing visibility. Wearing masks or respirators makes communication with other responders difficult.
- Some PPE items (e.g., latex) may cause **allergic reactions**.
- Your **physical health and condition**, as well as level of experience with PPE and response activities, can impact your health and safety.

Precautions

- **Be aware of physical limitations.**
  - Take your time performing tasks.
  - Know your limitations; do not overexert yourself.
  - Recognize when you are fatigued and take appropriate actions.
- **Use the Buddy System.**
  - Remain in close visual contact.
  - Assist as requested or needed.
  - Observe them for signs of distress or injury

Psychological and Mental Stress

- A range of physical, cognitive, and emotional symptoms can occur during and after a response.
- The situation is stressful and tasks necessary can be distressing.
- PPE is confining and can cause feelings of claustrophobia and psychological stress.

Precautions

- **Learn** stress-management techniques to help stay calm and focused under high-risk and/or emergency conditions.
- Be able to **recognize the symptoms of emotional stress**. Closely monitor yourself and fellow responders for any of these signs.
- Always take **appropriate self-care**. Seek assistance and support when needed.

Biological Risks During the Response

Some animal diseases have the potential to cause human infection and illness.

- Zoonotic diseases, also called zoonoses, include diseases that can be transmitted between animals and people. One example is avian influenza. Exposures may occur through the skin, eyes, mouth, or respiratory tract.

Precautions

- **Wear PPE properly to reduce exposure.**
- **Continually monitor your PPE.** Be aware of rips or breakdown of materials. If this occurs, replace compromised equipment.
- **Use the Buddy System.** Stay in close visual contact with your partner. Periodically check the integrity of their PPE.
- Always **wash your hands** thoroughly with soap and water after removing PPE.

Hazards from the Environment

Depending on the location or time of year, environmental conditions can impact responder health and safety while wearing PPE.

- **Site conditions**
  - Uneven or slippery ground surfaces will occur and make response tasks difficult. Rain, mud, snow can contribute to unsafe walking surfaces. **Slips, trips and falls can be common.**
  - Dark interiors of barns or response activities occurring at night can **limit visual abilities**.

Precautions

- **Stay safe**
  - Have appropriate training on proper PPE use before any response activity.
  - Remain alert! Watch for hoses, cables, ropes and slippery situations.
  - Ensure you have adequate lighting for tasks.
  - Mark hazardous areas to warn others of safety risks.
  - Continually monitor yourself and your team members for signs of fatigue.
  - Follow established guidelines, including rest periods, for the response.
  - Know the communication plan and procedures for medical emergencies.

- **Temperature-related illnesses:** Temperature extremes can also increase the risk for certain health and medical conditions.
  - **High heat:** PPE suits and gloves limit or prevent the evaporation of sweat which can lead to overheating. When combined with elevated temperatures, humidity, and working in direct sunlight, it can quickly lead to heat-related illnesses such as **heat cramps, heat stress, heat exhaustion**, or possibly **heat stroke** – a life-threatening medical emergency – when proper precautions are not taken.
  - **Severe cold:** At the opposite extreme, extended exposure to cold, windy, and wet conditions without adequate clothing can lead to frostbite or hypothermia – another life-threatening medical emergency.

Precautions

- **Avoid heat-related illnesses**
  - Drink plenty of fluids and replace electrolytes (e.g., salt, minerals).
  - When possible, conduct tasks during cooler times of the day. Take frequent rest breaks.
  - Wear clothing, such as cooling jackets or vests, or use field showers or hoses to reduce body temperature.
- **Prevent cold-related illnesses**
  - Keep your hands, head, face, and neck covered to prevent heat loss.
  - Dress in layers of loose-fitting, lightweight clothing.
  - Avoid overexertion since perspiration can lead to damp clothing; stay as dry as possible.
- **Continually monitor yourself and your team members** for signs of heat- and cold-related illnesses. Take prompt action to avoid serious injury.

This table describes symptoms of heat-related illnesses and first aid protocols.

Illness	Symptoms	First Aid/Treatment
Heat Cramps	Muscle spasms; pain in legs, arms, abdomen; flushed moist skin	Rest, drink clear juice/sports drink, seek medical attention if cramps persist >1 hour.
Heat Stress	Heavy sweating; weakness; fatigue; dizziness; fainting; nausea; vomiting; muscle cramps; rapid heart rate; cool, moist skin with goosebumps; confusion or irritability	Treat immediately; rest in shade, rehydrate, seek medical attention if symptoms persist.
Heat Exhaustion	Heavy sweating; weakness or fatigue; dizziness or fainting; nausea; vomiting; headache; muscle cramps; pale, moist skin; elevated body temperature	Move the person to a cool area, rehydrate, take cool shower/bath/sponge bath, wear lightweight clothing, seek medical attention if symptoms are severe or last >1 hour.
Heat Stroke	High body temp (104°F or higher); hot dry skin or profuse sweating; rapid pulse; confusion; slurred speech; loss of consciousness, seizures, convulsions	**Life-threatening – immediately call for medical assistance**; cool person down (e.g., cool wet cloths, ice packs); hydrate with water or sports drink; monitor closely.

This table describes symptoms of cold-related illnesses and first aid/treatment protocols.

Illness	Symptoms	First Aid/Treatment
Frostbite	Skin color changes (red or pale early, to white, blue or gray); cold, painful skin, tingling or numbness, skin may be hard or waxy-looking	Seek medical attention; move person to a warm location; remove wet clothing, gently rewarm area with warm water or cloth; DO NOT RUB. DO NOT use direct heat sources.
Hypothermia	Shivering; slurred speech, mumbling; slow, shallow breathing; weak pulse, clumsiness or lack of coordination; drowsiness, confusion; loss of consciousness	**Life-threatening - requires immediate medical attention**; move person to a warm location; remove wet clothing; warm with blankets or warm fluids.

Additional Just-In-Time training resources can be found on the CFSPH website.

Development of this resource was funding through the USDA National Animal Health Preparedness and Response Program.

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