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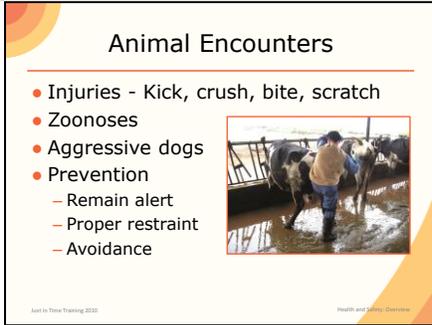
During an animal health emergency response, any number of physical, environmental even psychological hazards can occur. The specific hazards that you will encounter during your deployment will depend on the nature of the response (e.g., natural disaster, vs. animal disease outbreak, vs. terrorism event) as well as the location, time of the year and weather conditions. This Just-In-Time training presentation will provide an overview of some of the potential health and safety issues you should be aware of as an emergency responder.

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Some of the more common health and safety issues during a response are the various physical hazards that may occur while performing response activities. These can include animal related incidents, musculoskeletal injuries, slips, trips or falls, and fatigue.

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Any animal health emergency, will involve interactions with animals. These encounters can lead to any number of injuries from kicks, crushing incidents, as well as bites or scratches. If a zoonotic disease (a pathogen of animals transmissible to humans) is involved, there can also be a potential threat to you or other responders. Other situations can include the presence of aggressive dogs when visiting premises, such as for surveillance activities. Preventative measures for animal encounter situations involve remaining alert, implementing proper restraint and handling procedures, and when possible avoiding the hazardous situation until additional assistance can be obtained. [Photo from Pete Petch, USDA]

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Musculoskeletal injuries, such as strains, sprains or ergonomic related injuries can also occur. These injuries may occur after repetitive incident tasks, such as maintaining awkward postures during the collection of large numbers of blood or tissue samples, conducting administration of multiple vaccinations, or using high hand force while restraining animals. [Photo shows an animal health responder administering an injection to a cow in a chute, Photo from Phil Prater, USDA]

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Additionally, musculoskeletal injuries may occur following heavy, frequent or awkward lifting procedures. To prevent such injuries, practice safe lifting techniques. First, evaluate the object to be moved for its size, weight, and stability; also note if there are any sharp edges. If the object is heavy or awkward, seek assistance from another person or obtain machinery (e.g., fork lift) to handle the task. Only attempt to lift the object if it is within your ability level. To properly lift an object, stand close to the object, squat down, bending at your knees. Firmly grasp the object and slowly lift with your legs, keeping yourself in an upright position. Once the object is lifted, keep it close to your body and within your power zone (area between your knees and shoulders). Do not twist your knees, elbows or shoulders, instead pivot on feet.

**Slips, Trips and Falls**

- Common
  - Uneven, wet, icy surfaces
  - Personal Protective Equipment
    - May limit motion and vision
- Prevention
  - Watch for hoses, cables, ropes
    - Keep out of walkways
  - Adequate lighting
  - Identify hazardous areas

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Slips, trips and falls may occur when uneven, wet, or icy surfaces are present. Additionally, personal protective equipment (PPE) may limit your range of motion and vision predisposing you to a fall. Extra care should be taken when walking through the response site and while wearing PPE. Be cautious of hoses, cables, ropes, or anything else that may cause tripping. Be sure there is adequate lighting so that hazards can be clearly seen. If tripping hazards, such as holes or uneven surfaces, are identified, they should be fixed, clearly marked with signs, or roped off with caution tape.

**Sharps**

- Needles and other sharps
  - Needle sticks very common
- Handle and dispose of properly
  - Avoid recapping
  - Direct disposal
  - Use rigid disposal containers
  - Account for sharps after use



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Needles and other sharps will be commonly used during animal health emergencies. Needle sticks and cuts can be easily prevented by handling and disposing of any sharps properly. Avoid recapping needles before disposal. Instead discard the entire needle directly into the sharps container. This eliminates the potential for punctures while recapping. Sharps should always be disposed of in a rigid container that cannot be penetrated by the sharp item. Lastly, account for all sharps after use and before cleanup in order to prevent injury. [Photo from Danelle Bickett-Weddle, Iowa State University]

**Fatigue**

- Extended shifts
  - Increased errors, accidents, injuries
- Signs of fatigue
  - Sleepiness, decreased alertness or motivation
  - Irritability
  - Giddiness
  - Headaches, decreased appetite
- Rest or time off

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During a response, extended or unusual work shifts can be expected and will inevitably cause physical and mental fatigue, increasing your risk for operational errors, accidents, and injuries as well as emotional stress. Be aware of the signs of fatigue, which can include sleepiness, decreased alertness and motivation, irritability, giddiness, headaches, or decreased appetite. When any of these signs are recognized by either you or your supervisor, it is indicative of the need for some rest or time away from the response effort.

**ENVIRONMENTAL HAZARDS**

- Weather Related Injury
- Insects
- Noise
- Electrical Shock
- Chemical Exposure

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Next, lets look at some of the potential hazards found from the response environment itself. This can include things such as weather related injury, or exposure to insect vectors, hazardous noise levels, electrical shock potentials and various chemicals.

**Extreme Heat**

- Sunburn, dehydration
- Heat cramps
  - Muscle spasms
- Heat exhaustion
  - Paleness, dizziness, nausea, fainting
- Heat stroke
  - High body temperature, little or no sweating, confusion
  - Seek medical attention immediately

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Extremes in weather and temperatures can occur during a response. Hazards from extreme heat situations involve the combination of temperature and humidity, individual tolerance to heat, level of exertion and the use of PPE. Sunburn and dehydration can easily occur in these situations, especially during outdoor response activities. Heat related illnesses are also possible and can range from relatively minor to life-threatening. Heat cramps, involve muscle spasms or contractions usually in the gastrocnemius (hamstring) muscle. Heat exhaustion is usually due to dehydration, and manifest as paleness, dizziness, nausea, and fainting. Heat stroke is a more severe, life-threatening condition with symptoms of high body temperature, cessation of sweating, and confusion. If any of these signs occur, medical attention should be sought immediately.

**Extreme Heat**

- Prevention
  - Sunscreen
  - Monitor yourself and others for signs
  - Take breaks and seek shade
  - Keep hydrated - water/sports drinks
  - Avoid caffeine/alcohol



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The best way to prevent heat-related illness includes self-monitoring and monitoring of others for signs of heat illness. Wear sunscreen with an SPF of at least 15 and reapply frequently. Take breaks in the shade to allow your body to rest and recover. Keep hydrated by drinking water or electrolyte sports drinks; avoid caffeine or alcohol. If signs of heat illness are noticed, move to a shaded areas and contact the Safety Officer or other medical personnel.

**Extreme Cold**

- Frostbite
  - Cold, numb, hard, pale
- Hypothermia
  - Numbness, lethargy, behavior
- Prevention
  - Appropriate clothing
    - Cover ears, hands, and face
  - Stay dry and avoid over-exertion
  - Warm individual, seek medical attention



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Cold weather conditions may also occur during response situations. Cold temperatures combined with wet and windy conditions can contribute to both frostbite and hypothermia. Frostbite occurs when the skin and body tissue just underneath it freezes; the skin becomes very cold, numb, hard and pale. Mild forms can be treated with first-aid measures; severe cases will require medical attention. Hypothermia occurs if your body loses heat faster than it can be produced. Signs of hypothermia include shivering, lack of coordination, slurring of speech, numbness in extremities, lethargy, and confusion. A person with hypothermia usually isn't aware of his or her condition. If any of these situations occur, get the person to a warm location, and contact the site Safety Officer or other medical personnel immediately. To prevent cold-related problems, dress appropriately and in layers. Keep hands, ears, and face covered as these area are especially prone to frostbite. Stay as dry as possible and avoid over-exertion (i.e., sweating). [Photo from Danelle Bickett-Weddle, Iowa State University]

**Insects**

- Bites and stings
- Vector-borne diseases
- Prevention
  - Repellants with DEET or Picaridin
  - Wear long sleeves and long pants
  - Tuck pants into boots

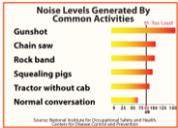


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Most animal emergency responses will occur in outdoor settings. Depending on the season (e.g., spring, summer), bites and stings from insects (e.g. flies, mosquitoes, or ticks) can occur. In addition to the physical trauma caused by these encounters, some insects may also transmit vector-borne diseases such as West Nile virus or Lyme disease. Preventive measures include applying repellent products containing DEET (N,N-diethylmetatoluamide) or Picaridin. Additionally, wearing long sleeves and long pants which are tucked into boots, can minimize exposure areas to these vectors. Graphic illustration by Dani Ausen, Iowa State University]

**Noise**

- Can lead to permanent damage
- Hazardous at 85 dBA for 8 hours
  - Conversation difficult at 3 feet



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Noise is another common environmental hazard at a response site and can come from any number of sources, including heavy equipment, power tools, or animal vocalization. Exposure to loud or prolonged noise can cause permanent hearing damage. Noise is measured by decibels adjusted or dBA. The figure shows the various noise levels generated by common activities. Eighty-five (85) dBA for 8 hours is considered hazardous. To roughly gauge noise levels of particular situations, hazardous levels are probable when holding a conversation or hearing another responder is difficult at 3 feet or arm's length. If entering "loud" situations, ensure some type of hearing protection is used. [Graphic illustration by Oriana Hashemi-Toroghi, Iowa State University]

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### Electrical Shock

- Power equipment, cords, downed power lines
- Prevention of shock and electrocution
  - Inspect cords/ cables for damage
  - Do not use damaged cords/cables
  - Use caution when working in wet areas
  - Observe area for downed power lines
  - Assume all power lines are active

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Another potential hazard at the response site is electrical shock. Power equipment, cords or possibly downed power lines may be present at a response site and can result in serious injury or death from shock or electrocution. Prevention measures include inspecting all cords and cables prior to use; do not use damaged cords or cables. Use caution when using power tools or equipment in wet conditions. If downed power lines are noted, assume they are “live” and avoid them until they can be removed.

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### Chemical Hazards

- Examples
  - Animal facilities
  - Carbon monoxide
  - Disinfectant products
- Prevention
  - Awareness
  - Do not use in confined spaces
  - Personal Protective Equipment

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Any number of chemical exposure hazards may also be present. Exposure to animal waste gases can be encountered when entering enclosed animal facilities. Carbon monoxide released from gas-powered tools can build to hazardous levels when used in confined spaces. Some disinfectants when aerosolized, such as during preparation or application, can cause mucous membrane and respiratory tract irritation. Remain vigilant of potential chemical exposures, especially when entering confined or enclosed places. Wearing respiratory protection can minimize some of the risk of exposure.

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### PSYCHOLOGICAL HAZARDS

- Stress
- Depression

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In addition to physical and environmental hazards, psychological impacts can also occur during an animal health emergency.

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### Stress

- Recognize the signs
- Physical
  - Nausea, dizziness, headaches
- Cognitive
  - Disorientation, memory
- Emotional
  - Anxiety, guilt, grief, irritability
- Behavioral
  - Anger, withdrawal, depression, drug or alcohol abuse

stress can cause

↓

physical effects

↓

cognitive effects

↓

emotional effects

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behavior effects

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Responding to emergencies can be stressful. Long unusual hours, physical demands and emotional stress, can affect responder mental health. This can manifest in a variety of ways. Physical symptoms of stress include fatigue, nausea, dizziness, headaches, and a high heart rate. Cognitive symptoms include disorientation or confusion, memory problems, or nightmares. Emotional signs include anxiety, guilt, grief, denial, panic, fear, and irritability. Finally, stress may cause changes in behavior, such as anger, withdrawal, emotional outbursts, as well as drug and alcohol abuse and depression. [Graphic illustration by Oriana Hashemi-Toroghi, Iowa State University]

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### Dealing with Stress

- Ways to reduce stress
  - Monitor self and others for signs
  - Take frequent rest breaks
  - Accept what cannot change
  - Maintain schedule as possible
  - Communicate with loved ones
  - Take advantage of support programs

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Stress will accompany any response effort, but to minimize the impact, it is important to take preventive steps. These include monitoring yourself and others for signs of fatigue and stress. Take occasional breaks away from the worksite. Recognize and accept things you cannot change, such as changes of command, equipment failures, or the event itself. Maintain a schedule that is as normal as possible when it comes to eating, drinking, and sleeping. Communicate frequently with loved ones or others on site to “destress” or take advantage of formal support programs.

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**CONTINGENCY PLANS**

- Evacuation
- Shelter-In-Place
- Fire/Explosion
- Hazardous Material Release
- Severe Weather

Even with the best planning, unforeseen situations, such as fire or severe weather, may arise. The Safety Officer is responsible for creating emergency and contingency plans specific for these incidents during the response.

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**Contingency Plans**

- Evacuation
  - Pre-determined signal and site
  - All are accounted for
- Shelter-In-Place
  - Pre-determined locations
  - Remain until "all clear" is given

If it is decided that evacuation is in order, you should go immediately to the pre-determined location where all personnel can be accounted for. Some situations will require "sheltering-in-place" in a pre-determined location until the "all clear" signal is given.

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**Fire/Explosion Response**

- Attempt to extinguish if deemed safe
  - Extinguisher kept in every vehicle
- If fire is out of control
  - Sound warning alarm
  - Evacuate to safe distance
  - Account for team members
  - Notify Command Staff and fire department
  - Remove vehicles and equipment if possible

Fire or explosions may be an unanticipated event during a response. If a fire occurs, attempt to extinguish it only if this can be done without injury to yourself or others. Fire extinguishers should be kept in all response vehicles and at all response sites. If the fire is out of control, first sound a warning alarm, then evacuate the area to a safe distance; account for all team members. Notify the fire department and the command staff of the incident. Finally, if possible and if it can be done safely, remove any vehicles or flammable field equipment from the area while waiting for the fire department. [Photo: California Environmental Protection Agency - <http://www.calepa.ca.gov/Disaster/fire/>]

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**Severe Weather**

- Considerations for halting work:
  - Heavy precipitation
  - Extreme heat or cold
  - Limited visibility
  - Treacherous conditions (tornadoes)
  - Lightning
  - Flood potential

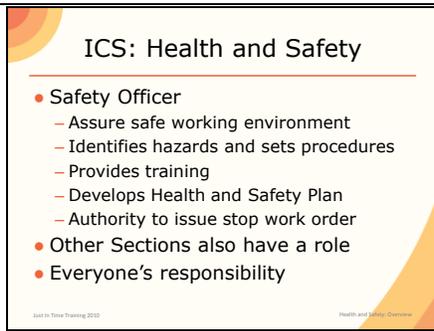
Severe weather is another unanticipated event that may occur during a response situations. Command Staff will determine if weather conditions are severe enough to stop work. Considerations for halting work include: treacherous conditions, heavy precipitation, extreme heat or cold, lightning, or flooding potential. [Photo from NOAA National Weather Service Photo Library, D. Burgess - <http://www.photolib.noaa.gov/htmls/nssl0066.htm>]

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**ROLES AND RESPONSIBILITY**

Let's look at the roles and responsibilities for health and safety issues during a response.

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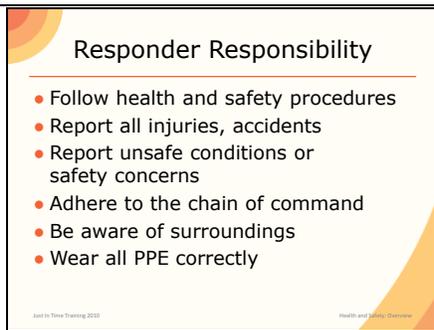
**ICS: Health and Safety**

- Safety Officer
  - Assure safe working environment
  - Identifies hazards and sets procedures
  - Provides training
  - Develops Health and Safety Plan
  - Authority to issue stop work order
- Other Sections also have a role
- Everyone’s responsibility

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While protecting the health and safety of personnel assigned to an emergency response is everyone’s responsibility, management and monitoring of a safe working environment for all responders is done by the Safety Officer. Additionally, the Safety Officer will identify current and potential hazards, establish and train responders on safe work procedures (e.g., appropriate personal protective equipment), and prepare a Health and Safety Plan specific for the incident. If unsafe work conditions are noted, the Safety Officer does have the authority to issue an immediate stop work order. Other Sections of the ICS structure do play a role in health and safety procedures for the response. The Operation Section is responsible for creating safe work conditions, the Finance and Administration Section handles worker’s compensation claims and the Logistics Section includes the Unit that provides first aid to responders.

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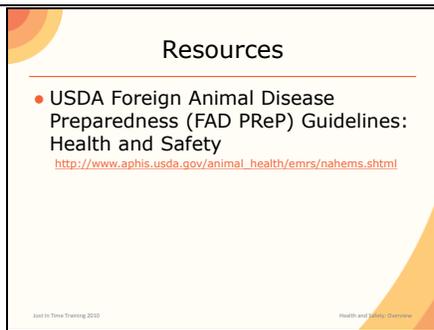
**Responder Responsibility**

- Follow health and safety procedures
- Report all injuries, accidents
- Report unsafe conditions or safety concerns
- Adhere to the chain of command
- Be aware of surroundings
- Wear all PPE correctly

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As a responder, your responsibility involves following all established health and safety procedures. Report all injuries, accidents and near misses. Additionally, report any unsafe conditions or safety concerns to your immediate supervisor. Maintain constant awareness of your surroundings for hazards, monitor yourself and other responders for changes in health conditions, especially when wearing personal protective equipment.

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**Resources**

- USDA Foreign Animal Disease Preparedness (FAD PReP) Guidelines: Health and Safety  
[http://www.aphis.usda.gov/animal\\_health/emrs/nahems.shtml](http://www.aphis.usda.gov/animal_health/emrs/nahems.shtml)

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For more information on health and safety issues during an animal health emergency response, consult the USDA FAD PReP Health and Safety Guidelines.

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**Acknowledgments**

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