Safety During Clean-up: Hazards Situations Found After A Disaster

The New England Consortium (TNEC)
May 17, 2021
Know the Risks - Know Your Region

The consequences of emergencies can be similar, but knowing the risks in your region can help you better prepare.

• Step one in safety is preparedness and knowing the risks in your region.

• Risks can include:
  • Blizzards
  • Droughts
  • Earthquakes
  • Extreme cold or heat waves
  • Floods
  • Hurricanes
  • Power outages
  • Winter storms
  • Wildfires
Electrical Hazards

- Four main types of electrical injuries seen in disaster cleanups:
  - Electric shock
  - Burns
  - Falls caused by contact with electricity
  - Electrocution
- Avoid working with electricity in wet environments. If this must be done, use equipment approved for wet conditions
- Electrical cords and outlets must meet OSHA standards
- Use double insulated tools
- Use Ground Fault Circuit Interrupters (GFCIs) on all power tools and cords as close to the panel as possible
- Do not re-energize electrical systems, or use electrical equipment that has been in fire or water, until it has been evaluated by a qualified electrician
Portable Generators

Hazards include:
• Carbon monoxide poisoning
• Electrocution from backfeed

• If it is necessary to use a portable generator, follow manufacturer’s recommendations and specifications:
  • Use a qualified electrician to assist in installation and start-up activities
  • If using gasoline- and diesel-powered portable generators, switch the main breaker or fuse on the service panel to the “off” position before starting the generator
  • Do not use on or in wet surfaces
  • Do not operate in rain unless the generator can be kept dry
  • When refueling, turn off and wait for motor to cool, or use appropriate funnel to prevent spills onto hot engine
  • Do not use indoors or in temporary or permanent shelter
Carbon Monoxide (CO) poisoning

Carbon Monoxide has no warning properties; it is a colorless, odorless gas! People are injured or die from CO poisoning.

- CO may be present with:
  - Any activity using gasoline, diesel, or propane-powered machinery
  - Work near operating equipment
  - Burning debris
  - Work near hot work (cutting, welding), especially in confined spaces

- To control CO exposures:
  - Wear CO monitoring equipment
  - Do not use gas/diesel powered equipment indoors or in enclosed areas
  - Use forced air ventilation (e.g., blower)

Symptoms: Headache, dizziness, drowsiness, or nausea progressing to vomiting and loss of consciousness. Prolonged or high exposure can lead to coma or death. If you experience any of these symptoms where CO may be present, **LEAVE THE AREA IMMEDIATELY.**
Hazardous chemicals

• Include household and industrial (small business use or displaced from other property) chemicals
• Do not handle any containers that are damaged/leaking
• Do not handle any chemical containers if you are unsure of contents
• Do not handle any industrial chemical containers
• Use gloves and safety glasses when handling household hazardous chemicals
• Do not mix chemicals
• Do not place chemicals near open flames/hot surfaces (running motor)
Hazardous Chemicals

1. Household Garbage
   - the unknown black bag
   - food
   - paper
   - Plastic
   - Styrofoam

2. Building Materials
   - carpeting
   - windows and mirrors
   - furniture
   - pipes
   - drywall
   - studs
   - asbestos-containing building materials (also hazardous waste)

3. Yard Waste
   - tree branches
   - soil and mud
   - grass clippings
   - plants, shrubs and bushes
Hazardous Chemicals

4. Hazardous Waste
   - swimming pool chlorine
   - propane cylinders
   - paint and thinner (flammables)
   - hypodermic needles/medical waste
   - motor oil
   - cleaning products (corrosives)
   - aerosol containers
   - car batteries

5. Large Appliances
   - refrigerators
   - washer/dryers
   - air conditioners
   - stoves
   - hot water heaters
   - dishwashers

6. Electronics
   - televisions
   - computers
   - stereos
Hazardous materials that may be found in commercial and residential debris

- Asbestos
- Ash
- Compressed gas cylinders and propane cylinders
- Gasoline cans (& other fuel containers)
- Bulk chemicals & chemical containers
- Lead acid batteries
- Paints and thinners
- Bulk pesticides
- Bulk fertilizers
- PCBs

- Moldy materials
- Munitions
- Laboratory equipment
- Lead
- Electrical transformers
- Air conditioners
- Large metal appliances & equipment
- Automobiles
- Transformers
- Other particulate matter
- Radiological material
Safety Data Sheets

Hazardous Substances

Required Parts of a Manufacturer’s Label
(Required by the PESH/OSHA Hazard Communication Standard)

1. n-Propyl Alcohol
   UN No. 1274
   CAS No. 71-23-8

2. DANGER
   Highly flammable liquid and vapor. Causes serious eye damage.
   May cause drowsiness and dizziness.

3. Keep away from heat/sparks/open flame/hot surfaces. No smoking. Avoid
   breathing fumes/mists/vapors/spray. Wear protective gloves/protective clothing/
   eye protection/face protection. IF IN EYES: rinse cautiously with water for several
   minutes. Remove contact lenses if present. Continue rinsing.

   Fill Weight: 18.65 lbs.
   Lot Number: B56754434
   Gross Weight: 20 lbs.
   Fill Date: 6/21/14
   Expiration Date: 6/21/2020
   See SDS for further information.

4. ACME Chemical Company-711 Roadrunner St.-Anywhere, NY 12345 USA-wwww.acmechem.com-317-444-3434

1. Product Identifier—Must match the product identifier on the Safety Data Sheet.
2. Signal Word—Must be either “Danger” (severe) or “Warning” (less severe).
3. Hazard Statements—A phrase that describes the nature of the product’s hazards.
4. Precautionary Statements—Recommended measures to minimize or prevent adverse effects of exposure.
5. Supplier Identification—The name, address and telephone number of the manufacturer or supplier.
6. Pictograms—Graphical Symbols intended to visually convey specific hazard information.
Hazardous Substances

Employers, manufacturerers, and distributors are required by the hazard communication standard to use labels with **pictograms** to alert users about hazards.

- **Health Hazard**
  - carcinogen
  - mutagenicity
  - reproductive toxicity
  - respiratory sensitizer
  - target organ toxicity
  - aspiration toxicity

- **Flame**
  - flammables
  - pyrophorics
  - self-heating
  - emits flammable gas
  - self-reactives
  - organic peroxides

- **Exclamation Mark**
  - irritant (skin and eye)
  - skin sensitizer
  - acute toxicity
  - narcotic effects
  - respiratory irritant
  - hazardous to ozone

- **Corrosion**
  - skin corrosion/burns
  - eye damage
  - corrosive to metals

- **Exploding Bomb**
  - explosives

- **Gas Cylinder**
  - gases under

- **Flame Over Circle**
  - oxidizers

- **Skull and Crossbones**
  - acute toxicity

- **Environmental**
  - aquatic toxicity

Each pictogram is a symbol on a white background framed within a red border and represents a distinct hazard(s).
NFPA markings are commonly found on tanks and buildings to communicate essential information to emergency responders. Red, blue and yellow sections have a number from 0-4 indicating an increasing degree of severity of the hazard. The white section uses a symbol or abbreviation for special hazards. Information in the Safety Data Sheet (pg. 4) will determine what goes on the NFPA sign or label.

<table>
<thead>
<tr>
<th>Health Hazards</th>
<th>Flammability</th>
</tr>
</thead>
<tbody>
<tr>
<td>4- Deadly</td>
<td>4- Below 73°F</td>
</tr>
<tr>
<td>3- Extreme Danger</td>
<td>3- Below 100°F</td>
</tr>
<tr>
<td>2- Hazardous</td>
<td>2- Above 100°F not exceeding 200°F</td>
</tr>
<tr>
<td>1- Slightly Hazardous</td>
<td>1- Above 200°F</td>
</tr>
<tr>
<td>0- Normal Material</td>
<td>0- Will Not Burn</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Special Hazards</th>
<th>Reactivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACID Acid</td>
<td>4- May Detonate</td>
</tr>
<tr>
<td>ALK Alkali</td>
<td>3- Shock and Heat May Detonate</td>
</tr>
<tr>
<td>COR Corrosive</td>
<td>2- Violent Chemical Change</td>
</tr>
<tr>
<td>OXY Oxidizer</td>
<td>1- Unstable if Heated</td>
</tr>
<tr>
<td>Radioactive</td>
<td>0- Stable</td>
</tr>
<tr>
<td>Use No Water</td>
<td></td>
</tr>
</tbody>
</table>
Look for any suspicious labels to identify hazardous materials and stay clear--report these to your local authorities or call 911 if threat is immediately dangerous.
Hazards of Containers

- Used to hide prohibited materials.
- Can contain hazardous residues.
- What’s inside is not necessarily what’s on the label.
- Can be too large or difficult to pick up.
- Can be overfilled and extremely heavy.
- Can contain animals, stinging insects and other vermin.
- Attached lids can pinch, crush or remove fingers.
- Cheap bags break, spilling contents on the legs and feet of workers.
- Boxes and other makeshift containers get wet and the bottom falls out.

Consider:

- size
- shape
- weight
- color
- design and construction
- markings and labels
- re-use (does not contain the original contents)
Batteries and Heavy Metals

Heavy metals in garbage are commonly found in batteries. Batteries are normally sealed, but the metals may be released when covers are broken or they burn or explode. Workers are not exposed to the metals if handling an intact battery. Heavy metals damage body systems and organs; for example, lead affects the central nervous system. Health effects and symptoms are listed on the SDS (pg. 4).

Rechargeable batteries contain heavy metals, including:

- Lead-acid (automotive, contain lead).
- Nickel-cadmium (Ni-cad, contain nickel and cadmium).
- Lithium-ion (Li-ion, contain lithium, cobalt and nickel).
- Nickel metal hydride (NiMH, contain nickel and cobalt).

Guidance

- Do not touch leaking batteries. The liquid is corrosive (pg. 11).
- All batteries are recyclable (automotive batteries are required to be recycled by state law) and each municipality should have a protocol for recycling all rechargeable batteries (pg. 50).
- Some metals, especially lithium, can burn creating high heat and blinding light (pg. 28).
- Mercury is a heavy metal (in a silver liquid form) found in old thermostats and thermometers that can be absorbed through the skin and should not be touched (pg. 43).
Paints and Thinner

The liquid part of paint is a solvent and the solid part is a metal that gives it color. Wet paint contains solvents that can cause irritation, dizziness or narcotic affects. Exposure to metals and other solids can occur in both wet and dry paints. They can cause irritation, skin, and liver and kidney diseases. For more information consult the SDS (pg. 4). Most municipalities will not pick-up paint with residential trash and debris.

Paint thinner is a solvent. Solvents are chemicals that dissolve substances, like grease, oil, tar, and paint (found in thinners, fuels, and paint). Solvents can enter the body by inhalation or through the skin. Solvents can irritate the skin causing it to dry and crack. When exposure is high, they can cause nausea, dizziness, and fatigue. Prolonged exposure can cause heart, liver, lung, and kidney damage. Certain solvents, like benzene (found in gasoline) can cause cancer. Solvents are also flammable.

Guidance
- Do not pick them up with routine trash (pg.50).
- They are frequently hidden inside other containers or bags (pg. 49).
- Follow all established hazardous material pick-up protocols (pg. 50).
- Wear all recommended protective equipment (pgs. 38-46).
- If eyes are exposed, flush with distilled water.
- If skin is exposed, wash with soap and water.
- See manufacturer’s labels and SDS for more information about the chemical (pgs. 4, 6).

Spray paints contain propellants (propane) that can ignite or explode.
Asbestos fibers, when airborne, may cause asbestosis, lung cancer, and mesothelioma. Picking up asbestos containing materials can expose workers to deadly fibers and should only be handled by properly trained and licensed personnel. Never cut, drill, grind or otherwise disturb asbestos containing materials. Asbestos should NEVER be cleaned up by dry sweeping or using compressed air; only wet-methods or HEPA vacuums can be used to clean up asbestos.

Common asbestos containing building materials

Asbestos Siding

Insulation Common Types

- sprayed on
- wall (resembles mineral fiber)
- vermiculite (loose fill insulation composed of small chunks with shiny flakes, shown below)

Pipe Wrap

Mused-on insulation (shown above) is often wrapped in duct tape. Pipes can also be wrapped with air-cell insulation which is a grayish material that resembles corrugated cardboard.

9x9 Floor Tile

Asbestos floor tiles are usually two or more various colors.

How to Handle Asbestos

- Leave it alone! Do not disturb it!
- Keep it wet.
- Follow municipal codes for pick-up.
- Have a plan for reporting suspected asbestos containing materials.
- Utilize specially trained crews.
- Report exposures to your union, employer, workers’ compensation, and doctor.

Asbestos materials should NEVER be compacted or mixed with routine trash.
• Mold is everywhere, but the aftermath of a disaster can greatly increase its presence

• Mold needs water, food and low light to grow

• Grows on almost any building material

• If mold spores become airborne and spores get into or contact your body, it can cause health issues including allergic reactions, infections and nasal, eye and skin irritation
Overhead hazards and falling debris

- Injuries on disaster sites are often the result of falling materials and debris related to unstable structures, and other compromised surfaces.
- Overhead falling hazards may include:
  - Loose debris
  - Building components
  - Unsecured building contents such as bathtubs, refrigerators, furniture, etc.

In these areas, follow safe work practices and wear appropriate PPE, such as hard hat, work clothes, safety shoes, gloves, safety glasses, and respirator.
Debris Piles and Unstable Surfaces

- Debris piles, standing water, cracks/voids in ground, recent fire
- Walk and work on surfaces you know are stable
- Look for fire/smoldering material on or beneath the surface
- Watch for hazardous materials
- Use other ways to get to work surfaces, such as bucket trucks

- Wear protective equipment including hard hats, safety glasses, leather gloves and safety shoes with slip resistant soles
- Watch for fall hazards to other levels
An example of structural inspection postings where it is not safe to enter
Debris removal

- Wear safety shoes with slip-resistant soles, safety glasses, leather work gloves, hard hat, long pants and shirt
- Do not handle broken chemical containers
- Do not remove debris that may destabilize piles or structures
- Do not lift too much, call for heavy equipment
- Segregate debris according to FEMA, U.S. Army Corps of Engineers, or Local/State requirements
- Special precautions are necessary when dealing with asbestos, lead, PCBs and mold
Safety During Clean-up: Hazards & Dangers To Workers Who are Cleaning Up After A Disaster

The New England Consortium (TNEC)
May 17, 2021
Severe weather creates trash, debris and waste. High winds and flood waters move waste, trash and debris around. Falling and flying objects, electricity, contaminated water and hazardous building materials complicate clean-up by creating other safety hazards. During snow and ice storms, snowplows may break open bags and other containers spreading the contents downstream.

**Extreme weather may expose workers to:**
- flood water (potentially contaminated with sewage, chemicals and other contaminates).
- downed power lines and other electrical hazards.
- open man-hole covers.
- slips, trips and falls.
- automobile accidents.
- falling limbs.
- lightning.
- flying trash and debris.
- hazardous building materials.
Exposure

There are four ways (or routes) substances can enter the body: inhalation, absorption, ingestion or injection. Harmful effects can be acute (immediate) or chronic (long-lasting). Symptoms may not appear immediately and some materials can take 20 years to develop.

**Inhalation:**
Breathing in a hazardous substance is the most common way for a substance to enter the body. Workers can inhale:
- solids (dusts or fibers)
- liquids (mists)
- gases (vapors)

**Ingestion:**
Occurs through the mouth by ingesting substances when:
- eating or drinking in contaminated areas
- not washing hands before eating
- use of cosmetics or chap-stick
- smoking

**Absorption:**
Absorption occurs through direct contact with the skin or eyes. Solids, liquids and gases can all be absorbed potentially causing local irritation, burns and rashes as well as systemic effects to various target organs.

**Injection:**
Occurs when a substance is forced through the skin or enters through broken skin. It is very dangerous because the substance goes directly into the blood stream. Examples of injection are:
- stuck by needles, medical waste
- glass, nails, other sharp objects
- pressurized hoses
Blood

Blood **MAY** contain infectious organisms that can cause diseases such as Hepatitis B, C & HIV. If blood comes in contact with the eyes, mouth, mucous membranes, non-intact skin or through a needle-stick, immediate action is required.

**Exposure to blood usually comes from the following sources:**
- co-workers (on-the-job cuts and lacerations)
- needles, lancets, and other sharps mixed in trash
- bandages
- towels or rags (used to clean up blood)
- sewage (pg. 17)
- injured residents

**Employers with workers at risk of exposure to blood or other infectious materials are required to:**
1. Have an Exposure Control Plan.
2. Conduct an assessment and implement safe work practices.
3. Provide personal protective equipment.
4. Offer employees the Hepatitis B vaccine.
5. Provide post-exposure treatment at no cost.
6. Provide annual training to covered employees.

**Guidance**
- Always assume blood is infectious.
- Avoid contact with potentially infectious material.
- Follow infection control protocols.
- Wear PPE.
- Use equipment such as forceps to handle sharp objects covered in blood.
- Frequently wash hands.
- More information on specific infectious diseases can be found at www.cdc.gov.

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**If stuck by a needle, workers should:**
- Follow the Exposure Control Plan.
- Report it to the employer.
- The employer must provide immediate medical attention.
- Preventive drug treatment for exposure to HIV should begin within 2 hours of the incident.
Sewage contains bacteria, fungi, parasites, and viruses that can cause skin, lung, intestinal, and other infections. Sewage may also contain toxic or flammable chemicals. When sewage decomposes it consumes oxygen and releases toxic gases that can be fatal.

**If working with or near sewage, employers should:**
- Train and educate all workers.
- Provide potable water for drinking and washing.
- Provide a place to change clothing.
- Provide proper equipment (pgs. 38-46).
- Provide clean areas for eating.
- Separately clean clothing and equipment.
- Establish procedures to wash hands before eating, drinking or smoking.
- Train workers to keep hands and fingers away from the face.
- Encourage workers to keep vaccines up-to-date.

Exposure to sewage generally causes mild cases of gastroenteritis which includes cramping, stomach pains, diarrhea, and vomiting. Exposure to raw sewage can cause other significant and potentially fatal diseases.

**Leptospirosis**—A bacteria found in rodent urine that causes infection with nondescript symptoms (often confused for other illnesses) that can lead to kidney damage, liver failure, respiratory distress, Weil’s Disease, and death.

**Hepatitis A/B**—Inflammation of the liver characterized by jaundice or yellowing of the skin caused by a virus found in feces, blood or other bodily fluids.

**Tetanus**—A bacterial infection causing headache, jaw cramping, painful muscle stiffness, trouble swallowing, high blood pressure, fever, and sweating.

**E. coli**—Bacteria found in feces that can also lead to respiratory illness and pneumonia.
Insects

Anaphylactic Shock
Caused by any stinging insect (if allergic, carry an epi-pen).
Onset: immediate.
Symptoms: immediate difficulty breathing, swelling, and can be fatal.

Lyme Disease
Spread by ticks.
Onset: 3-30 days.
Symptoms: circular red, warm rash with a “bulls-eye” appearance, fever, nausea, muscle and joint pain, swollen nodes, and malaise.

West Nile Virus
Spread by mosquitoes.
Onset: 5-15 days.
Symptoms: skin rash, fever, body and head aches, and swollen lymph nodes.

Bed Bugs
Do not carry disease and are large enough to see. Only New York City requires contaminated items to be wrapped in plastic. Wash exposed clothes separately and dry in high heat for at least 30 minutes.

Guidance
• Wear long sleeved shirts and pants.
• Apply 20-35% DEET containing insect repellent sparingly to the skin. Do not apply 100% DEET directly to the skin as it is HARMFUL. Use this concentration on clothing and equipment only.
• Apply repellent to clothing.
• Tuck pants into socks (ticks). White or socks will make it easier to spot them.
• Apply double sided tape around ankles (ticks).
• Look for unusual bites, swelling, or irritation and seek medical attention if necessary.
• All tick bites should be reported.
• Workers should be trained on problematic insects in their work area and how to avoid them.
## Heat and Cold Related Illnesses

<table>
<thead>
<tr>
<th>Heat-Related Illness</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Heat Stroke</strong></td>
<td><strong>EMERGENCY!</strong></td>
</tr>
<tr>
<td>Hot/dry red skin,</td>
<td>• Call 911.</td>
</tr>
<tr>
<td>rapid pulse, high</td>
<td></td>
</tr>
<tr>
<td>body temperature,</td>
<td>• Quickly move the person to a cool, dry place <strong>AND</strong></td>
</tr>
<tr>
<td>rapid breathing,</td>
<td>• Apply ice packs to neck, wrists, ankles, and arm-pits <strong>OR</strong></td>
</tr>
<tr>
<td>confusion, loss of</td>
<td>• Remove excess clothing and wrap in a cool, wet sheet.</td>
</tr>
<tr>
<td>consciousness</td>
<td></td>
</tr>
<tr>
<td><strong>Heat Exhaustion</strong></td>
<td><strong>SERIOUS SITUATION</strong></td>
</tr>
<tr>
<td>Heavy sweating,</td>
<td>• Can lead to heat stroke, seek help.</td>
</tr>
<tr>
<td>vomiting, fainting,</td>
<td>• Move to a cool place.</td>
</tr>
<tr>
<td>dizziness, headache,</td>
<td>• Apply cool, wet clothes to neck, face, and arms.</td>
</tr>
<tr>
<td>nausea, weakness,</td>
<td>• Sip water slowly.</td>
</tr>
<tr>
<td>cold-clammy skin</td>
<td></td>
</tr>
<tr>
<td><strong>Heat Cramps</strong></td>
<td>• Move to a cool place.</td>
</tr>
<tr>
<td>Abdominal and</td>
<td>• Drink cool water.</td>
</tr>
<tr>
<td>extremity cramps,</td>
<td></td>
</tr>
<tr>
<td>heavy sweating, mild</td>
<td></td>
</tr>
<tr>
<td>nausea</td>
<td></td>
</tr>
<tr>
<td><strong>Heat Rash</strong></td>
<td>• Move to a cool place.</td>
</tr>
<tr>
<td>Skin irritation in</td>
<td>• Keep affected area dry.</td>
</tr>
<tr>
<td>red cluster of</td>
<td>• Apply talcum powder.</td>
</tr>
<tr>
<td>pimples or small</td>
<td></td>
</tr>
<tr>
<td>blisters</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Cold-Related Illness</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Late Hypothermia</strong></td>
<td><strong>EMERGENCY!</strong></td>
</tr>
<tr>
<td>Shivering, blue skin</td>
<td>• Call 911.</td>
</tr>
<tr>
<td>dilated pupils,</td>
<td>• Quickly move the person to a warm place and remove wet clothing <strong>AND</strong></td>
</tr>
<tr>
<td>slow pulse and slow</td>
<td>• Warm body core first with electric blanket or body heat.</td>
</tr>
<tr>
<td>breathing, loss of</td>
<td>• Provide CPR as necessary.</td>
</tr>
<tr>
<td>consciousness</td>
<td></td>
</tr>
<tr>
<td><strong>Early Hypothermia</strong></td>
<td><strong>SERIOUS SITUATION</strong></td>
</tr>
<tr>
<td>Shivering, fatigue,</td>
<td>• Move to a warm place.</td>
</tr>
<tr>
<td>confusion,</td>
<td>• Remove wet clothing.</td>
</tr>
<tr>
<td>disorientation, loss</td>
<td>• Warm core first.</td>
</tr>
<tr>
<td>of consciousness</td>
<td>• Drink warm beverages (no alcohol).</td>
</tr>
<tr>
<td></td>
<td>• Seek medical attention as needed.</td>
</tr>
<tr>
<td><strong>Frost Bite</strong></td>
<td>• Move to a warm place.</td>
</tr>
<tr>
<td>Numbness, tingling,</td>
<td>• If on the feet, do not walk.</td>
</tr>
<tr>
<td>stinging, aching,</td>
<td>• Immerse in WARM water.</td>
</tr>
<tr>
<td>bluish-waxy skin</td>
<td>• Use arm-pit if necessary (hands).</td>
</tr>
<tr>
<td></td>
<td>• Do not rub.</td>
</tr>
<tr>
<td></td>
<td>• Seek immediate medical attention.</td>
</tr>
</tbody>
</table>
# Heat Stress

Common signs and symptoms that workers may experience if they have one of these conditions:

<table>
<thead>
<tr>
<th>Heat Stress</th>
<th>Heat Exhaustion</th>
<th>Heat Stroke</th>
</tr>
</thead>
<tbody>
<tr>
<td>Headache</td>
<td>Headache</td>
<td>Headache</td>
</tr>
<tr>
<td>Thirst</td>
<td>Dizziness</td>
<td>Dizziness</td>
</tr>
<tr>
<td>Profuse sweating</td>
<td>Confusion</td>
<td>Restlessness</td>
</tr>
<tr>
<td>Muscle aches</td>
<td>Nausea</td>
<td>Confusion</td>
</tr>
<tr>
<td></td>
<td>Sweating-pale, clammy skin</td>
<td>Hot, flushed dry skin</td>
</tr>
<tr>
<td></td>
<td>Cramps in legs &amp; abdomen</td>
<td>Body temp above 104°F</td>
</tr>
<tr>
<td>Cold related illnesses and symptoms</td>
<td></td>
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<tr>
<td><strong>Hypothermia</strong></td>
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<tr>
<td>Lower body temp</td>
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</tr>
<tr>
<td>Shivering</td>
<td></td>
<td></td>
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<tr>
<td>Loss of motor skill</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Confusion</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pale skin</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blue lips, ears, fingers</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Frost bite</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stinging or aching hands or feet</td>
<td></td>
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<tr>
<td>followed by numbness</td>
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<tr>
<td>Skin color becomes red, then purple, then white.</td>
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<tr>
<td>Skin may blister</td>
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<tr>
<td><strong>Trench foot</strong></td>
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<tr>
<td>Tingling, itching, or burning</td>
<td></td>
<td></td>
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<tr>
<td>sensations in feet</td>
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<tr>
<td>Blisters may be present</td>
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<tr>
<td><strong>Chilblains</strong></td>
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<tr>
<td>Skin redness with itching</td>
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<tr>
<td>Inflamed ulcers on the fingers or</td>
<td></td>
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<tr>
<td>toes</td>
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<tr>
<td>Red nose or earlobes</td>
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</table>
Mold often appears as discoloration, staining, or fuzzy growth, and it may be white, gray, brown, black, yellow, or green. Mold growth may be hidden behind or in materials. Mold is a major problem in water damaged buildings after flooding. Water damaged materials must be removed and should be properly bagged before disposal.

Mold only needs a few simple things to grow:
1. warm, dark, unventilated place
2. food source (wood, drywall, wallpaper, carpet, insulation, ceiling tiles)
3. moisture

The most common types of mold are usually not harmful. Pregnant women, infants/children, elderly, and those with asthma, allergies, or a compromised immune system can be more susceptible.

Symptoms of mold exposure may include:
- nasal and sinus congestion.
- respiratory problems (wheezing, shortness of breath).
- cough and/or sore throat.
- skin and eye irritation.
- upper respiratory infection.
- central nervous system problems.

Measures to minimize exposure to mold during clean-up (mucking and gutting of buildings):
- training
- decontamination procedures
- proper protective clothing (pg. 39)
- eye goggles (pg. 42)
- rubber gloves (pg. 43)
- N95 respirator (pg. 45, 48)
Working Around Heavy Equipment
• Wear the appropriate protective equipment:
  • Hard hat
  • Safety glasses
  • Hearing protection
  • Heavy work gloves
  • Cut-resistant legwear (chain saw chaps)
• Always cut at waist level or below
• Avoid contact with power lines
• Bystanders or coworkers should remain at least:
  • Two tree lengths (at least 150 feet) away from anyone felling a tree
  • 30 feet from anyone operating a chain saw to remove limbs or cut a fallen tree
Chain Saws and Chippers

Operating chain saws and chippers can result in death, amputation, cuts and exposure to hazardous noise levels.

Chain saws and chippers are frequently used during storm cleanup. Hazards arise when workers get too close or make contact with the saw or chipper. Workers may also be injured by falling limbs, materials thrown from the chipper or by the noise.

Employers must ensure that workers are trained to use the specific equipment assigned to them and wear proper personal protective equipment (PPE).

**Important Chain Saw Operating Rules**
1. Ensure the operator has been trained.
2. Be sure the saw is sharp.
3. Be sure the chain is taut.
4. Make sure the chain is oiled.
5. Ensure all safety devices are in place.

**Chain Saw PPE**
- safety glasses (pg. 42)
- hearing protection (pg. 41)
- hard hat with a mesh face shield and ear muffs (pgs. 42, 41)
- cut and vibration resistant gloves (no. 43)

**Chipper Safety**
- Never reach into a chipper while it’s operating.
- Do not wear loose fitting clothes.
- Always follow manufacturer’s guidelines and safety instructions.
- Use earplugs, safety glasses, hard hats and gloves (pgs. 41-46).
- Provide adequate training.
- Ensure chippers are properly guarded at both the in-feed and discharge ports.
- Ensure chippers on slopes are secured from rolling.
- Provide a safe distance between chipper operations and workers.
Flying debris and material handling

- Have an up-to-date tetanus immunization
- Do not walk under raised loads
- Wear personal protective equipment: hard hats, safety shoes, eye glasses, and work gloves
Hazardous Area

Workers should be trained to recognize the hazardous area around equipment. The size of this hazardous area depends on the boundaries of the driver's blind spot and the work area.

Hazards around the loader
1. equipment backing over workers
2. swing radius, struck by
3. overhead hazard (bucket)
4. overhead hazard (wires)
5. traffic moving around the vehicle striking workers
6. slips/trips and falls (road surface)
7. noise from engine, alarms, and traffic

WARNING! Workers risk injury and death when working on or near heavy equipment.
Hand and Portable Power Tools--always use PPE!

Hand Tools
• Inspect tools in accordance with manufacturer’s specifications
• Take damaged tools out of service
• Use only sharp tools

Portable Power Tools
• Inspect tools in accordance with manufacturer’s specifications
• Use with sharp blades
• Use with GFCI
• Use with proper gauge electric cord
• Take damaged electrical cords out of service
• Use double insulated tools
Lifting Hazards - Ergonomics

Risk factors for lifting injuries:
- repetition
- awkward postures
- vibration
- heavy objects
- no handles or poor grip
- twisting while lifting heavy objects
- uneven or slippery footing

Before lifting any object, “size-up” the load first.
1. Inspect the outside of the container for protruding objects or contamination.
2. Gently rock the object with your hands.
3. Without overexertion, gently test lift the object.
4. Consider factors affecting footing and grip.
5. Determine if one or two people or special equipment is needed.
6. Lift the object if determined to be within limits.
Uneven surfaces and slippery conditions from grease, oil, rain, snow and ice are the cause of most slips, trips and falls. Falls during riding or backing of garbage trucks and other heavy equipment are the major cause of fatalities and serious injuries in clean-up and sanitation work.

**Worker Protection**
- The proper installation and maintenance of riding platforms, fixed ladders and tipping floors.
- Workers should only ride on equipment that is specifically designed for it.
- Establish safe riding, mounting and dismounting procedures (pgs. 60-61).
- Never get on or off of a moving vehicle.
- Wear appropriate footwear with slip resistant soles (pg. 44).
- Take extra time and caution when carrying heavy, unbalanced or awkward loads.
- Utilize two person lifts for heavy objects.

**Conditions that contribute to falls:**
- slippery surfaces
- working at a fast pace
- inappropriate footwear
- moving from one surface to another
- climbing onto or jumping off of a moving vehicle
- carrying heavy, unbalanced or awkward objects
Sanitation and clean-up workers are exposed to many sharp objects. These objects should be handled as though they are contaminated with potentially infectious bacteria such as e-coli and tetanus and that needles are contaminated with hepatitis and HIV. All wounds that break the skin must be properly treated and reported.

- Train workers to recognize sharp hazards and to “size-up” the load before touching it (pg. 24).
- Train workers in first aid.
- Encourage workers to report all incidents.
- Provide appropriate cut, abrasion and puncture resistant gloves and footwear (pgs. 43, 44).
- Provide forceps and other equipment to handle sharps and broken glass.
- Provide materials to properly clean and protect compromised skin.
- Ensure first aid kits are routinely restocked and are adequate.
- Offer the tetanus vaccine to workers.
- Keep the wound clean, dry and regularly change dressing.
- Monitor the wound for signs of infection such as, redness, discharge and swelling.
- Monitor cuts that don’t heal or take an excessively long time to heal.
- If stuck by a hypodermic needle, follow established needlestick protocols (pg. 16).
- Provide sharps disposal containers for improperly disposed of sharp medical waste.
- Seek appropriate medical treatment as necessary.
Traumatic stress is natural and affects many people during and after a disaster

- Pace yourself and take frequent rest breaks
- Be conscious of those around you who may be exhausted, feeling stressed or even temporarily distracted - they may put themselves and you at risk
- Maintain as normal a schedule as possible: regular eating and sleeping are crucial
- Make sure that you drink plenty of fluids

A Red Cross volunteer comforts a Denning, AR tornado survivor