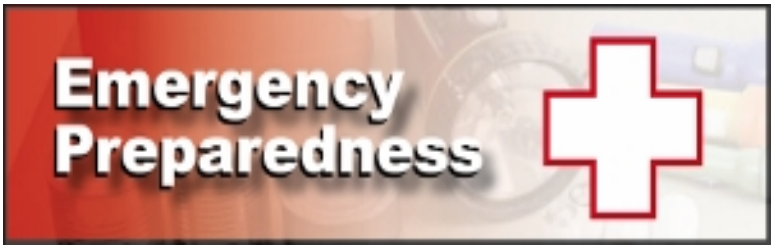
Disaster Preparedness 101

Participant Manual



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- Unit Summary

Introduction and Overview

The damage caused by natural disasters and manmade events can be extensive.

While emergency services personnel are the best trained and equipped to handle emergencies, they may not be immediately available in a catastrophic disaster. In such a situation, members of the community may be on their own for several days or longer. They may have to rely on their own resources for food, water, first aid, and shelter, and neighbors, coworkers, or classmates may have to provide immediate assistance to those who are hurt or need other help.

You will be able to assist those around you until help can arrive.

This training covers basic skills that are important to know in a disaster when emergency services are not immediately available. By learning how to work as a team, neighbors, coworkers, and classmates will be able to do the greatest good for the greatest number of people after a disaster.

UNIT 1: COMMUNITY PREPAREDNESS: ROLES AND RESPONSIBILITIES

In a disaster, it is important for the community to be prepared. To be effective you must address the unique attributes of the community:

- The threat and hazards profile and vulnerabilities of the area
- The existing infrastructure
- Resources and skills within the community

Government

- Emergency Management
- Law Enforcement
- Fire and Rescue
- Emergency Medical Services
- Public Health Services
- Public Works
- Human Services

Emergency Operations Plan (EOP)

This is a plan that is specific for your community where all government agencies have a specific roll in a disaster response. This shows how it is organized and how those organizations will coordinate their agencies' activities before and emergency or disaster.

The EOP is a document that:

- Assigns Responsibility
- Sets for lines of authority
- Describes how people and property will be protected
- Identifies personnel, equipment, facilities, supplies, and other resources

In short, the EOP describes how the community will function in an emergency.

The Public

The public also has a responsibility for preparedness. All members of the community should:

- Learn about community alerts and warnings, evacuation routes, and how to get critical information.
- Take training in preparedness, first aid, and response skills
- Practice skills and personal plans through periodic drills in multiple settings

- Network and be able to help others
- Participate in community feedback opportunities
- Report suspicious activity
- Volunteer

HAZARDS AND THEIR POTENTIAL IMPACT

Types of Disasters:

Disasters can be:

- Natural
- Technological
- Intentional

Key Elements of Disasters:

Regardless of the event, disasters have several key elements in common:

- They are relatively unexpected, with little or no warning or opportunity to prepare.
- Available personnel and emergency services may be overwhelmed initially by demands for their services.
- Lives, health, and the environment are endangered

In the immediate aftermath of a disaster, needs are often greater than professional emergency services personnel can provide.

Understanding Local Hazard Vulnerability

You need to assess and understand where your community's vulnerability to hazards may be. To do this you need to:

- Identify the most common disasters that occur
- Identify possible hazards with most severe impact
- Consider recent and/or historical impacts
- Identify susceptible locations in the community for specific hazards: people, buildings, and infrastructure.
- Consider what to expect for disruption of services and length of restoration.

Examples of Possible Impact of Damage to Infrastructure:

- Transportation
- Structures
- Communication Systems
- Utilities

- Water Service
- Fuel Supplies
- Financial Services

Results of damage to infrastructure will be that police are responding to incidences of grave public safety. Firefighters will be suppressing major fires and EMS will be responding to life threatening injuries. This means you will need to help yourself and those around you until you get professional services who can reach you. You may need to treat low priority victims as well as those with life threatening injuries.

Hazards Related to Structure Type:

You need to be aware of the types of buildings around you and what kind of damage they would sustain in different disasters. Here we have earthquakes. In an earthquake you can expect damage such as:

- Broken glass
- Falling panels
- Collapsing walkways and stairways

Keep in mind that the age, type of construction, and type of disaster are major factors in potential damage to detached homes and garages.

Multiple-Use Buildings

Buildings such as malls, sports arenas, airports, and places of worship, and other buildings with oversized roof spans pose particular hazards in a disaster:

- Strip shopping centers pose a threat from collapse and broken glass.
- Warehouse-type structures may also collapse.

There is also a risk in all types of structures from non-structural hazards.

Non-Structural Hazards

Everyone has non-structural hazards in their home, workplace, meeting place, school, and neighborhood. Fixtures and items within these places can pose a hazard during or after a disaster.

Some hazards include:

- Gas line ruptures from water heaters or ranges displaced by shaking, water, or wind
- Damage from falling books, dishes, or other cabinet contents
- Risk of injury or electric shock from displaced appliances and office equipment
- Fire from faulty wiring, overloaded plugs, frayed electrical cords

Reducing hazards is an important part of personal preparedness. There are several relatively simple measures that individuals can take to alleviate many home and workplace hazards. These will be covered later.

HOME PREPAREDNESS

Preparing for a Disaster

Many preparedness actions are useful in any type of emergency situation, and some are specific to a particular type of disaster. A critical first step to preparedness is to understand the hazards in your community and to learn about local alerts and warning systems, evacuation routs, and sheltering plans. It is also important to familiarize yourself with hazards in other areas when you are traveling and may experience a type of hazard you are not as familiar with.

Did you know?:

- Only 50% of the public is familiar with the alerts and warning systems in their community.
- Importance of family and community members in the first 72 hours of a disaster. 70% of people report and expectation to rely on household members, and 49% say they will rely on people in their neighborhood
- Nearly 30% indicate that a primary reason they have not taken steps to prepare is the expectation that fire, police, or other emergency personnel will help them.
- Only 40% of people nationwide think there is a likelihood of a natural disaster ever occurring in their community.
- 53% indicate confidence in ability to respond in the first 5 minutes of a sudden natural disaster, but only 20% report confidence in ability to respond to a terrorist attack.
- Preparedness differs according to age, education, income, language and culture, disabilities and abilities, experience, and other factors

Regardless of the type of disaster, important elements of disaster preparedness include:

- Having the skills to evaluate the situation quickly and to take effective action to protect yourself
- Having a family disaster plan and practicing the plan with drills
- Assembling supplies in multiple locations
- Reducing the impact of hazards through mitigation practices
- Getting involved by participating in training and volunteer programs

It is always important to address specific needs for yourself and people you know, including any access or functional needs, considerations for pets and service animals, and transportation.

Web Sites of Interest

www.ready.gov/

http://www.redcross.org

www.fema.gov/areyouready/

www.pandemicflu.gov

Protective Actions:

- Assess the Situation
- Decide to stay or change locations
- Staying or changing location is a critical early decision in disasters
- Seek clean air and protect breathing passages
- Protect yourself from debris and signal rescuers if trapped
- Remove contaminants
- Practice good hygiene

Sheltering

- Shelter in place
- Shelter for extended stay
- Mass care/community shelter

Developing a Disaster Plan

In addition to knowing immediate protective actions that you may need to take, an emergency plan can mean the difference between life and death in a disaster. For example:

- Where will you meet family members: You should have a location outside the house and another location outside the neighborhood
- Identify an out-of-state "check-in contact"
- Plan for all possibilities: extended stay, shelter-in-place, or evacuation
- How will you escape buildings where you spend time: home, workplace, school, place of worship, etc.?
- What route (and several alternatives) will you use to evacuate? Do you have transportation?

Family safety is the most important factor when disaster strikes. Do not panic! Always consider all options and which is best for your family. Practice evacuations with your family and practice using your "out of state check-in contact" so the whole family knows what to do. This way when they need to use it in a disaster it will be second nature to them.

Creating a Family Disaster Plan

To get started:

- Contact your local emergency management office and your local chapter of the American Red Cross
- Meet with your family
- Plan how your family will stay in contact if separated by disaster
- Complete the following steps
  a) Post emergency telephone numbers by every phone.
  b) Show responsible family members how and when to shut off water, gas, and electricity at main switch.
  c) Install a smoke alarm on each level of your home; especially near bedrooms. Test them monthly and change the batteries two times each year. (Change batteries when you change your clocks in the spring and fall.)
- Contact your local fire department to learn about home fire hazards
- Meet with your neighbors

Activity: Evacuate!

Take the scenario given and decide what things to bring with you and/or what to do in the time available.

Escape Planning

Your plan should have an escape from every room. Consider the needs of children and individuals with disabilities. You should inform and practice the escape drill with every member of the family and/or coworkers, classmates, troop, etc.

Storing Disaster Supplies

Make sure you store supplies in multiple locations. If you have them on hand you will not have to search for them after disaster strikes. Be prepared! If you have gathered supplies in advance you can evacuate or confine yourself in your home; whatever you choose to do.

To Prepare Your Kit

- Review the checklist given
- Gather the supplies from the list
- **Place the supplies you are apt to need for an evacuation in an easy-to-carry container. These supplies are listed with an asterisk (*).**

Water

Store water in plastic containers such as soft drink bottles.

- Look for the triangular recycling symbol with a number 1 on the bottom of the bottle as those are best for water storage. Do not store in containers that will decompose or break such as plastic milk jugs or glass bottles
- Wash the bottle with soap and warm water. Fill with water from your tap and store in a cool, dark area away from direct sunlight.
- Replace your emergency water every 6 months by repeating the process; like food and batteries, water does expire!

Keep in mind that a normally active person needs to drink at least 2 quarts of water each day. Hot environments and intense physical activity can double that requirement. Children, nursing mothers, and ill people will need more.

- Store 1 gallon of water per person per day (2 quarts for drinking, 2 quarts for food preparation and sanitation).*
- Keep at least a 3-day supply of water for each person in your household.

Purify water if you have any doubts about the water quality. You can heat water to a rolling boil for 1 minute or use commercial purification tablets to purify the water. You can also use regular household liquid chlorine bleach if it is pure 5.25% sodium hypochlorite. Do not use perfumed bleach!

- 1 Quart – 2 Drops of Bleach
- 1 Gallon – 8 Drops of Bleach
- 5 Gallons – ½ Teaspoon of Bleach

*****Note: If water is cloudy, double the recommended dosage of bleach*****

After adding the bleach, shake or stir the water and let it sit for 30 minutes before consuming.

Food

Store at least a 3-day supply per person of nonperishable food. Select food that does not require refrigeration, preparation, or cooking and little or no water. If you must heat food, pack a can of Sterno. Avoid salty foods if at all possible. Salt increases thirst. Include a selection of the following foods in your disaster supply kit. Check food and water expiration dates biannually.

- Ready-to-eat canned meats, fruits, and vegetables
- Canned juices, milk, soup (if powdered, store extra water)
- Staples – sugar, salt, pepper

- High-energy foods – peanut butter, jelly, crackers, granola bars, trail mix
- Foods for infants, elderly persons, or persons on special diets
- Comfort and stress foods – cookies, hard candy, sweetened cereals, lollipops, instant coffee, tea bags

Kitchen Items

- Manual can opener
- Mess kits or paper cups, plates, and plastic utensils
- All-purpose knife
- Household liquid bleach to treat drinking water
- Aluminum foil and plastic wrap
- Re-sealing plastic bags
- If food must be cooked, small cooking stove and can of cooking fuel

First Aid Kit*

- First Aid Manual
- Sterile adhesive bandages in assorted sizes
- Two-inch sterile gauze pads (4-6)
- Four-inch sterile gauze pads (4-6)
- Hypoallergenic adhesive tape
- Triangular bandages (3)
- Needle
- Moistened towelettes
- Antibacterial ointment
- Thermometer
- Tongue blades (2)
- Tube of petroleum jelly or other lubricant
- Assorted sizes of safety pins
- Cleaning agent/soap
- Non-latex exam gloves (2 pairs)
- Cotton balls
- Sunscreen
- Three-inch sterile roller bandages (3 rolls)
- Four-inch sterile roller bandages (3 rolls)
- Scissors
- Tweezers
- Hot and cold compress

Nonprescription Drugs

- Aspirin or non-aspirin pain reliever
- Antidiarrheal medication
- Antacid (for upset stomach)
- Allergy medication and if necessary, epinephrine
- Laxative
- Vitamins
- Activated charcoal (used if advised by the Poison Control Center)

Tools and Supplies

- Emergency preparedness manual*
- Battery-operated weather radio and extra batteries*
- Flashlight and extra batteries*
- Fire extinguisher: small canister, ABC type
- Tube tent
- Pliers
- Duct tape

- Compass*
- Matches in a waterproof container
- Aluminum foil
- Plastic storage containers
- Signal flare(s)*
- Paper, pencil*
- Needles, thread
- Work gloves
- Medicine dropper
- Non-sparking shutoff wrench to turn off household gas and water
- Whistle
- Plastic sheeting
- Landline telephone
- Fuel for vehicle and generator

Sanitation

- Toilet paper, towelettes*
- Soap, liquid detergent*
- Feminine supplies*
- Personal hygiene items*
- Plastic garbage bags, ties (for personal sanitation uses)
- Plastic bucket with tight lid
- Disinfectant
- Liquid hand sanitizer
- Household chlorine bleach

Pet Supplies

- Medications and medical records (stored in waterproof container) and first aid kit
- Current photos of your pets in case they get lost
- Information on feeding schedules, medical conditions, behavior problems, and the name and number of your veterinarian in case you have to foster or board your pets
- Sturdy leashes, harnesses, and/or carriers to transport pets safely and ensure that your animals can't escape
- Food, potable water, bowls, cat litter and pan, and can opener
- Pet beds and toys, if easily transportable

Clothing and Bedding

Include at least one complete change of clothing and footwear per person (and remember to change for the different seasons!)

- Sturdy shoes or boots*
- Rain gear*
- Blankets or sleeping bags*
- Hat and gloves*
- Thermal underwear*
- Sunglasses*

Household Documents and contact Numbers*

- Personal identification, cash (including change) or traveler's checks, and a credit card
- Copies of important documents: firth certificates, marriage certificate, driver's license, Social Security cards, passport, wills, deeds, inventory of household goods, insurance

papers, contracts, immunization records, bank and credit card account numbers, stocks and bonds. **Be sure to store these in a watertight container.**

- Emergency contact list and other important phone numbers
- Map of the area and phone numbers of places you could go
- An extra set of car keys and house keys
- Copies of prescriptions and/or original prescription bottles

Special Items

For Baby*

- Formula
- Diapers
- Bottles
- Powdered milk
- Medications

For All Family Members

- Heart and high blood pressure medication*
- Insulin*
- Other prescription drugs*
- Denture needs*
- Contact lenses and supplies*
- Extra eye glasses*
- Entertainment – games and books

***Items marked with an asterisk (*) are recommended for evacuation.**

Reducing the Impact of Hazards Through Mitigation

Mitigation is the reduction of loss of life and property by lessening the impact of disasters. Mitigation includes any activities that prevent an emergency, reduces the likelihood of occurrence, or reduces the damaging effects of unavoidable hazards.

Make sure you have flood insurance. Homeowner's insurance does not cover damage caused by flooding. Visit the National Flood Insurance Program Web Site, www.floodsmart.gov, to learn more.

Non-structural hazard mitigation means doing what you can to prevent injuries or damage from items in your home. Some examples include:

- Anchor heavy furniture
- Secure appliances and office equipment
- Install hurricane storm shutters
- Secure cabinet doors with childproof fasteners
- Locate and label gas, electricity, and water shutoffs
- Secure water heaters and have flexible gas lines installed

Other measures that may require a bigger investment are:

- Bolt house to foundation
- Install trusses or hurricane straps to reinforce the roof
- Strap propane tanks and chimneys
- Strap mobile homes to their slabs
- Raise utilities (above the level of flood risk)
- Build a safe room

A safe room is NOT the same as a shelter-in-place location. It requires significant fortification in order for the room to provide protection against extremely high winds. This is like an above ground storm cellar. For more information please visit www.fema.gov/plan/prevent/saferoom/index.shtm

Sheltering-in-place protects you from air contaminants. You do not need to alter the structure of the room. You simply need to seal off the room with plastic sheeting and duct tape for a short period of time until the air is safe.

Fortifying Your Home

There are many types of hazards and each one poses its own threats. For instance:

- Home Fires: If you have bars or locks on your windows make sure those are easy to open from the inside.
- Landslides and Mudslides: If you have flexible piping that will help reduce the change of water or gas leaks.
- Wildfires:
    - Do not use wooden shakes or shingles
    - Clear all flammable vegetation at least 30 feet from your home.
    - Propane tanks should be at least 30 feet from your home.
    - Firewood should be stacked at least 30 feet from your home and should be uphill if at all possible.

Learn more about the different types of disasters and hazards at www.fema.gov/hazard/index.shtm

Get Involved

- Ask about emergency planning at work, school, place of worship, and other social settings
- Start by talking to your friends and family. Find out the hazards in your area and what you will do to help each other in a crisis whether it is big or small.

- Make sure those who will be in charge are connected to community authorities on emergency management and planning.
- Plan and participate in drills
- Volunteer with local fire departments through the CERT program. Encourage your friends and family to do the same.

Disaster Response

Immediately following a disaster is when emergency personnel will be overwhelmed or delayed. This is where knowing all this information will come in handy. You should respond by:

- Locating and shutting off utilities (if safe to do so)
- Extinguishing small fires
- Treating life-threatening injuries until professional assistance can be obtained
- Conducting light search and rescue operations
- Helping disaster survivors cope with their emotional stressors.

If you are not a CERT member through Clark County; you will be able to locate them by their vests and hats. For more information on CERT programs in your community please visit https://www.fema.gov/community-emergency-response-teams. Videos are also available for view at https://www.fema.gov/video-materials.

Personal Protective Equipment

- Gloves (work and non-latex)
- N95 Mask
- CPR Mask
- Sturdy shoes or boots
- Pocket Knife

Additional Training

https://training.fema.gov/is/courseoverview.aspx?code=IS-100.PWb

This is a required online course for emergency preparedness for both Venturing and Scouting. Please take this course to earn this award.

UNIT 2: FIRE SAFETY AND UTILITY CONTROLS

Introduction and Overview

While a severe emergency is taking place, Firefighters and emergency personnel will be taking care of life safety and extinguishing major fires. It could be possible the roads are unpassable or weather conditions may affect their ability to get to you. There may also be a shortage of water as well as other inadequate recourses which make it impossible for the fire department to reach you.

At the end of this unit you will be able to:

- Identify and reduce potential fire and utility risks in the home, workplace, meeting place, school, etc.
- Conduct a basic sizeup for a fire emergency
- Explain minimum safety precautions, including:
    - Safety equipment
    - Utility control
    - Buddy system
- Extinguish small fires using a fire extinguisher

This unit will provide you with the knowledge and skills that you will need to reduce or eliminate fire hazards and extinguish small fires.

Fire Chemistry

Fire Chemistry

Fire requires three elements to exist:

- Heat: Heat is required to elevate the temperature of a material to its ignition point.
- Fuel: The fuel for a fire may be a solid, liquid, or gas. The type and quantity of the fuel will determine which method should be used to extinguish the fire.
- Oxygen: Most fires will burn vigorously in any atmosphere of at least 20% oxygen. Without oxygen, most fuels could be heated until entirely vaporized, yet would not burn.

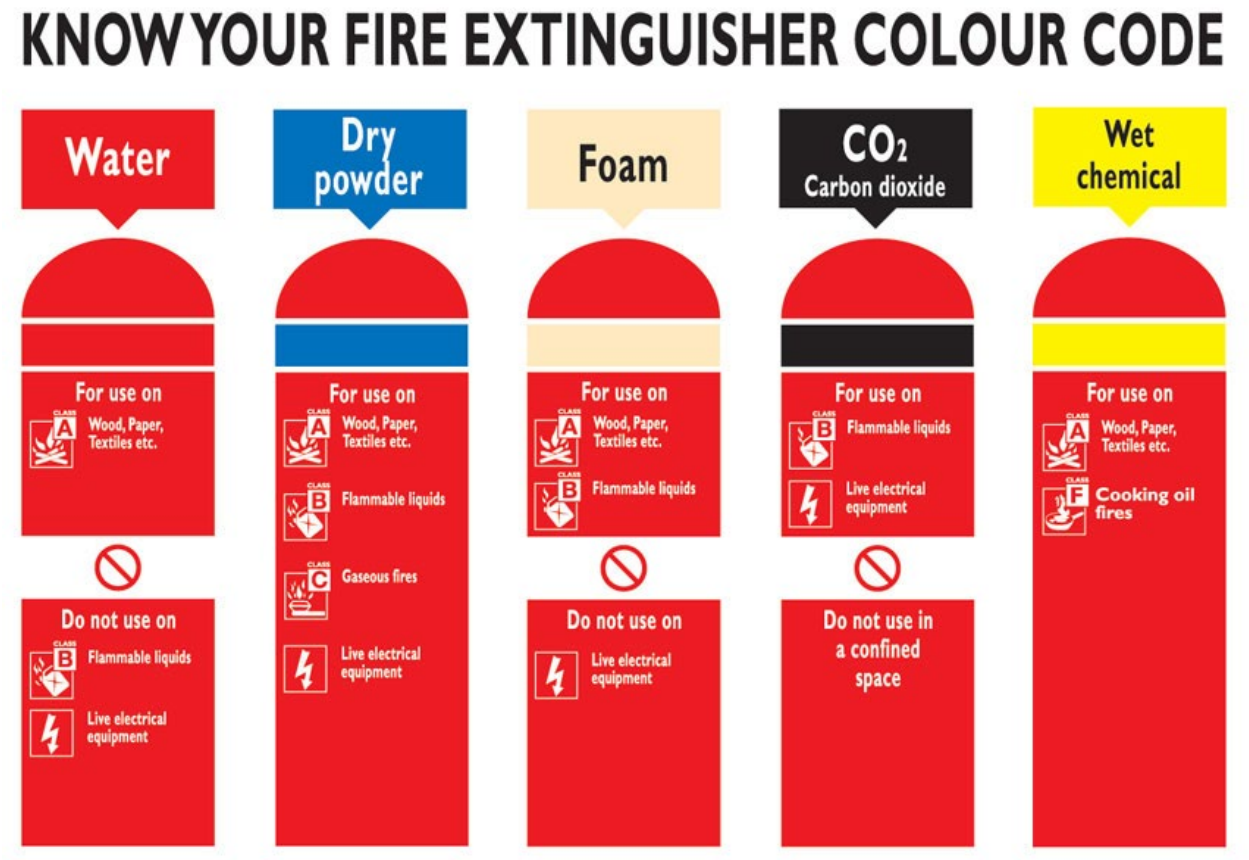
These three elements called the fire triangle create a chemical exothermic reaction, which is fire.

Classes of Fire

To aid in extinguishing fires, fires are categorized into classes based on the type of fuel that is burning:

- Class A Fires: Ordinary combustibles such as paper, cloth, wood, rubber, and many plastics
- Class B Fires: Flammable liquids (e.g., oils, gasoline) and combustible liquids (e.g., charcoal lighter fluid, kerosene). These fuels burn only at the surface because oxygen cannot penetrate the depth of the fluid. Only the vapor burns when ignited.
- Class C Fires: Energized electrical equipment (e.g., wiring, motors). When the electricity is turned off, the fire becomes a Class A fire.
- Class D Fires: Combustible metals (e.g., aluminum, magnesium, titanium)
- Class K Fires: Cooking oils (e.g., vegetable oils, animal oils, fats)

It is extremely important to identify the type of fuel feeding the dire in order to select the correct method and agent for extinguishing the fire.



Fire and Utility Hazards

We all have some sort of fire or utility hazard in our home or any place we could be should an emergency take place. We will deal with identifying and preventing fire and utility hazards. Most of these hazards fall into three categories.

- Electrical Hazard
- Natural Gas Hazard
- Flammable or combustible liquids

Simple fire prevention measures will help reduce the likelihood of fires:

- First, locate potential sources of ignition
- Then, do what you can to reduce or eliminate the hazards

Electrical Hazard

Here are some examples of common electrical hazards and simple ways they can be reduced or eliminated:

- Avoid the electrical octopus. Do not have tangled cords and do not over load outlets. Do not plug power strips into other power strips.
- Do not run electrical cords under carpets
- Check for and replace broken or frayed cords immediately
- Maintain electrical appliances and repair or replace malfunctioning appliances

Responding to Electrical Emergencies

Despite our best efforts, sometimes emergencies will happen. You should make sure that every member of your household knows what to do should an electrical emergency occur.

- Locate the circuit breakers or fuses, and know how to shut off the power. Post shutoff instructions next to the breaker box or fuse box.
- Unscrew individual fuses or switch off smaller breakers first, then pull the main switch or breaker
- When turning the power back on, turn on the main switch or breaker first, then screw in the fuses or switch on the smaller breakers, one at a time.

You should not enter a flooded basement or standing water to shut off the electrical supply because water conducts electricity.

Natural Gas Hazards

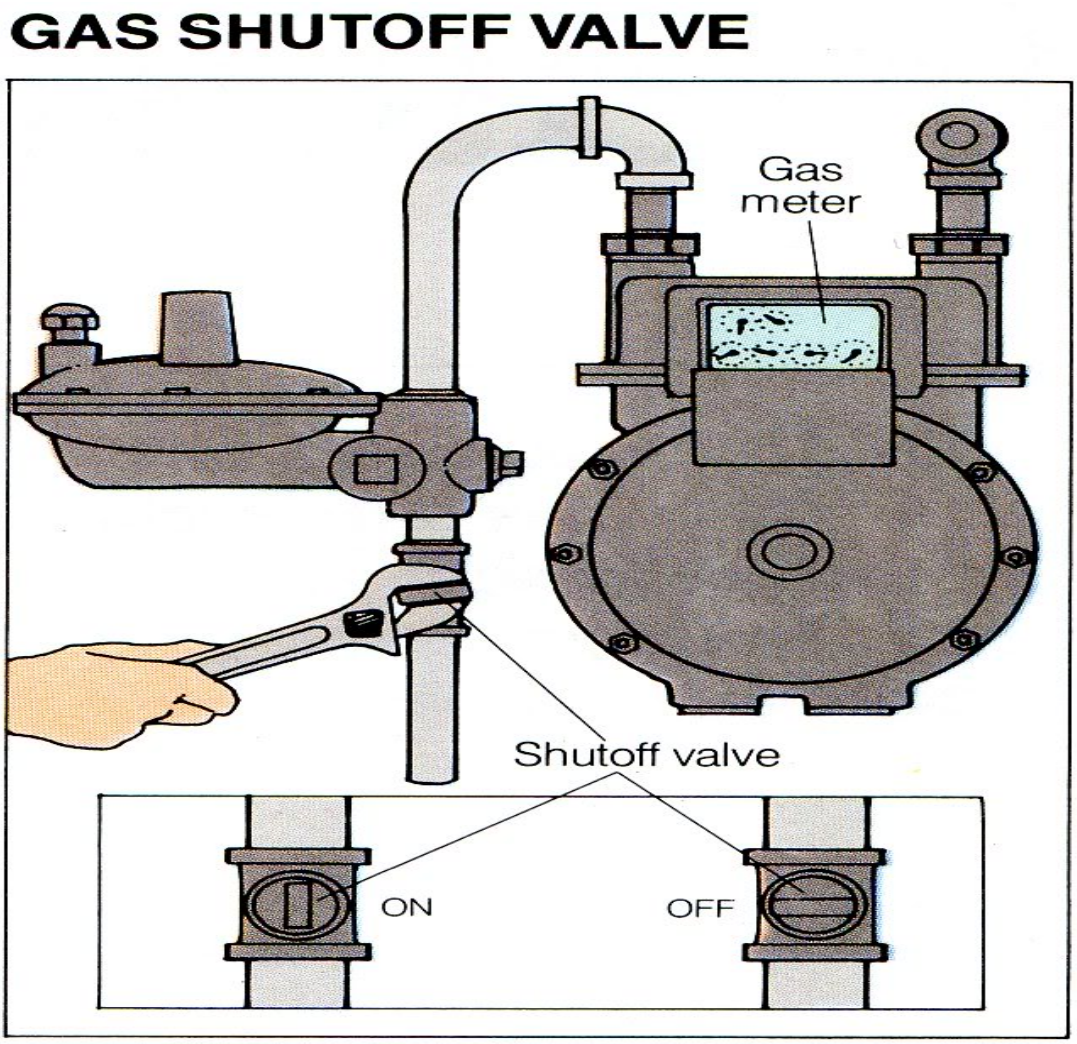
Natural gas presents two types of hazards. It is an:

- Asphyxiate that robs the body of oxygen
- Explosive that can easily ignite

Natural Gas Hazard Awareness

Here are several examples for monitoring natural gas in your home:

- Install natural gas detectors near the furnace, hot water tank, and gas appliances such as clothes dryers or stoves. Test the detector monthly to ensure it works.
- Install a carbon monoxide detector near the sleeping area. Detectors should not be placed within 15 feet of heating or cooking appliances or in or near very humid areas such as bathrooms. You may want to make sure every bedroom and hallway has a detector. Test them monthly to ensure it works.
- Locate and label the gas shutoff valve(s). There may be multiple valves inside a home in addition to the main shutoff. Know how to shut off the gas and make sure you have a proper non-sparking tool for shutting off the gas.



Gas Shutoff

If you have a gas meter inside your home, you should only shut it off with the instruction from local authorities. If you smell gas or see that gas is being used even if all appliances are turned off you need to evacuate the premises and call 9-1-1. Do not attempt to shut off the gas as fumes may be in the air. If you create a spark you could create an explosion.

If your gas meter is outside the home you should go outside and turn the meter off if you smell gas. No not attempt to turn the utilities back on by yourself. Remember that if the gas has been shut off it can only be turned back on by a trained professional such as your natural gas company.

There are some meters that have an automatic shut off in the case of an earthquake or other emergency. These are installed by a licensed plumber downstream of the utility point of delivery. If you are unsure whether your home has this shutoff device, contact your gas service company. If this shutoff device is closed, only a qualified professional should restore it.

Never enter the basement to turn off any utility if the structure is on fire.

Be sure to use a flashlight and not a candle if a light source is needed to locate and shut off the gas valve.

Flammable Liquid Hazard

Make sure you read labels to identify when products may be flammable and store them properly. You can use the L.I.E.S. method. (Limit, Isolate, Eliminate, Separate). You should only extinguish a flammable liquid using a portable fire extinguisher rated for Class B fires.

P.A.S.S.

Make sure you test the extinguisher first to ensure it works properly.

Fire Suppression Safety Rules

- Use safety equipment at all times
- Work with a buddy
- Have backup whenever possible

- Always have two ways to exit the fire area
- Look at the door
- Feel closed doors with the back of your hand
- Confine the fire
- Stay low to the ground
- Maintain a safe distance
- Never turn your back on a fire when backing out
- Overhaul the fire

NEVER get to close to a fire. Always stay to the outer reach of your extinguisher. If you feel the heat you are too close.

NEVER try and fight a fire alone. Your first priority is your personal safety. Never put that at risk.

NEVER try to suppress large fires. Stay within the capability of your equipment.

NEVER enter smoke-filled areas. Leave that to the firefighters. Remember, your life is your number one priority. Material loss is not worth your life.

Proper Fire Suppression Procedures

- Always use a buddy system
    - Person 1 puts out the fire with an extinguisher
    - Person 2 watches for hazards to ensure both their safety

Here is the proper fire suppression procedure:

1. Assume ready position. With the pin pulled, person 1 holds the extinguisher aimed and upright, approximately 20-25 feet from the fire for small fires.
2. When ready to approach the fire, person 1 should say, “Ready.” Person 2 should repeat, “Ready.”
3. As person 1 begins to move forward, he or she should say, “Going in.” Person 2 should repeat the command and stay within reach of person 1.
4. Both people should walk toward the fire. Person 1 should watch the fire and person 2 should stay close to person 1, keeping his or her hand on person 1’s shoulder. Person 2’s job is to protect person 1.
5. When person 1 is exiting the fire area, he or she should say, “Backing out.” Person 2 should repeat the command.
6. Person 2 should guide person 1 from the area with his or her hands as person 1 continues facing the fire and looking for other hazards. Person 1 must never turn his or her back on the fire scene.

UNIT 3: DISASTER MEDICAL OPERATIONS – PART 1

Introduction and Overview

The need to learn disaster medical operations is based on two assumptions:

- The number of victims could exceed the local capacity for treatment
- Survivors will attempt to assist others. You will need to know lifesaving first aid or post-disaster survival techniques to do this.

Medical operations can play a vital role in limiting deaths from trauma. The phases of death from trauma are:

1. Phase 1: Death within minutes as a result of overwhelming and irreversible damage to vital organs.
2. Phase 2: Death within several hours as a result of excessive bleeding
3. Phase 3: Death in several days or weeks as a result of infection or multiple organ failure (i.e., complications from an injury)

These phases underlie why disaster medical operations are conducted as they are (by identifying those with the most serious injuries as soon as possible and treating those with life-threatening injuries first). Some disaster victims in the second and third phases of death could be saved by providing simple medical care.

In a disaster there may be more victims than rescuers, and assistance from medical professionals may not be immediately available. You will get basic training for disaster medical operations and provide:

- Treatment for life-threatening conditions – airway obstruction, bleeding, and shock – and for other, less urgent conditions
- The greatest good for the greatest number of people by conducting simple triage and rapid treatment

START

Simple Triage And Rapid Treatment (START) is a critical concept for initially dealing with casualties in a disaster. 40% of disaster victims can be saved with simple (rapid) care. START is based on the premise that a simple medical assessment and rapid treatment based on that assessment will yield positive – often lifesaving – results.

STart = Simple Triage

stART = And Rapid Treatment

You are all encouraged to take basic first aid and CPR training. Just know that in most disaster cases you will not have time to use it. The idea in disasters is you treat as many victims as you can. You cannot spend time on those who are likely not to survive. The only exception to this is with your own family. Make sure you and your family is safe and medically sound before you go to help others.

Unit Objectives

At the end of this unity you should be able to:

- Identify the "killers"
- Apply techniques for opening the airway, controlling bleeding, and treating for shock
- Conduct triage under simulated disaster conditions

Remember, the goal of disaster medical operations is to do the greatest good for the greatest number.

Unit Topics

This section will introduce you to the principles of triage, including treating the "three killers": airway obstruction, excessive bleeding, and shock.

Throughout the unit you will have the opportunity to practice treatment techniques.

Treating Life-Threatening Conditions

In emergency medicine, airway obstruction, bleeding, and shock are "killers" because without treatment they will lead to death. The first priority of medical operations is to attend to those potential killers by:

- Opening the airway
- Controlling excessive bleeding
- Treating for shock

This section will train you to recognize the "killers" by recognizing their symptoms and their effects on the body.

Approaching the Victim

Ensure you are wearing proper safety equipment:

- Gloves
- Goggles
- Non-latex exam gloves
- N95 mask
- Sturdy shoes or boots

Remember to use non-latex exam gloves to prevent potential reactions by individuals who are allergic to latex.

There are several steps to take when approaching a victim. When ready to approach do the following:

1. If the victim is conscious, be sure he or she can see you.
2. Identify yourself by giving your name and indicating the organization with which you are affiliated.
3. ALWAYS request permission to teat an individual. If an individual is unconscious, he or she is assumed to have given "implied consent," and you may treat him or her. Ask a parent or guardian for permission to treat a child, if possible.
4. Whenever possible, respect cultural differences. For example, in some Muslim traditions it is customary to address the male when requesting permission to treat a female member of his family.
5. Remember, all medical patients are legally entitled to confidentiality (HIPAA). When dealing with victims, always be mindful and respectful of the privacy of their medical condition.

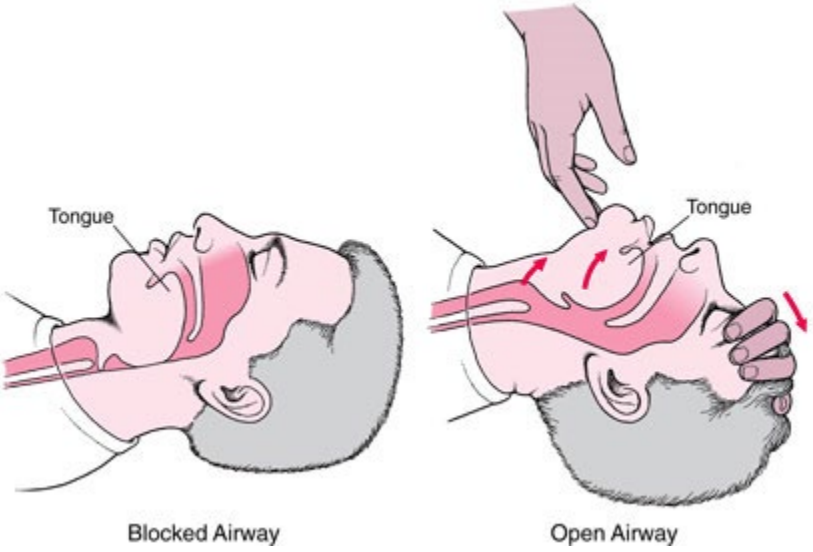
Opening the Airway

The respiratory system includes the following components:

- Lung
- Bronchus
- Larynx
- Pharynx
- Nasal Cavity
- Trachea

In an unconscious or semiconscious victim, especially one positioned on his or her back, the most common airway obstruction is the tongue. The tongue – which is a muscle – may relax and block the airway. A victim with a suspected airway obstruction must be checked immediately for breathing and, if necessary, the airway must be opened.

Open and Obstructed Airway



The Head-Tilt/Chin-Lift Method

In addition to opening the airway, this method causes little or no cervical-spine manipulation because only the head is manipulated.

Proper technique is always important in opening an airway, but so is speed.

Head-Tilt/Chin-Lift Method for Opening an Airway

1. At an arm's distance, make contact with the victim by touching the shoulder and asking, "Can you hear me?" Speak loudly, but do not yell.
2. If the victim does not or cannot respond, place the palm of one hand on the forehead.
3. Place two fingers of the other hand under the chin and tilt the jaw upward while tilting the head back slightly.
4. Place your ear close to the victim's mouth, looking toward the victim's feet, and place a hand on the victim's abdomen.
5. Look for check rise.
6. Listen for air exchange.
   - Document abnormal lung sounds (wheezing, gasping, gurgling, etc.).
7. Feel for abdominal movement.
8. If breathing has been restored, the clear airway must be maintained by keeping the head tilted back. If breathing has not been restored, repeat steps 2-7.

Controlling Bleeding

Uncontrolled bleeding initially causes weakness. If bleeding is not controlled, the victim will go into shock within a short period of time and finally will die. An adult losing 1 liter can result in death.

There are three types of bleeding and the type can usually be identified by how fast the blood flows:

- Arterial bleeding – Arteries transport blood under high pressure. Blood coming from an artery will spurt.
- Venous bleeding – Veins transport blood under low pressure. Blood coming from a vein will flow.
- Capillary bleeding – Capillaries also carry blood under low pressure. Blood coming from capillaries will ooze.

There are three main methods for controlling bleeding:

- Direct pressure
- Elevation
- Pressure points

Direct pressure and elevation will control bleeding in 95% of cases.

Shock

Shock is a condition that occurs when the body is not getting enough blood flow. When blood doesn't circulate, oxygen and other nutrients are not carried to tissues and organs. Blood vessels begin to close and organs are damaged, and if left untreated, will shut down completely. Shock can worsen very rapidly.

Remaining in shock will lead to the death of:

- Cells
- Tissues
- Entire organs

The main signs of shock you should look for are:

- Rapid and shallow breathing, (Note if the victim's breathing is rapid and shallow, i.e., more than 30 breaths per minute.)
- Capillary refill of greater than 2 seconds (use nail bed or radial pulse. Normal pulse rate is 60-100 beats per minute)
- Failure to follow simple commands, such as "squeeze my hand"

Treating for Shock

The body will initially compensate for blood loss and mask the symptoms of shock. Sometimes that makes it very difficult to diagnose. It is possible for an individual suffering from shock to be fully coherent and not complaining of pain. Pay attention to subtle clues, as failure to recognize shock will have serious consequences.

Avoid rough or excessive handling. It is important to maintain the victim's body temperature. Place a blanket under and over the victim to provide protection from temperatures. Position the victim on his or her back and elevate the feet 6 to 10 inches above the level of the heart to assist in bringing blood to the vital organs.

Although victims who are suffering from shock may be thirsty, they should not eat or drink anything initially because they may also be nauseated.

Procedures for Controlling Shock

1. Maintain and open airway
2. Control obvious bleeding
3. Maintain body temperature

Notes: Do not provide food or drink and avoid rough or excessive handling.

Triage

Triage is a French term meaning "to sort".

During medical triage, victims' conditions are evaluated and the victims are prioritized into four categories:

- **Immediate (I):** The victim has life-threatening injuries (airway, bleeding, or shock) that demand immediate attention to save his or her life; rapid, lifesaving treatment is urgent. These victims are marked with a red tag or labeled "I".
- **Delayed (D):** Injuries do not jeopardize the victim's life. The victim may require professional care, but treatment can be delayed. These victims are marked with a yellow tag or labeled "D".
- **Minor (M):** Walking wounded and generally ambulatory. These victims are marked with a green tag or labeled "M".
- **Dead (DEAD):** No respiration after two attempts to open the airway. Because CPR is one-on-one care and is labor intensive, CPR is not performed when there are many more victims than rescuers. These victims are marked with a black tag or labeled "DEAD".

Triage in a Disaster Environment

- Step 1: Stop, Look , Listen, and Think
- Step 2: Conduct voice triage.
- Step 3: Start where you stand, and follow a systematic route.
- Step 4: Evaluate each victim and tag them.
- Step 5: Treat Immediate (I = yellow tags) immediately.
- Step 6: Document triage results for:
    - Effective deployment of resources
    - Information on the victims' locations
    - A quick record of the number of casualties by degree of severity.

Remember that your safety is paramount during triage. It is important to wear proper protective equipment so as not to endanger your own health.

Unit Summary

- Use the head-tilt/chin-lift method for opening airways
- Control bleeding using direct pressure, elevation, and/or pressure points.
- If there is a question about whether a victim is in shock, treat for shock as a precaution.
- There are 4 triage categories (treat in this order):
    - Immediate – Red
    - Delayed – Yellow
    - Minor – Green
    - Dead – Black
- Triage in disaster environment consists of 6 important steps:
    - Stop, Look, Listen and Think, and make a quick plan.
    - Conduct voice triage
    - Begin where you stand and work systematically
    - Evaluate and tag all victims
    - Treat those tagged "I" immediately
    - Document your findings

UNIT 4: DISASTER MEDICAL OPERATIONS – PART 2

Introduction and Overview

Unit Objectives

- Perform head-to-toe patient assessments
- Establish a treatment area
- Apply splints to suspected fractures and sprains
- Employ basic treatments for other injuries

Unit Topics

- Public Health Considerations
- Functions of Disaster Medical Operations
- Establishing Medical Treatment Areas
- Conducting Heat-to-Toe Assessments
- Treating Burns
- Wound Care
- Treating Fractures, Dislocations, Sprains, and Strains
- Nasal Injuries
- Treating Cold-Related Injuries
- Treating Heat-Related Injuries
- Bites and Stings

Public Health Considerations

Maintaining Hygiene

Some steps individuals should take to maintain hygiene are to:

- Wash hands frequently
- Wear non-latex exam gloves at all times
- Wear an N95 mask and goggles
- Keep dressing sterile
- Thoroughly was areas that come in contact with body fluids

Maintaining Sanitation

Poor sanitation is a major cause of infection.

- Control the disposal of bacterial sources (e.g., soiled exam gloves, dressings, etc.)
- Putting waste products in plastic bags, tying off the bags, and marking them as medical waste. Keep medical waste separate from other trash, and dispose of it as hazardous waste.
- Burying human waste. Select a burial site away from the operations area and mark the burial site for later cleanup.

Water Purification

Potable water supplies are often in short supply or are not available in a disaster. Water can be purified for drinking, cooking, and medical use by heating it to a rolling boil for 1 minute or by using water purification tablets or non-perfumed liquid bleach.

The bleach to water ratios are:

- 8 drops of bleach per gallon of water
- 16 drops per gallon of water, if the water is cloudy or dirty

Let the bleach and water solution stand for 30 minutes. Note: if the solution does not smell or taste of bleach, add another six drops of bleach, and let the solution stand for 15 minutes before using.

Do not use anything but purified water on wounds. Anything else used must be the decision of trained personnel (e.g., hydrogen peroxide, Alcohol, etc.).

Preventing the Spread of Disease

Make sure to always wear non-latex gloves, N95 mask and goggles during medical operations. Cover all open wounds as a way of preventing the spread of infection.

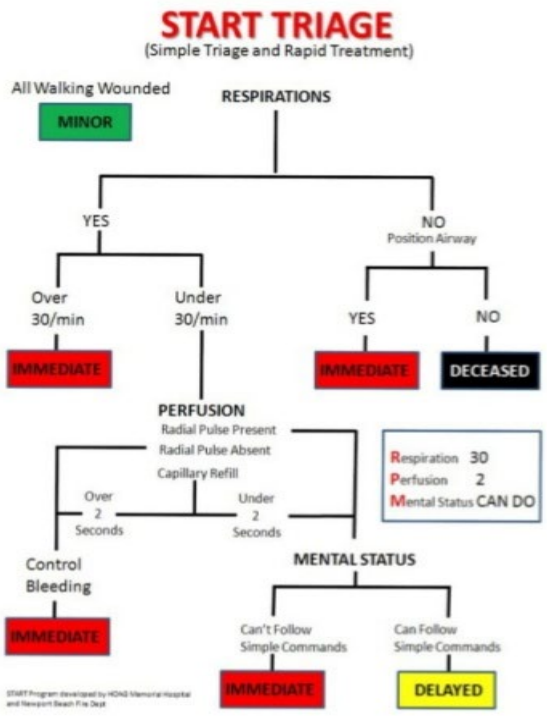
Functions of Disaster Medical Operations

There are five major functions of disaster medical operations:

- Triage: The initial assessment and sorting of victims for treatment based on the severity of their injuries
- Treatment: The disaster medical services provided to victims
- Transport: The movement of victims from incident location to the treatment area
- Morgue: The temporary holding area for victims who have died at the treatment area. Those who are tagged as "Dead" during triage are not removed from the incident site.
- Supply: The hub for crucial supply procurement and distribution

Wherever you set up your medical treatment areas you need to remember that your safety is the number one priority. Stay away from unstable buildings.

APPENDIX I: START/JUMP START TRIAGE



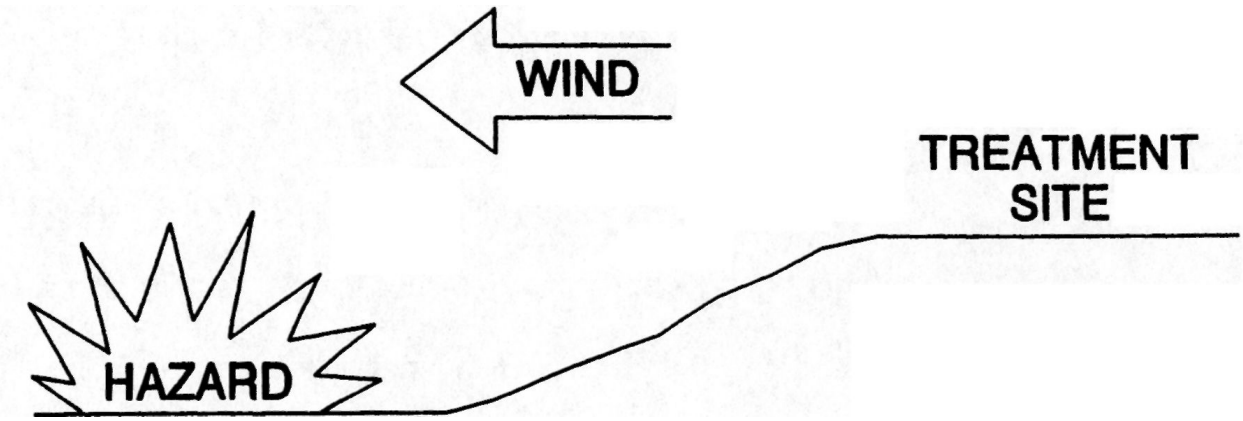
In addition to the severity of the damage to the structure where victims are found, there are other important safety considerations:

- The treatment area must be free of hazards and debris
- The site should be close to but uphill and upwind from the hazard zone.

If another treatment area is required make sure you keep it close to the main treatment area with all the same safety considerations. You should have each area (Immediate, Delayed, Minor and Morgue) set up the same as well.

If there are decentralized sites (multiple structures damaged) there should be a centralized treatment site established. This means the victims will be treated at the decentralized site and then moved if possible to the central location for extraction by a medical professional. EMS will be able to transport the injured more efficiently from one central location as opposed to multiple decentralized locations.

Always make sure your treatment site is expandable and accessible by transportation vehicles. This could be via ambulances, trucks, helicopters, etc.)



The treatment site should be uphill and upwind from the hazard

Treatment Area Layout

The treatment area must be protected and clearly marked. Signs should be used to identify the subdivisions of the area:

- I – Immediate Care
- D – Delayed Care
- M – Minor Injuries/Walking Wounded
- DEAD – Morgue

The "I" and "D" areas should be relatively close to each other to allow:

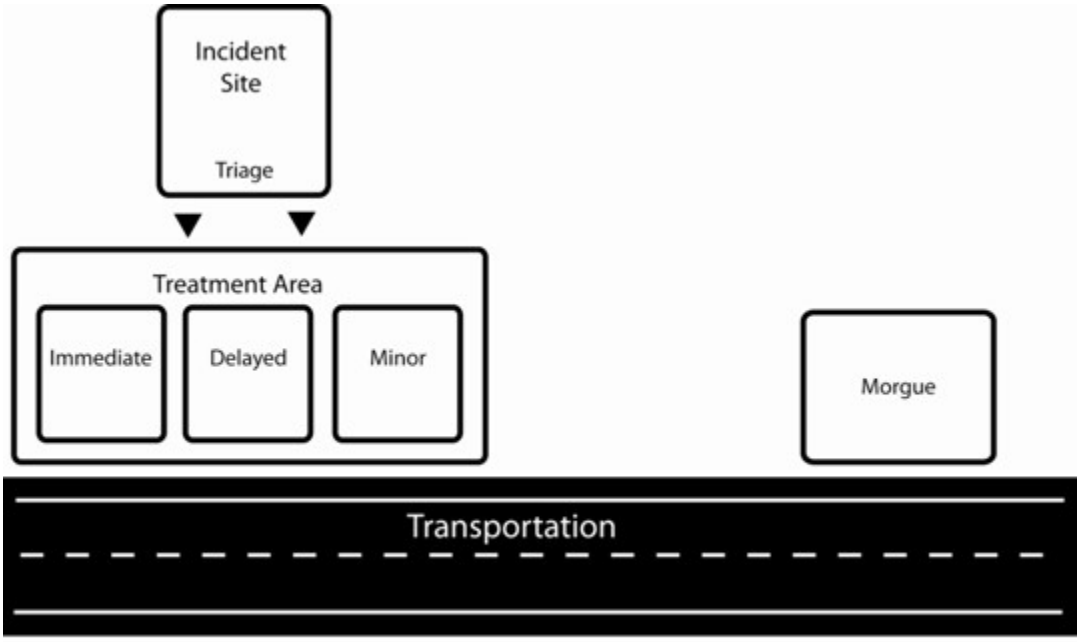
- Verbal communication between workers in the treatment areas
- Shared access to medical supplies which should be kept in a centralized location
- Easy transfer of patients whose status has changed

Victims who have been identified with minor injuries may choose to stay at the treatment area or leave. If they stay they can help assist. If they leave, it should be documented.

Patients in the treatment area should be positioned in a head-to-toe configuration, with 2-3 feet between victims. This will help provide:

- Effective use of space
- Effective use of available personnel. As you finish one head-to-toe assessment, you can turn around and you are at the head of the next patient.

The morgue site should be secure, away from and not visible from the treatment area. This will help minimize traffic near the area and reduce the potential psychological impact on those in the treatment area.



Treatment area layout, showing the organization for the incident site, triage, transportation, and morgue

Treatment Area Organization

It is very important to thoroughly document the victims in the treatment area, including:

- Name, address, and phone number if victim is able to talk
- Description (age, sex, body build, estimate height)
- Clothing
- Injuries
- Treatment
- Transfer location

Conducting Head-To-Toe Assessments

The objectives of a head-to-toe assessment are to:

- Determine, as clearly as possible, the extent of injuries
- Determine what type of treatment is needed
- Document injuries

Remember to always wear your personal protective equipment when conducting head-to-toe assessments.

What To Look For In Head-To-Toe Assessments

The medical community uses the acronym DCAP-BTLS to remember what to look for when conducting a rapid assessment. DCAP-BTLS stands for the following:

- Deformities
- Contusions (bruising)
- Abrasions
- Punctures
- Burns
- Tenderness
- Lacerations
- Swelling

Make sure you are looking at all parts of the body. Remember to provide IMMEDIATE treatment for life-threatening injuries.

You should pay careful attention to how people have been hurt (the mechanism of injury) because it provides insight to probably injuries suffered.

How To Conduct A Head-To-Toe Assessment

Whenever possible, ask the person about any injuries, pain, bleeding, or other symptoms. If the victim is conscious you should always ask permission to conduct the assessment. The victim has the right to refuse treatment. Talking with the conscious patient reduces anxiety.

Head-to-toe assessments should be:

- Conducted on all victims, even those who seem alright
- Verbal (If the patient is able to speak)
- Hands-on. Do not be afraid to remove clothing to look

It is very important you conduct head-to-toe assessments systematically. Doing so will make the procedure quicker and more accurate with each assessment. Remember to:

- Pay careful attention
- Look, listen, and feel for anything unusual
- Suspect a spinal injury in all unconscious victims and treat accordingly

Remember to check your own hands for patient bleeding as you perform the head-to-toe assessment.

Check body parts from the top to the bottom for continuity of bones and soft tissue injuries (DCAP-BLTS) in the following order:

1. Head
2. Neck
3. Shoulders
4. Chest
5. Arms
6. Abdomen
7. Pelvis
8. Legs

When conducting head-to-toe assessments always check for:

- PMS (Pulse, Movement, Sensation) in all extremities
- Medical ID emblems on bracelet or on neck chain

Closed-Head, Neck, and Spinal Injuries

A closed-head injury for the participants is a concussion-type injury, as opposed to a laceration, although lacerations can be an indication that the victim has suffered a closed-head injury.

The main objective when you come across suspected injuries to the head or spine is to **do no harm.** Minimize movement of the head and spine while treating any other life-threatening conditions.

The signs of a closed-head, neck, or spinal injury most often include:

- Change in consciousness
- Inability to move one or more body parts
- Severe pain or pressure in the head, neck, or back
- Tingling or numbness in extremities
- Difficulty breathing or seeing
- Heavy bleeding, bruising, or deformity of the head or spine

- Blood or fluid in the nose or ears
- Bruising behind the ear
- “Raccoon” eyes (bruising around eyes)
- “Uneven” pupils
- Seizures
- Nausea or vomiting
- Victim found under collapsed building material or heavy debris

If the victim is exhibiting any of these signs, he or she should be treated as having a closed-head, neck, or spinal injury.

Stabilizing the Head

In a disaster environment, ideal equipment is rarely available. You will need to be creative by:

- Looking for materials that can be used as a backboard – a door, desktop, building materials, etc.
- Looking for items that can be used to stabilize the head on the board – towels, draperies, or clothing – by tucking them snugly on either side of the head to immobilize it.

Remember: Moving victims with suspected head, neck, or spinal injury requires sufficient victim stabilization. If you or the victim is in immediate danger, however, safety is more important than any potential spinal injury and you should move the victim from the area as quickly as possible.

Treating Burns

The first step in treating burns is to conduct a thorough sizeup.

A few examples of burn-related sizeup questions to ask are:

- What caused the burn?
- Is the danger still present?
- When did the burning cease?

The objectives of first aid treatment for burns are to:

- Cool the burned area
- Cover with a sterile cloth to reduce the risk of infection (keeping fluids in and germs out)

Burns may be caused by heat, chemicals, electrical current, or radiation. The severity of a burn depends on the:

- Temperature of the burning agent

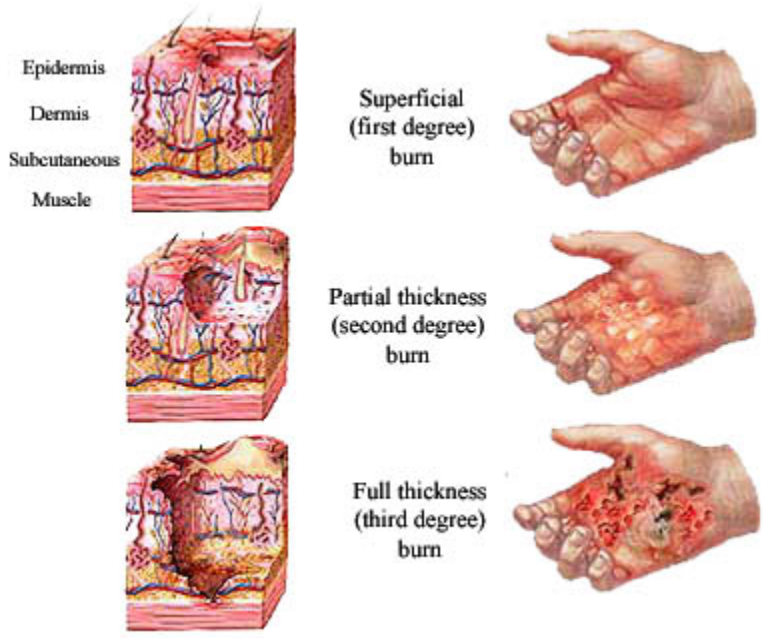
- Period of time that the victim was exposed
- Area of the body that was affected
- Size of the area burned
- Depth of the burn

Burn Classifications

The skin has three layers:

- The epidermis – The outer layer of skin. Contains nerve endings and is penetrated by hairs.
- The dermis – The middle layer of skin. Contains blood vessels, oil glands, hair follicles, and sweat glands.
- The subcutaneous layer – The innermost layer. Contains blood vessels and overlies the muscles.

Depending on the severity, burns may affect all three layers of skin.



Classification	Skin Layers Affected	Signs
Superficial	• Epidermis	• Reddened, dry skin • Pain • Swelling (possible)
Partial Thickness	• Epidermis • Partial destruction of dermis	• Reddened, blistered skin • Wet appearance • Pain • Swelling (possible)
Full Thickness	• Complete destruction of epidermis and dermis • Possible subcutaneous damage (destroys all layers of skin and some or all underlying structures)	• Whitened, leathery, or charred (brown or black) • Painful or relatively painless

List of Guidelines for Treating Burns

- Remove the victim from the burning source. Put out any flames and remove smoldering clothing unless it is stuck to the skin.
- Cool skin or clothing, if they are still hot, by immersing them in cool water for no more than 1 minute or covering with clean compresses that have been soaked in cool water and wrung out. Cooling sources include water from the bathroom or kitchen; garden hose; and soaked towels, sheets, or other cloths. Treat all victims of full thickness burns for shock.

  Infants, young children, and older persons, and persons with severe burns, are more susceptible to hypothermia. Therefore, you should use caution when applying cool dressings on such persons. A rule of thumb is do not cool more than 15% of the body surface area (the size of one arm) at once, to reduce the chance of hypothermia.

- Cover loosely with dry, sterile dressings to keep air out, reduce pain, and prevent infection.
- Wrap fingers and toes loosely and individually when treating severe burns to the hands and feet.
- Loosen clothing near the affected area. Remove jewelry if necessary, taking care to document what was removed, when, and to whom it was given.
- Elevate burned extremities higher than the heart.
- Do **NOT** use ice. Ice causes vessel constriction.
- Do **NOT** apply antiseptics, ointments, or other remedies.

- Do **NOT** remove shreds of tissue, break blisters, or remove adhered particles of clothing. (Cut burned-in clothing around the burn.)

General Guidelines for Treating Chemical Burns

Unlike more traditional burns, chemical burns do not result from extreme heat, and therefore treatment differs greatly.

Chemical burns are not always obvious. You should consider chemical burns as a possibility if the victim's skin is burning and there is no sign of a fire. If chemical burns are suspected:

1. Protect yourself from contact with the substance. Use your protective gear.
2. Ensure that any affected clothing or jewelry is removed
3. If the irritant is dry, gently brush away as much as possible. Always brush away from the eyes and away from the victim and you.
4. Use lots of cool running water to flush the chemical from the skin for 15 minutes. The running water will dilute the chemical fast enough to prevent the injury from getting worse.
5. Apply coo, wet compress to relieve pain.
6. Cover the wound very loosely with dry, sterile or clean cloth so that the cloth will not stick to the wound.
7. Treat for shock if appropriate.

Guidelines for Treating Inhalation Burns

Remember that 60% to 80% of fire fatalities are the result of smoke inhalation. Whenever fire and/or smoke is present, you should assess victims for signs and symptoms of smoke inhalation. These are indicators that an inhalation burn is present:

- Sudden loss of consciousness
- Evidence of respiratory distress or upper airway obstruction
- Soot around the mouth or nose
- Singed facial hair
- Burns around the face or neck

The patient may not present these signs and symptoms until hours (sometimes up to a full 24 hours) after the injury occurred, and such symptoms may be overlooked when treating more obvious signs of trauma.

Smoke inhalation is the number one fire-related cause of death. If you have reason to suspect smoke inhalation, be sure the airway is maintained and alert a medical professional as soon as possible.

Wound Care

The main treatment for wounds includes:

- Control bleeding
- Clean the wound
- Apply dressing and bandage

Cleaning and Bandaging Wounds

Wounds should be cleaned by irrigating with clean, room temperature water.

NEVER use hydrogen peroxide to irrigate the wound.

You should **NOT** scrub the wound. A bulb syringe is useful for irrigating wounds. In a disaster, a turkey baster may also be useful.

When the wound is thoroughly cleaned, you will need to apply a dressing and bandage to help keep it clean and control bleeding.

There is a difference between a dressing and a bandage:

- A dressing is applied directly to the wound. Whenever possible, a dressing should be sterile.
- A bandage holds the dressing in place

If a wound is still bleeding, the bandage should place enough pressure on the wound to help control bleeding without interfering with circulation.

Rules of Dressing

You should follow these rules:

1. If there is active bleeding (i.e., if the dressing is soaked with blood), redress over the existing dressing and maintain pressure and elevation to control bleeding.
2. In the absence of active bleeding, remove the dressings, flush the wound, and then check for signs of infection at least every 4 to 6 hours.

Signs of possible infection include:

- Swelling around the wound site
- Discoloration
- Discharge from the wound
- Red striations from the wound site

If necessary and based on reassessment and signs of infection, change the treatment priority (e.g., from Delayed to Immediate).

Amputations

The main treatments for an amputation (the traumatic severing of a limb or other body part) are to:

- Control bleeding
- Treat shock

When the severed body part can be located, you should:

- Save tissue parts, wrapped in clean material and placed in a plastic bag, if available. Label them with the date, time, and victim's name
- Keep the tissue parts cool, but NOT in direct contact with ice
- Keep the severed part with the victim

Impaled Objects

Sometimes, you may also encounter some victims who have foreign objects lodged in their bodies – usually as the result of flying debris during the disaster.

When a foreign object is impaled in a patient's body, you should:

- Immobilize the affected body part
- NOT attempt to move or remove the object, unless it is obstructing the airway
- Try to control bleeding at the entrance wound without placing undue pressure on the foreign object
- Clean and dress the wound making sure to stabilize the impaled object. Wrap bulky dressings around the object to keep it from moving.

Treating Fractures, Dislocations, Sprains, and Strains

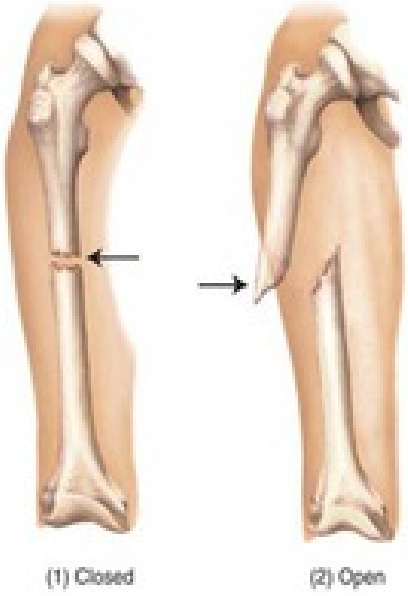
The objective when treating a suspected fracture, sprain, or strain is to immobilize the injury and the joints immediately above and below the injury site.

Because it is difficult to distinguish among fractures, sprains, or strains, if uncertain of the type of injury, you should treat the injury as a fracture.

Fractures

A fracture is a complete break, a chip, or a crack in a bone. There are several types of fractures.

- A closed fracture is a broken bone with no associated wound. First aid treatment for closed fractures may require only splinting.
- An open fracture is a broken bone with some kind of wound that allows contaminants to enter into or around the fracture site.



Treating an Open Fracture

Open fractures are more dangerous than closed fractures because they pose a significant risk of severe bleeding and infection. Therefore, they are a higher priority and need to be checked more frequently.

When treating an open fracture:

- Do **NOT** draw the exposed bone ends back into the tissue
- Do **NOT** irrigate the wound

You **SHOULD**:

- Cover the wound with a sterile dressing
- Splint the fracture without disturbing the wound
- Place a moist 4 by 4-inch dressing over the bone end to keep it from drying out

If the limb is angled, then there is a displaced fracture. Displaced fractures may be described by the degree of displacement of the bone fragments.

Non-displaced fractures are difficult to identify, with the main signs being pain and swelling. You should treat a suspected fracture as a fracture until professional treatment is available.

Dislocations

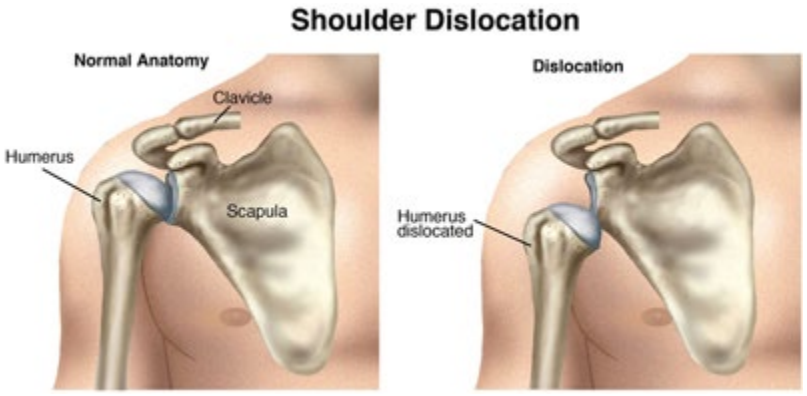
Dislocations are another common injury in emergencies.

A dislocation is an injury to the ligaments around a joint that is so severe that it permits a separation of the bone from its normal position in a joint.

The signs of a dislocation are similar to those of a fracture, and a suspected dislocation should be treated like a fracture.

If dislocation is suspected, be sure to assess PMS (Pulse, Movement, Sensation) in the affected limb before and after splinting/immobilization. If PMS is compromised, the patient's treatment priority is elevated to "I".

You should not try and relocate a suspected dislocation. You should immobilize the joint until professional medical help is available.



Sprains and Strains

A sprain involves a stretching or tearing of ligaments at a joint and is usually caused by stretching or extending the joint beyond its normal limits.

A sprain is considered a partial dislocation, although the bone either remains in place or is able to fall back into place after the injury.

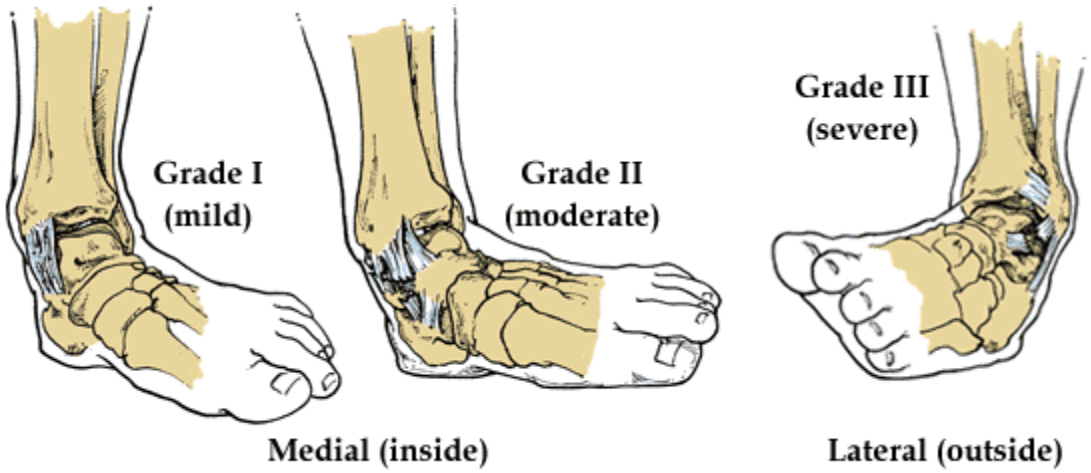
The most common signs of a sprain are:

- Tenderness at the site of the injury
- Swelling and/or bruising
- Restricted use or loss of use

The signs of a sprain are similar to those of a non-displaced fracture. Therefore, you should not try to treat the injury other than by immobilization and elevation.

A strain involves a stretching and/or tearing of muscles or tendons. Strains most often involve the muscles in the neck, back, thigh, or calf.

In some cases, strains may be difficult to distinguish from sprains or fractures. Whether an injury is a strain, sprain, or fracture, treat the injury as if it is a fracture.



Splinting

Splinting is the most common procedure for immobilizing an injury.

Cardboard is the material typically used for makeshift splints but a variety of materials can be used, including:

- Soft materials – towels, blankets, or pillows, tied with bandaging materials or soft cloths
- Rigid materials – a board, metal strip, folded magazine or newspaper, or other rigid items

Anatomical splints may also be created by securing a fractured bone to an adjacent unfractured bone. Anatomical splints are usually reserved for fingers and toes, but, in an emergency, legs may also be splinted together.

Soft materials should be used to fill the gap between the splinting material and the body part.

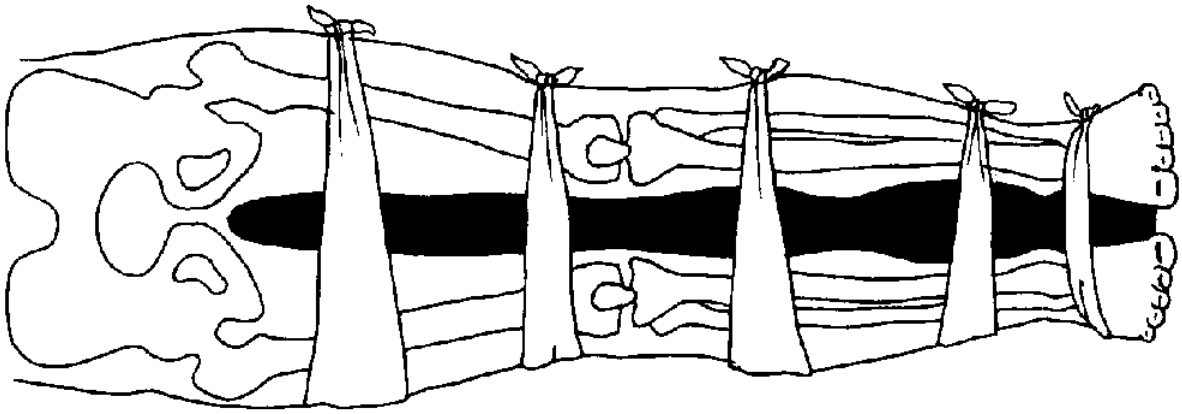
With this type of injury, there will be swelling. Remove restrictive clothing, shoes, and jewelry when necessary to prevent these items from acting as unintended tourniquets.

Cardboard Splint

Towel Splint

Pillow Splint

Anatomical Splint



Nasal Injuries

Bleeding from the nose can have several causes. Bleeding from the nose can be caused by:

- Blunt force to the nose
- Skull fracture
- Non-trauma-related conditions such as sinus infections, high blood pressure, and bleeding disorders

A large blood loss from a nosebleed can lead to shock. Actual blood loss may not be evident because the victim will swallow some amount of blood. Those who have swallowed large amounts of blood may become nauseated and vomit.

These are methods for controlling nasal bleeding:

- Pinch the nostrils together
- Put pressure on the upper lip just under the nose

While treating for nosebleeds, you should:

- Have the victim sit with the head slightly forward so that blood trickling down the throat will not be breathed into the lungs. Do not put the head back.
- Ensure the victim's airway remains open.
- Keep the victim quiet. Anxiety will increase blood flow.

Treating Cold-Related Injuries

Cold-related injuries include:

- Hypothermia - which is a condition that occurs when the body's temperature drops below normal

- Frostbite – occurs when extreme cold shuts down blood flow to extremities, causing tissue death.

Hypothermia

Hypothermia may be caused by exposure to cold air or water or by inadequate food combined with inadequate clothing and/or heat, especially in older people.

The primary signs and symptoms of hypothermia are:

- A body temperature of 95°F (37°C) or lower
- Redness or blueness of the skin
- Numbness accompanied by shivering

In later stages, hypothermia will be accompanied by:

- Slurred speech
- Unpredictable behavior
- Listlessness

Because hypothermia can set in within only a few minutes, you should treat victims who have been rescued from cold air or water environments.

- Remove wet clothing
- Wrap the victim in a blanket or sleeping bag and cover the head and neck
- Protect the victim against the weather
- Provide warm, sweet drinks and food to conscious victims. Do not offer alcohol.
- Do not attempt to use massage to warm affected body parts
- Place an unconscious victim in the recovery position:
    - Place the victim's arm that is nearest to you at a right angle against the ground, with the palm facing up.
    - Move the victim's other arm across his or her chest and neck, with the back of the victim's hand resting against his or her cheek
    - Grab a hold of the knee furthest from you and pull it up until the knee is bent and the foot is flat on the floor.
    - Pull the knee toward you and over the victim's body while holding the victim's hand in place against his or her cheek.
    - Position the victim's leg at a right angle against the floor so that the victim is lying on his or her side.
- If the victim is conscious, place him or her in a warm bath.

Do not allow the victim to walk around even when he or she appears to be fully recovered. If the victim must be moved outdoors, cover the victim's head and face.

Frostbite

A person's blood vessels constrict in cold weather in an effort to preserve body heat. In extreme cold, the body will further constrict blood vessels in the extremities in an effort to shunt blood toward the core organs (heart, lungs, intestines, etc.). The combination of inadequate circulation and extreme temperatures will cause tissue in these extremities to freeze, and in some cases, tissue death will result. Frostbite is most common in the hands, nose, ears, and feet.

There are several key signs and symptoms of frostbite:

- Skin discoloration (red, white, purple, black)
- Burning or tingling sensation, at times not localized to the injury site
- Partial or complete numbness

A patient suffering from frostbite must be warmed slowly! Thawing the frozen extremity too rapidly can cause chilled blood to flow to the heart, shocking and potentially stopping it.

- Immerse injured area in warm (NOT hot) water, approximately 107.6°F.
- Do NOT allow the body part to re-freeze as this will exacerbate the injury.
- Do NOT attempt to use massage to warm body parts.

Wrap affected body parts in dry, sterile dressing. Again, it is vital this task be completed carefully. Frostbite results in the formation of ice crystals in the tissue: rubbing could potentially cause a great deal of damage!

Treating Heat-Related Injuries

There are several types of heat-related injuries that you may encounter in a disaster scenario:

- Heat cramps are muscle spasms brought on by over-exertion in extreme heat.
- Heat exhaustion occurs when an individual exercises or works in extreme heat, resulting in loss of body fluids through heavy sweating. Blood flow to the skin increases, causing blood flow to decrease to the vital organs. This results in a mild form of shock.
- Heat stroke is life-threatening. The victim's temperature control system shuts down, and body temperature can rise so high that brain damage and death may result.

Heat Exhaustion

The symptoms of heat exhaustion are:

- Cool, moist, pale, or flushed skin
- Heavy sweating
- Headache
- Nausea or vomiting
- Dizziness
- Exhaustion

A patient suffering heat exhaustion will have a near normal body temperature. If left untreated, heat exhaustion will develop into heat stroke.

Heat Stroke

Heat stroke is characterized by some or all of the following symptoms:

- Hot, red skin
- Lack of perspiration
- Changes in consciousness
- Rapid, weak pulse and rapid, shallow breathing

In a heat stroke victim, body temperature can be very high – as high as 105°F. If an individual suffering from heat stroke is not treated, death can result.

Treatment

Treatment is similar for both heat exhaustion and heat stroke.

1. Take the victim out of the heat and place in a cool environment.
2. Cool the body slowly with cool, wet towels or sheets. If possible, put the victim in a cool bath.

3. Have the victim drink water, SLOWLY, at the rate of approximately half a glass of water every 15 minutes. Consuming too much water too quickly will cause nausea and vomiting in a victim of heat sickness.
4. If the victim is experiencing vomiting, cramping, or is losing consciousness, DO NOT administer food or drink. Alert a medical professional as soon as possible, and keep a close watch on the individual until professional help is available.

Bites and Stings

In a disaster environment, everything is shaken from normalcy, including insects and animals. In this time of chaos, insect bites and stings may be more common than is typical as these creatures, like people, are under additional stress.

When conducting a head-to-toe assessment, you should look for signs of insect bites and stings. The specific symptoms vary depending on the type of creature, but, generally, bites and stings will be accompanied by redness and itching, tingling or burning at the site of the injury, and often a welt on the skin at the site.

Treatment for insect bites and stings follows these steps:

1. Remove the stinger if still present by scraping the edge of a credit card or other stiff, straight-edged object across the stinger. Do not use tweezers; these may squeeze the venom sac and increase the amount of venom released.
2. Wash the site thoroughly with soap and water.
3. Place ice (wrapped in a washcloth) on the site of the sting for 10 minutes and then off for 10 minutes. Repeat this process.

You may help the victim take his or her own allergy medicine (Benadryl, etc.), but you may NOT dispense medications.

Bites and Stings and Allergic Reactions

The greatest concern with any insect bite or sting is a severe allergic reaction, or anaphylaxis. Anaphylaxis occurs when an allergic reaction becomes so severe the airway is compromised. If you suspect anaphylaxis:

1. Check airway and breathing.
2. Calm the individual.
3. Remove constrictive clothing and jewelry as the body often swells in response to the allergen.
4. If possible, find and help administer a victim's Epi-pen. May severe allergy sufferers carry one at all times.
    a. DO NOT administer medicine aside from the Epi-pen. This includes pain relievers, allergy medicine, etc.

5. Watch for signs of shock and treat appropriately.

Unit Summary

To safeguard public health, take measures to maintain proper hygiene and sanitation, and purify water if necessary. All public health measures should be planned in advance and practiced during exercises.

Disaster medical operations include five functions:

- Triage
- Treatment
- Transport
- Morgue
- Supply

Treatment areas must be established as soon as casualties are confirmed. Treatment areas should be:

- In a safe area that is close to, but uphill, upwind, and, if possible, upstream from the hazard area
- Accessible by transportation vehicles
- Expandable

Depending on the circumstances, you may establish a central medical treatment location and/or treatment locations at incident sites where many victims have been injured.

Head-to-toe assessments should be verbal and hands-on. Always conduct head-to-toe assessments in the same way – beginning with the head and moving toward the feet. If injuries to the head, neck, or spine are suspected, the main objective is to not cause additional injury. Use in-line stabilization and backboard if the victim must be moved.

Burns are classified as superficial, partial thickness, or full thickness depending on severity and the depth of skin layers involved. Treatment for burns involves removing the source of the burn, cooling the burn, and covering it. For full thickness burns, always treat for shock.

The main first aid treatment for wounds consists of:

- Controlling bleeding
- Cleaning
- Dressing and bandaging

In the absence of active bleeding, dressings must be removed and the wound checked for infection at least every 4 to 6 hours. If there is active bleeding, a new dressing should be placed over the existing dressing.

Fractures, dislocations, sprains, and strains may have similar signs. Treat all suspected fractures, sprains, and strains by immobilizing the affected area using a splint.

The key to treatment of cold-related injuries such as hypothermia and frostbite is to warm the victim slowly.

Anaphylaxis is the most critical concern when an insect bite is suspected. Know how to use an Epi-pen and make sure to monitor the victim's airway until professional help arrives.