

Student Manual

BLS

CPR

AED

First Aid

First Aid Standards guidelines

All courses meet or exceed the Federal Regulations of the following codes:
29 CFR 1910.151 ; 37 FR 5504 ; 29 CFR 1910.1030

<http://www.osha.gov/Publications/OSHA3317first-aid.pdf>

(OSHA) Occupational Safety and Health Association

Bloodborne Pathogens Guidelines

<http://www.osha.gov/Publications/osh3186.pdf>

(FDA) Food and Drug Association

Review guidelines for Emergency Oxygen

<http://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfcfr/CFRSearch.cfm?fr=201.161>

AED guidelines by State Legislation

<http://www.ncsl.org/default.aspx?tabid=14506>

Dept. of Homeland Security

Stop the Bleed

<https://www.dhs.gov/stopthebleed>

(ILCOR) International Liaison Committee on Resuscitation

<http://www.ilcor.org>

2015 AHA and ARC Guidelines for First Aid

(DOT) Department of Transportation

<https://search.usa.gov/search?query=oxygen&affiliate=usdot>

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Acting as a First Responder

Most injuries and illnesses are minor. These incidents normally involve a person who is breathing. An illness or accident becomes life-threatening when the event affects the amount of oxygen required by the body's tissues and organs.



Good Samaritan Laws



Legal doctrines that protect a rescuer who has voluntarily helped a person in distress from being successfully sued for "wrongdoing". The laws vary by jurisdiction, yet all 50 states have some type of Good Samaritan law.

Activating Emergency Medical Services

Getting EMS to the scene quickly is a fundamental responsibility of a responder. Activate EMS when a person has:

- Chest Pain
- Drug Overdose
- Heart Attack
- Heat Stroke
- Puncture Wounds
- Poisoning
- Serious Burns
- Bleeding That Will Not Stop
- Unequal Pupil Size
- Sudden Slurred Speech
- Injuries to the Hands or Face
- Sudden Blindness
- Problems with Movement or Sensation
- Vomiting Blood or Persistent Vomiting
- Broken Bone via an Open Wound



Universal Precautions

The actual risk of contracting a disease when providing first aid is minimal. It is prudent to protect yourself with personal protection equipment (PPE) such as face masks, gloves, gowns, foot protection and eye masks. PPE should be worn by an individual during events where bodily fluids are present to protect against exposure to bloodborne pathogens.





“Think” First First? AID AID?

First

First, verify scene safety. You cannot help the person if you become injured. Before approaching a person be aware of the dangers that you may face. Call out “HELP” to get the attention of bystanders.

A

Activate 911 ~ If no one responds to your call for help, call 911 yourself. If possible, place the phone at the side of the person, with the speaker on.

I

Inform the person you are trained in First Aid and obtain consent ~ ask, if you can help. A conscious person has the right to refuse or accept care. If the person is unconscious, consent is implied or assumed.

D

Don personal protection ~ Provide a barrier between you and potential infections. However minimal the risk of contamination, assume that all blood and bodily fluids are infected.



Is this scene safe? Could there be a shooter or electric dangers?

Assessment of the Person

After ensuring the scene is safe, caring for the person is divided into two stages; **Primary and Secondary Survey**. The Primary Survey deals with immediate life-threatening situations. The Secondary Survey involves physical exams and medical history to detect non immediate life-threatening injuries and illnesses.

TRIAGE

*If more than one person is injured, quickly perform a primary survey on each person. Give lifesaving care first. The secondary care assessment should **ONLY** be completed **AFTER** the primary survey.*

Primary Survey Life-Threatening

- Check Responsiveness
- Check Breathing
- Check for Severe Wounds
- Check for Shock

Secondary Survey Non Life-Threatening

A few examples:

- Minor Burns or Injuries
- Sprains, Strains or Broken bones
- Coughs, Colds and Sore Throats

Choreographed Team for Increased Success

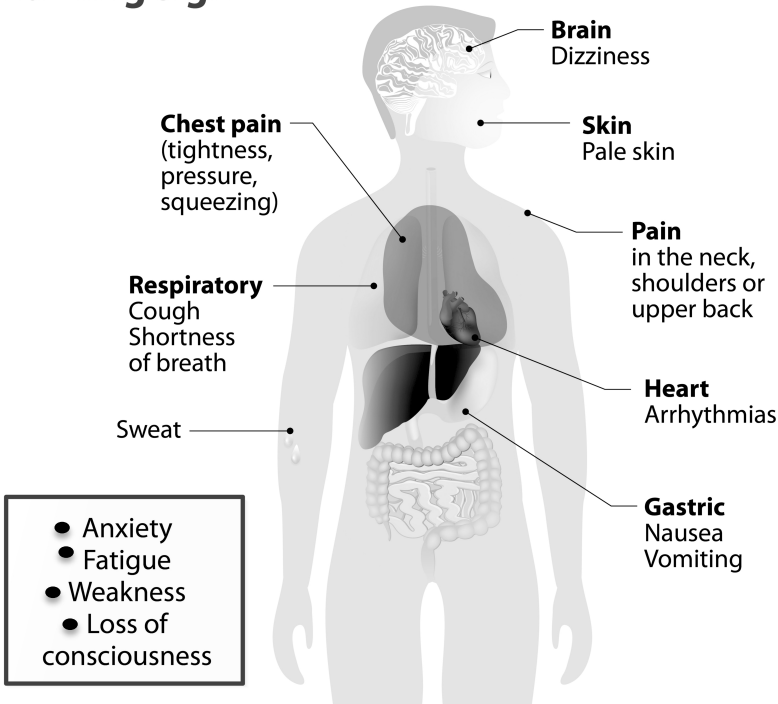
Ideally, more than 1 person will come to your call for help. Working together will increase the likelihood of a successful outcome and minimize interruptions in chest compressions when performing CPR.

Assign Team Tasks:

- Call 911
- Meet and Direct EMS
- Get the AED
- Monitor chest compression depth and rate
- Switch with the Compressor when fatigued



HEART ATTACK warning sign



Risk Factors for Heart Disease

Changeable conditions

- High blood pressure
- High cholesterol
- Diabetes

Changeable behaviors

- Smoking
- Unhealthy diet
- Obesity
- Physical inactivity
- Too much alcohol

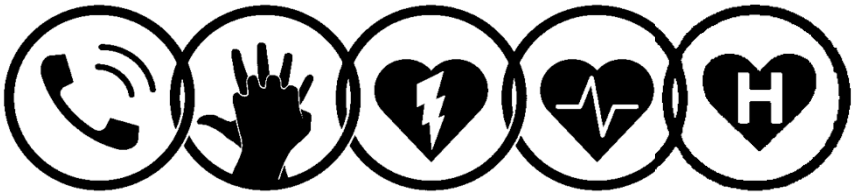
Unchangeable factors

- Older age
- Family history of heart disease

Chain of Survival

The chain of survival gives you the most successful approach to resuscitation outcome. The first three links are conducted by you, the lay responder.

Chain of Survival



Early
Access

Early
CPR

Early
Defibrillation

Early
Advanced Care

Early
Post Resuscitative
Care

CPR – Cardiopulmonary Resuscitation

CPR is a lifesaving technique used when a person's breathing has stopped.

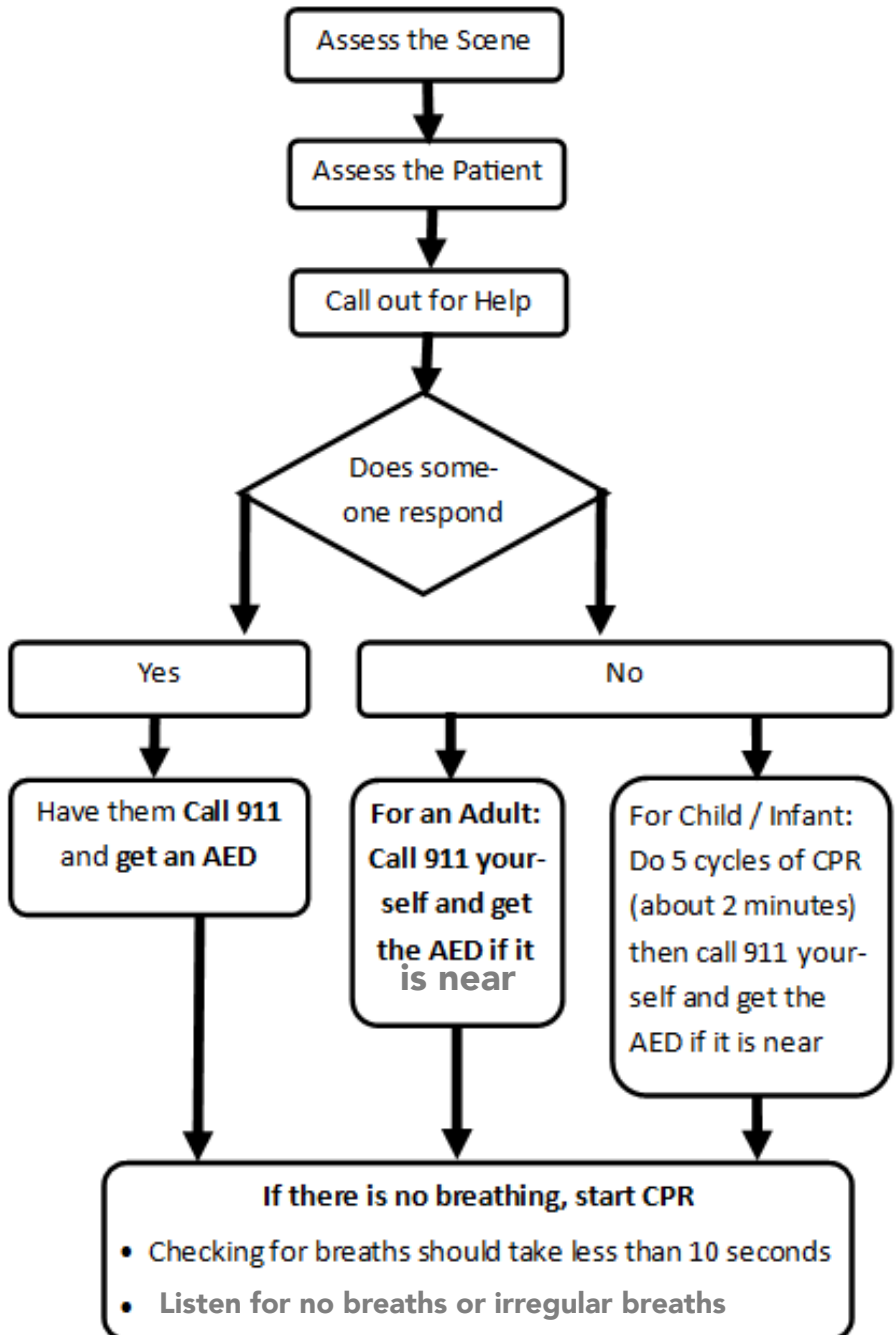
The American Heart Association states that everyone is to begin CPR with chest compressions. If you are not sure if they are breathing, they probably are not.



When to Start CPR

Start CPR when an Adult, Child, or Infant does not respond and is not breathing normally. Normal breathing has regular chest rise and exhaled air is CLEARLY evident. Gasping occasionally occurs and is not normal or regular. Gasping may also sound like snorting, snoring and gurgling, which is not normal.

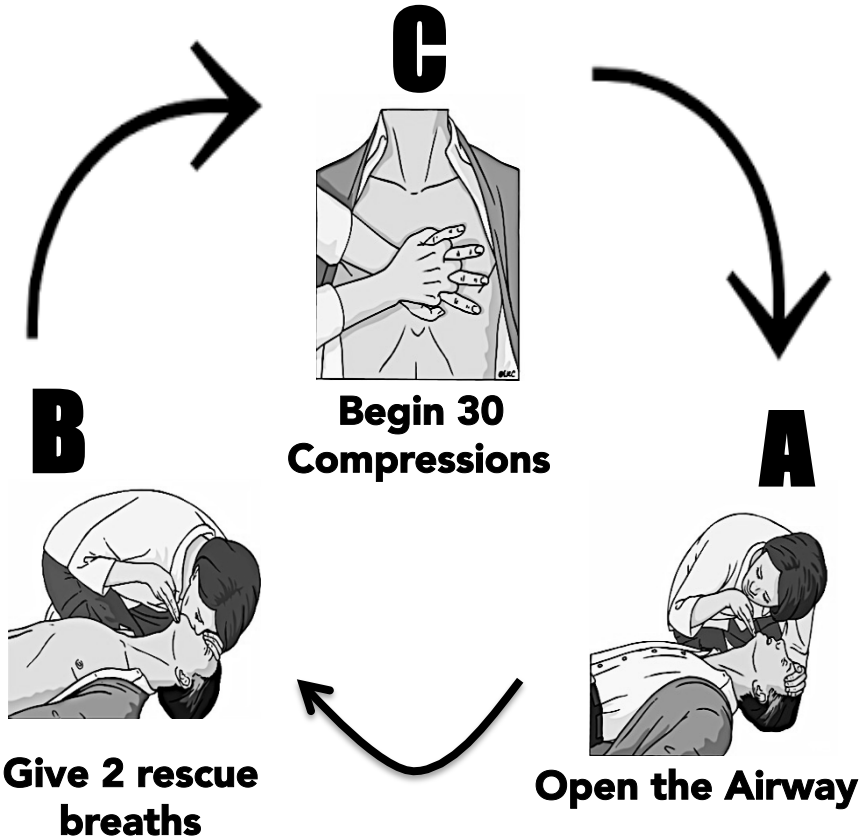
- **Adult CPR - At the onset of puberty**
- **Child CPR - Age 1 to the onset of puberty**
- **Infant CPR - Under the age of one**



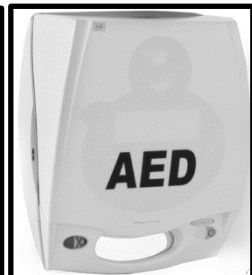
CPR Cycle for All Ages

If you can't wake a person and aren't sure if they are breathing, they probably are not - Start CPR.

Start CPR use C - A - B



When an AED arrives, turn it on and follow the voice prompts. Minimize interruptions during CPR compressions.



COMPRESSIONS

C

Use the heel of your hand, in the center of the chest on the lower half of the breastbone. Place your other hand on top of the first. Keep fingertips up, off the ribs; and shoulders over wrists.

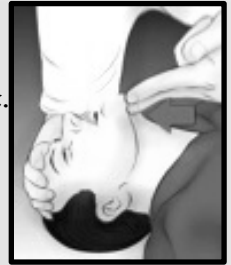
- **PUSH HARD – PUSH FAST!**
- Perform 30 Compressions.
- 100-120 compressions per minute.
- Compress at least 2 inches but not more than 2.4 inches.
- Allow for full chest recoil.
- Avoid leaning on chest.
- Minimize interruptions in chest compression.



AIRWAY

A

- Open the Airway.
- Perform a head-tilt / chin lift.
- Place your palm on the forehead.
- Place the fingertips of your other hand on the bony part of the chin to lift the tongue.



BREATHS

B

- Pinch the nose closed.
- Place your lips around the person's mouth to make a good seal.
- Give 2 normal breaths, one second each. Look for the chest to rise
- If the first breath does not go in, re-tilt the head and try again.
- Go back to chest compressions if the second breath is not successful.



C

COMPRESSIONS

Use one hand. Place the heel of your hand in the center of the chest, on the lower half of the breastbone. Position your shoulder directly over your wrist.

- **PUSH HARD - PUSH FAST.**
- Perform 30 Compressions.
- Compress 1/3 to 1/2 the anterior-posterior diameter of the chest, approximately 2 inches.
- 100-120 compressions per minute.
- Allow full chest recoil between compressions.
- Avoid leaning on chest.



A

**AIRWAY**

- Open the Airway.
- Perform a head-tilt / chin lift.
- Place your palm on the forehead.
- Place the fingertips of your other hand on the bony part of the chin to lift the tongue.

BREATHS

- Pinch the nose closed.
- Place your lips around their mouth to make a good seal.
- Give 2 normal breaths.
- 1 Second. Each.
- Look for the chest to rise.
- If the first breath does not go in, re-tilt the head and try again.
- Go back to chest compressions if the second breath is not successful.



B

COMPRESSIONS

C

Place two or three fingers of one hand vertically at the nipple line, in the center of the chest.



- **PUSH HARD – PUSH FAST.**
- Perform 30 Compressions.
- Compress about 1/3 the anterior-posterior diameter of the chest, approximately 1.5" inches.
- 100-120 beats a minute.
- Allow full chest recoil between each compression.

AIRWAY

A



- Open the Airway.
- Place your palm on the forehead.
- Place the fingertips of your other hand on the bony part of the chin.
- Tilt back to a "sniff" position.
- Avoid hyper-extension.

BREATHS

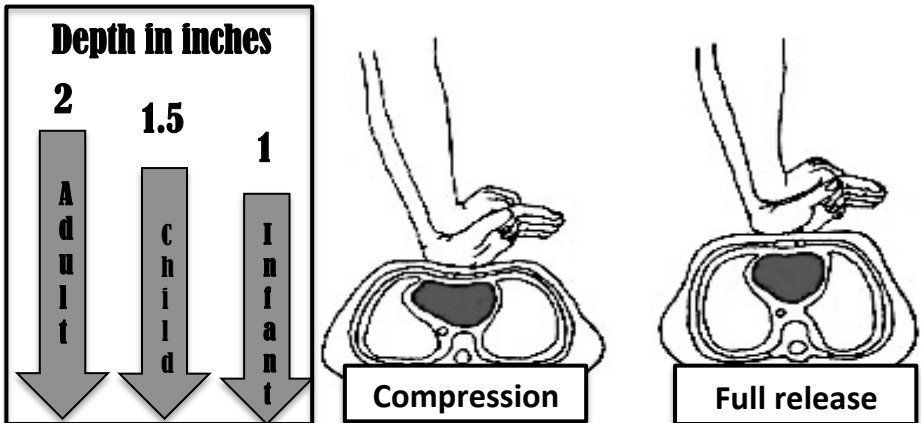
B

- Cover the baby's mouth and nose with your mouth, making a good seal.
- Give 2 puffs of breath, about the amount you can hold in your cheeks.
- Each puff will take one second.
- Watch for the chest to rise. If it does not rise, re-position and try again.
- Go back to Compressions after two attempts.



Quality CPR

Research shows that if high-quality chest compressions are started right away, and an AED is used, the likelihood of survival increases dramatically. Remember to avoid excessive breaths, count compressions out loud and switch compressors at the end of each cycle or when fatigued.



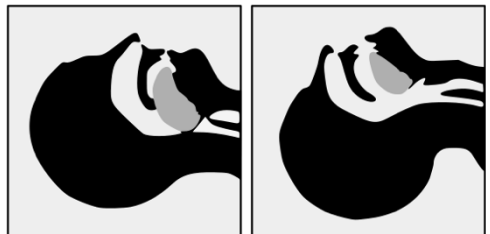
- **Avoid excessive ventilations**
- **Count compressions aloud**
- **When fatigued, switch compressors at the cycle's end**

Continue CPR Until

- The person shows signs of responsiveness
- Someone else takes over
- You are too exhausted to continue

Head Tilt-Chin Lift

The head tilt-chin lift is used to open the airway. This movement allows the tongue to lift off of the throat.



If for any reason a rescuer is unable to perform rescue breathing or a person is not trained in CPR, compression-only CPR can be used. However, it is recommended to have CPR and AED training to give the best chance of a person recovering.



NOTE: At some point during prolonged CPR, supplementary oxygen and rescue breaths are necessary.

Emotional Response by Rescuers

Performing CPR or using an AED is stressful and can cause emotional trauma. Each individual will have a different response but the event could cause post-traumatic stress, a disorder in which a person has difficulty recovering after experiencing or witnessing a terrifying event. This stress is present whether the person's life was saved or not saved.

Exposure to an extreme situation can cause:

- Anxiety
- Rapid breathing
- Sweating
- Reliving the event
- Self-doubt
- Depression

Your reaction is normal!

- Discuss your reactions with other people.
- Maintain normal activities.
- Return to normal employment or routine as soon as possible.
- Exercise your body.
- Be patient, time is important.



Recovery Position

If the person starts breathing normally, and is unresponsive. Use the Recovery Position to maintain an open airway and frequently assess breathing.

Other medical conditions that may benefit from the recovery position are strokes, seizures, drug or alcohol overdose.

Contraindications for placing a person in the recovery position include head, neck or spine injury. In those cases the person should remain in the position found.



1

Extend the arm that is closest to you at a 45 degree at the shoulder



2

Position the other arm across the chest, with the back of their hand against their cheek

Hand under chin to keep airway open



3

Grasp the farthest leg at the knee and pull up so it is bent with the foot on the ground. Pull from the shoulder and leg towards you



Leg bent to support position

Arm bent to prevent rolling over

The final position

Don't move an injured person unless there is a life-threatening situation and the person must be moved away from the danger. Use extreme caution to reduce the risk of injuring the person further.

Automated External Defibrillation 14

AED's are the 3rd step in the AHA chain of survival because they are the only effective treatment for Sudden Cardiac Arrest. For each minute without the use of an AED, the persons chance of survival decreases by 7 to 10%.



The only treatment for v-fib is defibrillation, so use an AED as soon as possible. The AED essentially makes the decisions and directs the rescuer's efforts. Stay calm and follow the directions given by the prompts. AEDs are easy to use and require minimal training.

AEDs have many common features, which will help coach a person using an AED but they do vary by manufacturer. Become familiar with the type of AED in your facility.

Most AEDs have:

- Power button
- Shock button
- Battery status indicator
- A simple drawing indicating pad placement
- Visual/audio prompts which guide the user through the CPR & AED steps

AEDs also have common voice prompts. Some are:

- ◆ Analyzing Rhythm
- ◆ Charging
- ◆ Stand Clear
- ◆ Do Not Touch the Patient
- ◆ Press the Shock Button
- ◆ Shock Delivered
- ◆ Start CPR

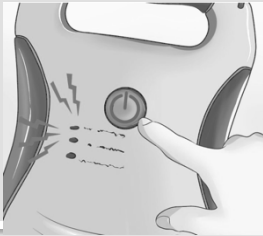


AED for Adult and Child (over age 8 and 55 LBS)

If you are alone, call 911 first and then start CPR, unless the person is a child, infant or suffering from asphyxia. In those cases, perform 5 cycles of CPR and then get the AED yourself. Otherwise, use the AED as soon as it is available.

Turn the on the AED.
Listen for the voice prompts from the AED.

1



Attach the pads to the person's dry, bare chest.

2



The AED will analyze the heart rhythm. Stand clear and do not touch the patient.

3



"Shock Advised"
"Do Not Touch"
"Stand Clear!" "Press the shock button".

4

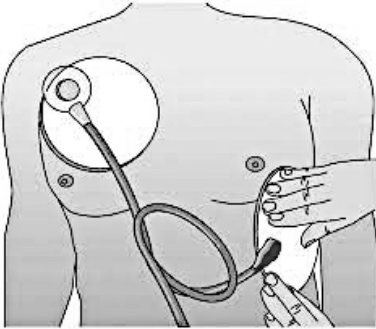


The AED will tell you when the shock has been delivered and that it is safe to touch the person.

The electrodes and the AED remain on. Most AEDs will prompt responders through CPR. The AED will advise when to stop CPR so that the AED can analyze the rhythm again, and if needed, deliver another shock.

Leave the AED On

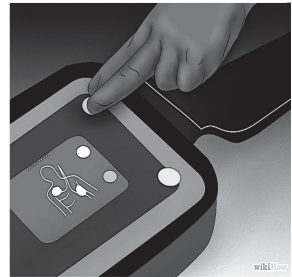
- Place the AED near the person's head and turn it on.
- Provide CPR until the AED states "Stand Clear".
- Minimize interruptions during chest compressions.
- Follow the voice prompts.



- Ensure that the adhesive AED pads are attached to a cable and are plugged into the AED.
- Remove the self-adhesive backing and attach electrodes to the person's bare chest.
- Attach the electrodes firmly to the skin.
- The AED will analyze and prompt, "Do Not Touch".

• The AED will say "Shock Advised, Press the Shock Button".

- Be sure no one is touching the person.
- Call out "Clear, everyone stay clear!".
- Push the Shock Button.
- Do not remove the electrode pads for CPR.
- Immediately resume CPR, starting with compressions.



- Continue CPR unless the person is responsive or EMS arrives and assumes care.
- The AED will continue to analyze every two minutes and will state again, "Stand Clear, Analyzing Rhythm".
- Do not remove the pads if the person becomes responsive. Leave them on until EMS arrives.
- If the voice prompt states: "No Shock Advised" check for normal breathing and continue to monitor the person until EMS arrives.

Certain circumstances require caution. To ensure that the AED & pads work effectively, check the following:

Water

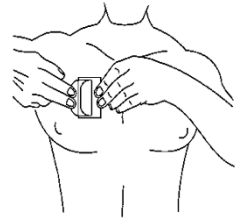
If the person is in water move them before defibrillation. A shock delivered in water could harm responders or bystanders. Dry the chest off quickly water may interfere with pad adhesion. The chest does not have to be completely dry.

Medical / Nitroglycerin Patch

Small round or square patches that deliver medication through the skin should be removed. Use caution when removing medication patches, use gloves or a piece of cloth to avoid contact with the medication.

Internal Pacemakers

Feel like a small lump the size of a cell phone battery. Place the pad least one inch away from implanted devices.

**Chest Hair**

Excessive amounts of hair may interfere with good pad adhesion. AEDs have kits with razors to remove hair where the pads need to be placed, or remove the pads, ripping out the hair and replace with a new set of pads.

Jewelry and Body Piercings

You do not need to remove jewelry and body piercings when using an AED. Leaving them on the person will do no harm. However, do not place the AED pads directly over metallic jewelry or body piercings. Adjust AED pads if necessary.

Metal Surfaces

It is safe to use an AED when they are lying on a metal surface, such as bleachers. However, care should be taken so that the electrode pads do not contact the conductive metal surface and that no one is touching the person when the shock button is pressed.

The most common cause of cardiac arrest in infants and young children is respiratory failure (asphyxia), which is an extremely insufficient supply of oxygen to the body. Some causes are drowning, choking, asthma and viral or bacterial infection, such as the flu. It is essential to quickly restore that oxygen. Because the most likely cause of cardiac arrest in infants and children is asphyxia, the CPR/AED algorithm will be slightly modified for the lone rescuer. If there are two rescuers, the algorithm remains the same: one should start CPR immediately, and the other should activate the emergency response system (911) and obtain an AED, if one is available.



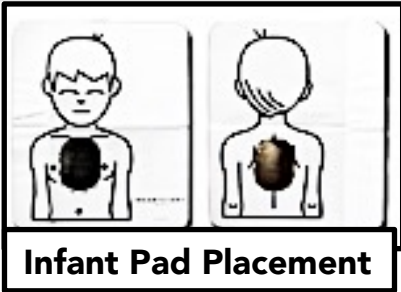
Do 5 cycles of CPR, about 2 minutes, then call 911 yourself and get an AED if it is near.

Ages one to the onset of puberty, the rescuer should use a pediatric dose-attenuator system if one is available. If one is not available, the rescuer should use a standard AED.

For **infants up to one year old**, a manual defibrillator is preferred. If it is not available, use an AED with pediatric dose attenuation. If neither are available, use an AED without a dose attenuator.

Pad Placement for Pediatrics

Pad placement for a child can be the same as an adult, but make sure the pads are not touching. If the pads risk touching each other on a child, place one pad in the middle of the chest, and the other pad on the middle of the back between the shoulder blades.



If two trained responders are present, one should perform CPR while the second responder operates the AED.

AED Maintenance and Medical Direction

AEDs save lives and are easy to use. However, to ensure your AED is ready when needed the AEDs must be maintained, follow the manufacturer's guidelines. Many companies use an outside source to handle the inspections, maintenance and medical direction for their AED. Common guidelines of most AEDs are:

- Attain medical direction for your AED. Many states require a physician, a prescription and notification of the AED location to EMS facilities.
- Are the batteries and pads expired? Inspect your AEDs pads, batteries and supplies on a regular schedule, as set by the AED manufacturer.
- Maintain records of all the inspections, expiration dates and actions taken with each AED.
- Do the batteries have enough energy for a full charge?
- Are the other accessories, such as razor and gloves, in the case?
- Are there any indications of equipment failure? Is the warning light on? Is the machine beeping? If at any time the machine fails to work properly or warning indicators are recognized, stop using the AED and contact the manufacturer immediately.
- Are there staff trained in CPR and AED?
- Is there an established protocol listed in the policy and procedure manual?
- Do you have a plan for post-event data including, AED function and replacement of parts?



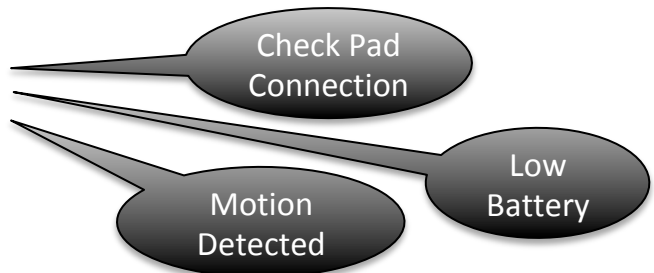
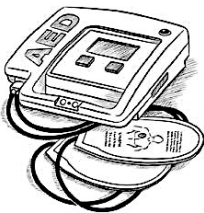
AEDs are able to read the heart rhythm of the person. They will NOT shock someone who is not in cardiac arrest.

AEDs can document the cardiac event for about 15 to 30 minutes. This information can be downloaded so physicians can review the ECG data. Consult your AED service provider, the AED manual or call the AED manufacturer for assistance.

AED Troubleshooting

AEDs will let you know if a specific issue needs attention. **STAY CALM** and follow the voice prompts of the AED.

| | |
|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Check Pad Connection | Look at the picture diagram and make sure the pads are placed correctly. Press the pads firmly against the chest. If the prompt continues, apply a new set of pads. |
| Motion Detected | CPR must stop. |
| Low Battery | If the AED states "low battery" and continues to give voice prompts, the battery life is at its end but will continue to give at least one shock. Send someone to get another AED if available. If another battery is available, after the first shock and CPR is in progress, switch the battery . |
| Plug in Cable | Ensure that the electrode cable is properly plugged into the machine. Switch pads if prompt continues. |



Choking occurs when a foreign object becomes lodged in the throat or windpipe, blocking the flow of air. Because choking cuts off oxygen to the brain, it can result in unconsciousness and cardiopulmonary arrest.

Signs and symptoms of choking include:

- Clutching the throat.
- Coughing, wheezing or gagging.
- Difficulty speaking.
- Making strange sounds a whistling or 'crowing' noise.
- Unable to make sound.
- Face, neck, lips, ears or fingernails turning blue.



If you observe a "conscious" adult or child choking:

- Ask the person, "Are you choking?"
- If they are coughing, talking, or breathing **DO NOT INTERFERE.**



If they cannot speak or cough, initiate 911

- Provide abdominal thrust. Make a fist and place it slightly above the navel, thumb side inward.
- Grasp the fist with the other hand. Press hard into the abdomen with a quick upward thrust.
- Continue uninterrupted until the object is relieved, the person becomes unconscious, or EMS arrives.

Unconscious Choking: If a choking adult becomes unresponsive while you are doing abdominal thrusts, activate 911 if not yet initiated.

Start CPR – with compressions.

- Ease the person to the floor.
- The only difference is that each time you open the airway – look for the obstructed object before giving each breath. Remove the object if you see it. No blind finger sweeps.



If Alone and Choking: Call 911 before performing self-administered abdominal thrusts. If unable to speak, tap 3 times, pause and repeat. This is the “SOS” distress signal for help to arrive.



Make a fist and place the thumb side against your abdomen, slightly above the navel. Grasp your fist with the other hand. Bend over something that is

waist high, forcefully push up on your abdomen. Repeat until air is forced out or the object is expelled.

Pregnant or Obese:

If you are unable to wrap your arms around the person. Position your hands higher at the base of the breastbone, just above the joining of the lowest ribs.

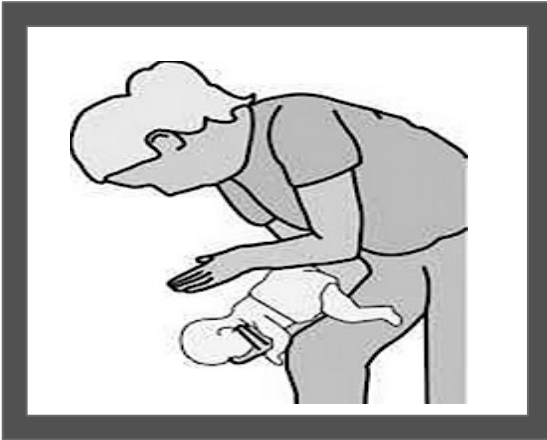


Choking - Infants

Choking in infants is usually caused by breathing in a small object such as a button, coin, balloon, toy part or watch battery that the infant has placed in their mouth. This may cause a complete or partial blockage of the airway.

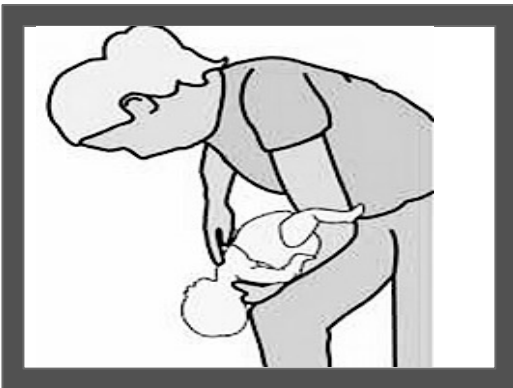
A complete blockage is a medical emergency. A partial blockage can become life-threatening if the baby cannot get enough air.

- **DO NOT** interfere if the infant is coughing hard or crying.
- If they cannot cry or cough, initiate 911.
- Continue until obstruction is relieved, the infant becomes unconscious or more advanced medical personnel take over.



Hold the infant face-down on your forearm, with your arm resting on your thigh; the infant's head should be lower than their heart. Support the head and neck.

Give 5 firm back blows between the body's shoulder blades with the heel of your hand.



Gently turn the infant face-up on your forearm. **Using 2 fingers placed** at the center of the infant's breast, give five quick compressions, about 1- 1/2 inches in depth.

If the child becomes unresponsive, or stops breathing **start CPR**. Notify your doctor after a child has been choking, even if the object has been successfully removed.

Severe bleeding is the leading cause of traumatic deaths. If the person is breathing, controlling the blood flow is the next step. Identify signs of **“life-threatening” bleeding**. Open or remove clothing if necessary to see the wound. Look for:

- blood that is squirting out of the wound.
- blood that won't stop coming out of the wound .
- blood that is pooling on the ground.
- clothing that is soaked with blood.
- bandages that are soaked with blood.
- loss of all or part of an arm or leg.
- bleeding in a person who is now confused or unconscious.

A

Alert

Call 911
or tell someone call 911



B

Bleeding

Find the
bleeding injury



C

Compressions

Apply pressure to stop
the bleeding, either
directly or with a
tourniquet



First Use Direct Pressure:

- Apply direct pressure.
- Use gloves if available.
- Cover the wound with a clean cloth and apply continuous pressure.
- Use two hands if at all possible in a fairly forceful manner, with elbows locked similar to CPR.
- Do not release pressure.
- Hold pressure until relieved by medical responders.



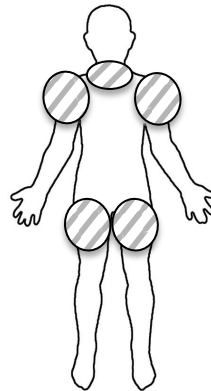
Arm and Leg

Severe wounds to the arm and leg can be controlled by **direct pressure, wound packing or a tourniquet.**



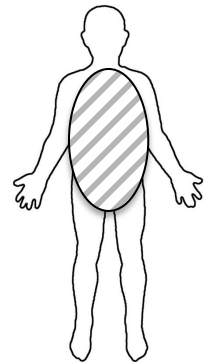
Torso

Severe Torso Junctional Wounds: neck, shoulder, and groin can be controlled by **direct pressure and wound packing.**



Chest and Abdominal

Chest and abdominal injuries - front, back, or side, usually caused by internal bleeding **CANNOT be stopped** outside the hospital, they must be identified to EMS providers when they arrive for rapid transport to the hospital.



When using a commercial pressure bandage, place the hard embedded piece over the point of bleeding.

All commercial pressure bandages will have a structure that allows you to reverse the wrap, do this piece tightly to place more pressure on the wound.

Wrap the elastic bandage tightly over the pressure bar to force more pressure.

Commercial bandages will have a clipping closure device at the end of the wrap. Check the wrap frequently to ensure bleeding remains controlled.

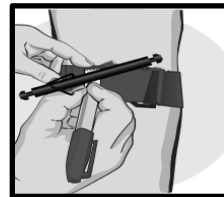
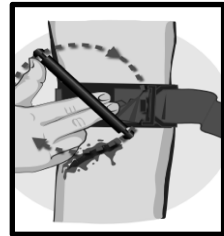
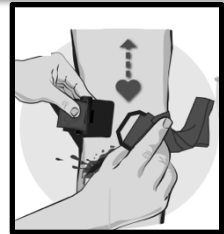
Tourniquets

Windlass Tourniquet

For a windlass tourniquet, place injured extremity through the loop and tighten the tourniquet above the injury, closer to the torso. Tighten the Velcro strap as tight as possible. Be sure to remove all slack before securing.

Twist the windlass until blood flow stops, typically 2 – 3 twists. If it is more than that, double-check the tightness of the Velcro strap.

Lock the windlass rod in place in the windlass clip. Secure rod and band with TIME strap. Note the time the tourniquet was applied.



Makeshift Tourniquet

If a commercial tourniquet is not an option, apply strong pressure with your hands, or use available materials like a T-shirt or towel. The makeshift tourniquet should be:

~ Broad ~ Flexible ~ Strong ~ Able to be twisted tightened and secured.

Wrap Tourniquet



- Place the wrap tourniquet above the wound.
- Overlap the first turn of the tourniquet.
- Pull tight enough that the shape of the diamonds becomes squares, and ovals become circles.
- On the final wrap, place fingers under the wrap to provide a space to tuck the tail of the tourniquet.

Tourniquets HURT when applied effectively. Do not remove, even if the person complains of pain

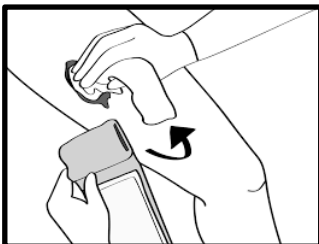
Common Tourniquet Mistakes

- Not using a second tourniquet, if needed.
- Not using a tourniquet or waiting too long to apply a tourniquet.
- Removing a tourniquet.
- Loosening the tourniquet to allow blood flow.
- Not making the tourniquet tight enough.

Wound Packing and Clotting Agents



Clotting of the wound can be assisted with Hemostatic dressings, powders and sprays. Hemostatic dressings are materials that help cause the blood to clot.



Packing a large deep wound will help with your manual pressure. Stuff gaping wounds with dressings, and if possible combine with clotting agents.

- Have the person sit down if they feel weak.
- Thoroughly irrigate and clean the area with soap and water to remove any dirt or debris, which lowers risk of infection.
- Apply light pressure with sterile gauze to help with clotting.
- Bleeding should stop after 5 - 8 minutes.
- Apply antibiotic cream if there are no known allergies.
- If the wound is from a bite, or if the wound was dirty make sure the person has had a tetanus shot.
- See a physician if the wound becomes swollen, irritated, red or turns warm. The wound may be infected.

Are Stitches Needed ?

- ✓ Wounds that are more than 0.25 inches deep, have jagged edges, or that gape open.
- ✓ Deep wounds over a joint, especially if the wound opens when the joint is moved or if pulling the edges of the wound apart shows fat, muscle, bone, or joint structures.
- ✓ Deep wounds on the hands or fingers.
- ✓ Wounds on the face, or any area where you are worried about scarring (for cosmetic reasons).
- ✓ If it continues to bleed after 15 minutes of direct pressure.



Wounds – Puncture Wounds

Puncture wounds don't usually cause excessive bleeding, but can be dangerous because of the risk of infection.

- **Stop the bleeding** with direct pressure.
- **Clean** with clear water and soap.
- **Apply an antibiotic.**
- **Cover the wound.**
- **Watch for signs of infection.**
- See a doctor if the wound doesn't heal or if it has redness, drainage, warmth, or swelling.



Wounds - Impaled Objects

Do not remove the object, as this will cause further damage.



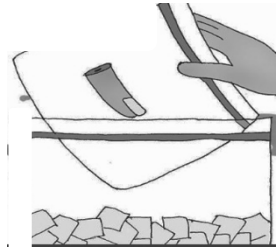
Treating an Impaled Object:

- DO NOT remove the object.
- Call 911.
- If the person must be moved, shorten the length of the object if possible.
- Stabilize the object with bandaging supplies or other support to limit further damage to surrounding tissues.

Wounds - Amputations

By responding quickly to an amputation, there is a good chance that the severed body part can be reattached.

- Call 911.
- Control bleeding by using direct pressure on the wound.
- Wrap and bandage the wound to prevent infection.
- If bleeding is significant, give care to minimize the risk of shock.
- Wrap the severed body part in sterile gauze or a clean cloth.
- Place the severed body part in a plastic bag, put on ice but do not freeze.
- Bring the body part to the hospital.



Wounds – Internal Bleeding

Call 911 if you suspect internal bleeding, signs may include:

- Bleeding from body cavities: the ears, nose or rectum.
- Vomiting or coughing up blood.
- Bruising on the neck, chest, abdomen or sides.
- Wounds that have penetrated the skull, chest or abdomen.
- Abdominal tenderness.
- Fractures.
- The person going into shock.



- Lean slightly forward.
- Pinch nostrils for 10 minutes.
- To prevent re-bleeding after bleeding has stopped, don't pick or blow the nose. Don't bend down until several hours after the bleeding episode.

Dental Injuries

If your tooth is knocked out, there is a good chance it can be successfully implanted. See a dentist and follow the first aid for an avulsed tooth.

- Clean bleeding wounds with saline solution or tap water.
- Stop bleeding by applying pressure with gauze or cotton.
- Handle the tooth by the crown, not the root.
- Try to replace your tooth in the socket. If it doesn't go all the way into place, bite down slowly and gently on gauze or a moistened tea bag to help keep it in place.
- Place the tooth in milk, or clean water if the tooth won't go into the mouth socket.
- Take the person and their tooth to a dentist quickly.

Ear Injuries

The ear can be injured a number of different way; from a slap to the ear, a cotton swab, or a severe blow. Minor wounds will follow the treatment for minor wounds.

Seek medical attention if:

- Skin is split open, deep, gaping or longer than 1/2 inch it may need stitches.
- Upper part of the ear is very swollen.
- Pointed object was put into the ear canal.
- Clear fluid is draining from the ear canal.
- Walking is not steady.
- There is hearing loss.
- Caused by an animal or human bite.

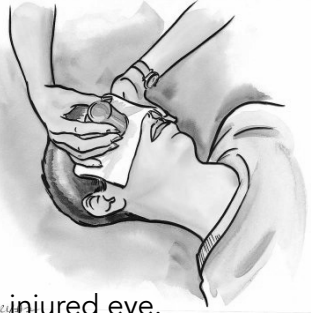


Small objects / specks in the eye:

- Do not rub your eye.
- Lift the upper lid over the lower and allow the lower lashes to brush the grit off the inside of the upper lid.
- Blink a few times and let the eye move the particle out.
- If it remains in the eye flush the eye with water or use an eye bath.
- Roll the eye around as it may help move the speck out.
- If the speck remains, keep your eye closed and seek medical help.

For an object embedded in the eye:

- Do not attempt to remove an object embedded in the eye.
- Protect the eye from further damage by stabilizing a long protruding object with clean dressings. For smaller protrusions, place a paper cup over the eye and secure in place with clean bandages.
- Bandage loosely with no pressure on the injured eye.
- Cover both eyes to limit movement, as the eyes move together.



Open Chest Injuries

Closed chest injuries result from a blunt force and usually damages the ribs. The person may have shallow breathing or sharp pain while breathing, coughing, or pressing on the injury. Have the person sit in a position most comfortable for them, support the area with a pillow, rolled blanket, or other soft material. Contact 911 and continue to monitor the person.

Open chest wounds typically occur from a penetration such as an impaled stick or gunshot wound to the chest and possibly lungs. This injury can cause a hole that pulls air into the chest cavity.

To treat a open chest wound:

- Follow the mnemonic A.I.D.
- Remove clothing.
- Leave an open chest wound exposed to ambient air without a dressing or seal. If one is applied, make sure that saturation of the dressing does not lead to partial or complete occlusion.
- Treat for Shock.
- Look for an entry and exit wound, treat the larger wound.



Surviving a gunshot wound depends on how quickly the person gets to a hospital. Ideally, a person should be in an ambulance within 10 minutes of being shot.

Treatment steps for gunshot wounds typically follow the same guidelines as severe bleeding.

- Apply direct pressure, using force.
- If the person is not breathing, begin CPR.
- If another bystander is available instruct them to use direct pressure on the wounds.
- If the penetration or exit wound is large, pack the wound.
- If the injury is on an arm or leg, use a tourniquet. If the person is conscious, they may sit or lie in a position most comfortable for them.
- If they are unconscious, they should be placed in the recovery position.
- Look for an exit wound and treat.
- If there is an open chest wound, follow the procedures listed on the previous page.



RUN – HIDE – FIGHT

The U.S. department of Homeland Security recommends the following responses when there is an active shooter.

RUN - Escape, have an escape route and plan in mind • leave your belongings behind.

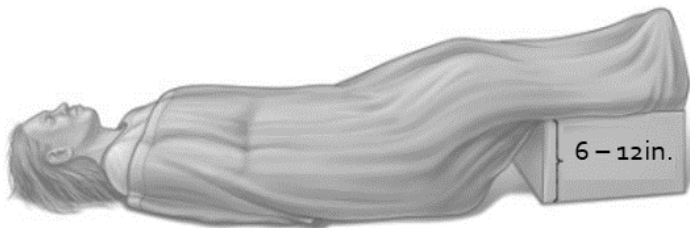
HIDE - Hide in an area out of the shooter's view • Block entry to your hiding place and lock the doors • Silence your cell phone or things that may create a noise.

FIGHT - As a last resort and only when your life is in imminent danger • Attempt to incapacitate the shooter • Act with physical aggression and throw items at the active shooter.

Shock may result from any traumatic injury or traumatic illness. When a person is in shock their organs are not getting enough blood or oxygen, which if untreated, can lead to permanent organ damage or death.

Signs and symptoms of a person experiencing shock:

- **The skin is cool and clammy.** It may appear pale or gray.
- **The pulse is weak and rapid.** Blood pressure is below normal.
- **Breathing** may be slow and shallow, or hyperventilation (rapid or deep breathing) may occur. Person may be anxious.
- **The person may be nauseated.** He or she may vomit.
- **The eyes lack luster and may seem to stare.** Sometimes the pupils are dilated.
- **The person may be conscious or unconscious.** If conscious, the person may feel faint or be very weak or confused.



Treatment for Shock:

- Have the person lie down on his or her back.
- Call 911.
- Keep the person warm and comfortable.
- Cover the person with a blanket.
- Raise feet 6"-12", provided the person has not suffered neck or back injury.
- Administer emergency oxygen.

After ensuring the scene is safe and there is no Primary Injury, which are injuries and illnesses that are immediately life-threatening, proceed to the Secondary Care Assessment.

Primary Care Assessment

- ✓ Responsiveness.
- ✓ Breathing and cardio function.
- ✓ Serious bleeding management.
- ✓ Shock management.
- ✓ Spinal injury management.



The primary survey should be conducted in the position found, if possible.



If more than one person is injured, perform a primary survey on each person in turn. Give life-saving first aid only.

If the person is without an immediate life-threatening situation, and if there are no other injured persons: Perform a SAMPLE history

Secondary Care Assessment

- ✓ Injury assessment
- ✓ Illness assessment
- ✓ Bandaging
- ✓ Splinting for dislocations and fractures

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- Signs and symptoms
- Allergies
- Medications
- Past medical history
- Last oral intake
- Events leading to emergency

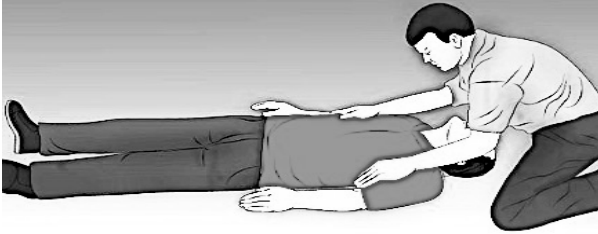
Protect Possible Neck or Spine Injuries

Do not move a person with potential neck or spine injuries unless their environment is life-threatening. Due to displaced pain, a person may not realize the neck is injured and they may attempt to move and get up, which can further complicate things. Therefore, it is imperative that upon arriving on scene, someone stabilizes the spine by placing their palms on either side of the person's head and wrapping their fingers around the chin and neck of the person. If conscious, the person must be told to not attempt to move. Rolled clothing may also be used to stabilize the head.

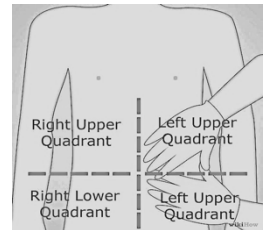


DO NOT move a person with a possible spinal injury!

Falls, car or bicycle accidents, impact to the head or something heavy falling on the head can indicate spinal or neck damage.



- Look at and feel the injured person's head and face. Note any abrasions, bruising, or fluids in the nose or ears, or depressions of the skull.
- Are the pupils of equal size? Do the eyes follow movement?
- Is skin color and temperature normal?
- Look at and feel the neck for any bruising or deformity.
- Look at and feel the shoulders, chest and collarbone. Note any asymmetries.
- If no spinal injury is suspected, slide your hand carefully under the injured person and feel the back and spine for any pain, bleeding or irregularities.
- Press on both of the protruding bones in the pelvis and see if there is any pain or deformity.
- Palpate the 4 quadrants of the abdomen. Check for tenderness, swelling, and lumps. Listen for abnormal sounds, such as gurgling.
- Ask the injured person to move his or her arms, legs, toes and fingers to check for full range of motion.
- Look and feel along the injured person's arms and legs for any bruising or deformity.
- Check the pulse and scratch both hands and feet and ask the injured person if he or she can feel the sensation.



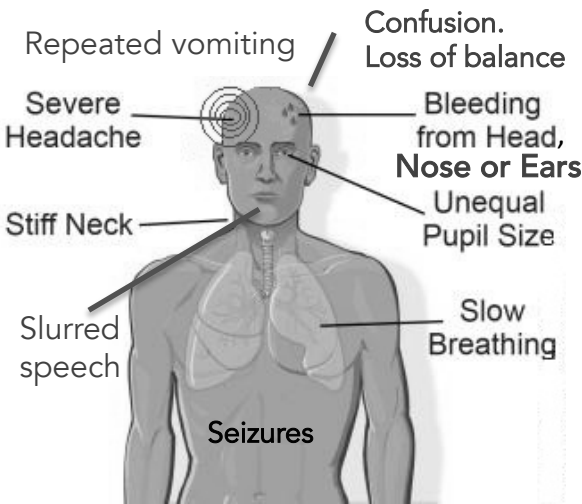
Most head trauma involves injuries that are minor and don't require hospitalization. However, call 911 if severe head trauma occurs.

Keep the person still, lying down and quiet with the head and shoulders slightly elevated until medical help arrives. Don't move the person unless necessary. Avoid moving the person's neck.

Stop any bleeding. Apply firm pressure to the wound with sterile gauze or a clean cloth. But don't apply direct pressure to the wound if you suspect a skull fracture.

Watch for changes in breathing and alertness. If the person shows no signs of circulation (breathing, coughing, or movement) begin CPR.

Get emergency help for:



For large head injuries, wrap a sterile gauze bandage around the head, "sweatband" style. Circle the head at least three times to keep the dressing underneath in place. Cut and use adhesive tape to attach the ends or tie them with a firm knot.

Heart Attack

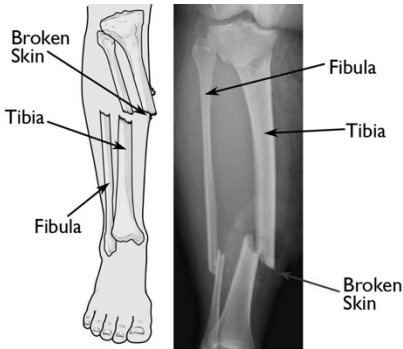
Heart Attacks usually occur when a blood clot blocks the flow of blood through a coronary artery. Interrupted blood flow to the heart can damage or destroy a part of the heart muscle. If enough of the muscle is damaged, sudden cardiac arrest (SCA) can occur.

Your overall lifestyle — what you eat, how often you exercise, and the way you deal with stress — plays a role in your recovery from a heart attack. Help prevent a heart attack by controlling risk factors that contribute to the narrowing of the arteries to your heart.

It is difficult to distinguish between sprains, strains or breaks. Often an x-ray or MRI is needed for a full diagnosis. However, since all of these injuries are treated the same way by a first-aid responder, a diagnosis is not required. The goal of treatment is to prevent further damage to the surrounding tissues and to limit pain. The symptoms are mild to severe pain, stiffness, swelling and / or bruising.

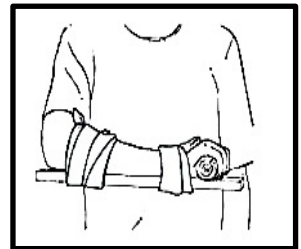
To treat:

1. Check to see if the injury caused an open wound. If so, follow the treatments learned in wound care. There are two types of fractures, open and closed.



1. Closed fractures are those in which the skin is intact.
2. Open fractures involve wounds with mild or severe bleeding. If bleeding, stop the bleeding by applying pressure to the wound with a sterile bandage or a clean cloth.

2. Stabilize the injured area. Ask the person not to move the injured extremity. Do not move or try to straighten an injured extremity. Place support materials around the injury, such as rolled clothing or blankets, to help buttress the injured site.



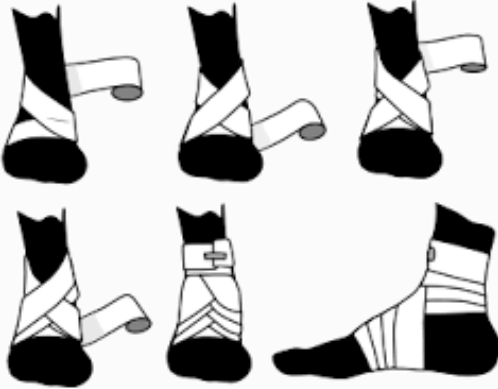
3. Ice for 20 minutes, then remove the ice for 20 minutes. Continue this pattern. Never put ice directly against the skin as it may cause damage. Use a thin cloth as barrier to protect the skin.



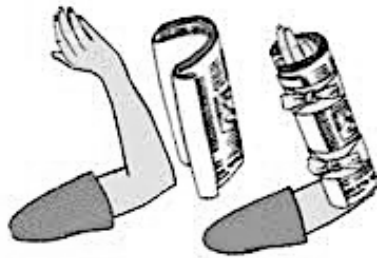
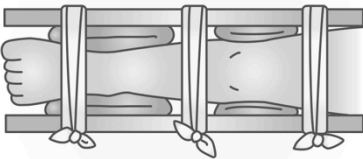
Immobilize the injured area in the position it was found. Splint the injured area ONLY if the person must be moved.

The figure-eight bandage is good to use around joint areas such as ankles, fingers, elbows and knees.

“Buddy” taping works good for fingers and toes.



A soft pillow or magazine can supply stability to an injured site.



Sling: If the person must be moved and an arm has been broken, a sling can also be made from a scarf, a torn shirt or a blanket hung from the neck.



Common causes of burns include:

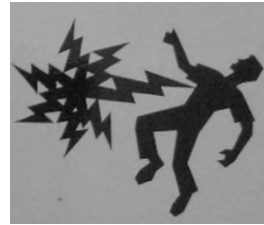
Thermal burns can be caused by flames, contact with a hot object, liquids, or steam. Basically any exposure to heat that damages the skin. This can cause first, second and third degree burns.



Chemical burns by strong acids, alkalis, or other corrosive materials. Reactions can be localized or affect the whole body.



Electrical burns can cause injury to the skin or internal organs. They occur when contact is made with exposure to an electric current. Electrical burns may look minor, but there may be internal damage.



Degrees of burns include:

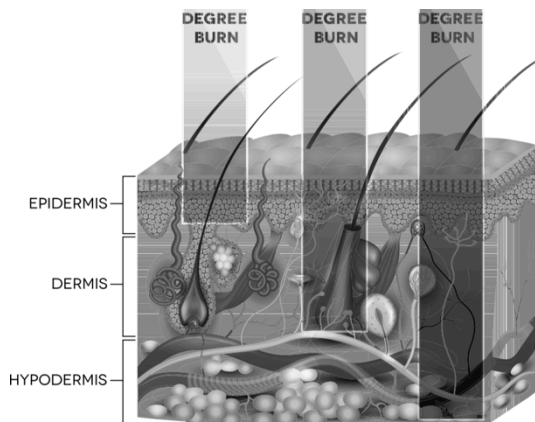
First degree burn: Affects only the outer layer of skin. The skin is usually red with swelling and pain sometimes is present.

Second degree burn: (Partial thickness) Affects the first and second layer of skin. Blisters develop and the skin takes on an intensely reddened, splotchy appearance. These burns produce severe pain and swelling.

Third degree burn:

Involves deep layers of the skin and causes permanent tissue damage. Fat, muscle and even bone may be affected.

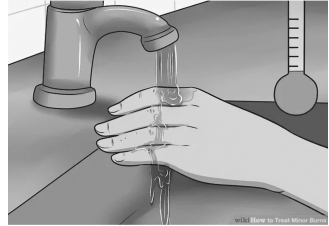
Areas may be charred black or appear dry and white.



Most first degree burns and small second degree burns can be cared for without medical intervention. The exception is if the minor burn covers a substantial portion of the hands, feet, face, groin or a major joint, or second degree burns larger than 3 inches in diameter.

- **Follow the mnemonic A.I.D.**

- **Cool the burn.** Hold the burned area under cold running water until the pain subsides, typically 10 - 20 minutes. If this is impractical, immerse the burn in cool water or cool it with cold compresses.



- **Do not pop blisters.**

- **Remove jewelry.**

- **Cover the burn with a sterile gauze bandage.** After cooling, wrap the gauze loosely to avoid putting pressure on burned skin. Bandaging keeps air off the burn, reduces pain, and protects blistered skin. If fingers or toes are affected, place sterile gauze pads between digits.

Treatment for Advanced Burns

Third degree and large second degree burns need immediate care. Especially if they are on the face, hands, feet or groin.

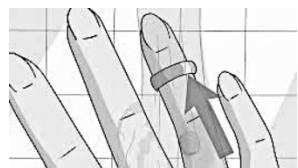
- **Follow the mnemonic A.I.D.**

- Make sure the person is no longer in contact with smoldering materials or exposed to smoke.

- **Cool the burn.** Hold the burned area under cold running water until the pain subsides, typically 10 to 20 minutes. If this is impractical, immerse the burn in cool water or cool it with cold compresses.

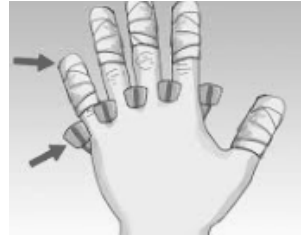
- **Remove jewelry** that is near the injury.

- **Loosely cover blisters** with a sterile dressing leaving blisters intact.



Remove Jewelry

- **Monitor for hypothermia** when cooling large burns. Look for signs such as shivering.
- **Cover the area of the burn** with a loose sterile dressing. Place gauze pads in-between fingers and toes so the skin does not touch.
- **Treat for shock and continue to monitor the person.**

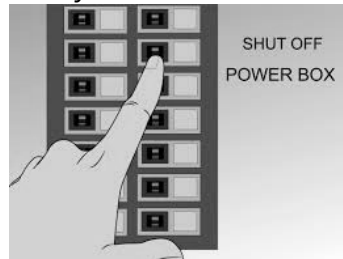


Electrical Burns

An electrical burn may appear minor or not show on the skin at all, but damage can extend deep into the tissues beneath the skin. If a strong electrical current passes through the body internal damage, such as cardiac arrest or respiratory arrest, can occur. Electrical burns can cause thermal burns, which may be present at the entry and exit site as well as the pathway. Sometimes the jolt associated with the electrical burn can cause you to be thrown or to fall, resulting in fractures or injuries.

Treatment:

- **Follow the mnemonic A.I.D.**
- **Look first. Don't touch.** A person may still be in contact with the electrical source.
- **Turn off the source of electricity if possible.** All materials conduct electricity when the voltage is high enough. If you can not turn off the power source, wait for 911.
- **Check for signs of circulation** (breathing, coughing, or movement). If absent, begin CPR immediately.
- **Look for entry and exit wounds.** Broken bones from a jolt are also possible.
- **Internal damage** to the organs is possible. Always seek medical attention with an electrical burn.
- **Cover the affected areas** with a sterile gauze bandage.
- **Treat for shock.**



If a chemical burns the skin, follow these steps:

- Remove the cause of the burn by first brushing any remaining dry chemical (use a gloved hand or brush).
- Rinse the chemical off the skin surface with cool, gentle running water for 20 minutes or more.
- Remove clothing and jewelry that has been contaminated by the chemical.
- Wrap the burned area loosely with a dry, sterile dressing or a clean cloth.
- Rewash the burned area for several more minutes if the person still has burning after the initial washing.

Seek emergency medical assistance if:

- The person shows signs of shock, such as fainting, pale complexion or breathing in a notably shallow manner.
- The chemical burn penetrated through the first layer of skin, and the resulting second degree burn covers an area more than 3 inches in diameter.
- The chemical burn occurred on the eye, hands, feet, face, groin, buttocks or over a major joint.

Chemical Burn to the Eyes:



- Immediately flush your eye with water. Use clean, lukewarm tap water for at least 20 minutes.
- Rinse contaminated eye downward so fluids flow away from the other eye.
- Don't rub the eye.
- Remove contact lenses. If they don't come out during the flush, then take them out.
- Know the name of the chemical.

Respiratory burns occur from inhaling air at over 300 degrees. Some signs of burn will be singed nasal hair, facial burns, blood stained sputum or difficulty breathing. If you suspect respiratory burns immediately get medical help.



Signs and symptoms of a stroke include:

- Sudden weakness or numbness in your face, arm, or leg on one side of your body.
- Sudden dimness, blurring or loss of vision.
- Loss of speech, trouble talking or understanding speech.
- Sudden, severe headache with no apparent cause.
- Unexplained dizziness or loss of coordination.
- Unsteadiness or a sudden fall, especially if accompanied by any of the other signs or symptoms.



If any 1 of these 3 signs is abnormal probability of stroke is 72%

Treatment for Stroke

- Call 911.
- Document the time of the symptom onset.
- If breathing and circulation are present, place the person on their affected side.
- Administer emergency oxygen and monitor breathing.

Unchangeable Risk Factors

- Increasing age
- Males have a greater risk than women
- Heredity, family history of stroke
- African-Americans tend to have a higher risk than other racial groups

Changeable Risk Factors

- High blood cholesterol
- High blood pressure
- Lack of physical activity
- Obesity/ Diabetes
- Stress
- Heart disease
- Tobacco smoking

Seizures occur when the brain's electrical activity becomes abnormal. Some seizures are hardly noticed while others cause the person to jerk violently for several minutes. Seizures can be caused by epilepsy, high fever, infections, brain injury or other illnesses.

Signs and Symptoms

- Twitching of limbs, shaking body or convulsions.
- Abnormal eye movements.
- Unusual smells, tastes, or feelings.
- Unusual breathing pattern.
- Clenched jaw.
- Feeling confused.
- Headaches.



When to Call 911:

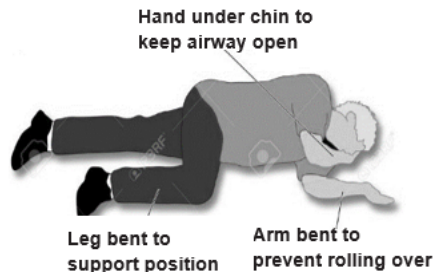
- Seizure greater than 5 minutes.
- The person is non-responsive for more than 5 minutes.
- The person is injured.
- The person is pregnant.
- It is the person's first seizure.

Treatment during the Seizure

- Always stay with the person until the seizure is over.
- Stay calm, most seizures only last a few minutes.
- Prevent injury by moving objects out of the way.
- Do not forcibly hold the person down.
- Do not put anything in the person's mouth.
- Try to protect the head.
- Do not give water, pills, or food until the person is fully recovered.

Treatment after the Seizure

- Remove tight clothing.
- Position the person in the recovery position.
- Do not restrain the person.
- Stay with the person until they're fully recovered or EMS arrives.



Cause: **Fainting** is a low supply of blood to the brain, usually caused by a drop in blood pressure causing a momentary loss of consciousness.

- Loosen/remove tight clothing.
- Assure open airway.
- Have the person lie down on their back and raise the legs.
- Ensure plenty of fresh air.
- If possible, ease the person's fall.
- After a few minutes, if unresponsive, call 911.

Diabetic Emergencies

Diabetic Emergencies occur when there is too much or too little sugar in the person's blood. Interview the person if you are not sure if they are diabetic. Also look for medical ID tags.

If they are diabetic, give about 2 heaping teaspoons of sugar which is equivalent to 4 oz of orange juice, or half of a candy bar. If there is no improvement within 15 minutes call EMS and give more sugar.

*Unsure if the diabetic is suffering from too much or too little sugar?
Always give sugar.
The additional sugar will not be enough to cause further harm.*

Symptoms of low blood sugar may include:

- CONFUSION
- SWEATY
- SHAKY
- DIZZY
- GRUMPY
- HUNGRY
- HEADACHE



During an asthma attack the muscles of the lower airways go into spasm and constrict, thus narrowing the airway and reducing the flow of oxygen into the lungs. In addition, “mucus plugs” form in the lower airways further inhibiting the ability of the body to oxygenate the blood.

Signs & Symptoms:

- Difficulty in breathing
- Wheezing as they breathe
- Tightness of the chest
- Difficulty in talking
- Distress and anxiety
- A dry, unproductive cough
- Possible loss of consciousness



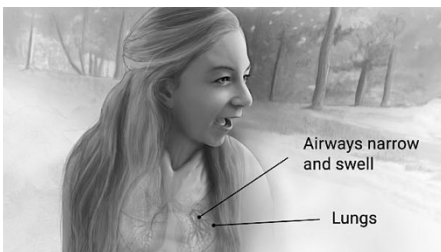
Treatment:

- Continually assess the person’s circulation and airway.
- Sit them down, ideally leaning slightly forward.
- Loosen tight clothing.

The person should be encouraged to self-medicate with their asthma metered dose inhaler (MDI) medication. This should relieve the symptoms of the attack within a few minutes. If there is no relief, allow them to self-medicate again. The rescuer may help the person with their prescribed MDI medication if they state they are having an asthma attack.

Call 911 in the following circumstances:

- The medicine is not working after 5 minutes.
- The condition is getting worse.
- They start to become exhausted.
- If you are unsure of the person’s status.
- Talking is becoming more difficult.

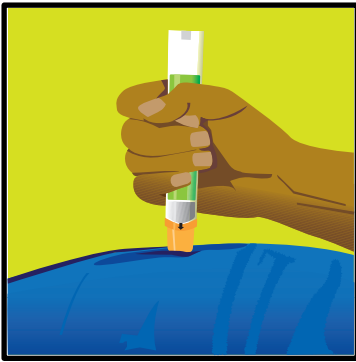


47 Allergic Reaction (Anaphylactic Shock)

An allergic reaction is an abnormal inflammatory reaction to a substance. Reactions range in severity from mild to life-threatening, called anaphylaxis. Anaphylaxis is a sudden severe systemic allergic reaction. People with known allergies may carry Epinephrine injectors.

EpiPen:

- Place the orange tip against the middle of the outer thigh (upper leg) at a right angle (perpendicular) to the thigh.



- Swing and push the auto-injector firmly until it “clicks” as the click signals that the injection has started.
- Hold firmly in place for 3 seconds (count slowly 1, 2, 3).
- Remove the auto-injector from the thigh. Massage the injection area for 10 seconds.
- The orange tip will extend to cover the needle. If the needle is still visible, do not attempt to reuse it.

Both auto-injectors must be used in the thigh. Never inject it anywhere else.



AUVI-Q:

- Place black end of AUVI-Q against the middle of the outer thigh.
- Push firmly until you hear a click and hiss sound.
- Hold in place for 2 seconds.
- AUVI-Q can inject through clothing if necessary.



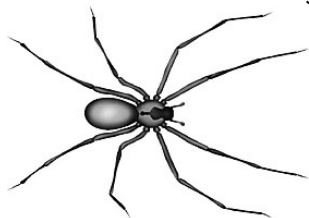
Human and Animal Bites

Human and animal bites are concerning because they may cause considerable injury and/or bacterial infection.

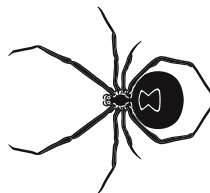
- **Stop the bleeding** if the wound is severe by applying direct pressure. If the bite barely breaks the skin and there is no danger of rabies, treat it as a minor wound.
- **Irrigate the bite** with copious amounts of water. This has been shown to prevent rabies and bacterial infection.
- **Apply antibiotic** cream and cover the bite with a clean bandage.
- **Seek** medical attention if the skin is broken.

Spider Bites

Only two spiders in the U.S. are considered a threat to human life, the Brown Recluse and the Black Widow. Although serious, the bites are rarely lethal.



Brown Recluse are typically painless, symptoms usually develop 2 – 8 hours after a bite.



Black Widow Spiders are active at night. They prefer dark corners or crevices, like garages.

Symptoms may include pain, burning, swelling and redness at the site. You may even see two fang marks.

To treat:

- Wash the area with soap and water.
- Apply a cold washcloth or ice pack to the area.
- Take an over-the-counter pain reliever.
- Apply an antibiotic cream or lotion to the bite.
- If the person has a severe allergic reaction follow the steps from Anaphylactic Shock. While waiting for EMS, treat for shock and continue to monitor their condition.

Snake Bites

React quickly! Although there only a few venomous snakes in North America, and most are not fatal, some have occurred. The most common venomous U.S. snakes are the rattlesnake, copperhead, cottonmouth and coral snakes.

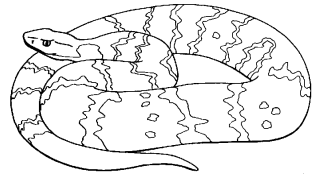
Coral Snakes are small and vibrantly colored – red, yellow and black stripes.



Copperheads are large, 24 - 40 inches, heavy bodied snakes with large, triangular heads and elliptical pupils. The body is tan to brown with darker hourglass-shaped cross-bands down the length of the body.



Cottonmouths are usually a dark shade of brown and will have lighter bands on its side. The cottonmouth has dark cross-bands with lighter brown shading in the center.



Treatment

- Call 911 immediately.
- Do not elevate. Keep the bite below the level of the heart.
- Wash the area with warm water and soap.
- Remove constricting clothing and jewelry from the bitten extremity.
- Apply a pressure bandage around the entire length of the bitten extremity to slow the spread of the venom. Do not apply so tight that the wrap impedes circulation.
- Immobilize the injured extremity.
- Keep calm and still as movement can cause the venom to travel more quickly through the body.
- Do not cool.
- Do not cut into or suck the snakebite.
- Note the time of the bite.
- Treat for shock and continue to monitor the person until EMS arrives.

Jellyfish Stings

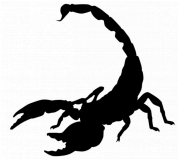
Treating jellyfish stings will help to prevent further nematocyst discharge and with pain relief. **ACT QUICKLY!**

- Wash liberally with vinegar for at least 30 seconds.
- If vinegar is not available, a baking soda slurry may be used.
- Reduce pain with hot-water immersion when possible. The person should be instructed to take a hot shower or immerse the affected part in hot water as soon as possible for at least 20 minutes or for as long as pain persists.

Scorpion Stings

Most scorpion stings are harmless. Only the Bark Scorpion has venom potent enough to cause severe symptoms.

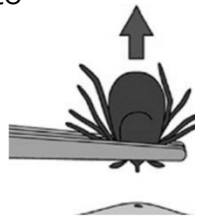
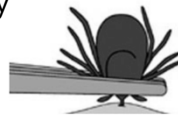
- Seek immediate medical care for any child stung.
- If you've been stung, get prompt care if you begin to experience widespread symptoms such as difficulty breathing, muscle twitching or thrashing, drooling, sweating, nausea and vomiting.
- If you're concerned about a scorpion sting call your local poison control center for advice.



Tick Bites

Remove a tick by:

- Grasping the tick with clean tweezers as close to the skin as possible in order to remove the head and mouthparts.
- Pull the tick straight out gently and steadily. Do not twist.
- If some mouthparts remain, do not try to remove them.
- After removing the tick, thoroughly clean the bite area and your hands with rubbing alcohol or soap and water.
- Don't try to remove a tick with a hot match. Save the tick or take a photo to show the doctor if you develop flu-like symptoms, a rash or lesions develop on the bite area.



Hypothermia

When exposed to cold temperatures, especially with a high wind-chill factor or a damp environment for prolonged periods, hypothermia, (defined as an internal body temperature less than 95 F) can result.

Signs and symptoms include:

- Shivering
- Slurred speech
- Abnormal slow breathing
- Cold, pale skin
- Loss of coordination
- Fatigue, lethargy or apathy
- Confusion or memory loss



Signs and symptoms develop slowly with gradual loss of mental acuity and physical ability. The person may be unaware that they need EMS.

Treatment for hypothermia:

- Get the person indoors if possible.
- Restore warmth slowly.
- Remove wet clothing and dry the person off, if possible.
- Warm the person by wrapping them in blankets or putting dry clothing on the person.
- Do not immerse the person in warm water. Rapid warming can cause heart arrhythmia.
- If using hot water bottles or chemical hot packs, wrap them in cloth; don't apply them directly to the skin.
- Begin CPR, if necessary, while warming the person.
- Give warm fluids, if conscious. Avoid caffeine or alcohol.
- Keep body temperature up. Once the body temperature begins to rise, keep the person dry and wrapped in a warm blanket. Wrap the person's head, neck, as well as hands.

Avoid Frostbite and Cold related Injuries:

- Use the "Buddy System" – watch each other.
- Keep a regular "self check" for cold areas, wet feet or numbness.
- If at any time you discover a cold injury, stop and rewarm the area (unless doing so places you at greater risk).

When exposed to very cold temperatures skin and underlying tissues may freeze, resulting in frostbite. The areas most likely to be affected by frostbite are your hands, feet, nose and ears. If your skin looks white or grayish-yellow, is very cold and has a hard or waxy feel you may have frostbite. Your skin may also itch, burn or feel numb. Severe frostbite can cause blistering and hardening. As the area thaws, the flesh becomes red and painful.

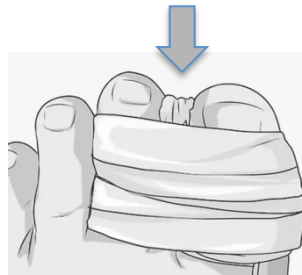
Frostbite Treatment

Protect your skin from further exposure. If you're outside, warm frostbitten hands by tucking them into your armpits. Protect your face, nose and ears by covering the area with dry, gloved hands. Do not rub the affected area.

Seek Medical attention:

- Do not rewarm the skin until you can keep it warm. Re-exposing the frostbitten area to cold air can cause worse damage.
- Gently warm the area in warm water (not hot) or with wet heat until the skin appears red and warm.
- Remove wet clothes.
- If no water is nearby, breathe on the area through cupped hands and hold them next to your body.
- Do not walk on frostbitten toes.
- Bandage the area.
- Do not use direct heat from heating pads, radiators or fires.
- Gradually warm frostbitten area.

Put gauze between fingers or toes to keep them separated
Loosely apply dry, sterile dressings.



If the person is suffering from hypothermia and frostbite, warm the person first, then treat the frostbite.



- ❖ **Moist and clammy skin**
- ❖ **Pupils dilated**
- ❖ **Normal or subnormal temperature**

Treatment for Exhaustion:

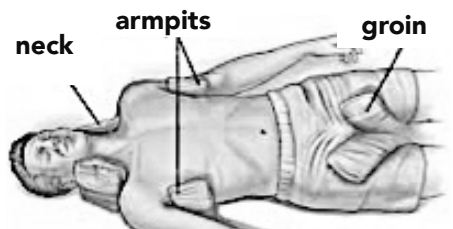
- Get the person into a shady, cool location.
- Lay the person down and elevate the legs and feet.
- Loosen or remove the person's clothing.
- Have the person drink cool water.
- Cool the person by spraying or sponging him or her with cool water and fanning.
- Monitor the person carefully.

Heat Stroke options if you can not immerse the person: cover them with damp cold sheets, place icepacks in pulse points or spray them with cool water.

- ❖ **Dry hot skin**
- ❖ **Pupils constricted**
- ❖ **Very high body temperature**

Treatment for Heatstroke:

- Call 911, intravenous fluids are needed.
- Cool the person by immersing them up to the chin in cold water.
- If immersion is not possible, cool the person by any available means.
- Do not try to force the person to drink fluid;,, but the person may drink if they are able and have the desire to drink.



Overdose deaths now outnumber car crash fatalities, making it the leading cause of accidental deaths in the U.S.

Common symptoms of an overdose are shown by:

- Slow or no breathing
- Blue or purplish lips
- Vomiting or gurgling
- Cold, clammy skin
- Check surroundings for drug needles, pipes, prescription drugs or other paraphernalia.
- Constricted pupils
- Extreme drowsiness
- Limp body
- Unconscious/won't wake up

Narcan is safe to give a person who is unconscious because of an opioid overdose. Narcan will not reverse overdoses from other drugs, such as alcohol or psychostimulants.



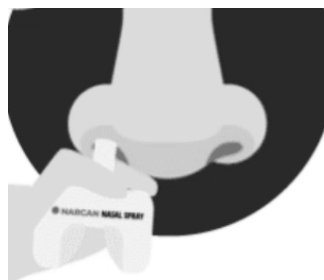
If you believe someone may be overdosing and they are:

- ◆ **Conscious:** If the person is awake and can answer simple questions call 911, place them in the recovery position, and monitor status while waiting for EMS.
- ◆ **Unconscious and breathing:** call 911 and then administer Narcan (see following page). Place in recovery position and monitor while waiting for EMS.
- ◆ **Unconscious and **NOT** breathing:**
 - Call 911.
 - Provide a few quick rescue breaths.
 - Administer Narcan.
 - Continue CPR while waiting for Narcan to take effect or until EMS arrives (see following Page).
 - If breathing begins, place in recovery position and monitor while waiting on EMS.

If you believe someone may be overdosing call 911 immediately, do not wait to see if the drug will wear off!

◆ If you have Narcan:

- Call 911
- Lay the person on their back.
- Remove the nasal spray from the box.
- Do not prime or test the nasal spray. It contains a single dose of naloxone and cannot be reused.
- Hold the nasal spray with your thumb on the bottom of the plunger and your first and middle fingers on either side of the nozzle.
- Support the person's neck by your hand and allow the head to tilt back before giving this medicine.
- Gently insert the tip of the nozzle into their nostril, until your fingers are against the bottom of their nose.
- Remove the nasal spray after the dose.
- Place the person on their side (recovery position).
- Continue to monitor the person until they respond or EMS becomes available.

**◆ If you do NOT have Narcan:**

- Call 911 immediately.
- If unconscious, try to wake up the person by talking loudly or nudging the individual.
- If the person is not breathing perform CPR.
- If the person is breathing, but not fully awake place them in the recovery position and monitor while waiting for EMS.

Many conditions mimic the signs and symptoms of poisoning including seizures, alcohol intoxication, stroke and insulin reaction. Look for the signs and symptoms listed below and if you suspect poisoning call your regional poison control center or the National Poison Control Center at **800-222-1222**, before giving anything to the affected person.

800-222-1222



Signs and symptoms of poisoning:

- Burns, redness or odor around the mouth or lips.
- Breath that smells like chemicals, such as gasoline or paint thinner.
- Burns, stains and odors on the person, their clothing, furniture, floor, rugs or other objects in the surrounding area.
- Empty medication bottles or scattered pills.
- Vomiting, difficulty breathing, sleepiness, confusion or other unexpected signs.

Call 911 immediately if the person is:

- Drowsy or unconscious
- Having difficulty or is not breathing
- Not responsive
- Uncontrollably restless or agitated
- Having seizures



If the person seems stable and has no symptoms, but you suspect poisoning, call the National Poison Control Center. Provide information about the person's symptoms, the person's age and weight. Supply any information you have about the poison, such as how long the person was exposed to the substance. If possible have the pill bottle or poison container on hand when you call.

What to do while waiting for help:

If the person has been exposed to poisonous fumes, such as carbon monoxide, get them into fresh air immediately.

57 Blood (BBP) and Airborne Pathogens (ABP)

BBP is required by the Occupational Safety and Health (OSHA) standard 29 CFR 1910.1030, and was established in 1991. It states the employer must minimize the exposure of students and employees to bloodborne pathogens whenever the potential for that exposure exists. OSHA has taken the position that there are no "risk-free" populations and enforcement of OSHA's general duty clause implies that employers must be knowledgeable of and comply with the bloodborne pathogens standard. Risk is minimized by using universal precautions in conjunction with protective equipment and maintaining proper housekeeping and workplace practices. OSHA requires annual training to ensure employee safety in the workforce.

Bloodborne Pathogens

BBPs are microorganisms in the blood or other body fluids that can cause illness and disease in people.

These microorganisms can be transmitted through your contact with contaminated blood and body fluids. Exposure to blood and other body fluids occurs across a wide variety of occupations. Healthcare workers, emergency response personnel, public safety personnel, and other workers can be exposed to blood through needle stick or other sharps injuries, mucous membrane and skin exposures. The pathogens of primary concern are the Human Immunodeficiency Virus (HIV), Hepatitis B Virus (HBV), and Hepatitis C Virus (HCV).

Other diseases are also carried through the blood, such as syphilis and malaria. Workers and employers are urged to take advantage of available engineering controls and work practices to prevent exposure to body fluids.

Means of Transmission

BBPs are transmitted when contaminated blood or body fluids enter the body of one person from another person.

- Open cuts, rashes or other skin openings that come into contact with contaminated blood or body fluids.
- Indirect transmission: Touching of dried or caked-on blood and then touching a mucous membrane.
- Puncture wounds caused by a contaminated item.
- Sexual contact.

Four conditions must be met for transmission:

1. A pathogen is present
2. There is enough of the pathogen to cause disease
3. A person is susceptible to the pathogen
4. The pathogen passes through an entry site

Hepatitis B (HBV)

HBV is a virus that can infect and inflame the liver. It is transmitted primarily through "blood-to-blood" contact. HBV can lead to serious conditions such as cirrhosis and liver cancer. The virus can survive in dried blood for up to seven days.

Hepatitis C (HCV)

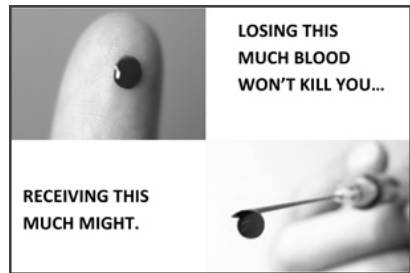
HCV is an infection caused by a virus that attacks the liver and leads to inflammation. Most people infected with the Hepatitis C Virus (HCV) have no symptoms. In fact most people don't know they have the Hepatitis C infection until liver damage shows up, decades later during routine medical tests.

Transmission of Hepatitis B and C

HBV and HCV are transmitted through blood and other potentially infectious bodily fluids and tissues.

They are transmitted through:

- ◆ Sexual contact
- ◆ Sharing needles
- ◆ Accidental needle sticks
- ◆ From mother to child during birth



HBV Symptoms

- Mild flu-like
- Fatigue
- Stomach pain
- Loss of appetite
- Nausea
- Jaundice
- Dark Urine

Hepatitis B Vaccine

Vaccination process includes:

- First series of three shots
- 2nd shot one month after the 1st
- 3rd shot five months after 2nd
- ❖ **This series must be offered at no cost to the employee during work hours**

HCV Symptoms

Infection usually produces no signs or symptoms during its earliest stages. When signs and symptoms do occur they're generally mild and flu-like and may include:

- Fatigue and fever
- Nausea or poor appetite
- Muscle and joint pains
- Tenderness in the area of your liver

Employees who have routine exposure to BBPs (such as doctors, nurses, first-aid responders, etc.) must be offered the Hepatitis B vaccine series at no cost to themselves unless they have an immunity, it is contraindicated for them or they have already had the vaccine series.

The vaccination must be offered within 10 days of initial assignment to a job where exposure to blood or other potentially infectious materials can be reasonably anticipated. Employees may opt to have their blood tested for antibodies to determine the need for the vaccine however, employers may not make such screening a condition of receiving the vaccination. Employers are not required to provide pre-screening.

Employees may opt to decline the vaccine, but they must complete a declination form. Employers must keep these forms on file so they know the vaccination status of everyone who has a potential exposure to blood. The employee has the right to change their mind at any time.

Side Effects of the HBV Vaccine

The vaccines are mild and well tolerated by most people. The most common symptoms are bruising, redness, headache, localized swelling and pain at the injection site. Severe side effects include allergic reactions – if this occurs seek medical attention.

Human Immunodeficiency Virus(HIV)

HIV (Human Immunodeficiency Virus) is the virus that causes **AIDS**, or acquired immune deficiency syndrome. The Center for Disease Control (CDC) estimates that more than one million people in the U.S. are living with HIV infection. One in five (21%) of those people living with HIV is unaware of their infection. An estimated 56,300 Americans become infected with HIV each year. There's no cure for HIV/AIDS, but there are medications that can dramatically slow the progression of the disease. These drugs have reduced AIDS deaths in many developed nations.

Transmission of HIV



HIV is transmitted through infected blood, semen or vaginal secretions that enter the body. One cannot become infected through ordinary contact such as hugging, kissing, playing sports or shaking hands with a person infected with HIV or AIDS. HIV can not be transmitted through air, water or insect bites.

The initial stage of HIV infection is called acute retroviral syndrome (ARS), the symptoms of which are:

Fever
Skin rash
Night sweats
Unexplained fatigue
Swollen lymph nodes
Muscle and joint pain
Gastrointestinal symptoms
and others ...

Universal Precautions

There is no cure for HIV/AIDS so precaution is the best defense. The CDC has established **Universal Precautions** to help prevent infection from a bloodborne pathogen. While there is no cure for HIV, there are a variety of drugs that can be used in combination to control the virus. The CDC recommends a four-week regimen of medication for prophylaxis after exposure to infected body substances.

The CDC states that universal precautions are a set of practices designed to prevent transmission of Human Immunodeficiency Virus (HIV), Hepatitis B Virus (HBV), and other contact with an infected person.

Under universal precautions, blood and certain body fluids of all persons are considered potentially infectious for HIV, HBV, and other bloodborne pathogens.

Being infected with HIV and becoming sick from AIDS are two different events. For most people, it takes many years from the time someone is infected with HIV before they develop symptoms of AIDS. There is almost always a significant period of time after infection when an HIV-positive individual will have no symptoms at all, often 10 years or more.

HIV Prevention

- Don't have unprotected sex, use illegal drugs or share needles.
- No need to worry about getting one of these diseases through casual contact.
- Don't eat, drink or keep food and drinks in areas where infectious materials are used.
- Never pipette by mouth.
- Never break, bend or recap contaminated needles.
- Don't clean up broken glass by hand, use a broom and dustpan.

Universal precautions apply to:

- ◆ Amniotic fluid
- ◆ Blood
- ◆ Synovial fluid
- ◆ Semen
- ◆ Pleural fluid
- ◆ Vaginal secretions
- ◆ Cerebrospinal fluid
- ◆ Peritoneal fluid
- ◆ Pericardial fluid
- ◆ Other body fluids containing visible blood



OSHA attempts to reduce the risk and exposure of BBP's to employees by instituting **Engineering Controls**, **Workplace Practice Controls**, **Universal Precautions** and **Personal Protective Equipment (PPE)**.

Engineering controls help minimize risk by improving the design and engineering of tools and equipment to enhance safety. Work practices are designed to influence the actions of employees to work with the engineering designs. Your employer is responsible for the cost of implementing these practices.

Engineering Controls are physical or mechanical systems used to eliminate hazards at their source and prevent employee exposures. A couple of examples include:

- Hand-washing or antiseptic facilities must be available at or near the point of care
- Sharps containers at proper height and properly located

Work Practice Controls are specific procedures or policies that must be followed to reduce your risk of exposure to blood or other potentially infectious materials (OPIM). A couple of examples include:

- Rules requiring the disposal of sharps into sharps containers
- Hand-hygiene policy which provides specific guidance on when and how to perform hand hygiene

Hand Washing

Hand washing is one of the most important (and easiest) practices used to prevent transmission of BBP. It is required that you wash your hands after removal of gloves, other PPE and/or cleaning of BBP areas. Hand washing facilities are required to be provided by the employer and accessible to all employees. The path to the hand washing facility must be easily accessible without the impediment of doors, hallways or stairwells. The employer must provide proper antiseptic hand cleaners for certain jobs, such as those outside of an office.



The goal of PPE is to provide a barrier between you and potential infections. Employers must make available, and employees must use, Personal Protective Equipment (PPE) when the possibility of exposure to blood or infectious materials exists. PPE must be accessible and clean.

- Gloves should be disposable and replaced as soon as they are torn or punctured.
- They should be made of latex or other fluid-impervious material.
- Inspect gloves before use.
- Double gloving can provide an additional layer of protection.
- If you have cuts or sores on your hands, you should cover these with a bandage or similar protection as an additional precaution before donning your gloves.
- Don't touch the outside of used gloves.
- Gloves should be carefully pulled off, inside-out and one at a time so the contaminated surfaces are inside, preventing any contact with potentially infectious material.
- When removing the first glove your hand is protected because both are covered by the gloves. Grab the outside of the infected glove and remove. To remove the second glove, your other hand is no longer protected, carefully slide one finger inside the glove where there is protection and remove the glove by inverting it upon itself.
- Change gloves and wash your hands when dealing with more than one person.
- Never rub your eyes, mouth or face while wearing gloves.
- Dispose of gloves in biohazard disposal bag.



- ✓ **Eye Protection** must be worn if there is a chance for a splash to occur.
- ✓ **Face Shields** provide protection to the nose, mouth and face to protect mucous membranes and skin openings.
- ✓ **Caps** are designed to protect and cover the head.
- ✓ **Gowns, aprons or jumpsuits** protect contaminated materials from exposed skin and clothes.
- ✓ **Booties** cover shoes and should be tied securely.
- ✓ **Pocket mouth-to-mouth resuscitation masks** provide a barrier during CPR.

Hygiene Rules: If you are working in an area where there is reasonable likelihood of exposure you should **NEVER:**

**Eat ~ Drink ~ Smoke ~ Apply Lip Products
~ Handle Contact Lenses**

Food Rules!

Do not keep food or drink in refrigerators, freezers, shelves, cabinets or on counter-tops where blood or potentially infectious materials are present.



Regulated Waste

The bloodborne pathogens standard uses the term, "regulated waste" to refer to the following categories of waste:

- Liquid, semi-liquid blood or other potentially infectious materials (OPIM)
- Items contaminated with blood or OPIM that could be released in a liquid or semi-liquid state if compressed.
- Items that are caked with dried blood or OPIM that could be released during handling.
- Pathological and microbiological wastes containing blood or OPIM.
- Contaminated sharps.

Disposal of regulated waste must be in accordance with applicable state regulations. In addition to state rules for disposing of regulated waste, there are basic OSHA requirements that protect workers.

The OSHA rules state: Regulated waste must be placed in containers which are:

- Closable
- Constructed to contain all contents and prevent leakage of fluids during handling, storage, transport or shipping.
- Red or Red-Orange in color.
- Labeled or color-coded in accordance with the standard.
- Closed prior to removal to prevent spillage or protrusion of contents during handling, storage, transporting or shipping.
- If outside contamination of the regulated container occurs, it must be placed in a second container meeting the above standards.

Biohazard bags must be a bright red or red-orange color and contain the universal symbol below.

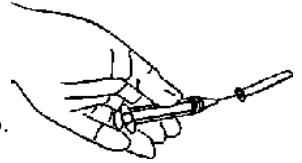


Handle reusable sharps properly and safely:

- Place contaminated reusable sharps in appropriate containers immediately, or as soon as possible.
- Store or process contaminated reusable sharps so that staff members are not required to reach into the container or sink by hand.
- Ensure reusable sharps containers aren't opened, emptied or cleaned manually, or in any other manner that would expose staff to contaminated sharps.

If re-capping is required:

- Use one-handed scoop technique.
- Place needle cap on table.
- Holding the syringe only, guide needle into cap.
- Lift up syringe so cap is sitting on needle hub.
- Secure needle cap into place.



If Exposure Occurs

- ✧ Immediately stop and wash your hands with soap and water.
- ✧ Flush mucous membranes.
- ✧ Report the incident to your supervisor immediately.
- ✧ Attempt to identify the source individual and collect any contaminated materials for testing purposes.
- ✧ Seek medical evaluation. If you have not had the HBV vaccine it can still be administered after an exposure.
- ✧ If clothing becomes contaminated with potentially infectious pathogens remove them in a manner that avoids contact with skin and mucous membranes. If necessary, cut clothing to safely avoid contact with the body.
- ✧ The employer is responsible for ensuring the confidentiality of your medical records. Your records can not be disclosed without your written consent.

Exposure Control Plan

The exposure control plan is a guideline for employees that have had exposure to blood or OPIM. Each work area where employees may be exposed to blood or body fluids must formulate an Exposure Control Plan, which is important because it details your plan for reducing exposures to BBPs and the steps to take when exposure occurs.

The plan includes but is not limited to:

- ✓ Employee exposure determination (a list of job classifications where employees may be exposed)
- ✓ HBV vaccination provisions
- ✓ Employee training (initial and annual training)
- ✓ Methods for control of BBPs

- ✓ Universal Precaution
- ✓ Engineering controls (i.e. safety devices and sharps containers)
- ✓ Work practice controls (i.e. sharps handling and disposal, hand-washing cleanup)
- ✓ Personal protective equipment (i.e. disposable gloves, face shields)
- ✓ Housekeeping policies
- ✓ Post-exposure reporting, evaluation counseling and follow-up procedures.
- ✓ Procedures for evaluating circumstances surrounding an exposure incident.
- ✓ Record-keeping, including sharps injury logs, training records, and annual plan updates.

Your Exposure Control Plan must:

1. Be specific to your department
2. Reviewed yearly
3. Accessible to all workers

Reporting After an Exposure

Employers should follow all federal and state requirements for recording and reporting occupational injuries and exposures. The following information should be included in the exposure report, recorded in the exposed person's confidential medical record and made available to qualified healthcare professionals:

- Date and time of the exposure incident.
- Location of the exposure incident.
- Job classification of the employee exposed to BBP.
- Identification and documentation of the source individual, unless that identification is not feasible.
- The route and circumstances of exposure.
- Details of the exposure, including the type and amount of fluid or material and the severity of the exposure.
- Identified procedural changes which would prevent reoccurrence of any conditions that increased the risk of exposure.
- Engineer controls, work practice controls and PPE that was used.



Post-Exposure Follow-up

Report the incident to your supervisor or appropriate person immediately after exposure to any pathogen. Failure to report may limit your ability to prove exposure or obtain appropriate medical treatment. If you are exposed to bloodborne pathogens, a confidential medical evaluation and follow up must be immediately made available to you at no charge. The evaluation and test results will be confidential. The employer is responsible for ensuring the confidentiality of your medical records. Your records cannot be disclosed without your written consent. During your medical consult with a healthcare professional, all test and follow-up plans will be discussed. All post-exposure treatments and plans should follow the CDC guidelines.

Clean-Up, Decontamination, and Sterilization

- Remove and dispose of gloves in red biohazard bag.
- Wipe up remaining contamination with disposable wipes and put in red biohazard bag.
- Wear gloves when cleaning infected areas.
- Clean site with a bleach solution of $\frac{1}{4}$ cup bleach per one gallon of water.
- Absorb liquid with absorbent powder or other absorbent material.
- Wipe up remaining contamination with disposable wipes and put them in red biohazard bag.
- When liquid is absorbed use scoops, cardboard or dustpans to collect as much of the absorbed material as possible and put material/scoops in red biohazard bag.
- Broken glassware, which may be contaminated, must not be picked up directly with the hands. Forceps, dustpan, spatula or other equipment should be used (a brush should not be used to avoid splashing).
- All equipment and surfaces must be decontaminated immediately with disinfectant after contact with blood or other potentially infectious materials. Wear gloves when cleaning.



Laundry

- Contaminated laundry must be handled as little as possible with minimum agitation.
- Contaminated laundry must be bagged or contained where used and should not be sorted or rinsed on location.
- Contaminated laundry must be placed and transported in bags or containers labeled and or color-coded in appropriate biohazard containers.
- When contaminated laundry is wet and presents a reasonable likelihood of leakage or soak-through from the bag or container, the laundry must be placed and transported in bags or containers which prevent soak-through or leakage.
- The employer must ensure that employees in contact with contaminated laundry wear protective gloves and other appropriate personal protective equipment.

Airborne Pathogens

A disease is classified as airborne when respiratory droplets from one person can easily contaminate the next person and can be transmitted through the air. Typically, airborne diseases travel on dust particles or respiratory droplets by way of sneezes, coughs, laughter and speaking. Viruses, bacteria and fungus may be to blame for causing such diseases. Simply washing hands and covering the mouth can decrease the prevalence of contracting an airborne disease.

Airborne Transmission depends on:

- The level of the infected carrier's contagiousness.
- Where the exposure occurs.
- How long the exposure lasts.
- How healthy you are at the time of exposure.



**Airborne pathogens
can enter through the
eyes, nose, and mouth**

Airborne Infection Protection

- **Stay healthy** - A healthy body means a strong immune system.
- **Be knowledgeable** - Look to reliable sources such as the U.S. Department of Health and Human Services for information.
- **Keep it clean** - Frequently wash hands or use alcohol-based hand sanitizers. Keeping an area clean and disinfected will kill pathogens that have contaminated surfaces.
- **Use good respiratory etiquette** - Cough or sneeze into a facial tissue or your sleeve and wash hands often. Dispose of tissue properly.
- **Consider wearing a facemask in public** - It may prevent inhalation of airborne particles from an infected person's coughs or sneezes.
- **Vaccines** - Keep current on vaccines although not all airborne pathogens have vaccines.
- **Be cautious with social contact** - Avoid handshakes or close contact, about six feet, with those who are ill.
- **Think carefully about travel** - Influenza viruses spread easily when people are confined to small spaces such as an airplane, train or bus.

Transmission Occurs

- 1. Through the air**
 - Use good hygiene.
 - Cough and sneeze into a tissue or sleeve.
 - Dispose of tissues in a trashcan.
 - Wear a surgical mask.
 - Keep a distance of six feet between yourself and a sick person.
- 2. Touching contaminated objects**
 - Avoid touching contaminated objects.
 - Avoid touching your eyes, nose and mouth.
- 3. Hand contact**
 - Wash your hands thoroughly.



When you are ill



- Call your doctor if your fever is high
- Stay home to prevent spreading the illness
- Rest!
- Drink plenty of fluids
- Take recommended medications

Caring for the ill

- Ask the person's healthcare provider whether the person should take antiviral medications.
- Keep the sick person away from other people as much as possible, especially those with weakened immune systems.
- Encourage the person to rest and hydrate.
- Disinfect objects touched by the infected person.
- Protect yourself. Wash your hands often. Use gloves and mask.
- Remind the person to cover coughs and sneezes and to frequently wash their hands.
- Get medical care right away if the person:
 - Has difficulty breathing or chest pain
 - Has purple or blue discoloration of the lips
 - Is vomiting and unable to keep liquids down
 - Shows signs of dehydration, such as feeling dizzy when standing or being unable to urinate
 - Has seizures
 - Is less responsive than normal or becomes confused



**Cover your
Sneezes
and
Coughs !**



Tuberculosis

In 2006 the CDC estimated that there are almost 14,000 cases of active Tuberculosis (TB). Pulmonary tuberculosis is an airborne disease that affects 10 out of every 100,000 people in the U.S. The exact cause for Pulmonary Tuberculosis is the Mycobacterium Tuberculosis Bacteria.

Treatment: Treatment for pulmonary tuberculosis involves taking antibiotic medications to eliminate the bacteria. This treatment may be for more than six months, depending upon the severity of the tuberculosis.

Develop a TB Exposure-Control Plan based on OSHA guidelines:

Include annual education program for all employees, annual TB testing and management of any TB exposures.

Exposure: Tuberculosis is most commonly found in healthcare facilities, correctional institutions, shelters, long-term care facilities for the elderly and drug treatment centers.

Safe Workplace: Employers must provide a workplace that is free from recognized hazards that can cause death or serious physical harm. When feasible, employers should control exposure to TB by using ventilation, isolating persons and confining certain areas. When these controls are not possible, they must provide respirators to all at risk employees.

Respirators: Employees must wear respirators whenever they enter a room housing someone with a suspected or confirmed case of TB.

Warning Signs: OSHA requires that warning signs be posted on respiratory isolation or treatment rooms. Sign must state "Pulmonary Isolation", "Respiratory Isolation" or "AFB Isolation" and give specific measures that must be taken to interact with patients. Employers must also use biological hazard tags on components of air systems so employees working on them know that they transport contaminated air. Tags must identify TB hazards.

Record Keeping: If an employee that has been exposed to someone with TB develops a TB infection, their employer must record the case on OSHA 300 log. Positive TB skin tests and TB disease are both recordable. If an infection goes on to develop into disease during the 5-year maintenance period, the employer must update the original entry in the log to show the new information. Positive TB skin tests provided within 2-weeks of employment do not need to be recorded

Accessing Records: Employers must keep records of all employees who have been exposed to TB in the workplace, a record of their TB skin test results, medical evaluations and treatments. A copy of the current fit-test record for each respirator user must also be kept. OSHA may have access to these records if the information is needed, and will use appropriate safeguards to protect employee privacy.

An Epidemic occurs when the incidence rate of a disease substantially exceeds the expected infection rate.

A Pandemic is an epidemic of an infectious disease that spreads through human populations across a large region, like a continent.

Oxygen is the body's fuel and all human beings require a constant supply of oxygen circulating in the blood and reaching the organs to survive. Fortunately, the air contains plenty (21%) so the needs of our cells and organs are easily met. However, threats to our health exist. If, for any reason, an insufficient amount of oxygenated blood reaches the tissues and organs a person can experience shock. Shock can lead to organ failure, brain damage and death.

When to Use Emergency Oxygen

The air a person normally breathes contains approximately 21% oxygen. Hypoxia, a condition in which insufficient oxygen reaches the cells can occur with any major illness or injury.

Signs and symptoms of hypoxia include:

- ❖ Increased breathing and heart rate
- ❖ Changes in level of consciousness
- ❖ Cyanosis (bluish lips & nail beds)
- ❖ Restlessness
- ❖ Chest pain
- ❖ Shock
- ❖ Dizziness

Oxygen Usage According to the American Heart Association and ECC Guidelines

OXYGEN for extended CPR

".., at some time during prolonged CPR, supplementary oxygen with assisted ventilation is necessary."

Asthma

"Oxygen should be provided to all Patients with severe asthma, even those with normal oxygenation."

Acute Coronary Syndrome

"Oxygen should be administered to patients with breathlessness, signs of heart failure and shock."

Stroke

"Patients with acute stroke are at risk for respiratory compromise."



Emergency and Therapy Oxygen equipment typically consists of the following parts: cylinder, regulator with gauge, handle, and delivery system: tubing, nasal cannula or mask.

The Cylinder

The cylinder holds medical oxygen in the form of compressed gas and are made of seamless steel or aluminum. The cylinder must meet the Department of Transportation (DOT) requirements for pressure. Steel cylinders qualify for pressure retest at 10-year intervals. Aluminum cylinders require retest at five-year intervals.

On the top of the cylinder is a **post valve** with two pinholes, an outlet and a **cap**. The pinholes are set to international specifications that will permit only an oxygen regulator to fit. The cap is set to permit connection by a handle for releasing the oxygen from the cylinder through the outlet.

Regulator with Gauge

The oxygen regulator has two pins that fit into the post of the cylinder. The cylinder valve connection allows the oxygen released from the cylinder to move directly into the regulator. The regulator is tightened to the cylinder to prevent a leak. The cylinder gauge reads empty when the device is at rest. When the gas is released from the cylinder, it enters the regulator and the gauge registers content pressure.



Handle

The handle sits on top of the cylinder's post. When the handle is turned, it opens the flow of oxygen from the cylinder to the regulator. Some devices use a two-stage "low pressure" regulator that reduces the pressure of the oxygen to less than two psi.

Combining an AED and Emergency Oxygen in a portable bag allows the rescuer to quickly respond to a person in need.

Oxygen is delivered from the regulator to the person with a medical tube/hose. Oxygen tubing is made of medical grade materials that permit the oxygen to pass from the regulator to the person cleanly, safely and at the required flow rate. All tubing is for single use only.

A **Nasal Cannula** is a plastic tube with two small prongs that are inserted into the person's nose. This device is used to administer oxygen to a breathing person with minor breathing problems. Oxygen is normally delivered through a nasal cannula at a low flow rate of one to six LPM.



A **Simple Face Mask** is connected to the tubing and placed over the person's nose and mouth and it can be held in place either by the person, rescuer, or with a strap. If the person **does not want a mask on his or her face**. It is possible to simply hold the mask under the chin.

A **Non-Rebreather Mask** may be used to deliver high concentration oxygen to a breathing person. A non-rebreather mask has an attached oxygen reservoir bag which collects additional oxygen from the regulator and a one-way valve which prevents the person's exhaled air from mixing with the oxygen in the reservoir bag.

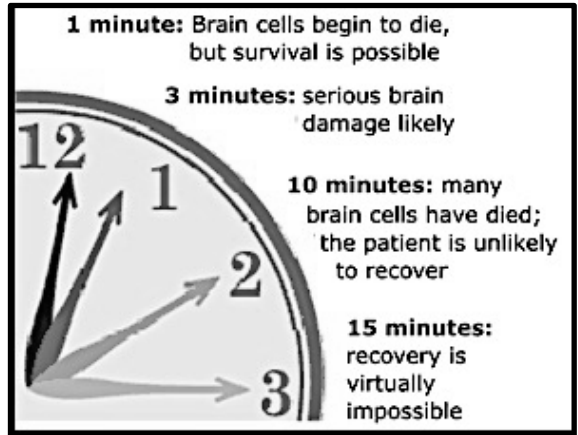
A **Resuscitation Face Mask** serves two purposes. For the breathing person, it permits delivery of oxygen similar to a simple face mask. For the non-breathing person, it can be pressed tightly over the nose and mouth by a trained rescuer to provide rescue breaths as part of cardiopulmonary resuscitation (CPR).

A **Resuscitation Bag Valve Mask (BVM)** is a device that is placed over the nose and mouth of a non-breathing person. When using an Emergency Oxygen unit, the simple or the resuscitation face mask can be removed and the BVM connected to the tubing. Each squeeze of the bag forces oxygen-enriched air through a valve and the mask, and into the person's airway.

If the oxygen level drops and continues to be low, the result can be:

- BRAIN DAMAGE
- ORGAN FAILURE
- DEATH

The most common use of oxygen is on a conscious, breathing person.



The three scenarios you may encounter are:

- ✧ Conscious breathing
- ✧ Unconscious breathing
- ✧ Unconscious, not breathing

How to Administer Emergency Oxygen

The Food and Drug Administration (FDA) considers emergency oxygen as first aid use and it does not require a prescription.

Administering Emergency Oxygen to a Conscious Person

After assuring the scene is safe:

- Gently shake the person and ask if they are okay.
- If they respond, introduce yourself and request consent.
- Activate 911
- Send someone to get Emergency Oxygen and an AED.
- Administer oxygen:
 - Activate the oxygen flow to the mask. Some units are equipped with an easy on/off handle.
 - Listen or feel for oxygen flow through the mask.
 - Assist the person with the mask. If the person is able, instruct them to hold the mask tight to their mouth and nose.
 - Instruct the person to breathe as normal as possible.



- Perform a head-to-toe exam.
- Provide first aid, if needed.
- Care for shock.
- Continue to assess and assist the person until EMS arrives.



Emergency O2 to an Unconscious Breathing Person

Use the mnemonic AID

- If there is no response, activate 911.
- Send someone to get Emergency Oxygen and an AED.
- Look, listen, and feel for breathing.
- If the person is breathing, administer emergency oxygen
 - Activate the oxygen flow to the mask. Some units are equipped with an easy on/off handle.
 - Listen or feel for oxygen flow through the mask.
 - Place the oxygen mask over the person's nose and mouth forming a tight seal. Do not use the strap behind the head if you suspect head or neck injuries.
- Provide first aid if needed.
- Care for shock and continue to access the scene.

Administration of Emergency O2 to an Unconscious NON Breathing Person

Survey the scene. Do not approach a person unless it is safe.

- Gently shake the person and ask if they are okay.
- If there is no response, activate 911.
- Send someone to get Emergency Oxygen and AED.
- Introduce yourself, assume consent for unresponsive persons.
- If they are not breathing normally, **begin chest compressions.**

When the oxygen arrives, direct a bystander to:

- Assemble the one-way valve if necessary.
- Activate the oxygen flow to the mask.
- Listen or feel for oxygen flow through the mask.
- Place the oxygen mask over the person's nose and mouth forming a tight seal. Place the rim of the mask between the person's lower lip and chin. Lower the resuscitation mask until it covers the person's mouth and nose.
- If trained in CPR perform rescue breathing through the mask.
- Care for shock and continue to assess the scene.

Emergency Oxygen Maintenance

Medical grade oxygen units need to be inspected on a routine basis. This is true regardless of their use. The regulator, cylinder and other components need to be evaluated on a routine schedule by a person knowledgeable with the equipment and testing tools.

Service and Maintenance Recommendations:

- Visual examination and inspection of the cylinder and case.
- Assure compliance of the emergency oxygen with all local, state, and federal regulations regarding emergency oxygen are compliant.
- Assess regulator liter flow using a flow meter gauge.
- Assess regulator static-back pressure.
- Assess high-pressure safety release.
- Assess total pressure reduction.
- Assess seals and connections.
- Examine hydrostatic test date.
- Assure the oxygen unit is securely mounted.
- Refill or replace unit if level is lower than twice the expected EMS time. If you use a maintenance company, they will refill the oxygen.



The FDA and the National Institute of the Occupational Safety and Health Administration (NIOSH) recommend that users of medical oxygen follow safe handling and use procedures. The following is a summary:

- **Do not permit smoking near oxygen** when oxygen is in use. This includes the prohibition of smoking from any area where oxygen is stored.
- **Store oxygen in a clean, dry location away from direct sunlight or heat.** Consider window locations and heat that may be behind a wall. This is because heat and sunlight can increase the pressure within the oxygen cylinder, which will give a false (high/filled) reading on the gauge. Also, too much heat can cause the pressure in the cylinder to reach the "escape" level that will empty the device. The LifeSafe Emergency and Therapy Oxygen devices have valves that will release oxygen safely into the air if the cylinder pressure becomes too high.
- **Oils and grease - Do not allow the parts of oxygen equipment – cylinder or post valve, regulator, handle, delivery system – to come in contact with oils, greases, organic lubricants, or any other combustible products.** Additionally, if using oxygen, hands should be clean or the user should wear protective gloves. This is because oxygen is incompatible with hydrocarbons. When they mix, the result can be combustion – the sudden release of heat and fire.
- **All cleaning, repair, servicing and replacing** of oxygen equipment is performed by qualified, properly trained personnel.
- **Use only tools specifically designed** for "Oxygen Equipment" during oxygen equipment service. After each use, ensure that the oxygen regulator does not have parts that impede oxygen flow. The connection on the post valve to the regulator and from the regulator to the cannula or mask must be clear. This is ensured by using compatible parts and routinely inspecting and replacing parts by LifeSafe oxygen service technicians
- **Protect all stand-alone oxygen cylinders from containments and particulates.** Use a cap cover when storing unused, filled, medical oxygen cylinders.

Each cylinder for the oxygen is labeled with the following required information:

- Product name: Oxygen USP (US Pharmacopeia, medical grade).
- Contents: by liters in the cylinder.
- Expiration date: month and year oxygen should be replaced.
- Lot number: source from which oxygen was drawn.
- Method of production: how it was extracted.
- Precautionary statements: indicating emergency or prescription use.



Oxygen Regulations, Policies and Protection

Medical oxygen devices and medical oxygen gas are regulated in the United States by the U.S. Food and Drug Administration (FDA).

An **Emergency Oxygen** device is regulated as appropriate for use without prescription and without medical supervision by properly trained responders when used in a medical emergency. The FDA qualifies an Emergency Oxygen device as one that delivers medical oxygen at a minimum flow rate of six liters per minute (LPM) for a minimum of 15 minutes. The LifeSafe Emergency Oxygen device meets this FDA requirement because it delivers medical grade oxygen at a flow rate of eight LPM for approximately 60 minutes.

If a medical oxygen device is capable of delivering medical oxygen at flow rates that are less than 6 liters per minute (LPM) or if the device permits delivery for less than 15 minutes, then the FDA considers this to be a **Prescription Oxygen** device. This type of device may only be used with a prescription and by a person either medically qualified or acting under medical supervision. The LifeSafe Therapy Oxygen device is provided by prescription because it delivers medical grade oxygen at flow rates ranging from 2 LPM to 25 LPM. At 2 LPM the device delivers for over 100 minutes and at 25 LPM the device delivers for over 15 minutes.

Student Notes

| DISEASE | INCUBATION | COMMON SYMPTOMS |
|-------------------------|--------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Avian Flu (Bird Flu) | 2-5 days | In most cases, they resemble those of conventional influenza, including cough, fever, sore throat and muscle aches. |
| Coronavirus | 2-14 days typically 5 days | Respiratory symptoms, fever, dry cough and breathing difficulties. |
| Hepatitis A | 15-50 days averaging 28 days | Fever, loss of appetite, nausea, abdominal discomfort and weakness followed by jaundice. Many unrecognized mild cases without jaundice occur, especially in children. |
| Hepatitis B | 45-180 days averaging 120 days | Only a small proportion of acute infections have clinical symptoms. Symptoms are similar to Hepatitis A. |
| Hepatitis C | 14-180 days averaging 45 days | Typically no symptoms in early stages. When they do occur they are generally mild and flu-like including fatigue, fever, nausea or poor appetite, muscle and joint pains, liver tenderness. |
| HIV | Variable | A broad range of disease manifestations affecting the immune system. |
| Influenza | 1-4 days | Usually starts suddenly and may include fever (usually high), headache, fatigue, cough, sore throat, runny or stuffy nose, body aches, diarrhea and vomiting. |
| Measles | 8-14 days | Fever, dry cough, runny nose, inflamed eyes, sensitivity to light, Koplik's spots in the mouth. A skin rash that appears after 3-4 days. |
| Meningitis | 2-10 days | Sudden onset of fever, headache, nausea, stiff neck and photophobia. Rash may occur in cases of meningococcal disease. |
| Pneumonia | 1-4 days yet varies | Fever, coughing, shortness of breath, sweating, chills, pleurisy, fatigue, muscle pains, headache. |
| SARS | 2-7 days and can be up to 10 days | Typically begins with flu-like signs and symptoms: fever, chills, muscle aches and occasionally diarrhea. After about a week, signs and symptoms include: fever of 100.4 F or higher, dry cough, shortness of breath. |
| Tuberculosis | 6 weeks to years | Cough, unexplained weight loss, fatigue, fever, night sweats, chills, loss of appetite. TB can remain in an inactive (dormant) state for years without causing symptoms or spreading to other people. |

