NationalCPRFoundation™

# Healthcare Professional (HCP) – Basic Life Support (BLS) Certification Course

**In this Healthcare (HCP) - Basic Life Support (BLS) Certification Course you'll learn how to perform CPR and how to use an Automated External Defibrillator (AED). You'll also learn how to apply First-Aid and you'll learn about Bloodborne Pathogens.**



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# Introduction

**Welcome to our Basic Life Support (BLS) Certification Course.** Here, you'll learn about Bloodborne Pathogens, Cardiopulmonary resuscitation (CPR), Automated External Defibrillation (AED) and First-Aid. Whether you'll need this course as a Healthcare Professional, for your workplace or if you're just interested in learning—you'll find everything you'll need for standard procedures.

## Good Samaritan Law

Any persons who assist those who're injured, ill or in peril are protected by the **Good Samaritan Law**. As long as you're acting voluntary, without expectation of reimbursement or compensation while performing such aid, on site—you'll have legal protection.

**Remember,** when performing the skills you're about to learn, every second counts. So, unless required otherwise, don't hesitate to call 911 or perform CPR and/or apply First-Aid.

# Understanding CPR

**The leading cause of death in the US** according to the **Center for Disease Control (CDC.gov)** is cardiovascular disease. Risk factors for cardiovascular disease are: smoking, high blood pressure, high cholesterol, lack of exercise, stress and obesity. Factors which are unavoidable are: age, sex, hereditary and diabetes. Death is most likely to occur after **10 minutes** of a loss of oxygen to the brain. From **6 to 10 minutes** brain damage is expected. From **4 to 6 minutes** brain damage is very possible and from **0 to 4 minutes** brain damage is virtually non-existent. However, CPR should still be performed.

**It's important to note:** the AHA guidelines recommends unconfident performers should at least perform chest compressions upon the patient since studies show chest compressions can be as effective as the combination of CPR.

## When to stop CPR

If the patient regains a pulse, if the area becomes unsafe, if cardiac arrest last longer than 30 minutes, if the rescuer(s) is too exhausted or ordered to stop. Or, if these complications arise: Fractures, punctures, lung ruptures or collapses, rib separation, bruises of the heart and/or lungs.

## Recommendation

It is recommended for untrained rescuers to provide Compression-only CPR because it is easy for an operator (dispatcher) to provide guided instructions over the telephone. **Remember, it is a priority to activate the Emergency Response System immediately and to provide chest compressions.**

The expectation is that Health Care Providers (HCP's) are properly trained in CPR and effectively able to perform both compressions and ventilation. Priority for the HCP (especially if alone) should be to activate the Emergency Response System as well as perform compressions. Priority may change sequence depending on circumstances (ie: AED availability).

**Bloodborne Pathogens to be aware of:**

Hepatitis B and C (HBV / HCV), Human Immunodeficiency Virus (HIV) and Tuberculosis (TB).

# Cardiopulmonary Resuscitation (CPR)

## When to Activate Emergency Response System

If possible, send someone to activate the Emergency Response System, and begin CPR immediately. As soon as it's available use an AED. If you're not with someone (and you do not have a mobile phone) leave the patient to activate the Emergency Response System while also retrieving an AED.

**Team Resuscitation:** HCP's can use flexibility when activating the emergency response to fit the provider's clinical setting, for better management.

## C is for Circulation – Compressions

**Chest Compressions** Circulate the blood within the patient. It's important to place your hands correctly upon the patient's chest when performing compressions.

To do so, find the point where the patient's ribs meet (just below both halves) and interlock your fingers with both hands. Make sure you're kneeling beside the patient's shoulders (Do Not Lean on Patient). Once in position, lock your elbows and use your body's weight to compress 2 inches upon the patient's chest. Make sure to let the patient's chest rise after each compression. Compressions on an infant are pressed just below the nipples.

**Infant CPR - 2 Rescuers:** One Rescuer should use two hands holding the infant facing up while positioning the fingers in the middle of the infant's chest as the other rescuer uses a one-way valve—placing it over the infant's mouth and nose. One rescuer will perform compressions while the other uses the rescue valve. You can also apply a ratio of 15:2 compressions to breathing.

**Chest Compression Tempo:** the correct tempo that should be performed matches the song "Staying Alive." Make sure to push hard and fast to that song's tempo.

**Chest Compression Fraction:** is the total percentage of resuscitation time when performed by the rescuer(s) during cardiac arrest. Whether intended or unintended interruptions (such as real-world delays) occur Chest Compression Fraction aims to minimize pauses in chest compressions. **Chest Compression Fraction Goal:** target of at least 60%

**Remember,** CPR should be administered until help arrives. 100-120 compressions should be performed per minute.

**Chest compressions** should be performed on patients who are obese.

**Chest compressions** should be performed on pregnant women and a modification if the pregnant woman's fundus height is at or above the level of the umbilicus. If the woman's fundus height is at or above the umbilicus, then High-quality CPR with manual left uterine displacement will be beneficial for relieving aortocaval compression during, the chest compression task. To perform manual left uterine displacement: push the uterus to the patient's left side with 1 hand while still providing CPR.

## A is for Airway. Clear the Airway

**Check for any obstructions, such as:** tongue, foreign objects, vomit, swelling or food blocking the patient's throat or windpipe (finger-swipe, if necessary).

# Cardiopulmonary Resuscitation (CPR)

Make sure the patient is on a solid/firm surface (on his/her backside). Next, kneel beside the patient's neck/shoulders. Open the patient's Airway by tilting the head back with the palm of 1 hand as the other hand gently lifts the chin. For no longer than 10 seconds, check for life: listen for any sounds, put your cheek beside the patient's mouth to feel for breathing and look for any motions. Tasks can be performed simultaneously.

**Chest Compressions should be performed on patient's who are obese or pregnant.**

## B is for Breathing. Mouth-to-Mouth

**Rescue Breathing** is widely known to be performed mouth-to-mouth—it can also be performed mouth-to-nose, mouth-to-mask and mouth-to-stoma, but in rare cases.

**Breathing tasks:** While still performing the Airway technique pinch the patient's nose shut. With a complete seal over the patient's mouth, with your mouth, breathe into the patient until you see the chest inflate. If the chest does not inflate repeat the Airway technique. When performing the breathing technique make sure to give 2 breaths for 1 second each.

**Once the breathing technique is applied you will continue the C-A-B's.**

## CPR for Infants (Age Less Than 1 Year, Excluding Newborns)

- Witnessed Collapse: call 911 or have someone call
- Un-Witnessed Collapse: perform CPR (for 2 minutes), call 911 or have someone call
- Chest compressions - 100-120/min
- Perform CPR - Circulate, Airway, Breathing (C-A-B's)
- Compressions at about 1½ inches (4 cm) - 1/3 AP diameter of chest
- 30:2 compressions over breaths (seal infant's mouth and nose) - 2 Rescuers 15:2
- 2 Rescuers: 2 thumbs compression
- Use AED as soon as it's available

**CPR - Components for Infants (Age Less Than 1 Year, Excluding Newborns) Scene safety**

1. Check the environment - making sure it's safe for rescuers and victims

### Recognition of cardiac arrest

1. Check responsiveness
2. No breathing or only gasping - ie: no normal breathing
3. Within 10 seconds - no definite pulse
   A. (You can check for a pulse and breathing simultaneously in less than 10 seconds)

# Cardiopulmonary Resuscitation (CPR)

### Activation of emergency response system

- **Witnessed collapse** 1. Leave the victim, if you're alone without a mobile phone, and activate the emergency response system while retrieving an AED before performing CPR
- **Unwitnessed collapse** 1. Give 2 minutes of CPR 2. Activate the emergency response system, get an AED and return to the victim 3. Resume CPR; use the AED as soon as it is available

### Compression- ventilation ratio without advanced airway

- **1 rescuer** 30:2
- **2 or more rescuers** 15:2

### Compression- ventilation ratio with advanced airway

- Chest compressions - 100-120/min
- Give 1 breath every 6 seconds (10 breaths/min)

### Compression rate

- 100-120/min

### Compression depth

- At least 1/3 AP diameter of chest
- About 1½ inches (4 cm)

### Hand placement

- **1 rescuer** Just below the nipple line - 2 fingers in center of chest
- **2 or more rescuers** 2 thumb–encircling hands in the center of the chest, just below the nipple line Just below the nipple line - encircling hands (2 thumbs) in center of chest

### Chest recoil

- Make sure not to lean on the chest of the victim - Allow a full recoil after each chest compression

### Minimizing interruptions

- Compression interruptions - limit to less than 10 seconds

# Cardiopulmonary Resuscitation (CPR)

## CPR for Children (Age 1 Year to Puberty)

- Witnessed Collapse: call 911 or have someone call
- Un-Witnessed Collapse: perform CPR (for 2 minutes), call 911 or have someone call
- Chest compressions - 100-120/min
- Perform CPR - Circulate, Airway, Breathing (C-A-B's)
- Compressions at about 2 inches (5 cm) - 1/3 AP diameter of chest
- 30:2 compressions over breaths - 2 Rescuers 15:2
- 2 Rescuers: Perform tasks simultaneously
- Use AED as soon as it's available

**CPR - Components for Children (Age 1 Year to Puberty) Scene safety**

1. Check the environment - making sure it's safe for rescuers and victims

### Recognition of cardiac arrest

1. Check responsiveness
2. No breathing or only gasping - ie: no normal breathing
3. Within 10 seconds - no definite pulse
   A. (You can check for a pulse and breathing simultaneously in less than 10 seconds)

### Activation of emergency response system

- **Witnessed collapse** 1. Leave the victim, if you're alone without a mobile phone, and activate the emergency response system while retrieving an AED before performing CPR
- **Unwitnessed collapse** 1. Give 2 minutes of CPR 2. Activate the emergency response system, get an AED and return to the victim 3. Resume CPR; use the AED as soon as it is available

### Compression- ventilation ratio without advanced airway

- **1 rescuer** 30:2
- **2 or more rescuers** 15:2

### Compression- ventilation ratio with advanced airway

- Chest compressions - 100-120/min
- Give 1 breath every 6 seconds (10 breaths/min)

# Cardiopulmonary Resuscitation (CPR)

### Compression rate

- 100-120/min

### Compression depth

- At least 1/3 AP diameter of chest
- About 2 inches (5 cm)

### Hand placement

- 1 or 2 hands can be used (optional for small children)
- On the lower half of the breastbone (sternum)

### Chest recoil

- Make sure not to lean on the chest of the victim - Allow a full recoil after each chest compression

### Minimizing interruptions

- Compression interruptions - limit to less than 10 seconds

## CPR for Adults & Adolescents

- Check for life
- Before performing CPR call 911 or have someone else call
- Chest compressions - 100-120/min
- 2 Rescuers: Perform tasks simultaneously
- Perform CPR – Circulate, Airway, Breathing (C-A-B's)
- Compressions at about 2 inches (5 cm)
- 1 or 2 rescuers - 30:2 compressions over breaths
- Use AED as soon as it's available

**CPR - Components for Adults & Adolescents Scene safety**

- Check the environment - making sure it's safe for rescuers and victims

# Cardiopulmonary Resuscitation (CPR)

### Recognition of cardiac arrest

1. Check responsiveness
2. No breathing or only gasping - ie: no normal breathing
3. Within 10 seconds - no definite pulse
   A. (You can check for a pulse and breathing simultaneously in less than 10 seconds)

### Activation of emergency response system

- If you do not have a mobile phone – leave the victim and activate the emergency response system while retrieving an AED before performing CPR.
- Have someone activate the emergency response system. Perform CPR immediately and use the AED as it becomes available.

### Compression- ventilation ratio without advanced airway

- **1 or 2 rescuers** - 30:2

### Compression- ventilation ratio with advanced airway

- Chest compressions - 100-120/min
- Give 1 breath every 6 seconds (10 breaths/min)

### Compression rate

- 100-120/min

### Compression depth

- At least 2 inches (5 cm)

### Hand placement

- 2 hands on the breastbone (sternum) on the lower half

### Chest recoil

- Make sure not to lean on the chest of the victim - Allow a full recoil after each chest compression

### Minimizing interruptions

- Compression interruptions - limit to less than 10 seconds

# Cardiopulmonary Resuscitation (CPR)

### Rescuers should never

- Compress slower than 100/min or faster than 120/min
- Compress in depth less than 2 inches (5 cm) or more than 2.4 (6 cm)
- Lean on victim's chest during compressions
- Allow interruption during compressions more than 10 seconds
- Provide excessive ventilation during breathing task, ie: excessive breathing with force or too many breaths

### When to stop CPR

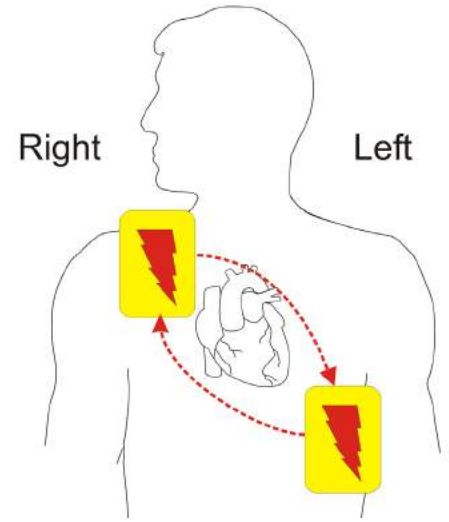
- When you're too exhausted to continue
- If the patient's ribs are broken, lung collapses, etc…
- If an Automated External Defibrillator (AED) is accessible
- If Emergency Medical Services (EMS) arrives

# Automated External Defibrillator (AED)

## Fibrillation

**Ventricular Tachycardia** is a rapid heartbeat that begins at the bottom chambers of the heart, named Ventricles. Ventricles are the main heart's main chambers which pump. Ventricular Tachycardia can be very life-threatening because it can lead to Ventricular Fibrillation.

**Ventricular Fibrillation** is when the cardiac muscles quiver rather than contract. Ventricular Fibrillation requires immediate medical response. If the patient receives no attention he/she will fall degenerate with no blood circulation. After 4 minutes serious brain damage can occur and after 8 minutes brain damage is likely to be severe and can result in death.




**Automated External Defibrillator (AED) Guidelines**

## When should an AED be used?

**CPR is a very important action when saving a patient's life.** However, an AED is crucial towards regaining the natural rhythm of the heartbeat as well as restarting the patient's heart. CPR should be performed if the patient is non-responsive and not breathing and an AED should be applied after performing CPR. If the AED does not bring the patient back to consciousness CPR should be re-administered. It's crucial to call 911 or any Emergency Medical Service (EMS) before performing CPR or applying an AED.

## How to use an AED

Turn on the AED – Usually there will be an "On" button but in some cases there might be a lever. Remove all clothing from the patient's arms, chest and abdomen—whether male or female. Attach pads to bare skin on the chest. Make sure to use the appropriate system for the child or adult (an AED should not be used on an infant). Place the left pad under the left armpit—to the left of the nipple and right pad under the collarbone on the right side of the chest. Make sure to place the pads at least one inch away from any implanted devices. Next, connect the wiring. Analyze the patient's heart rhythm. Make sure you DO NOT touch the patient during the defibrillator process. If the AED does not begin analyzing automatically make sure to press the analyze button. If a shock is advised then push the shock button.

Make sure your patient is cleared of any debris such as: metal, large amounts of water, etc…

## For Infants

If the pads are able to touch make sure to place one pad directly on the back of the infant.

**Newer AED's only shock once;** however, some models do shock up to 3 times. If the patient is shocked but doesn't regain a pulse immediately perform CPR for 2 minutes. If a shock is not advised continue CPR. Make sure to stay clear of any large amounts of water or any metals. Make sure to shave the patient, if needed, when using an AED. Make sure to place the pads at least one inch away from any implanted devices or Transdermal medication patches (or remove patch).

**Note:** Before using an AED physical training is recommended.

# Automated External Defibrillator (AED)

**Resuscitation (special circumstances)**

**Drowning:** make sure to remove the patient's wet clothing and replace it with something warm and dry. Make sure to perform rescue breaths if the patient is unconscious. If rescue breaths aren't accessible make sure to perform chest compressions.

**Trauma:** make sure to use the jaw-thrust maneuver when performing the airway task. Make sure to check for any injuries, such as: head, spinal and neck, to maintain patient's protection.

**Electroshock:** make sure to check for safety before attempting any performance on the patient. Make sure the patient isn't near any electrical currents or fuse boxes. CPR is priority 1 for Cardiac arrest patient's, burns, scrapes and other bodily harms aren't considered priority 1. If the patient is unresponsive or pulse less, perform CPR.

Rescuers should be physically & mentally fit as well as skillfully prepared and readied for emergency responses. Rescuers should be knowledgeable of all equipment necessary for usage, beforehand.

# Standard – First-Aid

## Welcome to the First-Aid Section

From cuts to burns to fractures and nosebleeds many accidents take place everyday. **Understanding First-Aid** will not only better equip you in case of an emergency but could perhaps mean the difference between life and death of a patient. In this section we'll examine basic First-Aid procedures and at the end of the course you'll be tested on your knowledge.

## Items you'll need in a medical kit:

1. Gauze pads (at least 4 x 4 inches).
2. Two large gauze pads (at least 8 x 10 inches).
3. Box adhesive bandages (band-aids).
4. One package gauze roller bandage at least 2 inches wide.
5. Two triangular bandages.
6. Wound cleaning agent such as sealed moistened towelettes.
7. Scissors.
8. At least one blanket.
9. Tweezers.
10. Adhesive tape.
11. Latex gloves.
12. Resuscitation equipment such as resuscitation bag, airway, or pocket mask.
13. Two elastic wraps.
14. Splint.
15. Directions for requesting emergency assistance.

**Remember the Goal:** Recognize when help is needed and how to get it. Learn how and when to access the EMS system, ie: 911, activate the emergency response plan, and to contact the **Poison Control Center** (1-800-222-1222).

The faster you retrieve advanced care for the patient the higher the survival rates. If you're alone and/or in harm's way then provide basic care before leaving (if possible). Basic care such as: applying pressure to the body that's severely bleeding and opening an airway. These steps should be followed before attempting to activate the Emergency Response System.

# Types of Wounds

**Open Chest Wounds may be left open.** If it is required for dressing and direct pressure to stop the bleeding, than extreme care must be provided to ensure that the dressing doesn't become too saturated with blood, which can inadvertently become occlusive. Dress appropriately and modify the procedure when it is needed.

**A higher value is placed on the avoidance of providing dressings to victims with open chest wounds.** The life-threatening risk is to inadvertently cause tension pneumothorax when compared with other risks associated with an open chest wound.

**Dressing Open Chest Wounds:** First, activate the Emergency Response System. Check to see if there's more than one open wound (for more than 1 wound determine if dressing will be applied). Remember, dressing should only be applied if there is rapid blood loss. Remove clothing (leave stuck clothing). Cut dressing but make sure it's larger than the wound. Seal the wound to prevent the loss of blood (apply pressure if needed). Never remove objects from the wound.

**Punctured Wounds** can be very serious. It's very dangerous if the wound gets infected. If the wound has excessive bleeding make sure to call 911. Remember, if the patient falls unconscious or is non-responsive without a pulse make sure to call 911 and perform CPR.

**Treatment:**

1. Stop the bleeding.
2. Apply thorough pressure (seek EMS attention if bleeding is excessive.
3. Clean the wound thoroughly with water and soap (stay clear of the wound itself).
4. Apply an ointment such as: Neosporin.
5. Provide a pain reliever such as: Advil.
6. (Re) wrap the wound to keep the wound from infection.
7. Seek medical attention at the nearest hospital if the wound worsens.
8. Have the patient get a Tetanus or Tetanus Booster shot.

**Amputations.** There are several steps to follow when treating amputations.

**Treatment:**

1. Always practice universal precautions.
2. Call 911 immediately.
3. If the patient isn't breathing perform CPR.
4. Apply direct pressure. Make sure to raise the injured area. Use a tourniquet or tight bandage, if needed.
5. If possible clean the amputated part and make sure to keep it with the patient.
6. Wrap the part in a cloth and put it in a plastic sealed bag inside of ice cold water.
7. If the amputated part is below the heart make sure to raise the legs 12 inches above the heart.
8. Watch for any signs of shock.

# Types of Wounds

**Cuts & Scrapes.** There are several basic steps to follow when aiding Cuts & Scrapes.

**Treatment:**

1. Stop the bleeding.
2. Apply thorough pressure (seek EMS attention if bleeding is excessive or cut is deeper than 1/4 inch).
3. Thoroughly clean the cut/scrape with water and soap (stay clear of the injury itself).
4. Apply an ointment such as: Neosporin.
5. Provide a pain reliever such as: Advil.
6. (Re) wrap the injury to keep it from infection.
7. Seek medical attention at the nearest hospital if the injury worsens.
8. Have the patient get a Tetanus or Tetanus Booster shot.

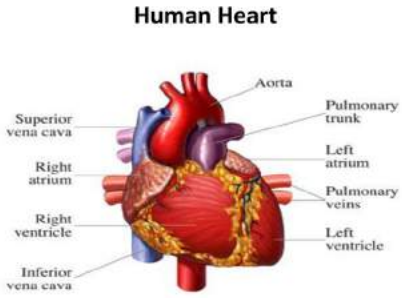
**Keeping the wound clean is very important.** Make sure the patient gets a tetanus or booster shot.

# The Human Heart

**Cardiopulmonary Arrest** (Cardiac Arrest) is the ineffective contractions of the heart causing a cessation of blood circulation throughout the body. The cessation of circulated blood will result in the patient falling unconscious due to a lack of oxygen. If Cardiac Arrest patients are left untreated brain damage, and even death, is very likely. Immediate response is crucial in saving the life of a Cardiac Arrest patient. CPR should be performed immediately.

A **Heart Attack** is when the heart isn't receiving oxygenated blood. When a patient isn't receiving oxygenated blood the heart begins to die. The patient might undergo pain in the center of the chest, sweating, nausea, dizziness and faintness. Also, pain throughout the body in areas such as: neck, shoulders, jaw, teeth and arms.

**Treatment:** check universal precautions, call 911 immediately or rush the patient to the nearest hospital, have the patient chew aspirin (unless allergic or told otherwise). If the patient is unconscious or unresponsive perform CPR.




**Chest Pain** — For patients with Chest Pain the provider may encourage the patient to chew 1 adult or 2 low-does aspirins (if signs suggest the patient is having myocardial infarction and if the patient doesn't have allergies to aspirin). If the provider is unsure or uncomfortable with such administration of aspirin then the patient can be deferred to EMS.

**Respiratory Arrest** is the cessation of oxygen throughout the body. Failure of the lungs to deliver oxygen can result in death if untreated. A lack of oxygen to the brain will result in a loss of consciousness and immediate treatment is important for the chances of survival. Artificial ventilation treatment is the necessary act for saving respiratory arrest patients. Make sure to call 911 immediately and then, perform CPR.

# Fractures, Bruises, Avulsions, Sprains & Strains

A **Fracture** can be very serious. It's important to understand Fractures and understand what to do according to the severity of the injury. If there are any signs of a concussion, broken bones at the neck, head or back, deformed joints, no pulse, heavy bleeding, any abnormalities of the broken bone such as: a piercing of the skin or if the bone is irregularly fixed, call 911 immediately and perform CPR, if needed.

**Treatment:** Make sure to stop the bleeding by applying pressure to the Fracture and wrapping it if necessary. Apply a splint to the Fractured area. If the patient isn't moving do not try and move the patient yourself. If needed, apply a cold cloth or ice to the fracture.

**Remember,** if the patient appears to be light-headed or on the verge of fainting lift the legs slightly higher than the victim's heart to raise the blood pressure.

**Dental Avulsion** — For lack of skill and required training to re-implant an avulsed tooth it may be beneficial to store the tooth in solution. Storing the tooth in solution prolongs the viability of dental cells. Such solution, which has shown efficacy: Hank's Balanced Salt Solution. Cell viability: 30-120 minutes.

**Bruises** are broken blood vessels that leak under the skin—dark spots caused by a blow, fall, etc…

**Treatment:** Make sure to elevate the injured area which will alleviate the pain. Also, apply an ice-pack or cold cloth. If needed, have the patient take a pain-reliever such as: Tylenol to reduce the pain and swelling. If the Bruise appeared on the head or if the bruise lasts longer than 2 weeks consider taking the patient to the hospital.

**Sprains & Strains** differ in where the injury takes place on the body. **Sprains** occur in any ligaments, such as: ankles, wrists, etc… **Strains** occur when a muscle/tendon is torn. Strains can occur in the back (hamstring) or thigh, etc…

**Treatment:** rest the Sprained/Strained area in a sling, crutch or flint. Make sure to place ice over the area to prevent swelling and limit application to 20 minutes unless the patient is irritated - limit 10 minutes. Make sure to apply a bandage to the joint or limb or use a brace, if possible. Make sure to raise the patient's Sprained/Strained part 12 inches above the heart.

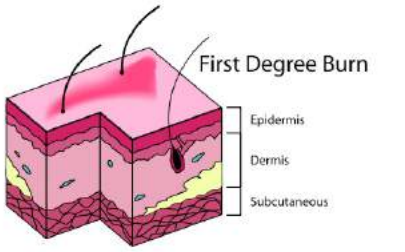
# Types of Burns

**Burns** vary on the degree of which layer the burn reaches. Remember, their are **3 common categories**— 1st-degree, 2nd-degree and 3rd-degree.

**1st-degree Burns** have persistent pain, are red, and usually are accompanied by swelling.

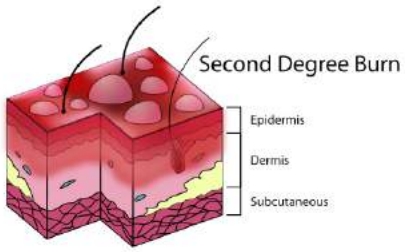
**Treatment:**

1. Keep the burn cool (wrap the burn with a cool cloth or soak the burn in a bath.
2. Apply ointment such as: Aloe Vera.
3. Wrap the burn with gauze (keep from infection). Replace, once a day.
4. Administer a pain reliever such as: Advil.

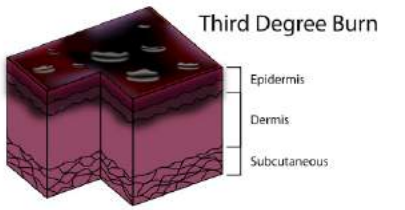



**2nd-degree Burns** refer to the burn breaching the 1st layer of skin and reaching the 2nd. Usually there will be blisters accompanied by severe pain and swelling.

**Treatment:** if the burn is larger than 3 inches, seek medical attention at your nearest hospital. If the burn is smaller treat it as you would a 1st-degree burn.




**3rd-degree Burns** are the most serious of all. These burns will be charred and can be deeper than the 3rd layer of the skin. Medical attention is much needed and you should call 911 immediately. 3rd-degree burn patients usually won't feel much pain due to the charring of nerve-endings.




**Treatment:**

1. Call 911 and/or rush the patient to the nearest hospital.
2. Perform CPR, if needed.
3. Do not remove the patient's clothing.
4. Raise the burn injury above the patient's heart (increase blood pressure).
5. Cover the injuries in a cool moist cloth (material).

**Remember, never add anything frozen to cool off a burn.** Placing ice on the burn can cause tissue ischemia. Cool burns with clean cold water for at least 10 minutes. If water isn't available than a clean cool compress can be used as a substitute.

**If needed (when evaluated by the provider), activate EMS immediately if:**

1. Blistering or broken skin
2. Difficulty breathing
3. Face, neck, hands, or genitals
4. A larger surface area, such as trunk or extremities
5. Or, other causes of concern

# Types of Burns

**Electroshock's** can cause no harm, mild harm or severe harm.

**Treatment:**

1. Call 911 if the patient undergone any serious injuries.
2. Perform CPR, if needed.
3. Turn off power source.
4. Make sure the patient is free of all electrical currents before touching the patient.
5. Move patient away from electrical source (use non-conductive materials if possible.
6. If needed, raise the patient's legs above his/her heart to increase blood pressure.

# Poisoning

Many **Bites & Stings** have mild reactions; however, some bites and stings can have serious consequences, if untreated. Most stings aren't fatal but few insects do carry fatal diseases, such as: West Nile virus or Lyme disease. If severe reactions (anaphylaxis) are present, these are some symptoms you should look for: lowered blood pressure, abdominal pain, difficulty breathing, swelling, redness, vomiting and nausea.


**Mild reactions:** use universal precautions, remove the stinger, apply a cold pack, give the patient a pain reliever, and use ointment, such as: Benadryl, or any antihistamine, if necessary. Mild allergic reactions are: diarrhea, swelling, cramps, nausea and vomiting.

**Severe reactions:** difficulty breathing, swelling (lips, throat, etc…), nausea, vomiting, hives, rapid heart beat and faintness and dizziness.

**Treatment:** administer an auto injection into the patient (in butt or thigh and massage injection for faster response). Perform CPR, if needed. Have the patient lay on his/her side to prevent choking, if necessary

A **Drug Overdose** is a dose larger than the recommended assumption. There are many reactions that can occur, such as: sleepiness or unconsciousness, excitement with a rapid heart beat, hallucinations, impaired judgment and decision-making skills. **Symptoms:** death, unconsciousness, convulsions, delusional behavior, abnormal pupil size, difficulty breathing, nausea, non-reactive pupils, vomiting, sweating, numbness and violent aggressive behavior.

**Treatment:** Check universal precautions. Check if there's a pulse, if not, perform CPR. Keep the patient calm and reassured of his/her safety. Check for any shock symptoms. For seizures and convulsions apply first-aid. Monitor vital signs. Make sure to document any and all drugs taken and keep the container and/or label.

If a **Poisoning** is suspected make sure to call the **National Capital Poison Center** at: 1-800-222-1222. **Signs of Poisoning:** vomiting, difficulty breathing, sleepiness, confusion, burns (redness) around the mouth, chemical odors out from the mouth and burns on clothing or skin. For poison ingestion do not administer anything by mouth unless advised to do so by the PCC or EMS personnel.

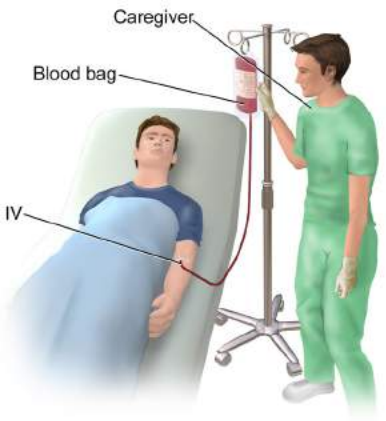
**Treatment:** make sure to take the patient outside for fresh air. Have the patient flush out his/her mouth. Make sure to read the label of the chemicals that were induced and read the instructions for poisoning. Flush the patient's eyes and/or have the skin cleansed. If the patient isn't breathing perform CPR. If the patient needs medical attention make sure to give the container, label and/or pills to the **Emergency Medical Services** (EMS) personnel.

# Hemorrhages & Hypoglycemia

A **Hemorrhage** is a loss of blood. There are **4 classes** of Hemorrhages.

1. A loss of 15% blood volume. No change in vital signs.
2. A loss of 15-30% blood volume. Blood transfusion isn't usually necessary, but may need Saline solution (salt water). Rapid heart beat.
3. A loss of 30-40% blood volume. Blood transfusions are necessary. Drop in blood pressure with rapid heart beat.
4. A loss of 40% blood volume. Resuscitation is necessary for death prevention.

**Treatment:** check for universal precautions. Perform CPR, if necessary. Wrap hemorrhage, if possible. Call 911 or bring the patient to the nearest hospital.



Blood Transfusion

**Nosebleeds** are very common. Whether it's a hot day or a minor fall nosebleeds are not a serious medical problem.

**Treatment:** If the nosebleed results from a more serious injury such as: a broken nose or a head injury, make sure to call 911. If the patient falls unconscious or is non-responsive without a pulse, perform CPR. If the nosebleed occurs to be a serious injury make sure to apply pressure to the nose for roughly ten minutes—make sure to have the patient breathe through his/her mouth. After applying pressure, make sure to clear the patient's nose cavity. If the patient is congested, thoroughly wash the cavity or use a decongestant after the patient has tried blowing his/her nose.

**If the patient undergoes many nosebleeds** it can be a more serious injury than it appears so have the patient call his/her doctor to set-up and appointment.

**Hypoglycemia** is a syndrome which results from low blood sugar.

**Symptoms:** (may vary from person-to-person) anxiety, fatigue, heart palpitations, hunger, irritability, pale skin, shakiness, sweating, and tingling sensation around the mouth.

**As it worsens - symptoms worsen:** abnormal behavior, blurred vision, confusion state of mind, seizures, unable to perform routine tasks and unconsciousness.

**Treatment:** for symptomatic hypoglycemia provide a rapid clinical relief with oral glucose tablets. If glucose tablets aren't available provide other foods and liquids containing sugars such as: fructose, sucrose, and oligonucleotides. Such foods can effectively reverse mild symptomatic hypoglycemia.

# Choking, Hypothermia & Dehydration

**Choking** is caused when an object is blocking the throat or windpipe. Adults often choke by large pieces of food, however, children often swallow small toys or other objects.

**Remember,** the universal sign for choking is mimicking choking yourself. Make sure to ask the patient if he/she is choking because, many times, the person is merely coughing. If the patient is unconscious make sure to call 911.

**Infants 12 months or younger:** rest the patient on your forearm, while also resting your forearm, on your thigh. Perform 5 thumps with the heel of your hand upon the infants back. If the patient is still choking turn the infant over, face-up, and with 2 fingers upon the breastplate perform 5 chest compressions. Repeat the process until the object is dislodged.

**Children and Adults:** when performing the Heimlich maneuver make sure to stand behind the person. Lean the person slightly forward and wrap your arms around his/her waist. Next, press hard with a closed fist into the abdomen than grab your fist with your other hand. Perform 5 quick thrusts. If the object still hasn't cleared the patient's throat/windpipe, repeat the cycle.

**Unconscious Person:** when performing the Heimlich maneuver on an unconscious person lay the patient on his/her back. Make sure to clear the patient's airway, if needed, finger swipe the patient's mouth to pick out any foreign objects. If you can't see or can't take the object out of the patient's mouth, make sure to perform CPR. Chest compressions will most likely clear the patient's airway.

If you're still unable to clear the patient's airway and/or if the patient falls unconscious, make sure to call 911 and perform CPR and chest compressions.

**Hypothermia** is when the body temperature is below 95 F. Hypothermia occurs when the body loses heat faster than the body can produce energy. Hypothermia often occurs when the body is immersed in cold water. If the patient is left untreated the nervous system will not be able to work properly which will result in organ damage and possibly death.

**Treatment:** Make sure to remove the patient's wet clothing and replace it with something warm and dry. Make sure to perform rescue breaths if the patient is unconscious. If rescue breaths aren't accessible make sure to perform chest compressions. If possible, give the patient a warm beverage and a warm, dry compress (hot water in a bag to hold or cover the patient with). **Do NOT** apply direct heat.

**Exertional Dehydration** — usually dehydration occurs with vigorous exercise in hot and humid environments. Dehydration occurs when you lose fluids more than you take in. If loss fluids aren't replaced dehydration will occur.

**Treatment:** Have patient orally re-hydrate with carbohydrate-electrolyte (CE) drinks. Ingestion of fluids: 5-8% will facilitate hydration. Other drinks: coconut water and 2% milk. Alternatively, if drink aren't available then potable water may be used.

**Severe Dehydration Treatment:** If the patient is severely dehydrated or is in a life-threatening situation activate the EMS. EMS will be able to provide an Intravenous hydration that consists of essential nutrients.

# Types of Injuries

There are several kinds of **Eye Injuries**, such as: a Black Eye, a Foreign Object caught in the eye and a Chemical Splash in the eye.

**Black Eye:** is caused by broken blood vessels (or, bleeding beneath the skin) around the eye. Sometimes, there can be bleeding inside the eye which is called, Hyphema—blood in the front chamber of the eye or in the cornea.

**Treatment:** make sure to apply a cold pack or ice pack to reduce the swelling of the patient's injured eye. If blood is visible, in the eye, seek medical attention at the nearest hospital. If the patient has any vision problems and/or any blood leakage from the eye seek medical attention immediately.

**Foreign Objects:** in the eye can be very serious and proper aid is necessary.

**Treatment:** make sure your hands are clean. Make sure to pull the lower lid down while having the patient look up and vice versa in the opposite direction. Clean the patient's eye with saline solution or water. Make sure to call 911 or take the patient to the nearest hospital if: the object is in-removable, if it's embedded in the eyeball, if there 's any abnormalities or persistent pain once the object is removed.

**Chemical Splash:** can cause extreme pain, mild pain and no pain.

**Treatment:** make sure to have the patient run his/her eyes under lukewarm water for at least 20 minutes. Make sure contact lenses are removed. If the patient undergoes persistent pain make sure to call 911 or bring the patient to the nearest hospital. Make sure to have the patient take the bottle or the name of the chemical to the hospital (for medical determinations).

**Concussions are very serious. Make sure to call 911 if the patient has:**

1. Vomited more than once
2. Unequal pupils
3. Having/had a seizure
4. Unable to balance
5. Slurred speech
6. Neck and/or spinal pain
7. Very drowsy
8. Has Weakness on one side of the body

Evaluate the patient who suffered a head injury by checking for concussion symptoms and change in consciousness. This check should occur as soon as possible.

**Treatment:** Make sure to have the patient stop the activity. Allow the patient to rest. To prevent swelling and worsening of injury apply ice wrapped in a washcloth. Treat pain with over-the-counter acetaminophen (Tylenol), aspirin or ibuprofen (Advil, Motrin). Note: it may make bruising worse. Monitor Symptoms and if any symptom is on the list above make sure to call 911 or EMS immediately. Perform CPR if needed.

# Types of Injuries

**Head Injuries** usually result in minor bruises or bumps, however, some head injuries can be very serious and even fatal.

**If these signs appear call 911 immediately:** If the victim has a seizure, slurs while speaking, if the patient's pupils are unequal in size, any inabilities in the usage of body parts or motor skills, any loss of balance (make sure to tell the patient to sit down), confusion, any discoloration in the face, a severe headache or if there's any severe bleeding from the head, nose, ears or face call 911 immediately.

**Do Not attempt** to remove any articles off of the patient and unless necessary, do not move the patient. Cover the wound if blood is immense; however, do not apply any pressure for any head injuries (lightly cover the wound). If the patient falls unconscious or is non-responsive without a pulse make sure to call 911 and perform CPR.

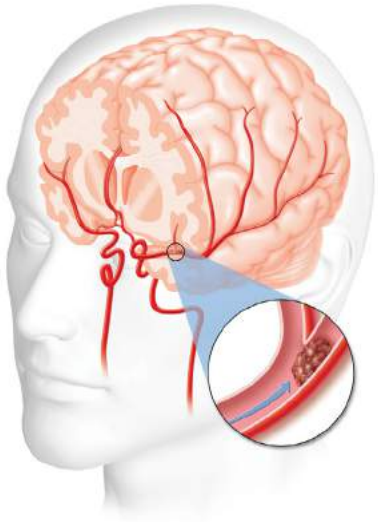
**Spinal Injuries** are very serious. If any suspicion, whatsoever, of a spinal injury do not move the patient. If the patient has had a head injury, back pain, has any numbness or lacks control of limbs, bladder or bowels—suspect a spinal injury.

**Treatment:** Call 911. Make sure to keep the patient from moving. Perform CPR, if needed. If there isn't a pulse make sure to perform chest compressions. Do not remove any items off the patient. If the patient is vomiting or is bleeding from the mouth or nose turn the patient on his/her side only if there are 2 responders—making sure to move the patient in accordance with each responders movement.

**A cervical collar is not recommended.** There is no good evidence of a benefit for cervical collars. Have the patient remain as still as possible until EMS arrives.

# Shocks, Seizures & Strokes

A **Shock** can occur for many reasons. Some reasons are: poisoning, burns, blood loss, heatstroke, trauma and any other serious medical accident. When a patient is Shocked it can lead to a loss of oxygenated blood to vital organs which, if untreated, can lead to organ damage or possibly death. Signs of Shock: cool and clammy skin, unconsciousness or poor responsiveness, dilated pupils and nausea.



**Treatment:** If the patient is unconscious call 911 immediately then perform CPR—if the patient is a child or infant perform CPR for 2 minutes and then call 911. Make sure to lay the patient down with his/her feet 12 inches above the heart. Check for C-A-B's. You may need to put the patient on his/her side to prevent choking. Make sure to check for other injuries.

## Seizure

When a **Seizure** occurs these are signs to look for: dizziness or faintness, uncontrolled bowel movement, breathing difficulties, unconsciousness or unresponsiveness, arching of the back, clenching of things—such as teeth. If a patient is ever unconscious or unresponsive make sure to perform CPR and to call 911. Some causes of Seizures are: head injuries, fevers, brain damage, poisoning, cessation of oxygen to the brain and diabetes.

**Treatment:** check universal precautions, remove any life threatening objects, loosen clothing, and make sure to call 911 and respond with appropriate orders. Make sure to NOT restrain the patient unless the patient is going to be hurt or is going to hurt someone.

## Stroke

A **Stroke** occurs when there is a ruptured/blocked blood vessel in the brain. When the brain has a cessation of oxygen it begins deteriorating. If the patient falls unconscious or is unresponsive, call 911 and perform CPR immediately. It is recommended for providers to use a stroke assessment system. A System such as Cincinnati Prehospital Stroke Scale (CPSS) is a simple tool when assessing a stroke patient. **CPSS Stroke Scale:**

**Facial Droop**
**To check:** ask patient to smile
**Normal:** patient's cheeks move equally on both sides
**Abnormal:** patient's face moves unequally on both sides

**Arm Drift:**
**To check:** have patient raise arms at shoulder length for 10 seconds
**Normal:** both arms equally move together (another condition might occur: pronator drift)
**Abnormal:** arms fail to respond equally

**Speech**
**To check:** ask patient a question
**Normal:** patient does not slur and answers correctly
**Abnormal:** patient is mute, using abnormal words and/or slurring

If 1 out of the 3 examinations occur there is a 72% probability of a stroke.

**Risk factors are:** high blood pressure, heart disease, diabetes, smoking and having had a prior stroke.

# Pathogens, Viruses & Diseases

**Bloodborne Pathogens:**

**Hepatitis A, B, C Virus**

**Human Immunodeficiency Virus (HIV)**

**Acquired Immunodeficiency Syndrome (AIDS)**

**Other Disease Pathogens**

**Transmission:** Cuts, abrasions, burns, needle sticks, punctures, rashes, bites and mucous membranes.



**Fluids:** Semen, pleural fluid, synovial fluid, vaginal fluid, cerebrospinal fluid.

**No-Risk Fluids:** Vomit, nasal, sweat, tears, saliva, sputum, urine.

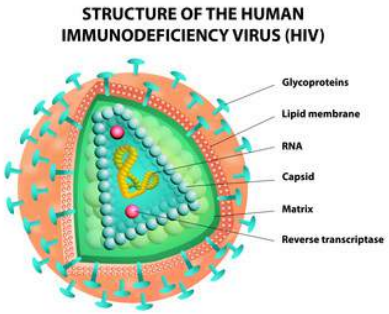
**Risk Factors:** Intravenous drug users, sexual contact, birth, hemodialysis patients, any contact with blood or body fluids.

**Hepatitis:** Causation through a virus/toxin, liver inflammation (swelling, soreness).

**Hepatitis A:** Not persistent in blood, minor form of Hepatitis, caused by RNA virus.

**Symptom:** Fatigue, nausea, vomit, abdominal pain/discomfort, loss of appetite, fever, dark urine, muscle pain, jaundice.

**Treatment:** Vaccine




**Hepatitis B:** Persistent in blood, transmitted through indigestion of blood and/or body fluids, sexual contact and injection.

**Symptoms:** Fatigue, nausea, vomit, abdominal pain/discomfort, loss of appetite, fever, dark urine, muscle pain, jaundice, joint pain.

**Treatment:** Vaccine, transplant

**Hepatitis C:** Persistent in blood, transmitted through contact of blood, sexual contact, drug use, contaminated needle stick about 1.8%.

**Symptoms:** Fatigue, nausea, vomit, abdominal pain/discomfort, loss of appetite, fever, dark urine, muscle pain, jaundice, joint pain.

**Treatment:** No vaccine available

# Pathogens, Viruses & Diseases

## Difference between Acute and Chronic

**Acute:** First-time infected, 15-20% cleared without treatment.

**Chronic:** Second or more infected, 75-85% will carry virus long-term with 60-70% chronic liver disease, 1-5% death of complications.


## Human Immunodeficiency Virus (HIV)

Persistent in blood, semen, vaginal fluids, pre-ejaculation, breast milk, is a free particle virus and within cells, cause of Acquired Immunodeficiency Syndrome (AIDS) spread through needles, mother-to-infant, sexual contact & drug users.

**Symptoms:** Fever, headache, sore throat, swollen lymph glands, rash.

**Treatment:** No vaccine, hormones for women, Hepatitis C drugs, antiviral medicines.

## Acquired Immunodeficiency Syndrome (AIDS)

The final stage of HIV, caused by damaged immune system.

**Symptoms:** Sweating, fatigue, shortness of breath, dry coughing, chronic diarrhea, white lesions on tongue and in mouth, headache, and weight loss.

**Treatment:** No vaccine, hormones for women, Hepatitis C drugs, antiviral medicines.


**HIV / AIDS in the US:** 16.5 per 100,00 population

**HIV / AIDS in the U.S. risk to Health Workers:** Less than 100 Health Workers infected

**Risk:** Needle stick/cut 0.3%

**OSHA Required Prevention:**

**Engineering Controls**

**Work Practices**

**Personal Protective Equipment (PPE)**

**Universal Precautions**

**Body Substance Isolation (BSI)**

# Pathogens, Viruses & Diseases

## Engineering Controls

- Labeling of infectious materials (biohazard labeling)
- Cleaning faculties (eye, hands, showers, etc…)
- Containment of infectious materials (containers, refrigerators', freezers, bags, etc…)
- Proper waste control (transportation, etc…)
- Reusable tools should be labeled in appropriate storage

**Sharp with Engineered Sharps Injury Protections (SESIP)**

- Retractable needles
- Retractable finger-prick lancet
- Needleless systems (needle guards, blunted needles, retractable scalpels, etc…)

**Proper recapping of needles**

- One-handed motion
- Mechanical device

**Injury**

- Document injury
- Testing—successions
- Safe sexual contact
- Therapy/Counseling
- Stop breastfeeding
- Immediate evaluation of presumed illnesses

## Work Practices

**Personal Protective Equipment (PPE)** disposure in appropriate places and thorough cleaning of hands before/during & after, usage of gloves and all reusable tools. Usage of sharp objects must be adequately disposed of and/or cleaned. Workstation and environment (must be cleaned regularly) with proper towels, tools, etc… for later use and disposal. Proper usage of tools to pick up contaminated objects and fluids.

# Pathogens, Viruses & Diseases

## Personal Protective Equipment (PPE)

**Used for Prevention of:** Bloodborne Pathogens and OPIM's

**Protecting:** Head, torso, arms, hands, feet, etc…

All PPE should be properly disposed of after usage of such equipment in proper disposal units.

**Equipment:** gloves, aprons, gowns, face protectors, masks, safety eye glasses, coats, linen.

**Bleach solutions usage:**

For medical equipment 1:10

For work stations 1:100

## Universal Precautions

**All blood and other body fluids are to be considered infected besides:** Vomit, nasal, sweat, tears, saliva, sputum, urine

## Body Substance Isolation (BSI)

BSI practices are used to lessen the chances of transmissions of any diseases and/or infections—all fluids are to be suspected of infectious diseases. OSHA's guidelines are to be followed by all persons dealing/working with Bloodborne Pathogens and other OPIM's. These guidelines are for the protection of all workers and bystanders who come in contact with any Bloodborne Pathogens and OPIM's.

For more information regarding OSHA's guidelines please visit www.osha.gov.

**Congratulations!** You've just finished the Course. You can now take the Exam.

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