TRAIN FOR SUCCESS INC.
BASIC FIRST AID

4 HR.

STUDY GUIDE

WRITTEN BY

MICHELLE A. BROOMFIELD RN

TRAIN FOR SUCCESS INC.
BASIC FIRST AID

AGENDA FOR CLASS SESSION (If applicable)

9:00-9:10AM Introductions/ Welcome

9:10-11:30AM First Aid introduction

- The Good Samaritan Legislation
- Infection control
- Prioritizing care
- Calling 911
- Head, Neck and Spine Injury
- Recovery position
- Bleeding/ Treatment
- Shock
- Burns / Treatment
- Allergies / Anaphylaxis
- Fractures
- Strains and Sprains
- Bites and Stings
- Poisoning Emergency
- Contacting toll-free Poison Help line

11:30- 11:50am Lunch break

11:50 – 12:30p Hands on Practice

12:30-1:30 pm Written Examination

- Review of Exam
- Course Eval

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First Aid

The purpose of this course is to review the principles of basic first aid for some common injuries, such as: Bleeding, sprains, strains, shock, Head, Neck and Spine Injury, allergies, anaphylaxis, fractures, burns, stings, animal Bites, Snake bite, spider bite, scorpion stings and poisoning emergency.

When the student has successfully completed this course, he/she will be able to:

1. Describe the Good Samaritan Legislature,

2. Describe how to prioritize care/ Head, Neck and Spine Injury

3. Describe reasons to initiate call to 911,

4. Explain the initial assessment procedures,

5. Explain how to place a patient in the recovery position,

6. Discuss first, second, third and fourth degree burns and describes the treatment,

7. Describe RICE therapy; the mnemonic for 4 elements used to treat soft tissue for Injuries such as treatment for sprains and strains

8. Describe treatment for fractures

9. Describe treatment for bleeding

10. Describe the signs/ symptoms of shock,

11. Describe the treatment for shock

12. Describe treatment for nosebleed

13. Describe the treatment for Animal, Snake, and spider bite, Scorpion stings

14. Discuss treatment for Allergy

15. Describe treatment for anaphylaxis,

16. Discuss Steps in a Poisoning Emergency

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Introduction

First aid is the immediate care that is provided or given to an ill or injured individual. Sometimes, the first person on the scene may not be licensed or a trained medical personnel, but is able to keep that injured person safe and comfortable with directives from a 911 operator until medically trained personnel arrive. It is very important and helpful for individuals to receive training and have some idea regarding first Aid, so that individual can provide some assistance to the ill or injured person, which can possible save a life. It is very helpful to have a first aid kit available. A first aid kit should be checked and restocked as needed; check to make sure supplies are not expired and items that have been used are replaced. Keep a First Aid kit at home and one in the car.

A First Aid Kit should contain items such as:

- Gloves
- Adhesive tape (Hypoallergenic)
- Bandage strips
- Elastic wrap bandages/ Ace bandage
- Roller gauze
- Nonstick sterile bandages
- Eye shield or eye pad
- Face mask
- Soap (Anti-bacterial)
- Hand sanitizer
- Splints in various sizes
- Instant cold packs
- Scissors
- Cotton balls
- cotton-tipped swabs
- Safety pins
- Antibiotic ointment
- Antiseptic towelettes
- Duct tape
- Thermometer
- safety pins
- First-aid manual
- Plastic bags

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OSHA standard 1910.151 (b) also states an employer must have adequate first aid supplies that is readily available for use, if an employee has an injury on the job. OSHA does not have a minimum requirement, but references American National Standards Institute ANSI Z308.1-2003 Minimum Requirements for Workplace First Aid Kits. According to the ANSI document, a basic workplace first aid kit should contain:

- At least four sterile pads, 3 in. x 3 in. (7.5 x 7.5 cm)
- At least one absorbent compress, 32 sq. in. (81.3 sq. cm.) with no side smaller than 4 in. (10 cm)
- At least 16 adhesive bandages, 1 in. x 3 in. (2.5 cm x 7.5 cm)
- One roll of adhesive tape, 5 yd. (457.2 cm) total
- At least six applications of burn treatments, 0.5 g (0.14 fl. oz.)
- One triangular bandage, 40 in. x 40 in. x 56 in. (101 cm x 101 cm x 142 cm)
- At least ten packets of antiseptic, 0.5g (0.14 fl oz.) applications
- Two or more pairs of medical exam gloves(non-latex or latex)

Additional optional items include:

- CPR barrier device
- Four 2x2 inch bandage compresses
- Two 3x3 inch bandage compresses
- One roller bandage, three inches wide
- One 4x4 inch bandage compresses
- Two roller bandages, two inches wide
- One chemical cold pack, 4x5 inch

- One ounce of eye wash
- One eye patch

OSHA recommendation does not include the automated external defibrillator (AED), but current emergency cardiac care guidelines from the American Heart Association recommend automated external defibrillator in most public places.

January 12, 2015, the standard has been revised and is a good starting point for your First Aid Kit needs (ANSI/ISEA Z308.1-2014).

Item	Minimum Required	Size
16	Adhesive Bandages	1x3 inches
1	Adhesive Tape	2.5 yards total
10	Antibiotic Applications (Increased)	.14 fl. ounces
10	Antiseptic	.14 fl. ounces
1	Breathing Barrier	
1	Burn Dressing	Gel Soaked and 4x4 inches
10	Burn Treatment (Increased)	1/32 ounces
1	Cold Pack	4x5 Inches
2	Eye Covering with means of attachment	2.9 sq. inches
1	Eye/Skin Wash	1 fl. ounce
1	First Aid Guide	
6	Hand Sanitizer	1/32 ounces
2	Medical Exam Gloves	Pairs
1	Roller Bandage	2 Inches x 4 yards
1	Scissors	
2	Sterile Pad	3x3 inches
2	Trauma Pad	5x9 inches
1	Triangular Bandage	40x40x56 inches

Tab-A ANSI 2014 new minimum first aid kit requirement

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The Good Samaritan Legislation

The Good Samaritan laws refer to an individual who gives aid, in an emergency, to an injured or ill person on a voluntary basis. An individual is not obligated by law to do first aid in most states. When the unconscious person cannot respond, a Good Samaritan can assist them on the grounds of implied consent. However, if the person is conscious and can respond, the individual should first ask their permission to help them.

The Good Samaritan Legislation vary from State to State; Some states offer immunity to Good Samaritans, but if there is negligence, this could result in a claim of negligent care if the illness or injuries were made worse by the volunteer's negligence. Good Samaritan laws often does not apply to an individual giving emergency care or assistance during the course of regular employment, such as services provided by a health care worker , whose job is to give care to a patient within a health care facility. An individual who provides First aid in good faith within their level of training and knowledge are covered by the Good Samaritan laws.

Good Samaritan laws generally involve the following:

- Obtaining consent; verbal, non-verbal or implied consent
- It is an emergency situation
- The individual who is giving first aid is volunteering, not expecting payment or reward
- The individual who is giving first aid is doing so in good faith and has intent to assist the ill or injured person
- The individual who is giving first aid does not provide care that is negligent or against first aid guidelines.

See the Florida Statutes Below:

768.13 Good Samaritan Act; immunity from civil liability.—

(1) This act shall be known and cited as the "Good Samaritan Act."

(2)(a) Any person, including those licensed to practice medicine, who gratuitously and in good faith renders emergency care or treatment either in direct response to emergency situations related to and arising out of a public health emergency declared pursuant to s. 381.00315, a state of emergency which has been declared pursuant to

s. 252.36 or at the scene of an emergency outside of a hospital, doctor's office, or other place having proper medical equipment, without objection of the injured victim or victims thereof, shall not be held liable for any civil damages as a result of such care or treatment or as a result of any act or failure to act in providing or arranging further medical treatment where the person acts as an ordinary reasonably prudent person would have acted under the same or similar circumstances.

(b)1. Any health care provider, including a hospital licensed under chapter 395, providing emergency services pursuant to obligations imposed by 42 U.S.C. s. 1395dd, s. 395.1041, s. 395.401, or s. 401.45 shall not be held liable for any civil damages as a result of such medical care or treatment unless such damages result from providing, or failing to provide, medical care or treatment under circumstances demonstrating a reckless disregard for the consequences so as to affect the life or health of another.

2. The immunity provided by this paragraph applies to damages as a result of any act or omission of providing medical care or treatment, including diagnosis:

a. Which occurs prior to the time the patient is stabilized and is capable of receiving medical treatment as a nonemergency patient, unless surgery is required as a result of the emergency within a reasonable time after the patient is stabilized, in which case the immunity provided by this paragraph applies to any act or omission of providing medical care or treatment which occurs prior to the stabilization of the patient following the surgery.

b. Which is related to the original medical emergency.

3. For purposes of this paragraph, "reckless disregard" as it applies to a given health care provider rendering emergency medical services shall be such conduct that a health care provider knew or should have known, at the time such services were rendered, created an unreasonable risk of injury so as to affect the life or health of another, and such risk was substantially greater than that which is necessary to make the conduct negligent.

4. Every emergency care facility granted immunity under this paragraph shall accept and treat all emergency care patients within the operational capacity of such facility without regard to ability to pay, including patients transferred from another emergency care facility or other health care provider pursuant to Pub. L. No. 99-272, s. 9121. The failure of an emergency care facility to comply with this subparagraph

constitutes grounds for the department to initiate disciplinary action against the facility pursuant to chapter 395.

(c)1. Any health care practitioner as defined in s. 456.001(4) who is in a hospital attending to a patient of his or her practice or for business or personal reasons unrelated to direct patient care, and who voluntarily responds to provide care or treatment to a patient with whom at that time the practitioner does not have a then-existing health care patient-practitioner relationship, and when such care or treatment is necessitated by a sudden or unexpected situation or by an occurrence that demands immediate medical attention, shall not be held liable for any civil damages as a result of any act or omission relative to that care or treatment, unless that care or treatment is proven to amount to conduct that is willful and wanton and would likely result in injury so as to affect the life or health of another.

2. The immunity provided by this paragraph does not apply to damages as a result of any act or omission of providing medical care or treatment unrelated to the original situation that demanded immediate medical attention.

3. For purposes of this paragraph, the Legislature's intent is to encourage health care practitioners to provide necessary emergency care to all persons without fear of litigation as described in this paragraph.

(d) Any person whose acts or omissions are not otherwise covered by this section and who participates in emergency response activities under the direction of or in connection with a community emergency response team, local emergency management agencies, the Division of Emergency Management, or the Federal Emergency Management Agency is not liable for any civil damages as a result of care, treatment, or services provided gratuitously in such capacity and resulting from any act or failure to act in such capacity in providing or arranging further care, treatment, or services, if such person acts as a reasonably prudent person would have acted under the same or similar circumstances.

(3) Any person, including those licensed to practice veterinary medicine, who gratuitously and in good faith renders emergency care or treatment to an injured animal at the scene of an emergency on or adjacent to a roadway shall not be held liable for any civil damages as a result of such care or treatment or as a result of any act or failure to act in providing or arranging further medical treatment where the

person acts as an ordinary reasonably prudent person would have acted under the same or similar circumstances.

INFECTION CONTROL

Infection control refers to guidelines / regulations that are designed for educating, reporting, monitoring, managing and isolating healthcare related and/or community acquired infections. Therefore, infection control measures are important to control, eliminate or minimize employee exposure to bloodborne pathogens and communicable diseases.

Protect yourself from bloodborne pathogens.

Bloodborne pathogens can threaten your health and your wellbeing by causing you to develop sickness, disease/ infection. If you have a first aid kit available, sanitize your hands and put on sterile gloves. If gloves and /or sanitizer are not available, protect your hands by using extra gauze, cloth or handkerchiefs. Try to avoid direct contact with the victim's blood. If you have made contact, clean yourself off as soon as possible.

Term	Definition
Bloodborne pathogens	pathogenic microorganisms that are present in human blood and can cause disease in humans.
Pathogens	Microorganisms that cause diseases.
Microorganism	An organism or infectious agent of microscopic or submicroscopic size

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Regulations

Infection control standards and policies published by Occupational Safety and Health Administration (OSHA), the Centers for Disease Control and Prevention (CDC) the Association for Professionals in Infection Control and Epidemiology (APIC) and National Institute of Occupational Safety and Health (NIOSH) have made recommendations. These guidelines are designed to reduce the transmission of bloodborne and other pathogens and apply to every patient regardless of their diagnosis.

These guidelines reinforce the idea that body substances such as oral and body secretions; blood, breast milk, urine, feces, airborne spray from coughing or droplet, vomits, tissue, wound, or any other drainage; can be a source of infection. These guidelines also explain that the environment can also be a source of infection.

Universal Precaution

Universal Precaution is an infection control principle that treats all human blood and other potentially infectious materials (OPIM) as infectious (29 CFR1910.1030(d)(1). OSHA regulation for preventing any exposure to HBV, HIV, and HCV in the workplace and requires the proper use of Personal protective equipment (PPE).

Standard Precautions

Standard Precautions: recommendations from the Centers for Disease Control and Prevention (CDC) which focuses on all body fluids; whether or not blood is present. Body fluids from excretion, secretion (except sweat), and contact with non-intact skin or mucus membranes.

Hand washing

The hands must be washed before and after victim/ patient contact. The hands are to be washed during patient care if they become soiled. Wash the hands with liquid soap and water immediately after removing gloves.

The components of good hand washing include:

Using adequate amount of soap
Rubbing the hands together to create some friction and
Rinsing under running water

The mechanical action of washing and drying removes most of the transient bacteria that is present. Washing hands thoroughly between patient contacts and after contact with body fluids, blood, excretion, secretion, articles or equipment contaminated by them is an important component of infection control and isolation precautions.

Some institutions recommend use adequate soap, make lather and continue rubbing for *15-20 seconds*. To wash for the correct time, sing “Happy Birthday to You” twice.
If soap and water are not available, you can use an alcohol based hand rub to clean your hands. These foam gels significantly reduce the number of germs on the skin and are fast acting. Follow your institutions’ policy and procedure.

Personal protective equipment (**PPE)**

Personal protective equipment or PPE are protective wear/ materials used to protect you from any splashes or body exposures to blood, and or other contaminates. PPE are equipments such as gloves, scrubs, lab coat, goggles, gowns, surgical shoe covers, aprons, caps etc. Disposable face masks are to be worn whenever there is a reasonable expectation that droplet transmission may occur. Appropriate use of PPE is required by the Bloodborne Pathogens standard, if exposure to blood is anticipated (29 CFR 1910.1030(d)(2)(i)

Prioritizing care

Priority refers to actions that are established in order of importance or urgency. When an individual arrives on scene of an accident, the rescuer has to first assess the situation. Your initial observations will allow you to take appropriate actions that will assist the victim or injured person, without causing further harm or injury to that person or to yourself. Prioritize all actions in order of urgency/ importance. There might be several injured persons at the scene; prioritizing care will allow you to determine who will need assistance or treatment first.

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Conduct an Initial assessment

Always check the environment (Scene), look carefully to make sure the scene is safe. Do not just rush to the victim. There might be dangers that you are not aware of, for example, the victim may have a gunshot wound and the attacker might still be at the scene or in the area. There may also be environmental hazards, such as electrical issues or power lines down making it unsafe to get to the injured person, therefore in this instance, you cannot get to the victim and must call 911 tell them what you observed, the victim and the environmental dangers. The 911 operator will ask you for important information regarding location etc. so stay on the line until that 911 operator tells you otherwise.

Other environmental hazards that may prevent you from getting to the victim may include, but not limited to:

- Flooding,
- Fire,
- Lightning,
- High winds,
- Traffic,
- Ground is unstable or sinkhole activity
- Edge of cliff
- Wild animals in environment

If in your initial assessment you observed that the scene is safe;

Check the person for responsiveness; call out "Do you need help"? This might be an individual who was just sleeping / taking a nap. If you receive no response, tap the individual on the shoulder and call out again "are you OK?

If you have encountered an emergency situation and the victim is **conscious**;

- Tell the victim your name

- Obtain consent by asking the victim if you can help him/her
  If the victim gives consent, provide the appropriate care.
- Ask the victim what happened,
- Ask if he/she has any pain/discomfort
- Ask if he/she has any medical conditions,
- Ask if he/she has any difficulty moving any extremities (arms or legs)
- Ask if he/she is experiencing any numbness,
- Ask if he/she has any allergies,
- Ask when was last time he/she had anything to eat,
- Ask when was last time he/she had anything to drink,
- Ask if he/she are taking any medications.

Update the EMS personnel with this information, when they arrive on scene. Remember, If the victim is conscious and does not give you his/her consent, ***do not*** give care but call 911.

Term	Definition
Consent	To agree to do or allow something: to give permission for something to happen or be done.

If the victim is unconscious and therefore unable to give verbal consent; in this situation you will use implied consent. The victim is also unable to give you clues regarding what has happened but as you assess the victim, check for Medic Alert bracelet, watch, sports bands, necklace, shoe tags, ID bracelets which may provide a diagnosis.

Check the injured person/victim to find out whether he/she has a severe injury that requires a call to 911 or if the injury is minor and can be easily taken care of on scene or by a car ride to a physician's office or hospital. If you are not sure regarding the severity of the victim status, call 911.

HEAD -TO -TOE ASSESSMENT

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Check the victim from the Head to Toe. Start by looking at the top of the head, face, ears, nose and his/her mouth. You are looking for bumps/ swelling, bruises, discoloration, cuts, fluid leakage, bleeding and any unusual depressions or indentation in the skin.

- Look at the coloring of the skin,
- Look at the color changes on the face (pale, flushed)
- Look at the color changes on the lips (cyanosis, blue)
- Check how the skin feels (moist, sweating, increased warmth/hot or cold)
- Check the forehead with the back of your hand (for temperature changes)
- Monitor for changes in breathing and consciousness
- Check/ look all over the body, try not to move the victim,
- Observe the victim for signs/ symptoms of pain (the victim may grimace or make have facial expression changes when a part of the body is touched).
- Listen for sounds of discomfort/pain (moaning or groans)

Remember, as mentioned earlier, not all incidents will require a call to 911. There will be times when the victim may only require a car ride/ transport to the hospital or a physician office.

Call 911 for serious accidents/ injuries such as:

- Difficulty breathing
- Victim losses consciousness
- Signs/ symptoms of shock
- Confusion
- Accident with impact injury/injuries
- Severe bleeding
- Burns that are severe
- Severe fall
- Traumatic Head injury
- Drug overdose
- Fracture with bone piercing through the skin
- Possible fracture of spine, neck, head, femur or pelvis
- Chest pain, tightness or pressure
- Unable to move

- Decreased or loss of sensation
- Open wound
- Pupils are unequal
- Deformity of the extremities or joints
- Cyanosis of extremities or lips

Head, Neck and Spine Injury

Spinal Column Anatomy

When an injury occurs within the spinal cord, movement and sensation may be interrupted, this may cause a permanent or temporary loss of function, paralysis and loss of sensation.

Some basic anatomy facts are:

The brain is surrounded by the skull. The skull is a bony structure; the head in the skeleton, which supports the structures of the face and forms a cavity for the brain. The adult skull consists of two parts which are of different embryological origin the;

- Neurocranium and the
- viscerocranium.

The neurocranium (braincase) is a protective cranial vault that surrounds the brain and the brainstem. The viscerocranium (facial skeleton or splanchnocranium) is formed by the bones supporting the face. With the exception of the mandible, all of the bones of the adult skull are joined together by synarthrodial (immovable) joints formed by bony ossification, with Sharpey's fibres (bone fibers) permitting some flexibility. Sharpey's fibres are a matrix of connective tissue consisting of bundles of strong collagenous fibres connecting periosteum to bone. They are part of the outer fibrous layer of periosteum, entering into the outer circumferential and interstitial lamellae of bone tissue. The skull’s bony structure is to protect the brain from any damage.

If an injury occurs to the head, there is always risk of brain damage. Therefore, you should always assume that if there is a risk of head injury then there is also a risk of

neck injury and spine injury.

Term	Definition
Neurocranium	Those bones of the cranium enclosing the brain, as distinguished from the bones of the face.
Viscerocranium	That part of the cranium derived from the embryonic pharyngeal arches; comprises the facial bones of the facial skeleton(under *bone*) and is distinct from that part of the cranium that forms the neurocranium (braincase).
Periosteum	a dense layer of vascular connective tissue enveloping the bones except at the surfaces of the joints.

The spinal cord

The spinal cord is a bundle of nerves that runs down the middle of the back. The spinal cord carries signals back and forth between the body and the brain. A spinal cord injury may disrupt the signals.
The spinal cord is surrounded by rings of bone called the vertebrae. Both are covered by a protective membrane. The vertebrae and the membrane make up the spinal column, or the backbone.

The backbone/ spinal column protects the spinal cord; it starts at the base of the skull and ends just above the hips. The *spinal cord is about 18 inches long*. It extends from the base of the brain, down the middle of the back, to just below the last rib in the waist area.

The main function of the spinal cord is to be the communication system (carries signal) between the brain and the body by carrying messages that allow the individual to move and feel sensation.

Spinal nerve cells, which are called neurons, carry the messages to and from the spinal cord by way of the spinal nerves. The messages carried by the spinal nerves leave the spinal cord through openings that are located within the vertebrae.
Spinal nerve roots branch off the spinal cord in pairs, one goes to each side of the body. Every nerve has a special function for movement and feeling. The nerves tell the muscles in the arms, hands, fingers, legs, toes, chest and other parts of the body how to move and when to move. They also able to carry the messages back to the brain about sensations, for example pain, touch and temperature.

You should suspect injury to head, neck and / or spine in cases such as:

- Car accident
- Motorcycle accident
- Fall from height
- Electrocution
- Injury to the head from sporting event or fight
- even minor bump can cause internal head injury

Also suspect a head, neck and/ or spine injury if the following symptoms occur after an accident:

- Lack of responsiveness
- confusion
- Seizures
- Visual problems
- Vomiting
- Headache
- Moaning

- Problems walking
- Problems moving

Steps for administering First Aid:

Always make sure the scene is safe for you and the victim
Call 911 or designate someone to call 911
Hold the neck and head so it does not move, bend or twists

Turn the victim only if:

- Victim is in danger,
- if you need to check if the victim is breathing,
- if the victim is vomiting

NOTE: If you have to turn the victim, make sure you are holding the head and neck in place to avoid movement, bending or twisting.

Head Injury Guidelines

Answer the following questions, this will help you determine whether the victim should be taken to the physician, the emergency room, or be treated at home.

Has the victim experience unconsciousness? If yes, seek medical attention.

Has the victim experience loss of memory about the injury? If yes, seek medical attention.

Has the victim experience seizure activity? If yes, seek medical attention.

Are any of the following symptoms / situations present?

- bleeding from the eyes

- bleeding from the ears
- bleeding from the mouth
- fluid draining from nose
- vomiting repeatedly
- visual problems
- change in behavior, irritable, sleep
- lethargy
- irregular heart rate or breathing
- victim under the influence of drugs or alcohol
- possible child abuse
- possible domestic abuse

If answered yes to any of the above, then you must seek medical attention.
If you answered NO to the above questions, then apply home treatment.

Home Treatment for Head Injuries include:

Apply ice to the bruised area to minimize the swelling. A bump often develops at the bruised site. The victim has to be observed carefully. The symptoms of bleeding inside the head usually occur within the first 24 to 72 hours.

A minor head injury may occur when the victim runs into something or someone and bangs his or her head. A bump/ bruise usually begin to form. The victim may vomit once or twice in the first few hours. He or she may nap but is easily aroused, the pupils are not enlarged. Within eight hours, the individual is back to normal, but the bump/ swelling may take a longer time to resolve.

Spinal injury

NOTE !!

Take special care when assisting the spinal injury victim. All damage to the spinal cord is permanent, because the nerve tissue cannot heal itself. The result of nerve damage is paralysis or death.
If you have to move the victim, remember to keep the neck and the torso of the body as straight as possible; pull in the direction that will keep the victim's spine in a straight line.

Pull the body from the shoulders or feet. You may also pull the victim by the clothing. You may grab the victim by the collar of the shirt and support the victim's head with your forearm while pulling. The clothing drag is preferred method because the victim's head is supported while the victim is being moved. NEVER try to pull the body sideways. It is more ideal to have at least two rescuers assist the victim.

Some causes of spinal injuries include traumatic injuries due to:

- Motor vehicle accidents
- Falls
- Diving into shallow water
- Football
- Gymnastics
- Fight /Violence

The majority of people who sustain a spinal cord injury are young adults between the ages of 16 and 30 due to riskier behaviors displayed. Spinal cord injury affects more men than women.

Some causes of spinal injuries non-traumatic injuries/illnesses may be caused by:

- Cancer
- Osteoporosis
- Inflammation of the spinal cord
- Arthritis
- Multiple sclerosis

The effects of spinal cord injury may cause symptoms such as:

- Inability to move / Loss of movement
- Unable to feel/ Loss of sensation
- Loss of control of bowel and/or bladder
- Changes in sexual function
- Changes in sexual sensitivity
- Changes in fertility
- Exaggerated spasms or reflex actions
- Pain or intense tingling sensation

Levels of Spinal Injury

The Vertebrae are grouped into different sections:

- High-Cervical Nerves (C1 – C4)
- Low-Cervical Nerves (C5 – C8)
- Thoracic Nerves (T1 – T5)
- Thoracic Nerves (T6 – T12)
- Lumbar Nerves (L1 – L5)
- Sacral Nerves (S1 – S5)

The higher the injury occurs on the spinal cord, the more dysfunction can occur.

High-Cervical Nerves (C1 – C4)

This is the most severe of spinal cord injury levels
Paralysis noted in arms, hands, trunk and the legs
The victim may not be able to breathe on his/her own
The victim may not be able to cough
The victim may not be able to control bladder or bowel movements
The ability to speak is sometimes reduced or impaired
When all four limbs are affected, this is called quadriplegia, tetraplegia
The individual will require 24 hour a day personal care
He /she will not be able to drive a car on their own
The victim will require complete assistance with all activities of daily living, such as dressing, eating, bathing, moving in or out of chair or bed etc.
He /she may be able to use a powered wheelchair which has special controls so that he/ she can move around on his/her own.

Low-Cervical Nerves (C5 – C8)

Corresponding nerves control the arms and hands.
The individual with this level of injury may be able to breathe on his/ her own.
The individual with this level of injury may be able to speak normally.

C5 injury

The victim can raise his / her arms and can bend the elbows.
May have some paralysis or total paralysis of wrists, hands, trunk and the legs
Is able to speak and use diaphragm, but breathing will be weakened
Will require assistance with most activities of daily living, but is able to move around in a power wheelchair.

C6 injury

Typical to observe paralysis in hands, trunk and the legs
Nerves affect the wrist extension.
May be able to bend the wrists back
Able to speak and use the diaphragm, but breathing will be weakened
Will be able to move in and out of the bed and wheelchair with assistive equipment
He /she may also be able to drive an adapted vehicle
Very little or no voluntary control of bladder or bowel, but may be able to manage on his/ her own with special equipment.

C7 injury

The Nerves control elbow extension and some finger extension
Most victims can straighten the arm and have normal movement of the shoulders
He /she may also be able to drive an adapted vehicle
The victim is able to do most activities of daily living by himself/ herself, but may need assistance with more difficult activities / tasks
May have little or no voluntary control of bowel or bladder, but may be able to manage on their own with special equipment.

C8 injury

The nerves control some hand movement.
The victim should be able to grasp objects and release them

He /she can do most activities of daily living by themselves, but may require assistance with the tasks that are more difficult.
May have little or no voluntary control of bowel or bladder, but may be able to manage on their own with special equipment.

The victim may be able to also drive an adapted vehicle.

The Thoracic vertebrae

The Thoracic vertebrae are located in the mid-back.

Thoracic Nerves (T1 – T5)

The corresponding nerves affect the muscles; upper chest, mid-back and muscle of the abdomen.
The victim's arm and hand function is usually normal.
The Injuries usually affect the trunk and the legs which is referred to as paraplegia.
The victim most likely will use a manual wheelchair
He /she can learn to drive a modified car
The victim may be able to stand in a standing frame or may be able to ambulate with braces.

Thoracic Nerves (T6 – T12)

The nerves affect the muscles of the trunk (abdominal and back muscles) depending on the level of injury.
When these nerves are affected, this usually results in paraplegia
The victim may have little or no voluntary control of bladder or bowel but can manage with special equipment
The victim will have normal upper body movement
He / she will have fair to good ability to balance and control the trunk while in seated position.
The victim should be able to have a productive cough; if the muscles of the abdomen are intact.
Some individuals can stand in a standing frame, others may walk with braces.
He /she will most likely use a manual wheelchair.
The victim can learn to drive a modified car

Lumbar Nerves (L1 – L5)

The injuries usually result in some loss of function in the legs and the hips.
The victim, depending on strength in his/ her legs, may need the wheelchair and may also ambulate with braces.
The victim may have little or no voluntary control of bladder or bowel, but can manage with special equipment.

Sacral Nerves (S1 – S5)

Injuries usually result in some loss of function to the hips and the legs.
He /she most likely will be able to ambulate.
The victim may experience little or no voluntary control of bladder or bowel, but can manage with special equipment

Some common terminologies surrounding the spinal injury may include:

Autonomic Dysreflexia

Autonomic Dysreflexia is a potentially life threatening condition caused by painful stimuli below the level of injury that the body cannot respond to because of non-functioning nerve cells; especially in victims with complete tetraplegia. Symptoms may include painful headache due to a sudden increase in blood pressure, slowed/ reduced heart rate, red blotches on the skin, increased or abnormal sweating and restlessness. It is very important to assess for the causes; for example, impacted stool, an overfull bladder, infection/ infected pressure ulcers and/ or ingrown toenails.

ASIA/ ISCoS Exam and Grading System
American Spinal Injury Association (ASIA) / International Spinal Cord Society (ISCoS)

System to describe the spinal cord injury and help to determine future rehabilitation and the recovery needs. It is based on a victim's ability to feel sensation at multiple/ different points on the body and also tests the motor function. It is usually first given within 72 hours after the initial injury.

ASIA/ ISCoS Exam Chart (ASIA Impairment Scale):

- **Grade A -** Complete lack of motor and sensory function below the level of injury (including the anal area)
- **Grade B -** Some sensation below the level of the injury (including anal sensation)
- **Grade C-** Some muscle movement is spared below the level of injury, but 50 percent of the muscles below the level of injury cannot move against gravity.
- **Grade D-** Most (more than 50 percent) of the muscles that are spared below the level of injury are strong enough to move against gravity.
- **Grade E-** All neurologic function has returned.

Arteriovenous malformation
Arteriovenous malformation refers to misconnection between the arteries and the veins.

Complete injury
No function or sensation below the level of the injury.

CT Scan (Computerized Tomography)
Provides the physicians with more detailed information about spinal cord or brain damage than X-rays are able to show.

Incomplete injury
Some sensory function or motor function below the primary level of the injury.

Hemorrhage
External or Internal bleeding caused by damage to a blood vessel.

Motor Function
The ability to control the muscles voluntarily and their resultant use.

Motor Index Score (MIS)
A portion of ASIA/ISCoS exam that determines muscle strength of 10 different muscles on both sides of the body.

MRI (Magnetic Resonance Imaging)
MRI uses a strong magnetic field and radio waves to produce computer-generated images. It can help identify swelling, blood clots or skull fractures that may be compressing the brain and/or the spinal cord.

Myelography

Myelography is a test using injected dye to enable the physician to visualize the victim's spinal nerves more clearly. After the dye is injected into the spinal canal, X-rays and CT scans of the vertebrae can reveal herniated disks or other anomalies.

Paraplegia
Loss of motion/ paralysis. It typically affects the trunk and both legs, but not the arms. This is usually a result of injuries at the thoracic and lumbar levels.

Physiatrist
The Physician who specializes in physical medicine and rehabilitation.

Physical therapist
Treats disabilities that result from motor and sensory impairments

Recreational therapist or therapeutic recreation specialist
Helps the victims to discover the wide variety of recreational options they may be able to participate in and trains him/ her to do so.

Rehabilitation nurse
The Nurse with special training in rehabilitative and restorative medicine.

Tetraplegia also called quadriplegia
Paralysis located from approximately the neck down, due to injury to the spinal cord in the neck and is associated with partial or total loss of function in bilateral upper and lower extremities (both arms and legs).

Sensory Index Score (SIS)
Part of ASIA/ISCoS exam- it measures the victim's response to light touch and a pinprick in 28 points on each side of the body to determine what the victim is able to feel. Together, the Sensory Index Score (SIS) and Motor Index Score (MIS) determine the victim's level and severity of injury.

Vocational therapist
Helps the individual assess his/ her job skills/readiness, and return to work options.

Some helpful Resources, and Credible Organizations and Web Sites are:

The American Trauma Society
Dedicated to the prevention of trauma and improvement of trauma care.

www.amtrauma.org 1- 800-556-7890

Christopher & Dana Reeve Paralysis Resource Center
Promoting the health and wellbeing of people living with spinal cord injury, mobility impairment and paralysis by providing comprehensive information, resources and referral services.

www.paralysis.org
Tellephone:1-800-539-7309

Family Voices
Aim to achieve family-centered care for all children and youth with special health care needs and/or disabilities.

www.familyvoices.org/states
telephone: 1-888-835-5669

Disabled Sports USA
A network of community-based chapters offering sports rehabilitation programs to anyone with a permanent disability

www.dsusa.org/chapter.html
information@dsusa.org

National Spinal Cord Injury Association
Leading the way in maximizing the quality of life, and opportunities for people with spinal cord injuries and diseases since 1948.

www.spinalcord.org
1- 800-962-9629

NTAF
NTAF helps families address financial hardships arising from uninsured medical expenses related to catastrophic spinal cord or brain injury. Established in 1983 by medical professionals, NTAF is a 501(c)(3) nonprofit organization that provides expert fundraising guidance to patients, families and communities nationwide, while offering fiscal accountability for funds raised.

www.ntafund.org
Telephone: 1-800-642-8399

Office of Disability Employment Policy
Federal government agency within the U.S. Department of Labor helping ensure that people with disabilities have equal employment opportunities

www.dol.gov/odep
telephone: 1- 866-487-2365

Spinal Cord Injury Information Network
The UAB-SCIMS works to maintain and improve a cost-effective, comprehensive service delivery system for people who incur a spinal cord injury. A Model System facility must demonstrate outstanding care to individuals with spinal cord injury, from the emergency medical services to acute care in the hospital to rehabilitation.

www.spinalcord.uab.edu
telephone: 1- 205-934-3450

If the individual has a dual diagnosis of both brain and spinal cord injury, the following organizations are available resources:

American Heart Association
Works to build healthier lives, free of cardiovascular diseases and stroke

www.americanheart.org
telephone: 1- 800-242-8721

American Stroke Association
Works to build healthier lives, free of cardiovascular diseases and stroke

www.strokeassociation.org
telephone: 1- 888-478-7653

Brain Injury Association of America
Dedicated to increasing access to quality health care and raising awareness and understanding of brain injury through advocacy, education and research

www.biausa.org
telephone:1-800-444-6443

TRAIN FOR SUCCESS INC.
BASIC FIRST AID

Brain Trauma Foundation
Dedicated to improving the outcome of traumatic brain injury (TBI) patients worldwide by developing best practices guidelines, conducting clinical research, and educating medical professionals and consumers

www.braintrauma.org
telephone: 1-212-772-0608

Rates of traumatic brain injury (TBI)

According to the CDC, the total combined rates for traumatic brain injury (TBI)-related emergency department (ED) visits, hospitalizations and deaths have increased over the past decade. Total combined rates of TBI-related hospitalizations, ED visits, and deaths climbed slowly from a rate of 521.0 per 100,000 in 2001 to 615.7 per 100,000 in 2005. The rates then dipped to 595.1 per 100,000 in 2006 and 566.7 per 100,000 in 2007.

The rates then spiked sharply in 2008 and continued to climb through 2010 to a rate of 823.7 per 100,000. Total combined rates of TBI-related hospitalizations, ED visits, and deaths are driven in large part by the relatively high number of TBI-related ED visits. In comparison to ED visits, the overall rates of TBI-related hospitalizations remained relatively stable changing from 82.7 per 100,000 in 2001 to 91.7 per 100,000 in 2010. TBI-related deaths also decreased slightly over time from 18.5 per 100,000 in 2001 to 17.1 per 100,000 in 2010.

For each year, 2001–2010, men have had higher rates of TBI-related ED visits compared to women. For men, rates of TBI-related ED visits have increased by more than 50% in those years, increasing from 494.6 visits per 100,000 in 2001 to 800.4 per 100,000 in 2010. Similarly, rates of TBI-related ED visits in women have increased from 349.3 per 100,000 in 2001 to 633.7 per 100,000 in 2010. From 2007 – 2010, there was a striking increase in rates among both men and women. Rates among men grew from 491.6 per 100,000 in 2007 to 800.4 per 100,000 in 2010, a 63% increase. Also, the rates among women increased from 424.3 per 100,000 in 2007 to 633.7 per 100,000 in 2010, a 49% increase.

Recovery position:

If the victim is unconscious and does not appear to be at risk for spinal cord injury or severe head or neck injuries, he/she should be placed in the recovery position instead of lying on the back or in the supine position.

In the recovery position, the victim is turned to the side and the head is positioned so that the airway is not obstructed; the chin is raised to keep the airway open, and the mouth is positioned downward this will allow drainage of any secretions.

There are various recovery positions; one of the most common is to:

- to raise the arm on the side to which the victim is to be turned,
- place the opposite arm across the chest,
- raise the opposite knee,
- grasp the opposite shoulder,
- while holding the opposite knee and shoulder and
- Turn victim in a smooth movement.

Observe the victim carefully while in the recovery position to make sure that he/she is still breathing. If the victim starts vomiting, wipe the mouth to prevent any obstruction in the airway.

Definition	
Supine position	*Lying on the back*

BLEEDING

Bleeding is defined as blood escaping from the circulatory system. Bleeding may occur inside the body as blood leaks from organs or from blood vessels and bleeding can occur outside the body when the blood flows through a natural opening such as; the mouth, rectum or through a break in the skin from trauma.

The circulatory system / vascular system

With every heart beat, blood is pumped through a system of blood vessels, called the circulatory system which is a network of blood vessels, blood, and lymph that is found throughout the body. The blood vessels are elastic, muscular tubes that carry blood to every part of the body. Blood is very essential. It carries fresh oxygen from the lungs and the nutrients to the tissues of the body; it also takes the body's waste products, including carbon dioxide, away from the tissues. This is necessary to sustain life and promote the health of all parts of the body.

Circulation of blood through the Heart:

As blood travels from the body, it goes into the right atrium, moves into the right ventricle and it travels to the pulmonary arteries where it is oxygenated in the lungs. The oxygenated blood then goes back to the heart through the pulmonary veins into the left atrium, to the left ventricle and to the aorta where it goes out to the body's tissues. The vascular system is made up of blood vessels, which include arteries, arterioles, capillaries and veins. These vessels vary in size and function.

The arteries carry oxygenated blood away from the heart. The aorta is the largest artery, emanating from the heart. Arteries branch off the aorta. As they branch off the aorta, they decrease in size and become arterioles.

The arterioles subdivide into capillaries. The capillaries provide nutrients to the tissue and take wastes away. Capillaries connect with venules, which are the smallest veins. The venules connect with larger veins, eventually leading to the vena cava, which is the largest vein and connects directly to the heart. Veins carry deoxygenated blood back to the heart. The deoxygenated venous blood is carried to the right atrium through the superior vena cava (SVC) and the inferior vena cava (IVC). The blood enters the right ventricle, exiting through the pulmonary artery to the lungs, where it is oxygenated and carried to the left atrium through the pulmonary veins.

EXCEPTION TO THE RULE: The pulmonary artery carries deoxygenated blood and the pulmonary veins carry oxygenated blood; these are the only exceptions to the rule that an artery contains oxygenated and a vein deoxygenated blood.

The vein

The vein consists of three layers: Tunica adventitia, Tunica media and Tunica intima.

1. The tunica adventitia, the outermost layer, is the strongest of the three layers. It is composed of collagenous and elastic fibres. (Collagen is a connective-tissue protein.)
2. The Tunica media is composed primarily of elastic fibres.
   The elastic and muscle tissues causes dilation and contraction.
3. The Tunica intima, the innermost layer, consists of an inner surface of smooth endothelium covered by a surface of elastic tissues. Within the tunica intima layer are valves which are directed toward the heart, and prevent blood from flowing toward the extremities.

Minor Bleeding / Excessive Bleeding

Minor bleeding episodes are common, and they are often easy to treat. Most of the time, the bleeding will stop spontaneously. Minor bleeding episodes often have no long-term consequences. However, if the victim is having a major bleeding episode; this major bleeding can be very dangerous, and can be fatal.

Extensive bleeding may occur in any situation. Always assess the victim who is bleeding for other injuries or trauma such as fractures or head injuries. A punctured wound, cuts or laceration caused by a sharp object can result in a significant amount of bleeding.

Excessive amount of blood loss causes a decrease in the amount of blood that is available to perfuse the tissues and organs of the body and will lead to shock and death if not treated.

Wounds to the abdomen and chest

Wounds to the abdomen and chest can be very serious because of the possibility of severe internal bleeding:

- Call 911- Seek immediate medical care for any chest or abdominal wound.
- If organs can be seen through the wound, cover the injury with a moistened cloth or bandage if available.
- Do not attempt to push organs back into place; you may cause further injury to the victim.
- Apply very gentle pressure to stop the bleeding.

Bleeding under the skin

Bleeding can cause blood to collect under the skin causing the skin to have a black and blue appearance /bruise;

- Apply a cool compress to the area as soon as possible to reduce edema / swelling.

- Place ice over the injury but wrap the ice in a towel. Do not place the ice directly on the skin.

Symptoms of Bleeding:

Symptoms of bleeding may include:

- Observation of blood coming from a wound
- Black and blue color to the skin / Bruising
- Shock which may cause the following symptoms:
    - decrease alertness or confusion
    - moist, pale, clammy skin
    - lightheaded or dizzy
    - weakness
    - Decrease in blood pressure
    - pallor / paleness
    - increased heart rate, rapid pulse

- Difficulty breathing /Shortness of breath

Symptoms of internal bleeding may also include:

- Chest discomfort/ pain
- Abdominal discomfort/ pain and swelling
- External bleeding pouring through a natural opening, for example;
    - Blood seen in the vomit may look brown like coffee-ground or bright red.
    - Blood from the rectum, seen in the stool may appear bright red, black or maroon.
    - Blood seen in the urine may appear pink, tea-colored or red,
- Skin color changes may be observed several days after a trauma or injury. skin color may change to bluish, purple, black, yellowish green)

Bleeding Treatment

- When the victim has external bleeding, the most important step is to apply direct pressure to try to stop the bleeding.
- Use gloves when treating someone who is bleeding (if available).
- Wash your hands before and after giving first aid to the victim who is bleeding. This will help to prevent against infection.
- If the bleeding is severe call 911 and take steps to prevent shock.
- if there is head, neck, back, or leg injuries do not move the victim because you may make the injury worse.

Treatment for external bleeding:

- Reassure the victim to keep him/ her as calm as possible.
- If the wound is superficial; meaning it only affects the top layers of the skin, wash it with soap and warm water, and pat the area dry. Bleeding from superficial scrape or wounds is often slow and stops very quickly.

- Lay the victim down, this will reduce the chance of the victim passing out or fainting. When the victim is laying down this increase the blood flow to the victim's brain. If possible, elevate the part of the body that is bleeding.
- Remove any dirt or loose debris that you can see from a wound. But ***do not try to remove an object that is stuck in the body such as such as a knife, glass or stick. If you remove such objects, you can cause further bleeding or injuries to the victim. It is best to put some bandages or pads around the object and tape the object securely in place.***
- Place direct pressure on a wound with a clean cloth or sterile bandage. You may even use a piece of clothing.
- Continue to apply pressure until the bleeding stops, then tightly wrap the wound dressing with some tape or if no tape is available use a piece of clean clothing. Then put a cold pack over the dressing.
- If bleeding continues and is leaking through the dressings on the wound, ***reinforce the dressing, never remove it.*** Add more dressing or cloth over the first dressing until 911 personnel arrive.
- DO NOT apply a tourniquet to control bleeding, except as a last resort because this may cause more harm than good. A tourniquet should be used only in a life-threatening situation and should be applied by a trained individual.

Tips !!!

Remember to seek medical assistance if:

- The bleeding cannot be controlled
- The bleeding was caused by a serious injury
- The wound or bleeding site need stitches
- Unable to remove dirt or gravel with gentle cleaning
- You think that there might be having internal bleeding or symptoms of shock
- Signs / symptoms of infection develop, including fever, increased pain, redness, swelling, brown or yellow fluid observed from the wound site.
- The victim has not had a tetanus shot in the last 5-10 years

Nosebleed (Epistaxis)

Epistaxis, or bleeding from the nose, is a common complaint. Sometimes the nosebleed may occur in the front of the nose, which is referred to as, anterior epistaxis and involve only one nostril. Some blood may drain down the back of the nose into the throat. Bleeding from blood vessels in the back part of the nose is referred to as posterior nosebleed.

Many factors may lead to a nosebleed, such as:

A. Environmental changes, for example:

Dry climates; low humidity, cold
High altitude
Fumes
Chemical
Smoke

B. Injury to the nose, for example:
Blowing the nose
Object in the nose
Picking the nose
Trauma to the nose
Piercing the nose

C. Medical problems, for example:

Colds
Allergies
sinus infections
High blood pressure
Liver disease
Blood clotting disorders, such as Hemophilia, thrombocytopenia or leukemia
Kidney disease
An abnormal structure within the nose, such as a deviated nasal septum
Abnormal blood vessel in the nose.

D. Medications, for example:

Medicines that affect blood clotting, such as warfarin (Coumadin), aspirin, enoxaparin (Lovenox), or nonsteroidal anti-inflammatory drugs (NSAIDs).
Cold medicines
Allergy medicines
Oxygen therapy
Nasal inhalers, for example Afrin
Steroid nasal sprays
Nasal abuse of illegal drugs.

Term	DEFINITION
Thrombocytopenia	is any disorder in which there is an abnormally low amount of platelets. Platelets are parts of the blood that help blood to clot.

Treatment for nosebleed:

1. Have the victim sit up straight and tip the head slightly forward. Do not tilt the head back because this may cause the blood to run down the back of the throat. Swallowing blood can irritate the stomach and cause nausea and vomiting. Vomiting may cause the bleeding to get worse or cause it to restart. Encourage the victim to spit out blood if he/ she is able.
2. Use your thumb and forefinger to firmly pinch the soft part of the nose shut. The nose has a hard, bony part and a softer part that is made of cartilage. Apply pressure towards the face. The victim will have to breathe through the mouth. Use a tissue or damp washcloth to catch the blood.

3. You may also apply an ice pack to the nose. Cold will cause constriction of the blood vessels and may help to stop the bleeding.
4. Keep pinching for a full 5 minutes. Use a clock to time the 5 minutes. Do not try to peek to check if bleeding has stopped after only a few Minutes.
5. Check to see if bleeding has stopped after 5 minutes. If it is, hold it for 5 more minutes. Most nosebleeds will stop after 10 to 20 minutes of direct pressure. If the bleeding stops, tell the victim not to blow his/her nose for at least 12 hours after the bleeding has stopped. Then have the victim rest quietly for a few hours.

Seek medical attention if:

- A nosebleed cannot be stopped after 10 to 20 minutes of direct pressure.
- Nosebleeds become more severe.
- The blood is flowing down the back of the throat rather than out front through the nose even though the victim is sitting with body and head leaning slightly forward. This may indicate a posterior nosebleed which almost always requires a physician's intervention.
- The victim feels faint or weak
- The nosebleed follows a fall, an accident or an injury to the head.
- Having nasal bleeding while taking blood thinners, such as aspirin or warfarin (Coumadin). The physician may need to adjust the medication dosage.

Shock

Shock is a life-threatening condition that takes place when the body is not getting enough blood supply / blood flow. With lack of blood flow, the organs and cells will not get enough oxygen and nutrients that it needs to function effectively. Therefore, many

organs can suffer damage. Shock requires immediate medical care /treatment and can get worse very quickly and may lead to death.

Types of shock include:

- Hypovolemic shock which occurs when there is too little blood volume.
- Anaphylactic shock is caused by an allergic reaction.
- Cardiogenic shock occurs due to heart problems
- Septic shock is due to an infection
- Neurogenic shock is caused by damage to the nervous system.

Signs / symptoms of shock include:

- Irritability / Restlessness
- Rapid breathing
- Changes in level of consciousness
- Rapid pulse
- Pale skin color, cool, moist skin
- Nausea and vomiting
- Bluish color to lips (cyanosis)
- Bluish color to nail bed (cyanosis)

Term	Definition
Cyanosis	***Cyanosis is a bluish color to the skin or mucus membranes that is usually due to a lack of oxygen in the blood.***

<u>For the Conscious victim showing signs of shock:</u>

Check the environment for safety and then check the victim
CALL 911
Monitor the victim circulation, airway and breathing

Control bleeding if noted
Keep the victim comfortable, make sure he/she is not getting cold or over heated
Elevate the legs, about 12 inches (if no injury or fracture is noted to head, neck, back, hips or the legs.
Stay with the victim until EMS arrives

If the victim is unconscious:

Check the environment for safety, then check the victim
Shout to the victim and tap the shoulder to assess if he/she will respond
If the victim does not respond, call 911 (or have someone else call while you attend to the victim)
Look at the victim, assess if he/she is breathing
Look/watch for the chest to rise and fall,
Listen, put your ear near to nose and mouth and listen for breathing
Feel for breathing, with your ear near to nose and mouth, you will feel the air flowing from the victim if he/she is breathing.
As you look, listen and feel for breathing, do so for 5 seconds;
Timing is very, very, very important.
If the victim is unconscious and is breathing, place him/her in the Recovery position.
If the victim is not breathing, this person will need Rescue breathing and possible CPR if the victim has no pulse, then CPR is needed. (You will need to learn Cardio Pulmonary Resuscitation (CPR) refer to the CPR Training.

Burns

Burn is defined as damage to the skin or other parts of the body caused by flame, extreme heat, or contact with a hot object, electricity or chemicals. Burns are classified as first, second, third or fourth degree, depending on the depth/ extent of the tissue damage. The treatment for burns depends on the depth, area, and the location of the burn, as well as other factors, such as the material that may be burned into or onto the skin. Treatment options may be simply applying a cold pack or may require emergency treatments or skin grafts.

First Degree Burns

A first degree burn is superficial and causes local inflammation of the skin. Sunburns are categorized as first degree burns. The inflammation is characterized by redness, pain, and some swelling. The skin may be very tender to touch.

Second Degree Burns

A Second degree burn is deeper and the victim experiences blistering of the skin in addition to the pain, inflammation and redness.

Third Degree Burns

A Third degree burn is much deeper and involves all layers of the skin. The nerves and the blood vessels are damaged. Third degree burns appear leathery and white and tend to be painless.

Fourth Degree Burns

With Fourth Degree Burn the damage of third-degree burns extends beyond the skin into muscle, ligaments, nerves, blood vessels, tendons and bones.

A first degree burn may progress from first degree to second degree within a few hours. As time moves on, the first degree burn may progress to deeper layers of the skin and become a second degree burn. For example, the sunburn may develop blisters and become second degree burn. Also second degree burns may involve deeper structures and become third degree burns.

The burn victim is at high risk for an infection to develop due to the break in the skin which increases the risk of infection at the site of the injury and also throughout the body.

Burns also cause fluids to collect or accumulate leading to swelling and inflammation in the wound and the areas surrounding the wound.

The burn victim is at risk for scarring and permanent injury as the burns extends into deeper tissues which are not able to regenerate itself. Therefore the skin in that area may not return to normal function.

Burn Treatment

The treatment for minor burns for example, first degree burns that involve a small area of the body may include:

- Remove the victim from the burning location/ area (if safe to do so).
- Gently cleaning the wound with water; make sure water temperature is NOT hot.
- Remove Jewelry such as bracelets, rings, and other items that can be potentially constricting. Remember the burn areas will develop swelling or edema from the inflammation which may occur and the items may cut into the victim's skin.
- If available, dress/ treat the burn with a topical antibiotic ointment such as Neosporin or Bacitracin. Silver sulfadiazine/ Silvadene topical is a preferred agent for most burns.
- If the burn is deeper and may be second, third or fourth degree, seek medical care.
- The physician may order a Tetanus immunization.

Treatment for major burns such as second, third or fourth degree burns may include:

- Call 911.
- Remove the victim from the burning location/ area (if safe to do so).
- Remove any burning material from the victim; use caution to prevent Rescuer from getting burn also.
- When the victim is in a safe location, keep victim warm and still.
- Try to wrap the injured areas in a clean sheet, if available.
- DO NOT use cold water on the victim; this may drop the body temperature and cause hypothermia.

For electrical burns

Call 911- Victims of electrical burns should always seek medical care.

ELECTRIC BURNS

Electricity is capable of traveling through conductors. Conductor is any material which allows the electrical flow as it tries to reach the ground. People make excellent conductors; therefore minor electric shock is a common household hazard. Some basic precautions should be taken to make sure that the shock does not interfere with the body's normal electrical impulses which include the functions of the heart and the brain. Exposure to a direct source of electricity can cause severe electrical burns to the skin and to the tissues.

When the individual has experienced an electric shock DO NOT rush to assist the victim until you are sure that he/she is no longer in contact with the electricity because the current will pass through the victim directly to you.

- Whenever possible; turn off the source of the electricity, for example; circuit breaker, light switch etc.

  If this is not possible option, use non-conductive material such as dry wood or plastic to separate the source of electricity from the victim.

- After the victim is removed from the electric source, check his /her vital signs. Check the respiration; note the rate and depth of the breathing assess the regularity of the heart beat etc. If the victim is unconscious, not breathing and no heartbeat is noted; the victim needs CPR.
- Provide treatment to any area of the victim's body that has sustained burns.
- If the victim is responsive and does not appear to have any serious injuries but looks faint or pale, he/she may be at risk of going into shock. Gently lay him / her down with the head slightly lower than his chest and the feet elevated.

For chemical burns

- Identify the chemical involved.
- Victims with chemical burns to their eyes should always seek emergency care.
- Contact the Poison Control Center in your area or your local hospital's Emergency Department. **The United States National Poison Hotline is 1-800-222-1222.** You will be automatically linked to the nearest poison control center.

  Many chemical burns may be treated with local wound care. Some chemicals can cause life- and limb-threatening injuries and need emergent intervention.

Burn Incidence and Treatment in the United States: 2015

The following information was collected from sample and registry statistics compiled by ongoing national health care and fire casualty surveys, state health data systems, and the National Burn Repository (NBR) of the American Burn Association (ABA). The American Burn Association NBR reports describe admissions to the hospitals with specialized services which were provided by the burn centers.

Burn Injuries Receiving Medical Treatment: 486,000

This general estimate is collected mainly from the federal surveys which provide annual estimates of the hospital admissions and the visits to hospital emergency departments. The estimate range acknowledges that some burns may have been treated solely at community health centers, hospital clinics, or private medical offices. Such burns are more likely to be minor, and the number of such facilities sampled is too small to provide reliable estimates for burns. Additional Sources include: National Hospital Ambulatory Medical Care Survey: 2011 Emergency Department Summary Tables.

Fire/Smoke Inhalation Deaths: 3,240

This total includes:

- 2,855 deaths from residential fires,
- 300 from vehicle crash fires, and
- 85 from other sources.

One civilian fire death occurs every 2 hours and 42 minutes. The odds of a United States resident dying from exposure to flames, fire, or smoke is 1 in 1418. Fire and inhalation deaths are combined because deaths from thermal burns in fires cannot always be distinguished from deaths that occur due to inhalation of toxins in smoke. Additional Sources include: National Fire Protection Association: Fire Loss in the U.S. during 2013 and National Safety Council Injury Facts Sheet 2014.

Hospitalizations Related to Burn Injury: 40,000, including 30,000 at hospital burn centers

Over 60% of the estimated U.S. acute hospitalizations that were related to burn injury were admitted to 128 burn centers. Such centers now average over 200 annual admissions for burn injury and skin disorders requiring similar treatment. The other 4,500 U.S. acute care hospitals average less than 3 burn admissions per year. Additional sources include National Inpatient Sample 2010 data; National Hospital Discharge Survey 2010 data.

Selected Statistics: 2003-2012 Burn Admissions to Burn Centers
American Burn Association National Burn Repository 2014:

Survival Rate: 96.7%

Gender:

- 69% Male,
- 31% Female

Ethnicity:

- 59% Caucasian,
- 20% African-American,
- 14% Hispanic,
- 7% Other

Admission Cause:

- 43% Fire/Flame,
- 34% Scald,
- 9% Contact,
- 4% Electrical,
- 3% Chemical,
- 7% Other

Place of Occurrence:

- 73% Home,
- 8% Occupational,
- 5% Street/Highway,
- 5% Recreational/Sport,
- 9% Other

ALLERGIES

Allergy involves hypersensitivity or an exaggerated response of the immune system, often to common substances such as medication, pollen or foods. A rash or a life threatening reaction such as Anaphylaxis can occur if the patient takes a medication or comes into contact with a substance that he/ she is allergic to.

Some types of Allergies are:

- Food allergies
- Drug allergies
- Latex allergies
- Seasonal allergies
- Contact dermatitis
- Animal allergy

Anaphylaxis

Anaphylaxis is a severe, whole-body allergic reaction to a chemical or substance that has become an allergen. An allergen is a substance that can cause an allergic reaction. Some drugs such as, Penicillin, aspirin, x-ray dye, morphine and others, may cause an anaphylactic-like reaction when the victim is first exposed to them.

Anaphylaxis can occur in response to any allergen. Common causes include:

- Food allergies
- Drug allergies
- Insect stings / bites

Symptoms will develop very quickly, often within seconds or minutes. They may include:

- Difficulty breathing
- Light headed / dizziness
- Loss of consciousness
- Swelling of the face and eyes
- Chest tightness/ discomfort

- Palpitations
- High pitched abnormal breathing sounds
- Wheezing
- Coughing
- Speech becomes slurred
- Difficulty swallowing
- Swelling of the tongue
- Restlessness / anxiety
- Redness of the skin
- Itchy /hives
- Diarrhea
- Abdominal pain
- Nausea or vomiting

Treatment

Anaphylaxis is an emergency situation that requires medical attention immediately. **Call 911 immediately.**

Check the victim's circulation, airway and breathing. A warning sign of dangerous throat swelling is very hoarse sounds or whispered voice when the victim is breathing in air.

1. **Call 911**.
2. Reassure the victim and try to keep him/her calm
3. If the person has emergency allergy medicine on hand, help the person take or inject the medication. Avoid oral medication if the victim is having breathing difficulty. If able, ask if the victim if he/she has an Epi-pen/ injectable epinephrine or an antihistamine and administer the medicine, following directions on the package. If victim is not able to talk effectively, check bags if has Epi-pen, injectable epinephrine or an antihistamine and administer the medication.
4. Do not give the victim anything by mouth if he/she is having trouble breathing.
5. Take steps to prevent shock. Have the victim lie flat, raise his/ her feet about 12 inches, and cover him / her with a blanket or coat.
   (Do not place the victim in this position if a head, neck, back, or leg injury is suspected or if it causing discomfort).

Paramedics or other health care providers may place a tube through the nose or mouth into the airways; Endotracheal intubation. Emergency surgery may be done to place a tube directly into the trachea; cricothyrotomy or tracheostomy.

The victim may receive medicines to further reduce the symptoms.
If the allergic reaction is from a bee sting, ***scrape the stinger off the skin*** with something firm (such as a plastic credit card). Do not use tweezers because squeezing the stinger will release more venom.

According to an article, *Anaphylaxis in America: The Prevalence and Characteristics of Anaphylaxis in the United States,* a public survey was completed which included 1,000 adults, of whom 7.7% reported a prior anaphylactic reaction. Using increasingly stringent criteria, it was estimated that 5.1% and 1.6% had probable and very likely anaphylaxis, respectively. The patient survey included 1,059 respondents, of whom 344 reported a history of anaphylaxis. The most common triggers reported were:

- Medications (34%),
- foods (31%), and
- Insect stings (20%)

Forty-two percent sought treatment within 15 minutes of onset,

- 34% went to the hospital,
- 27% self-treated with antihistamines,
- 10% called 911,
- 11% self-administered epinephrine, and
- 6.4% received no treatment.
  Although most respondents with anaphylaxis reported:

- 2 or more prior episodes (19% reporting ≥5 episodes),
- 52% had never received a self-injectable epinephrine prescription, and
- 60% did not currently have epinephrine available.
  The prevalence of anaphylaxis in the general population is at least 1.6% and probably higher. Patients do not appear adequately equipped to deal with future episodes, indicating the need for public health initiatives to improve anaphylaxis recognition and treatment.

FOOD ALLERGY

Food allergy is an immune system reaction that usually occurs while the victim is eating or soon after eating a certain food item that he/ she has an allergy to. Even a very small amount of the allergy-causing food can trigger signs/ symptoms such as hives, itching, or difficulty with breathing as the airways become swollen. In some victim, a food allergy can lead to severe symptoms or ***even the life-threatening reaction known as anaphylaxis.***

Some food allergy signs and symptoms include:

- Itching (of body or in the mouth)
- Hives,
- Swelling of the tongue,
- Swelling of the lips,
- Swelling of the face,
- Swelling of the throat or other body parts,
- Trouble breathing,
- Wheezing,

- nasal congestion,
- Dizziness,
- Lightheadedness,
- Abdominal pain,
- nausea / vomiting,
- diarrhea,
- fainting

Treatment

For minor allergic reactions:

Antihistamines over-the -counter (OTC) or prescribed may help to reduce the symptoms. These medications can be taken after experiencing a food allergy. Antihistamines help to relieve hives or itching.

For a severe allergic reaction:

Call 911, the victim may need an emergency injection of epinephrine and medical attention in the emergency room. Individuals with allergies will have an epinephrine auto injector such as an EpiPen or Auvi-Q. The device is a syringe and needle that injects a single dose of medication when it is pressed into the body (thigh). The intramuscular route for example, in the thigh muscle results in the fastest rise of blood levels of epinephrine.

DRUG ALLERGY

A drug allergy is the abnormal reaction of your immune system to a medication.

Drug allergy symptoms may include:

- Skin rash
- Hives

- Itching
- Fever
- Swelling
- Shortness of breath
- Wheezing
- Runny nose
- Itchy, watery eyes

TREATMENT

The following interventions may be used to treat an allergic reaction to a drug:

- As mentioned before if the victim is experiencing s/s of Anaphylaxis: call 911. With Anaphylaxis the victim needs an immediate epinephrine injection and hospital care to sustain life, support respiratory function and maintain blood pressure.
- If the victim has minor allergic reaction an Antihistamine can be used. Antihistamines may be prescribed by the physician or available over-the-counter such as diphenhydramine (Benadryl) that can block the immune system substances activated during the allergic reaction.
- Corticosteroids: may be used to treat inflammation associated with more-serious reactions.
- Withdrawal of the drug: If the physician determines that the victim had a drug allergy, that medication that caused the reaction will be discontinued.

LATEX ALLERGY

Latex allergy refers to a reaction to certain proteins that are found in natural rubber latex, a product that is made from a milky fluid from rubber trees. Latex allergy may also cause allergic reactions ranging from minor skin irritation to anaphylaxis, the life-threatening condition; this depends on the victim's sensitivity and the amount or degree of latex exposure. The reaction may become worse with multiple /repeated exposure to latex.

Mild symptoms

Mild latex allergy symptoms may include:

- Itching
- Redness to skin

- Hives or rash

More severe symptoms

May include:

- Sneezing
- Difficulty breathing
- Itchy eyes,
- watery eyes
- itchy throat
- Wheezing
- Cough
- Runny nose
- Anaphylactic shock

TREATMENT

If the victim goes into anaphylactic shock, follow the same procedure:

- An emergency injection of epinephrine /adrenaline (Epi pen)
- Call 911 for emergency room care
- While in hospital physician will order oxygen, antihistamine, corticosteroids and other supportive care as needed.
- The physician / health care provider will provide patient teaching encouraging the individual to avoid products that contain latex to prevent an allergic reaction in the future. And the need to carry injectable epinephrine at all times.
- For less severe reactions, the victim may need antihistamines, corticosteroids medications to reduce the symptoms of latex allergy.

SEASONAL ALLERGIES

Seasonal allergies involve reactions caused by inhaling airborne particles, such as pollen. A common type of seasonal allergies is hay fever / allergic rhinitis.

General allergy symptoms may include:

- watery eyes
- sneezing
- clear, watery nasal discharge,
- nasal congestion
- itchy eyes,
- itchy nose, and
- itchy throat

To ease the allergy symptoms, there are several types of nonprescription / over- the-counter medications available such as:

Antihistamines: Antihistamines will help to relieve itching, sneezing, watery eyes and runny nose. Some examples of oral preparations of antihistamines are:

- loratadine (Claritin, Alavert),
- cetirizine (Zyrtec Allergy)
- fexofenadine (Allegra Allergy)
- diphenhydramine (Benadryl) - cause drowsiness and
- chlorpheniramine (Chlor-Trimeton) - cause drowsiness.

Decongestants: Oral decongestants can provide temporary relief from nasal stuffiness such as :

- pseudoephedrine (Sudafed, Afrinol)
- Decongestants (nasal sprays) such as oxymetazoline (Afrin) and phenylephrine (Neo-Synephrine). It is recommended to use nasal decongestants sprays for only short-term relief. Because long-term use worsen symptoms, cause rebound congestion.
- Nasal spray. Cromolyn sodium (an anti-inflammatory medication) nasal spray can ease allergy symptoms and does not have serious side effects, but it is most effective when start using it before the symptoms start.

Contact Dermatitis

Contact dermatitis is a red, itchy rash caused by a substance that comes into contact with the skin and irritates the skin or triggers an allergic reaction. There are two types of contact dermatitis:

1. Irritant contact dermatitis. This type occurs when an individual touches a substance that he/she is sensitive to (an irritant). This is the more common type.
2. Allergic contact dermatitis. This type occurs when an individual touches a substance that he/she is allergic to,

Some of the possible causes or allergens may include fragrances, soaps, jewelry, plant such as poison ivy, cosmetics, and substance on the job.

For successful treatment of contact dermatitis, the individual needs to identify and avoid the cause of the reaction. If the allergen can be avoided, the rash should clear up in 2-4 weeks.

Signs and symptoms of contact dermatitis may include:

- Red rash
- Red bumps
- Itching – sometimes severe
- Skin is dry, cracked/ scaly (if chronic condition)
- Swelling
- burning
- tenderness
- Blisters (draining fluid and crusting) if reaction is severe

The severity of the rash depends on:

- How long the individual was exposed,
- The strength of the allergen /substance that caused the rash,
- The individual genetic makeup, which may affect how he/she responds to a particular substance,
- Environmental factors, for example the temperature, airflow.

Seek medical attention if:

- The rash is painful, severe
- The rash is very uncomfortable
- The rash is widespread
- The rash does not get better within a few weeks
- The rash affects the face
- The eyes are painful and inflamed
- The rash affects the genital areas
- The lungs or nasal passages are painful and inflamed, due to inhaling an allergen.

Treatments

- Try soothing the skin with cool, wet compresses,
- anti-itch creams such as hydrocortisone cream
- The Physician may prescribe steroid pills or ointment, and an antihistamine.

Animal allergy / Pet allergy

Animal /Pet allergy is an allergic reaction to substances found in the animal's saliva, skin cells or urine. Some signs of pet/animal allergy are similar to signs experienced from hay fever, such as runny nose and sneezing. Some individuals have also experienced signs of asthma, such as difficulty breathing and wheezing.

Animal /pet allergy is often triggered by an exposure to dander (dead flakes of skin) that the animal sheds. Any animal/ pet with fur can be a source of pet allergy, but this type of allergy is often seen with dogs, cats, horses and rodents.

As the nasal passages become inflamed, some signs / symptoms may include:

- Sneezing,
- Cough
- Postnasal drip
- Runny nose
- Nasal congestion
- Frequent rubbing of nose (observed in children)
- Itchy throat
- Itchy nose
- Itchy eyes
- Watery eyes
- Red eyes
- Pain/ pressure in the face
- Hives (Red, Raised patches of skin)

If the animal/ pet allergy contributes to asthma, the individual may also experience:

- Difficulty breathing,
- wheezing
- coughing
- Chest Pain or tightness
- shortness of breath,
- Trouble sleeping due to breathing problems

TREATMENT

- Avoid the allergy-causing animal
- Control symptoms with medications

Some Allergy Medications include:

1. Antihistamines which reduce the production of immune system substance that is active in allergic reaction, therefore, helps to relieve sneezing, itching and runny nose.

Prescription antihistamines taken as a nasal spray include:

Olopatadine (Patanase) and

Azelastine (Astelin, Astepro).

Some Over-the-counter (OTC) antihistamine tablets include:

Loratadine (Claritin, Alavert),

Fexofenadine (Allegra Allergy), and

Cetirizine (Zyrtec Allergy);

Some Prescription antihistamine tablets, such as:

Desloratadine (Clarinex) and

Levocetirizine (Xyzal).

2.Corticosteroids (as nasal spray) such as:

Mometasone furoate (Nasonex),

Triamcinolone (Nasacort AQ)

Fluticasone (Flonase) and

Ciclesonide (Omnaris).

Nasal corticosteroid provides a low dose of the drug and they have much lower risk of side effects than the oral corticosteroids preparations.

3. Decongestants helps to shrink the swollen tissues in the nasal passages making it much easier to breathe through the nose. Some over-the-counter allergy tablets combine an antihistamine with a decongestant. Oral decongestants can cause an increase in the blood pressure and should not be taken if the individual has high blood pressure, cardiovascular disease, Glaucoma and enlarged prostate.

NOTE!!

Over-the-counter decongestants taken as a nasal spray may ***briefly reduce*** allergy symptoms. Do not take a decongestant spray for more than 3 days straight, it can lead to congestion.

4.Cromolyn sodium prevents release of immune system substance that cause inflammation and may reduce the symptoms. This is available over-the-counter nasal spray and should be used several times a day. It is most effective when used before the signs and symptoms develop. Cromolyn sodium inhalation is used to prevent asthma attacks, bronchospasm, wheezing, chest tightness and trouble breathing.

5.Leukotriene modifiers block actions of certain immune system substances. The physician may prescribe this tablet, Montelukast (Singulair), if the individual cannot tolerate the corticosteroid nasal sprays or the antihistamine nasal spray.

When the individual minimize exposure to pet allergens, he/she should expect to have less allergic reactions and less severe. It is often difficult to eliminate all exposure to the animal allergens. Sometimes the individual may encounter pet allergens that are present on other people's clothing and trigger an allergic reaction.

FRACTURE

A fracture is a break, usually in a bone. There are different types of fractures. When the broken bone cuts or punctures through the skin, this is called an open fracture. This is a very serious type of fracture because the skin is open and infection in the bone and the wound can develop.

A closed fracture occurs when the bone is broken but there is no open wound or puncture in the skin. A bone may also be partially fractured or completely fractured. There are other types/ descriptions of fractures such as a comminuted fracture where the bone injury results in more than two separate bone components and others that are not mentioned in this study.

The most common causes of fractures are:

- The result of trauma, for example, from a car accident or a fall,
- Overuse of muscles can place more stress or force on the bone. This can cause a stress fracture.
- Osteoporosis which is a disorder that weakens bones and makes them more likely to break. Sometimes, the victim may just be walking and hears a popping sound- due to a fracture; then he/she experiences pain and may even fall due to the fracture for example if it is in the hip or lower extremities.

Different Types of Fractures and Bone healing complications

The following table describes various types of fractures and some bone healing complications:

Types of Fractures & Bone healing complications	**Description**
Greenstick Fracture	A greenstick fracture occurs when a bone bends and cracks, instead of breaking completely into separate pieces. This type of broken bone most commonly occurs in children because their bones are softer and more flexible than are the bones of adults.
Delayed Union Fracture	A delayed union is when a fracture takes longer than usual to heal.

Malunion Fracture	Malunion is a clinical term used to indicate that a fracture has healed, but that it has healed in less than an optimal position.
Nonunion Fracture	Some broken bones do not heal even when they get the best surgical or nonsurgical treatment. When the broken bone fails to heal it is called a nonunion.
Oblique Fracture	An oblique fracture is when the break has a curved or sloped pattern
Spiral Fracture	A Spiral fracture, sometimes called a torsion fracture, in which a bone has been twisted apart.
Transverse Fracture	A transverse fracture is when the broken piece of bone is at a right angle to the bone's axis.
Compound Fracture	A fracture in which a bone is sticking through the skin. Also known as an open 'fracture.
Comminuted Fracture	A comminuted fracture is when the bone breaks into several pieces.
Pathologic Fracture	A pathologic fracture is caused by a disease that weakens the bones.
Stress Fracture	A stress fracture is a hairline crack.

Tab. # 1 types of fractures and some bone healing complications

Some Signs / Symptoms of a fracture are:

- Abnormal shape of the limb or joint,
- Limited mobility or unable to move the extremity/ limb,
- Joint is out-of-place,
- severe pain,
- Swelling,
- bruising or cyanosis of a limb,
- bleeding,
- tingling and numbness.

Treatment:

- Seek medical care for all fractures. If the victim is involved in an accident call 911, there might be other injuries you are not aware of.
- Avoid any unnecessary movement, which may cause the broken bone to dislodge, increase tissue damage or cause an increase in internal bleeding.
- If there is bleeding, apply pressure to control blood loss.
- The fractured site should be immobilized in the position found without any attempt to realign bones or to straighten a limb. Do Not attempt to apply a splint unless trained to do so. For broken arm or leg bones, put a splint (made of wood, plastic, metal, or another rigid material padded with gauze) against the area to prevent movement; wrap the splint to the area using gauze. If there is bleeding, apply pressure to stop bleeding before splinting, then elevate the fracture.
- Ice packs can be applied to the area of the fracture; this will help to reduce the swelling; but remember to place a cloth over the area to avoid direct contact of ice to the skin.
- For fractures of the hand, arm, elbow, shoulder, or clavicle a sling from a triangle of cloth or bandage may be applied until victim is transported to the emergency department.

In the Emergency department, the Physician may order Imaging tests to confirm the fracture diagnosis; Imaging tests such as, an x-ray, Bone scan, or a Magnetic resonance imaging (MRI).

- **X-rays:** Sometimes, a stress fracture is not seen on a regular X-ray taken shortly after the time the victim develop signs and symptoms. It sometimes takes several weeks for evidence of stress fractures to show up on the X-rays.
- **Bone scan:** A few hours before the bone scan, the victim will receive a small dose of radioactive material through an intravenous line (I.V.). The radioactive substance will accumulate mainly in the areas where the bones are being repaired.

- **Magnetic resonance imaging (MRI):** MRI uses radio waves (a type of electromagnetic radiation) and a strong magnetic field to produce detailed images of your internal structures. MRI usually can see/ visualize stress fractures within the first week of injury, and this type of test is more capable of distinguishing between the stress fractures and soft tissue injuries.

Sometimes, after the fracture diagnosis has been made, the victim may need other tests such as an angiogram, a special X-ray of the blood vessels to determine whether other tissue around the bone has been damaged, Computerized Axial Tomography (CAT or CT scan) which combines X-rays and computer analysis to generate detailed images of the body.

The victim may need to wear a cast or splint.
Sometimes he/she needs surgery to put in pins,
plates or screws to keep the bone aligned or in place.

Sometimes medication is limited to pain medication to help to reduce the pain and the physician may prescribe antibiotics for open fractures, to prevent infection from developing.

COMPLETE THE FOLLOWING ACTIVITY

Match Types of Fractures & Bone healing complications with definitions.

A. Greenstick Fracture

B. Delayed Union Fracture

C. Malunion Fracture

D. Nonunion Fracture

E. Oblique fracture

F. Spiral Fracture

G. Transverse fracture

H. Compound Fracture

I. comminuted fracture

J. Pathologic fracture

K. Stress fracture

1. _____ is when the bone breaks into several pieces.

2. _____is caused by a disease that weakens the bones.

3._____ is when the break has a curved or sloped pattern.

4. Some broken bones do not heal, even when they get the best surgical or nonsurgical treatment. When the broken bone fails to heal it is called a _____.

5. _____ is when a fracture takes longer than usual to heal.

6. _____ fracture occurs when a bone bends and cracks, instead of breaking completely into separate pieces. This type of broken bone most commonly occurs in children because their bones are softer and more flexible than are the bones of adults.

7. _____, sometimes called a torsion fracture, in which a bone has been twisted apart.

8. _____ is a hairline crack.

9. _____is when the broken piece of bone is at a right angle to the bone's axis.

10. _____ fracture in which a bone is sticking through the skin. Also known as an open fracture.

11. _____ is a clinical term used to indicate that a fracture has healed, but that it has healed in less than an optimal position.

STRAINS AND SPRAINS

Strain is an injury to a muscle or tendon, in which the muscle fibers tear as a result of over-stretching.

Strains are classified as:

- Grade 1
- Grade 11
- Grade 111

Grade 1

In grade 1 muscle strain, the muscle or tendon is overstretched. Small tears to muscle fibers may or may not occur. The individual may have mild pain with swelling or without swelling. Grade I strain is also known as mild muscle strain.

Grade 11

Grade II strain also known as moderate muscle strain, occurs when the muscle or tendon is overstretched with fibers torn but not complete. Symptoms may include increase pain and swelling. The area of the injury is tender. If blood vessels at the site of injury are damaged, then bruising may be observed. Movement of the injured area may be difficult due to the pain.

Grade 111

Grade 111 strain, is called severe muscle strain. It is the most serious of the three grades of muscle strains. Most of the muscle fibers are completely ruptured or torn. Pain, tenderness, swelling, and bruising are often present. Movement is very difficult.

TREATMENT

Moderate and severe muscle strains should be assessed by a physician / qualified health care provider.

Grade 1 muscle strain:

- RICE Therapy (rest, ice, compression, elevation) therapy may be enough to manage symptoms. See the table below.

R= Rest	Stop doing the activity that caused the problem and avoid any more damage to injured area.
I= Ice	Apply ice or cold compresses for 15-20 minutes an hour for the first 24-48 hours to reduce swelling.
C= Compression	Apply an Ace bandage or similar dressing to apply gentle pressure and prevent swelling.
E= Elevate	Keep the injured area above the level of the heart to promote drainage.

Tab.2-A RICE therapy

SPRAIN

Sprain is commonly known as torn ligament, is damage to one or more ligaments in a joint. Sprain is often caused by injury/ trauma or the joint being pushed beyond the functional range of motion. The ligaments are tough, elastic-like bands that connect bone to bone and hold the joints in place. The ligament can be partially torn, or it can be torn apart completely.

The severity of the sprain ranges from a minor injury usually resolves in a few days to a major rupture of one or more ligaments which will require surgical intervention /fixation and immobilization for a period of time.

Sprains are classified as:

- Grade 1
- Grade 11
- Grade 111

Grade 1 is stretching or slight tearing of the ligament with mild tenderness, stiffness and swelling. The individual may experience with minimal pain.

Grade II is a larger, incomplete tear with moderate pain, bruising and swelling.

Grade III is complete tear of the ligament or ligaments with severe swelling, pain and bruising.

TREATMENT

RICE therapy see table below:

R= Rest	Stop doing the activity that caused the problem and avoid any more damage to injured area.
I= Ice	Apply ice or cold compresses for 15-20 minutes an hour for the first 24-48 hours to reduce swelling.
C= Compression	Apply an Ace bandage or similar dressing to apply gentle pressure and prevent swelling.
E= Elevate	Keep the injured area above the level of the heart to promote drainage.

Tab. 2-B. RICE therapy

If the injury takes place where there is no ice or dressings available, then elevate the affected limb and support the limb for transport to medical care.

ANIMAL BITE

An animal bite is a wound that is received from the teeth of an animal. Animals may bite in an attempt to prey on food, in self-defense, and as part of their normal interaction. Other animal bite attacks may be unprovoked.

Call 911 if:

1. The victim has been seriously wounded.
2. Bleeding is severe.
3. Blood is spurting from the wound.

4. Bleeding cannot be stopped after 10 minutes of firm pressure has been applied. The victim may require stitches, depending on the location and severity of the animal bite, so need to get to the Emergency room.

Animal Bite Treatment

- Stop the bleeding- Try to stop the bleeding by applying direct pressure until the bleeding stops.
- Clean the wound- For the wound or superficial scratch from an animal bite: Gently clean the wound or scratch with soap and warm water; then thoroughly rinse well with more water for several minutes after cleaning.
- Apply antibiotic cream to reduce risk of infection, and cover with a sterile bandage, if you have on hand.
- Seek medical assistance immediately for all animal bite that is more than a superficial scratch or if the animal was a stray or a wild animal, regardless of the severity of the injury. The victim may also require a tetanus booster or shot.
- Find out if the animal has had rabies shots and obtain record from owner; If the owner of the animal is available, Give this information to the EMS or health care provider. If there is risk of rabies infection, the health care provider will recommend anti-rabies treatment.
- If the animal bite was from a wild animal or a stray, update the local health department or animal control immediately.
- The health care provider may recommend Tylenol or ibuprofen for the pain.
- The health care provider will clean the wound thoroughly and may also prescribe some antibiotics.

NOTE:

Human Bite
A human bite can also be dangerous because human saliva may contain many types of bacteria which may cause infection.

Term	Definition
Rabies	Rabies is a preventable viral disease of mammals most often transmitted through the bite of a rabid animal. The vast majority of rabies cases reported to the Centers for Disease Control and Prevention (CDC) each year occur in wild animals like raccoons, skunks, bats, and foxes. The rabies virus infects the central nervous system, ultimately causing disease in the brain and death.

Contact information for the CDC

Centers for Disease Control and Prevention

1600 Clifton Road Atlanta, GA 30329-4027 USA

800-CDC-INFO (800-232-4636)

Http://www. Cdc.gov/cdc-info/requestform.html

SNAKE BITES

A snake bite is an injury caused by a bite from a snake which often results in puncture inflicted by the snake's fangs and sometimes resulting in Envenomation. Most of the snake species are non-venomous and typically kill their prey with constriction rather than with venom.

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BASIC FIRST AID

Term	Definition
Envenomation	The process by which venom is injected into some animal by the bite (or sting) of a venomous animal.

After a Snake bite, some of the Symptoms depend on the type of snake and may include:

- Bleeding from fang marks or wound
- Burning of the skin
- Swelling at the bite site
- Pain at the site of the bite
- Discoloration of skin
- Blurring of vision
- Very fast pulse
- Faint
- weakness
- dizziness
- convulsion
- poor or loss of muscle coordination
- numbness
- tingling
- Increase sweat production
- Fever
- Very thirsty
- Nausea /vomiting
- Diarrhea
- Tissue death
- Death

Preventive measures

The risk of being bitten by a snake can be reduced with taking some actions/ preventive measures, such as:

Wearing protective footwear

and avoiding areas known to be inhabited by dangerous snakes.

Bites received from non-venomous snakes, can also result in injury, often due to lacerations caused by the snake's teeth, or the snake bite may lead to an infection.

A snake bite can also cause an anaphylactic reaction, which can be fatal.

Recommendations for snake bites

Snake bite first aid recommendations vary because:

- Different snakes have different types of venom.
  Some have little local effect, but life-threatening systemic effects, other venoms causes localized tissue damage around the bitten area. .
- Because snakes vary from one country to another, first aid methods also vary.

First aid recommendations for snake bites will depend on the snakes inhabiting the region, as effective treatments for bites inflicted by some species can be ineffective for others.

Identification of the snake is important in planning treatment in certain areas of the world, but is not always possible. Ideally the dead snake would be brought to the ER with the victim.

Trying to kill or catch the snake will put you at risk for re-envenomation or create a second person bitten situation, and is not recommended.

First aid guidelines for snake bites:

- Protect the victim from further bites. Risking further bites or delaying proper medical treatment by attempting to kill or capture the snake is not recommended.

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BASIC FIRST AID

- Keep the victim calm and as still as possible. If necessary, carry the person to safety. An acute stress reaction will increase blood flow and will endanger the victim.
- Call 911, the victim needs to go to the nearest ER, where Antivenom for snakes common in the region/area, will be available.
- Immobilize the injured area.
- Keep the bitten Extremity/ limb below the victim's heart level, to minimize blood return to the heart and other parts of the body.
- Do not give the victim anything to drink or eat, for example, alcoholic beverage is a vasodilator and will speed up the rate of absorption of the venom.
- Do not administer pain medications, unless directed to do so by a physician.
- Remove clothing or items which may cause constriction of the bitten extremity/ limb. As the extremity swells; a ring, watch, bracelet or footwear will become tight and can lead to further harm to the victim.

CAUTION:

1. *NEVER apply a tourniquet,*
2. *NEVER cut into a snake bite ,*
3. *NEVER suck out the venom by mouth,*
4. *NEVER apply cold compresses to a snake bite and*
5. *Do not raise the site of the bite above the level of the victim's heart.*

Some organizations recommend washing the bite with soap and water. Some countries recommend against cleaning the wound; due to traces of venom left on the skin/bandages from the bite may be used in combination with a snake bite identification kit to identify the species of snake. This helps to speed the determination of which antivenom to administer in the emergency room.

Helpful TIPS!!!!!

Call 911 if the victim has been bitten by a snake.
If possible, call ahead to the emergency room so that antivenom can be ready when the person arrives.

You may also contact the National Poison Control Center (1-800-222-1222). The center can be called from anywhere in the United States. This national hotline number will allow you to talk to experts. They will give you further instructions.

This is a free and confidential service. All local poison control centers in the United States use this national number. You should call if you have any questions about poisoning or poison prevention. It does NOT need to be an emergency. You can call for any reason, 24 hours a day, 7 days a week.

SPIDER BITES

A few spiders can be very dangerous. Within the United States, these include the Black widow spider and the Brown recluse spider. If the individual has been bitten by a Black widow spider or the Brown recluse spider he/ she need to be taken to an emergency department immediately.

Antivenom Therapy

Antivenom therapy is available for the black widow spider bites. However, there is no anti-venom for a brown recluse spider bite. Medications, if started early, are available to treat brown recluse bites but the efficacy of the medications for the treatment of brown recluse spider bites is controversial.

Black widow spider

A black widow spider is sometimes identified by the hourglass marking on its belly. The *southern* black widow spider is one of the two commonly found species of the black widow spiders found in the United States and they can be identified by its black, shiny, globular abdomen which has a distinctive hourglass shape on its belly.

The *northern* black widow spider does not have the hallmark red hourglass shape on its belly, instead it can be identified by a row of red spots (spots may also be yellow or white) down the middle of the upper surface of its abdomen, and two crosswise bars on the undersurface. The spider may be brown or have red legs.

They are observed throughout the United States. Their toxin can cause nerve cell dysfunction and twitching of the muscle cells.

Some Signs and symptoms of a black widow spider bite may include:

- The initial bite of the black widow spider is usually painful; the victim will often see the spider during the bite.
- A halo lesion with a pale circular area surrounded by a ring of redness.
- Numbness, tingling, sweating, rashes, nausea, vomiting, cramps, rigid abdominal muscles, weakness, dizziness, chest tightness, and difficulty breathing may occur.
- Pain in the abdomen due to the spider bite can be so severe that it mimics some abdominal medical conditions.
- High blood pressure/Hypertension is a possible reaction to the venom.

Brown recluse spider

The brown recluse spider can be identified by a violin-shaped marking on its back, but this mark can be difficult to see. In the United States of America, its range is central and southern states. The initial bite may or may not be noticed by the victim.

Signs and symptoms of a brown recluse spider bite vary but may include:

- Brown recluse bite causes local swelling, pain, itching, redness, tenderness, and blisters. They eventually forming large ulcers and may cause tissue death/necrosis.
- Chills, fever, rash, nausea and vomiting may also develop.
- Other severe reactions may include kidney failure, blood coagulation abnormalities, difficulty breathing, Death can also occur.

Term	Definition
Necrosis	Death of the tissue.

TREATMENT

To take care of a spider bite:

- Wash the bite with soap and water and remove all jewelry. Swelling can occur; this will make it difficult to remove jewelry later.

- Apply cool compresses,
- Do not cut into the wound,
- Do not apply suction,
- Diphenhydramine (Benadryl) 25- to 50-mg tablets, every six hours helps to relieve the itch.
- Acetaminophen (Tylenol), one - two tablets every four hours, helps with pain relief (follow the instruction on label). Avoid medications such as Aspirin, Ibuprofen (Advil, Motrin), Naproxen (Aleve).
  The pain caused by the black widow spider bite is usually very severe requiring stronger pain medications often prescribed by the physician.
- Antibiotics may not be helpful unless the individual develops an infection.
- See a physician as soon as possible!!!
- The physician may also recommend a tetanus booster/ shot.

NOTE

Seek medical attention promptly, if:

- You are not sure if the victim was bitten by a poisonous spider,
- The victim who was bitten is experiencing severe pain, abdominal cramping or a growing wound/ulcer at the bite site,
- The victim is not breathing.

SCORPION STINGS

Scorpion stings can be very painful. About 30 of the estimated 1,500 species of scorpions can inflict potentially fatal stings. Within the United States, only the ***bark scorpion***, found mainly in the desert Southwest, has venom potent enough to cause severe symptoms. Lethal scorpion stings occur predominantly in Mexico, parts of Africa, South America, the Middle East and India.

Scorpion stings are more serious in young children, older adults and the pets. In the United States, a “healthy” adult usually does not need treatment for scorpion stings, but if a child is stung, seek immediate medical care.

Most scorpion stings in the United States cause only minor signs and symptoms, such as:

- pain and warmth at sting site
- swelling in area around the sting

The venom of the Bark scorpion, is native to New Mexico, Arizona and the California side of the Colorado River, is more toxic and can be life-threatening, especially in children.

Mild signs and symptoms may include:

- Pain (can be intense)
- swelling (area around sting)
- Numbness/ tingling (in the area around sting)

More-severe signs and symptoms might include:

- Sweating
- Drooling
- Muscle movement/ twitching
- Vomiting
- Unusual eye movements
- Unusual head movements
- Unusual neck movements
- High blood pressure or
- low blood pressure
- Increased heart rate or
- irregular heart beat
- Restlessness
- inconsolable crying (children)

TREATMENT

- Move the victim away from the scorpion,
- Use ice pack to reduce pain and to slow the absorption of venom by vasoconstriction; (most effective during the first 2 hours following the sting).
- Immobilize the affected part below the level of the heart to delay venom absorption, keep the victim calm to lower the heart rate and the blood pressure; limit the spread of the venom.

Seek medical attention, it is always best to be safe.

- Call the local poison control center for advice. To reach a poison control center in the United States, call the Poison Help at 1-800-222-1222.
- Seek immediate medical care for children stung by a scorpion.
- The physician may administer pain medication, antihistamine, a topical or local anesthetic agent to the wound to decrease paresthesia, tetanus prophylaxis. Supportive care in all cases and antivenom in severe cases are used for the treatment of scorpion envenomation.

POISONING

First Steps in a Poisoning Emergency

If the individual has poisons in the eyes:

- Rinse the eyes with Running water for 15-20 minutes,
- Call the toll-free Poison Help line (1800-222-1222) which connects you to your local poison center

If the individual has inhaled poison:

- Get to fresh air right away

- Call the toll-free Poison Help line (1800-222-1222) which connects you to your local poison center

If the individual has poison on the skin:

- Take off all clothing that the poison has touched,
- Rinse off skin with Running water for 15-20 minutes,
- Call the toll-free Poison Help line (1800-222-1222) which connects you to your local poison center.

ALERT!!!

Sometimes you cannot give first aid, for example if the individual swallowed too much medication or the wrong medication;

- Call the toll-free Poison Help line (1800-222-1222) which connects you to your local poison center.

If the child swallows something poisonous:

- Immediately call the toll-free Poison Help line (1800-222-1222) which connects you to your local poison center. Every poisoning is different. The treatment advice will depend on the amount and the type of poison involved, the child weight, Age, medical history will also affect treatment.

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BASIC FIRST AID

ANSWER KEY/ FRACTURE ACTIVITY

1. I
2. J
3. E
4. D
5. B
6. A
7. F
8. K
9. G
10. H
11. C

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BASIC FIRST AID

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