

**Biblical resuscitation:** I Kings 17:20-23 ", Why have you done such a terrible thing to this widow? You killed her son!" Then Elijah stretched himself out on the boy three times and **prayed**, "O LORD my God, restore this child to life!" The LORD answered Elijah's prayer; the child started breathing again and revived.

II Kings 4:31-36 "...There was no sound or response at the boy's face... and Elisha **prayed** to the Lord... and then he got up and laid upon the boy, mouth to mouth...he repeated it again and the boy opened his eyes..."  
(New EMT Paraphrase)

## SCENE SIZEUP - PATIENT CONTACT

### Scene Size up- Trauma

- A. Incident information
- B. "The big picture" MOI (**Mechanism Of Injury**) What do you see? What happened?
  - 1. Safety- Situational Awareness [Scene safe? You safe? Patient safe?]  
No FIRE, No WIRE, No GLASS, No GAS, No ARMS, No HARMS No BLOOD No

CRUD

**SP** [Standard Precautions]

- C. Face to face - Additional resources?
- D. Patient Contact: Bring order (Hat, Vest, ID), Touch & Position

### Primary Exam

- Your senses: Eyes, Ears, Nose, Touch
- 1. Inspect - visual
  - 2. Palpate - touch
  - 3. Percuss - touch & hearing
  - 4. Auscultate - hearing with a stethoscope
- A. General Impression, Introduction, Touch & Position, Permission to treat & patients' name, age
  - B. **ABC:** Airway (Consider C-Spine), **B**reathing, **C**irculation (Life threatening bleeding) (Pulse) (CR)
  - C. **Skin** – color, temperature, moisture. Heart: rate, rhythm & intensity
  - D. **LOC** (Level of Consciousness)-
    - A&O x 3** (Alert and Oriented to person, place, and time)
    - AVPU** (Alert- awoken to Voice- awoken to Pain -Unresponsive)
  - E. **Sick/Not Sick** - Triage

### Secondary / Focused Exam

- A. Complete Vital Signs: 1. Blood pressure 2. Pulse 3. Respirations 4. LOC
- B. Complete head to toe exam with neuro and second set of vitals.
- C. Chief Complaint (**C/C**) Complaining of (**C/O**)
- D. **SAMPLE:** Signs and Symptoms (**S&S**), Allergies, Medications, Past Medical History (**PMHx**)  
Last meal. Events leading up to the problem

## TRAUMA OF THE HEAD, SPINE, CHEST AND ABDOMEN

**\*\*AS WITH ALL INJURIES- PREVENTION IS THE BEST Rx (prescription)\*\***

$$KE = \frac{M \times V^2}{2}$$

### HEAD TRAUMA

**\*\*\*\*Always assume an associated neck injury\*\*\*\***

- A. **look for bleeding**, (there is a rich blood supply to the face and scalp), scalp lacerations, deformities, swelling, tenderness, skull fractures- (linear, comminuted, depressed, basal), ecchymosis that develops under the eyes ("raccoon eyes") or behind the ear over the mastoid process ("Battle's sign"), cerebrospinal fluid,

projectile vomiting, yawning, hiccups, Decreasing level of consciousness. **GCS** (Glasgow Coma Scale)

### **B. Neuro Watch Chart- Assessing the severity of a head injury**

1. Vital signs - Pulse, BP, Respirations Pupils - PEARL (pupil mid equal and reactive to light)
2. LOC changes - **the single most important step** in evaluating a patient with a head injury is assessing the LOC. These LOC changes can take place immediately or develop later on after the injury.
3. (AVPU) **A**lert, awoken to **V**oice, awoken to **P**ain, **U**nresponsive (A&OX3) **A**lert and **O**riented to person, place, and time

### **C. injuries of the Brain**

1. **Concussion** - is temporary loss of some or all of the ability of the brain to function.
2. **Contusion** - is a bruise to the brain tissue that produces longer lasting and perhaps permanent damage to the brain tissue. There may be associated bleeding and swelling from injured blood vessels.  
**Signs and Symptoms (S/S)** maybe - confusion, dizziness, "sees stars", headache, N & V, amnesia (some loss of memory surrounding the injury), retro grade amnesia (cannot remember events that occurred prior to the injury), usually a severe concussion. Numbness, weakness, paralysis, loss of consciousness, the swelling may cause prolonged periods of unconsciousness.
3. **Intracranial bleeding** - the brain occupies nearly the entire space inside the skull. There is little room for a bleeding. A severe injury that causes a laceration of a vessel inside the brain or laceration of the meninges that cover the brain produces an intracranial hematoma. The S/S produced by intracranial bleeding are the result of pressure on the brain from the expanding hematoma within the skull. The classic vital signs of increased intracranial pressure: **SLOW PULSE, HIGH BP**. Decreasing LOC, unequal pupils, posturing and changing respirator patterns may also be present.

- D. Treatment:**
1. ABC's & O2
  2. Protect the cervical spine from injury every 10 minutes
  3. Elevate the head of the stretcher and or Backboard about six inches to promote the drainage of blood.
  4. Control bleeding and *dress wounds lightly*
  5. Assess the patient's LOC and continue to monitor it

### **SPINAL TRAUMA**

#### **A. Spinal Injuries -**

If injury to the spinal column has made it unstable, it can no longer protect the spinal cord. The spinal cord fills most of the spinal canal. Even slight displacement of one vertebra could pinch or shear the spinal cord. It is imperative that no further motion occurs in an unstable spine. An unstable fracture or dislocation, displacement of one millimeter may be enough to compress, pinch, or shear the spinal cord. This damage may make the difference between normal function and permanent paralysis.

1. **History** - mechanism of injury - high-velocity injury, automobile, motorcycle accidents, diving, falls from a height, cave-ins, GSW (Gun Shot Wound) and electricity. If not sure of the mechanism of injury at the scene of an accident "think spinal injury".
2. **Examination** –

**SYMPTOMS** of a spinal injury are: Pain, Numbness, Tingling, or Weakness in on or more of the extremities.

**SIGNS** of a spinal cord injury are: Deformity of the spine, Tenderness (point tenderness) over any portion of the spine, Laceration or Contusions to the head, face, or areas of the neck, shoulders, back or abdomen. Paralysis or Anesthesia (any weakness or loss of sensation) that can be demonstrated on physical exam. Spinal cord injuries in the neck may cause paralysis of all four extremities as well as **diaphragmatic breathing** - breathing efforts performed by the contraction of the diaphragm alone, without the assistance of the intercostal muscles. The upper abdomen bulges with inspiration.

3. **Treatment:**
- |                                       |                    |
|---------------------------------------|--------------------|
| a. ABC's & O <sub>2</sub>             | b. Cervical collar |
| c. Rigid splinting with the backboard | d. Treat for shock |

## CHEST TRAUMA

### A. History of Patient with Chest Trauma

- |  |   |
|--|---|
| 1. What was the mechanism of injury? (MOI)             | 4. What is the nature and extent of injuries? (IOS) |
| 2. Is the patient having any dyspnea? (SOB)            | 5. Is there any pain, if so where                   |
| 3. Is there any cough or hemoptysis? (Blood in Saliva) |   |

### B. Physical Examination of Patient with Chest Trauma

- |  |                                      |
|--|--------------------------------------|
| 1. Is the airway adequate and respiration normal?  | 5. Is there any bleeding?            |
| 2. Is there paradoxical respirations?<br>distress?   | 6. Is there any signs of respiratory |
| 3. Is there subcutaneous emphysema?  | 7. Is the pulse rapid and weak?      |
| 4. Is the blood pressure low?  |                                      |
| 8. Is there failure of one or both side of the chest to expand normally with inspirations? |                                      |

### C. Rib Fracture

A simple rib fracture is perhaps one of the most common chest injuries and is chiefly because the pain associated with a rib fracture tends to inhibit the patient from taking adequate breaths.

1. **History**-What was the mechanism of injury - usually a direct blow to chest and commonly involving the 5th - 10th ribs, which are not protected by the shoulder girdle.
2. **Exam** - A common finding in all patients with a single or multiple rib fracture is pain localized at the site of the fracture and made worse by deep breathing or coughing. The patient will try to remain still and will take shallow breaths. Often the patient will lean toward the injured side and place a hand over the fracture area to "splint" the fracture and ease the pain. There may be rib deformity, contusions, and lacerations in the area of injury.
3. **Treatment:**
  - a. ABC's
  - b. Place patient in comfortable position
  - c. Immobilize chest wall on injured side with sling and swathe

### D. Flail Chest

When three or more ribs are broken, each in two places, the segment of the chest wall lying between the fractures becomes a free-floating segment. This segment will collapse rather than take part in the normal expansion of the chest wall each time the patient attempts to inhale. When the patient exhales, the segment will protrude slightly while the rest of the chest wall contracts. The motion of this floating is paradoxical because it is opposite to

normal movement of the rest of the chest wall. The lungs beneath the flail segment do not expand properly when the patient inhales, thus decreasing the efficiency of ventilation.

1. **History** - mechanism of injury - diagnosed through close observation of the chest wall. Much more important, however, is the amount of force that must be exerted on the chest wall to cause a series of ribs to fracture in several places and produce the flail segment.

2. **Exam** - A flail segment almost always produces severe contusion of the lung tissue lying underneath the flail segment. Contusion of the lung causes immediate bleeding and swelling into the lung tissue and loss of respiratory function. Severe hypoxia, cyanosis, dyspnea, respiratory distress.  
A flail chest is very painful.

3. **Treatment** : a. ABC's & O<sub>2</sub>  
b. Stabilize the flail segment by applying firm support to it  
c. Monitor vital signs

### **E. Pneumothorax**

Is the presence of air within the chest cavity in the pleural space but outside the lung. In this condition the lung has been separated from the chest wall and is said to be "collapsed". The volume of the lung is diminished, and the amount of air that can be inhaled into it is reduced. As a result, hypoxia will occur and, as the degree of pneumothorax increases, respiratory distress becomes more severe. Air may enter the pleural space due to a rupture in the lung caused by a traumatic injury.

1. **History** - mechanism of injury - usually due to trauma (can be spontaneous), flail chest, rib fracture, penetrating injuries, or other trauma of the chest resulting in a rupture to the lung.

2. **Exam** - sudden sharp chest pain, dyspnea/SOB, increasing difficulty in breathing, there may be mild, moderate, to severe respiratory distress, decreased breath sounds on injured side, tracheal deviation (shift) towards injured side, S/S of shock. A pneumothorax can develop into a tension pneumothorax.

3. **Treatment** : a. ABC's, High flow oxygen      b. Splint fractured ribs      c. Treat for shock

### **F. Open Pneumothorax (Sucking Chest Wound)**

Is when air is sucked through the wound (hole) in the chest wall into the pleural space when the patient inhales? Ordinarily, the pressure inside the chest cavity is slightly less than atmospheric pressure. Inhalation further reduces this pressure. If there is an open wound in the chest wall, air will move through the wound just as it moves through the nose and mouth during normal respiration. The air that enters through the wound remains in the pleural space (a pneumo-thorax), and the lung does not expand. When the patient exhales, air passes back through the wound. The seriousness of the open pneumothorax depends on the size of the opening; if the hole (wound) is larger than the size of the glottis, "ALL" air will enter the chest there, instead of the mouth and nose, (rapidly fatal, as no air enters the alveoli), **severely** compromising respiratory function.

1. **History** - mechanism of injury - penetrating injury caused from a knife, spear, ice pick, gun shot, or other injuries of a penetrating nature.

2. **Exam** - chest wound with air moving in and out with respiration, sucking or slurping sounds, s/s of acute respiratory distress, s/s of shock.

3. **Treatment** - It is imperative that sucking chest wounds be sealed with an airtight dressing. The purpose

of the airtight dressing is to seal the wound and prevent air from passing through it.

- a. Ensure open airway
- b. The sucking chest wound must be closed immediately by any available means, "**DO NOT WASTE TIME**" looking for a fancy dressing! Use anything immediately available to cover the wound, aluminum foil, plastic, handkerchief, or bare hand, If available use pressure dressing, Vaseline gauze, or plastic wrap, and the covering held in place manually or tape all edges to the chest wall to prevent any leakage of air.
- c. Just before sealing the wound, ask patient to cough, then immediately apply a dressing tightly in place.
- d. The dressing should be large enough to more then adequately cover the wound.
- e. If the S/S of a tension pneumothorax develops, loosen the dressing.

### G. Tension Pneumothorax

Develop when the air continuously leaks out of the lung into the pleural space, expanding the space with every breath the patient takes. The air becomes trapped in the pleural space and cannot escape. Therefore, with each breath the affected lung collapses more until it is completely reduced in size to a very small ball 2 to 3 inches in diameter. At this point pressure in the affected chest cavity begins to rise, and the collapsed lung is pressed against the heart and the lung on the opposite side. The remaining uninjured lung in turn becomes compressed. As the pressure in the chest cavity rises further, it may exceed the normal pressure of blood in the veins returning to the heart. The blood then cannot travel to the heart to be pumped out, and death can follow rapidly. A tension pneumothorax cannot exist without an intact or well-sealed chest wall. However, it is not limited to closed chest injuries. A patient with an open wound of the chest and a severe lung laceration may develop a tension pneumothorax after the external chest wall has been effectively bandaged and sealed. In this situation, the lung continues to leak air into the now closed pleural space, and a tension pneumothorax develops.

1. **History** - mechanism of injury - same as for a pneumothorax caused by trauma.
2. **Exam** - anxiety, restlessness, dyspnea, **progressive respiratory distress**, weak rapid pulse, **falling blood pressure**, **distended neck veins**, inflated chest, bulging of costal and clavicle spaces, **tracheal deviation** (shifts) AWAY from injured side, **decreased breath sounds** on injured side, subcutaneous emphysema, hyper resonance (drum-like) to percussion on injured side, "Bell" sounds heard on auscultation, s/s of shock.
3. **Treatment** -
  - a. ABC's, Oxygen to the max
  - b. Decompress the chest
  - c. Splint fractured ribs
  - d. Treat for shock
  - e. Pray

**HEART TRAUMA:**      A. Contusion      B. Tamponade      C. V.F.

### ABDOMINAL TRAUMA

A. INJURIES OF THE ABDOMEN In general, the organs of the abdominal cavities and in the retroperitoneal space are either hollow or solid. Hollow organs are tubes through which material passes. Solid organs are solid masses of tissue where much of the chemical work of the body takes place. Injuries to the abdomen and pelvis can damage either hollow or solid organs, In general, hollow organs discharge their contents into the abdominal cavity when they are lacerated, while solid organs tend to bleed copiously. Spilled contents from solid organs usually set up an intense inflammatory reaction, called peritonitis, which is very painful. Bleeding from the solid organs can lead to shock and be rapidly fatal.

1. **History** - mechanism of injury - high-velocity accidents, penetrating injuries, blunt trauma

2. **Exam** - The SIGNS of abdominal injuries are bruises, tire or seat belt mark, entry and exit wounds (bullets), lacerations or stab wounds, decreased BP, increased pulse, local or diffuse abdominal tenderness, guarding, rigidity, distention, vomiting. The SYMPTOMS of abdominal injuries are - abdominal pain, referred pain, nausea, and anxiety
3. **Treatment** -
  - a. ABC's
  - b. Treat for shock
  - c. **Do not return bowels or viscera back to abdomen.** Cover with sterile, moist dressing, if sterile dressing is not available then cover completely with occlusive dressing.
  - d. **Do not remove impaled objects,** stabilize them.
  - e. Repeat vital signs every ten minutes.

## PELVIC INJURIES

A. Pelvic fractures- The pelvic girdle is an extremely vascular structure. Pelvic fracture can lead very quickly to shock, then death. Be extremely concerned with patients that complain of posttraumatic pelvic pain, patients can easily lose 2 liters of blood with no external evidence of blood loss.

1. **History** - mechanism of injury
2. **Exam** – Check by pressing the pelvis A&P (anterior& posterior) and laterally
3. **Treatment** – ABC, O<sub>2</sub>, treat for shock

The key with a pelvic Fx is they need to be splinted to reduce bleeding. A quick splint is called sheeting. Slide a sheet under and around the pelvis, cross the end and tighten, to stabilize the injury.

**RECOVERY POSITION:** Patients **without suspected neck injuries** and a decreased level of consciousness are placed on their side to allow fluid drainage from the mouth; This is to help prevent fluid (blood, vomit, etc.) from entering their lungs.



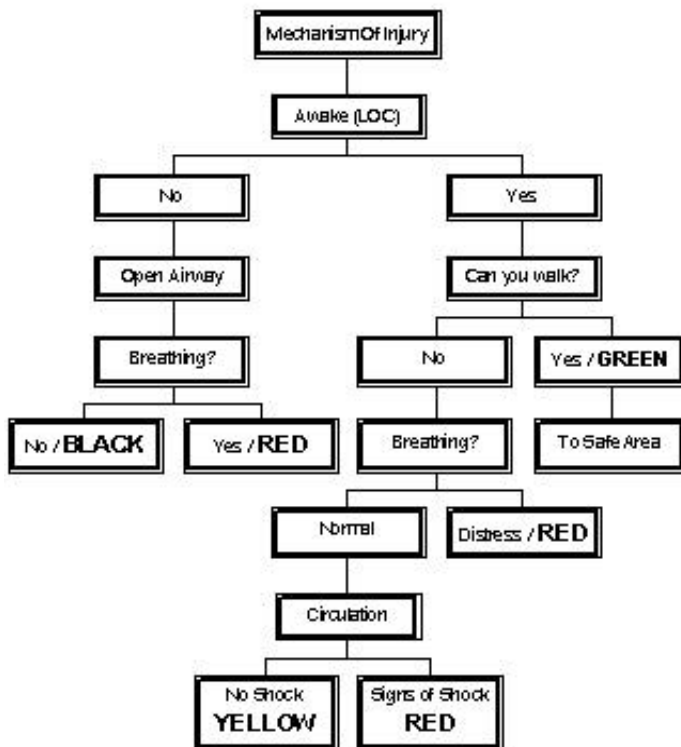
## MASS CASUALTY INCIDENT (MCI)

- MCI** = 1. The incident has more patients than you have resources  
 2. Your job - do the most good for the most people

- a. **Triage** – Sorting
- b. **Treatment** area
- c. **Transportation**

- GREEN** WALKING WOUNDED: Call out and ask everyone who can walk to come over here. Walking wounded may help attend to other patients or secure the scene. As resources permit, do not leave them unattended
- YELLOW** DELAYED: Minor bleeding, fractures without shock, conscious and not confused with adequate breathing. Have a medically trained per with them at all times to monitor and begin treatment.
- RED** IMMEDIATE: Rapid respiration, poor capillary refill decreasing LOC, major burns, major traumatic injuries, shock. Patients need to be moved to advance treatment to prevent death.
- BLACK** DEAD or IMMINENT DEATH: Major head injuries, unconscious unresponsive without pulse after opening airway.

### **ABC Triage Algorithm**



### **SHOCK**

A. Homeostasis:

Shock is failure of the cardiovascular system to provide sufficient blood flow, resulting in **inadequate tissue perfusion** to vital organs and the rest of the body

## B. Anatomy and physiology

1. Cardiovascular system (Goal: Perfuse tissue)
  - a. Pump: Heart
  - b. Pipes: Vessels
  - c. Fluid: Blood

## C. The Eight major **classifications of shock** (Cause=PPF)

1. Hemorrhagic: blood loss, trauma, burns, OB (Obstetrics)
2. Respiratory: inadequate oxygen, airway, air (no O<sub>2</sub>), PE (Pulmonary embolism), Pneumo Thorax
3. Anaphylactic: severe allergic reaction, Rx?
4. Cardiogenic: inadequate functioning of the heart, MI, Tachy, Tampo, Tension Pneumo
5. Psychogenesis: fainting, syncope
6. Neurogenic: loss of vascular control: Neck Fx
7. Metabolic: loss of body fluid
8. Septic: severe infection & blood vessel damage

## D. **SIGNS & SYMPTOMS OF SHOCK:**

- |                              |                                       |
|------------------------------|---------------------------------------|
| 1. Decreasing blood pressure | 7. Increasing pulse                   |
| 2. Skin pale, cool and moist | 8. Weakness                           |
| 3. Dizziness                 | 9. N & V (nausea & vomiting)          |
| 4. Diaphoresis               | 10. Eyes dull with dilated pupils     |
| 5. Anxiety and restlessness  | 11. Decreasing level of consciousness |
| 6. Thirst                    | 12. Poor capillary refilling          |

## E **TREATMENT OF SHOCK:**

- |   |                                     |
|---|-------------------------------------|
| 1. Assure clear airway and breathing, O <sub>2</sub>              | 6. Prevent loss of body heat        |
| 2. Control bleeding   | 7. Give nothing by mouth            |
| 3. Elevate the lower extremities 12" /30 cm<br>excessive handling | 8. Keep pt still, avoid rough, and  |
| 4. Calm and reassure<br>intervals                                 | 9. Record pt's vital signs at 5 min |
| 5. Postural BP? (Laying, sitting standing)                        |                                     |

## **SOFT TISSUE, MUSCULOSKELETAL, AND ENVIRONMENTAL INJURIES**

**SOFT TISSUE INJURIES:** The soft tissue of the body includes the skin, muscle, blood vessels, nerves, fatty tissue, fascia, and tissues that line or cover organs.

I. **SKIN:** The skin is the largest organ of the body providing our first line of defense against *infection*. One of its primary functions is *temperature* control. Skin has two principal layers the *epidermis* and *dermis*.

II. Soft tissue injuries may be a **CLOSED** or **OPEN** wound:

- A. A closed wound is an internal injury beneath the skin but in which there is no break from the outside surface of the skin to the injured site beneath. There may or may not be damage to the skin.



- B. A open wound is an injury in which there is a break in the surface of the skin, exposing the tissues underneath. [Main concern: INFECTION]
- C. Classification of soft tissue injuries:
- |                  |                         |
|------------------|-------------------------|
| 1. Contusion     | 2. Abrasion             |
| 3. Hematoma      | 4. Laceration/ Incision |
| 5. Avulsion      | 6. Amputation           |
| 7. Puncture/ GSW | 8. Crushing             |
- D. Soft Tissue Wound Care:
1. A **DRESSING** is any material applied to a wound in an effort to control bleeding and prevent further damage, contamination, and possible infection. Dressings should be sterile.
  2. A **BANDAGE** is any material used to hold a dressing in place. Bandages need not be sterile.
  3. **Occlusive dressings** are used when it is necessary to form an air-tight seal for open wounds to the abdomen, and for certain types of open wounds to the thorax. There are three different forms:
    - a. Plastic wrap
    - b. Aluminum foil
    - c. Petroleum gel-impregnated gauze
  4. Principles for dressing & bandaging:
 

a. Use sterile or very clean materials	b. Cover the entire wound
c. Control bleeding	d. Do not remove dressings
e. Do not bandage too tightly or loosely	f. Do not leave loose ends
g. Do not cover the tips of fingers of toes	
- E. Emergency Care for Open Wounds:
- |                        |  |
|------------------------|--|
| 1. Expose the wound    | 5. Clear the wound surface                 |
| 2. Control bleeding    | 6. Prevent further contamination           |
| 3. Calm & reassure pt  | 7. Apply the dressing and bandage in place |
| 4. Keep pt lying still | 8. Treat for possible shock                |
- F. Emergency Care for Puncture Wounds Containing Impaled Objects
1. **"DO NOT REMOVE THE IMPALED OBJECT"**
  2. Expose the wound area
  3. Control profuse bleeding from the entrance wound by direct pressure if possible. "CAUTION" position your hand so the fingers are on either side of the object and exert pressure downward. "DO NOT" put pressure on the object or tissue directly adjacent to its cutting edge.
  4. Stabilize the impaled object with a bulky dressing
  5. Keep the pt at rest and provide emotional support
  6. Carefully transport pt to nearest hospital
- G. **Emergency Care for Avulsions:**
1. Clear the wound surface and as gently as possible, **fold the skin back to its normal position.**
  2. Expose the wound area
  3. Should skin or another body part be torn from the body. Save the avulsed part in a plastic bag, plastic wrap, or aluminum foil. If none of these items are available at the scene, wrap the avulsed part in lint-free, sterile dressing. The avulsed part should be kept as cool as possible. "DO NOT" immerse the avulsed part in water or saline.

H. **Emergency Care of Amputations:**

1. Direct pressure, and elevate the injured limb and apply a direct pressure dressing. This should be placed on the stump. **Pressure point techniques** or a blood pressure cuff also may be required to stop the bleeding.
2. When possible, wrap or bag the amputated part in plastic and transport with the patient. It is best to keep the part cool, but not in direct contact with ice. Be sure to label the part wrapped, including what the part is and the name of the patient. "DO NOT" immerse the amputated part in water or saline.
3. Tourniquet **THIS PROCEDURE IS A LAST RESORT** used only when other methods to control life threatening bleeding have failed.
4. If a commercially made tourniquet is not available a makeshift one may be prepared from a cravat bandage, a stocking, or some flat material. The ideal width for a tourniquet is 4 - 5 cm.

#### **APPLICATION OF A TOURNIQUET**

- a. Select a place as close as possible, but not flush with, the edge of the wound.
- b. Place a pad made from a dressing or folded handkerchief over the main supplying artery before applying the constricting band.
- c. Wrap the triangular bandage (cravat) twice around the extremity and pad. Tie one knot over the pad with the ends of triangular bandage. A stick, rod or similar device should be inserted into the knot and used to tighten the tourniquet. Turn the device until the bleeding is controlled. **DO NOT** tighten beyond this point. Tape or tie the tightening device in place.
- d. **KEEP THE TOURNIQUET IN PLACE - DO NOT LOOSEN IT**
- e. Attach a notation to the patient to indicate that a tourniquet has been applied and the time of application.

### **FRACTURES**

A Fracture, Dislocation, Fracture-dislocation, Sprain, and a Strain are referred to as musculoskeletal injuries. They are among the most common problems seen in emergency care.

A. **FRACTURE (Fx):**

Is a traumatic injury to a bone in which the continuity of the tissue of the bone is broken. A fracture is classified by the bone involved, the part of that bone, and the type of break.

B. **CATEGORIES OF FRACTURES:**

1. **Closed** (Simple) Fx
2. **Open** (Compound) Fx

**SIGNS & SYMPTOMS OF FRACTURES:**

- |   |   |
|---|---|
| 1. Pain or tenderness                                   | 6. Deformity                                    |
| 2. Guarding   | 7. Swelling and Ecchymosis                      |
| 3. Exposed bone fragments                               | 8. Crepitus (grating) "Do not elicit this sign" |
| 4. Loss of function                                     | 9. False motion                                 |
| 5. Distal embarrassment (loss of radial or pedal pulse) |   |

**DISLOCATIONS:** means disruption of a joint that the bone ends are no longer in contact. This can only happen if the supporting ligament (a band of white fibrous tissue connecting bones) of the joint are torn, allowing the bone ends to separate from each other.

**SIGNS & SYMPTOMS OF A DISLOCATION:**

- |                              |                               |
|------------------------------|-------------------------------|
| 1. Joint deformity           | 4. Joint swelling             |
| 2. Constant pain             | 5. Increased pain on movement |
| 3. Frozen (a "locked") joint |                               |

**SPRAIN:** usually produced by twisting or stretching of a joint beyond its normal range of motion. As a result some of the ligaments are stretched or torn. A sprain is a partial, temporary dislocation. The

bone ends are not completely displaced by the force of the injury, and thus, they fall back into alignment when the force is removed. Therefore, the deformity seen in a dislocation is not present in a sprain.

**SIGNS & SYMPTOMS OF A SPRAIN:**

1. Tenderness
2. Pain on movement
3. Swelling and ecchymosis
4. Inability to use the extremity

**EXAMINATION OF MUSCULOSKELETAL INJURIES:** Once the pt's general condition is stabilized, attention can be directed at evaluation of the injured limb. Four steps should be followed:

1. **LOOK:** the clothing should be gently and carefully removed from the injured limb so that a thorough assessment can be done.
2. **ASK:** the pt to move the injured limb carefully. With any significant musculoskeletal injury, movement of the injured part will be painful. If even the slightest motion by the patient increases the pain, no further motion should be made.  
"DO NOT USE THIS STEP" when evaluating an injured patient complaining of neck or back pain because even the slightest motion may cause permanent damage to the spinal cord.
3. **FEEL:** gently palpate the extremities and the spine to identify point tenderness (the best indicator of an underlying fracture, dislocation, or sprain.)
4. **EVALUATE PMS:** neurovascular function of the limb. Many important vessels and nerves lie close to the bone, especially around major joints. They supply blood and nerve impulses to all the tissue distally. Recheck after splinting the limb and every 30 min. until pt is hospitalized. Check these neurovascular parameters for each limb:
  - a. **Pulse,** Capillary refilling
  - b. **Motor function**
  - c. **Sensation**

**TREATMENT OF MUSCULOSKELETAL INJURIES:** Emergency management of fractures, dislocations, and sprains takes place after the injured pt's vital functions are assessed and stabilized.

1. All open wounds should be treated by covering the entire wound with a dry, sterile dressing and applying local pressure to control bleeding. Once a sterile compression dressing is applied to an open fracture, it should be managed in the same way as a closed fracture.
2. All fractures, dislocations, and sprains should be splinted before the pt is moved unless the pt's life is immediately threatened.
3. A splint can be fashioned from any material. It is simply a device to prevent motion of the injured part. The following general rules of splinting should be understood and followed:
  - a. The clothing is best removed from the injury
  - b. Note and record the circulatory and neurological (motion and sensation) status distal to the injury.
  - c. In a fracture, the splint should immobilize the joint above and the joint below the fracture.
  - d. In a dislocation or sprain, the splint should immobilize the bone above and the bone below the injury.
  - e. During splint application, minimal movement of limb should be allowed.
  - f. A severely deformed limb may be straightened with constant gentle manual traction so that the limb can be incorporated into a splint.
  - g. If gentle traction increases the pt's pain significantly or if resistance to the limb alignment is encountered, the limb must be splinted in the position of deformity.
  - h. In all suspected neck and spine injuries, correct the deformity only as much as is necessary to eliminate airway obstruction and to allow effective application of a splint.
  - i. Cover all wounds with dry, sterile dressing before applying a splint.
  - j. Pad all splints to prevent local pressure.
  - k. Recheck Pulse Motor Sensory.
  - l. When in doubt, SPLINT.
  - m. Sprains= (**ICE**) Ice, Compression, Elevation