12. Wash your hands after taking care of the patient. Use soap and water to wash your hands. If no soap is available, you can use ash to wash your hands. Alcohol-based sanitizers can also be used, if available.

### D.9.4 WHEN TO REFER TO A HEALTHCARE FACILITY?

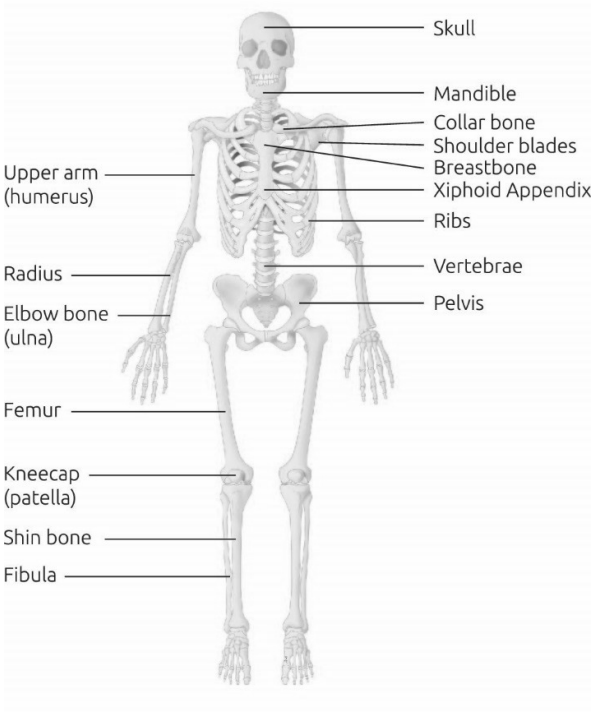
Always urgently transport a casualty showing shock symptoms to the nearest healthcare facility.

# E. BONES, JOINTS AND MUSCLES

In this chapter you will learn about:

- The skeleton.
- Joints.
- Muscles.
- Fractures (injuries to bones).
- Injuries and fractures to the head, neck and spine.
- Injuries and fractures to the cheek bone, nose and lower jaw.
- Injuries and fractures to the collar bone and shoulder.
- Injuries and fractures to the ribs and breast bone.
- Injuries and fractures to the upper limb (upper arm, elbow, forearm, wrist, hand and fingers).
- Injuries and fractures to the pelvis.
- Injuries and fractures to the lower limb (thigh bone, knee, lower leg, ankle, foot and toes).
- Dislocations (injuries to joints).
- Strains and sprains (injuries to ligaments, muscles and tendons).

## E.1 THE SKELETON




The skeleton forms the supporting framework of the body and consists of 206 separate bones in an adult joined together by means of cartilage, ligaments and muscles.

The bones in different parts:

- Head and face: skull, two cheek bones and lower jaw bones.
- Body: back bone or spine, the ribs and breast bone.
- Upper limbs: arm, forearm (long bones), and palm (short bones).
- Hip: the pelvis.
- Lower limbs: thigh and Leg (long bones), foot (short bones).

### E.1.1 THE SKULL

The skull is made up of 22 bones (21 immobile, 1 mobile) joined together:

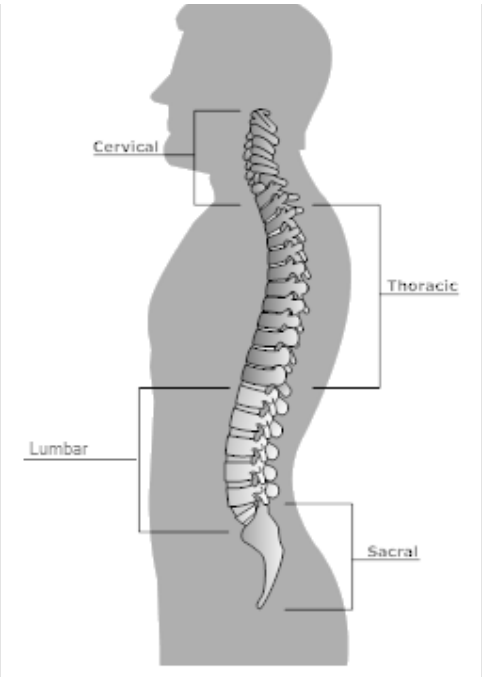
- one in the front, corresponding to the forehead, called the frontal bone;
- two, one on either side, called the parietal bones;
- two, one on either side below the parietals, at the level of ears, called the temporal bones;
- one behind, corresponding to the back of the head, called the occipital bone;
- the 5 bones that make up the skull base are the ethmoid, sphenoid, occipital, paired frontal, and paired temporal bones;
- two cheek bones on each side (called maxilla, zygomatic bones), two nasal bones and one lower jaw bone (called the mandible) (face); and

- two small bones located at the tear channels of the eye, called the *lacrimal bones*.

The bones of the skull provide protection for the brain and the organs of vision, taste, hearing, equilibrium, and smell. The bones also provide attachment for muscles that move the head and control facial expressions and chewing.

### E.1.2 THE BACKBONE OR SPINE (VERTEBRAL COLUMN)

The vertebral column consists of 33 small pieces of bones, each called a *vertebra* (plural: *vertebrae*), placed one above the other starting from skull to the tail bone below.

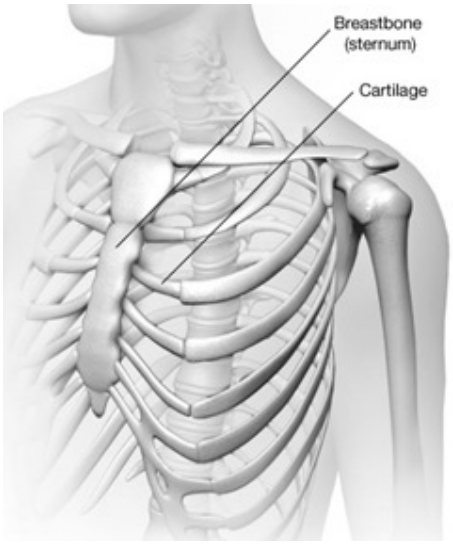



The vertebral column can be divided in different regions:

- 7 cervical vertebrae in the neck referred to as C1-C7;
- 12 thoracic or dorsal vertebrae from the back referred to as T1-T12;
- 5 lumbar vertebrae at the waist region form the lower back referred to as L1-L5;
- 5 sacral vertebrae at the hip region, fused together, form the sacrum; and
- the remaining four form the tail bones.

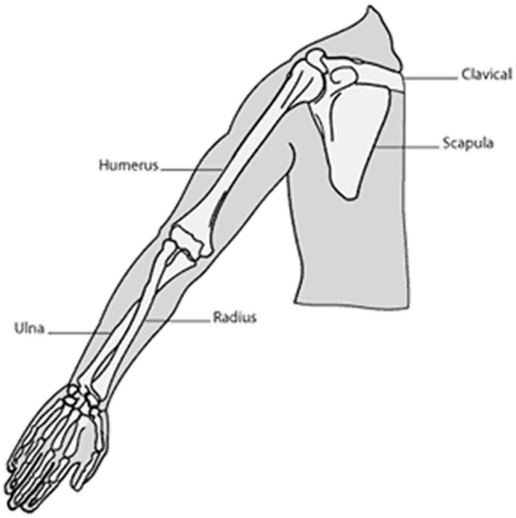
Between each pair of vertebrae is a *disk* of cartilage that acts as a shock absorber and allows movement. Muscles and ligaments attached to the vertebrae stabilize the spine and control the movement of the back. Inside the central canal the *spinal cord* passes which carries impulses from and to the brain.

### E.1.3 THE RIBS AND BREAST BONE (STERNUM)




The lungs and heart are protected by the *thoracic cage*. It consists of twelve pairs of ribs, attached to the corresponding vertebrae at the back. The first seven pairs of the ribs are attached to the breastbone (also called *sternum*) in the front. The eighth, ninth and tenth pairs of ribs are each attached to the rib above. The eleventh and twelfth pair of ribs have no frontal attachment and are called *floating ribs*.

### E.1.4 THE SHOULDERS AND UPPER LIMBS (ARM, ELBOW, WRIST AND HAND)




#### *E.1.4.1 THE SHOULDER*

Each shoulder consists of following bones:

- a collar bone (Clavicle) in the front on each side of the upper part of the breast bone, and
- a shoulder blade (Scapula) on each side at the upper outer back.

### *E.1.4.2 THE UPPER LIMB: ARM, ELBOW, WRIST AND HAND*

The bones of the upper limbs (arms) are:

- the upper arm, called humerus;
- the forearm bones:
  - The outer side forearm bone or radius,
  - The inner side forearm bone or ulna.

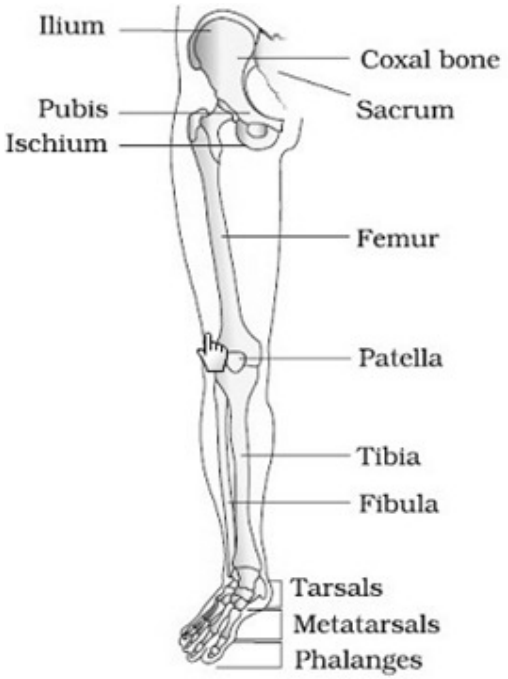
The joint between the upper arm and forearm is called the elbow.

There are eight *carpal bones* in each wrist, five *metacarpal bones* in each palm and three small bones called phalanges in each finger (only two in each thumb).

## E.1.5 THE PELVIS AND LOWER LIMBS (LEG, KNEE, ANKLE AND FOOT)

### *E.1.5.1 THE PELVIS*

Two hip bones, one on either side, join together to form the *pelvis*. The hip bones are attached at the back with the lower part of the vertebral column. At the front, it is attached together with ligament called *symphysis pubis*.




The pelvis forms a basin shaped cavity which contains intestines, urinary bladder and reproductive organs. There are two sockets one on either side of the pelvis, where the thigh bones join forming the hip joint.

### *E.1.5.2 THE LOWER LIMB: LEG, KNEE, ANKLE AND FOOT*

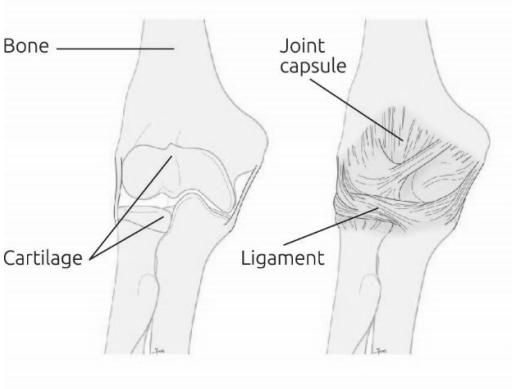
The thigh bone, called *femur*, is the longest and strongest bone in the body. Its upper end forms a part of the hip joint while its lower end forms a part of the knee joint.

The knee joint in the front is covered with a small bone called the knee cap or *patella*, which can easily be felt under the skin.

The two bones of the lower part of the leg are the shin bone, called *tibia*, and the outer bone, called *fibula*. The tibia extends from the knee joint to the ankle joint. Its sharp edge can be felt immediately beneath the skin of the front of the leg. The fibula lies on the outer side of the tibia. It does not enter in to the formation of the knee-joint; its lower end forms the outer part of the ankle-joint.

There are seven tarsal bones and five metatarsal bones in each foot, and three small bones called phalanges in each finger (two in each big toe).

## E.2 JOINTS




Joints are the places at the junction of two or more bones.

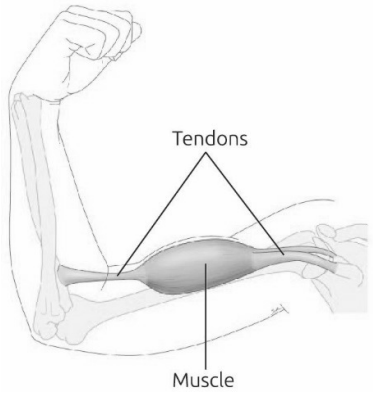
There may be no movement (immovable joints) as in skull or there may be free movements (movable joints) as in knee, elbow, shoulder and hip joints.

In movable joints, the ends of the bones are covered by cartilage, the joint is encased in a capsule containing a lubricant material.

There are three types of movable joints:

- *Ball and socket joints* as found in the shoulder and hip. The round head of the bone enters the socket of the other bone, allowing movement in several directions and planes.
- *Hinge joints* as the ankle, elbow or the knee. These joints allow only movement in one plane only as with the hinge of a door.
- *Gliding joints* as in the wrist, feet, between the ribs and the vertebras of the spinal column. These joints allow only limited movements.

## E.3 MUSCLES




Muscles to the layman mean "flesh" and produce movement of the limbs and organs.

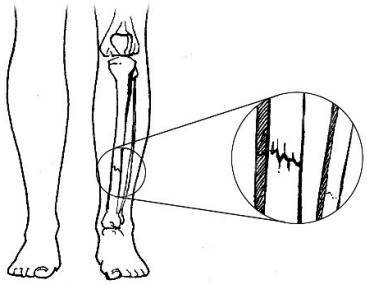
An individual muscle consists of bundles of long muscle fibres. The whole muscle is covered with a strong connective tissue sheath and attached to a bone by inextensible tendons.

There are two types of muscles:

- Voluntary muscles, which are under the control of the will and are generally attached to the skeleton.
- Involuntary muscles, like those found in the heart and digestive system, work without the control of the will, but are under the influence of the autonomous nervous system.

## E.4 FRACTURES (INJURIES TO BONES)

A fracture is a break/bend or crack in a bone. Generally, a considerable force is needed to break a bone, unless it is diseased or old. The bones that are still growing are supple and may split, bend, or crack.



### E.4.1 CAUSES OF FRACTURES

Fractures may happen when direct (a blow) or indirect force (a twist, a wrench) is inflicted on a bone.

#### *E.4.1.1 DIRECT FORCE*

The bone breaks at the spot of application of the force e.g. a severe fall on a projecting stone, a bullet passing into bones, or a wheel passing over the body, etc.

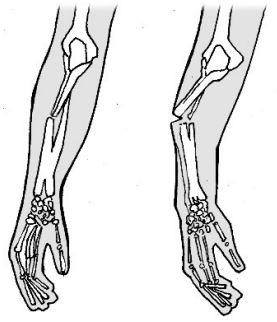
#### *E.4.1.2 INDIRECT FORCE*

The bone breaks at the spot away from the spot of application of force e.g. collar-bone-fracture when the fall is on outstretched hands, etc.

#### *E.4.1.3 MUSCULAR FORCE*

The fracture occurs due to a violent contraction of a group of muscles (e.g. fracture of ribs on violent cough). This type of fracture happens very rarely and is mostly related to other underlying diseases (e.g. weakened bone structure).

## E.4.2 TYPES OF FRACTURES



### *E.4.2.1 OPEN AND CLOSED FRACTURES*

#### E.4.2.1.1 CLOSED FRACTURES

The skin above the fracture is intact, although the bone ends may have damaged nearby tissues and blood vessels.

#### E.4.2.1.2 OPEN FRACTURES (COMPOUND FRACTURES)

The skin above the fracture is not intact. There is bleeding. The bone is exposed to the outside air at the surface; dirt, dust and germs can enter the wound. There is a high risk of infection.

### *E.4.2.2 SIMPLE AND COMPLEX FRACTURES*

The term "*complex fracture*" describes a broken bone that is more severe than what is more common. Fractures are considered to be complex when:

- The bones are broken into many pieces.
- The soft tissues and vital organs are severely damaged.
- There are multiple fractures at several levels in a single bone.
- There is an associated joint dislocation or joint injury.

Otherwise, the fracture can be classified as a '*simple fracture*'.

## E.4.3 WHAT DO I SEE AND ENQUIRE?

Following signs and symptoms may be observed when a person suffered a fracture:

- The injured complains of pain at the spot of fracture or around it.
- The injured complains of tenderness i.e. pain on touching over the injured spot.

⓿ Never press hard on a suspected fracture spot!

- There might be swelling of the area of the fracture.
- There might be a bleeding at the location of the fracture.
- The bone might be sticking out.
- There might be a discoloration in the area of the fracture.
- The injured may have lost the capability of normal movements of the affected part.

- There might be a deformity of the affected limb. The limb may have lost its normal shape. Sometimes the muscles may pull up the lower free end, causing an apparent shortening of the limb.
- An irregular outline of the bone can be felt (e.g. on lower limb fractures).
- The injured may feel an unnatural movement at the spot of fracture.

The response of an injured person to a dislocated limb or a broken bone can be very different. Some people might even be able to walk with a broken leg with some pain, whilst others might not be able to move at all.

If you are not sure whether a bone is broken, it is safer to assume that it has broken.

If the broken leg looks deformed or dislocated, do not try to reset it. This might make the injury worse and will cause pain.

## E.4.4 WHAT DO I DO?

### *E.4.4.1 SAFETY FIRST AND CALL FOR HELP*

1. Make sure there is no danger to you and the person.
2. The person needs help. Shout or call for help if you are alone but do not leave the person unattended. Ask a bystander to seek help or to arrange transport to the nearest healthcare facility. Tell him to come back to you to confirm if help has been secured.

### *E.4.4.2 HYGIENE*

3. If possible, wash your hands before taking care of the injured. Use soap and water to wash your hands. If no soap is available, you can use ash to wash your hands. Alcohol-based sanitizers can also be used, if available.
4. Use gloves to protect yourself. If gloves are not available, you can use a clean plastic bag. Try not to come in contact with the person's blood.

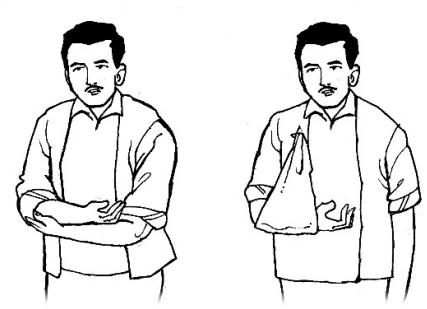
### *E.4.4.3 PROVIDE FIRST AID*

5. Fractures often occur in major accidents. Therefore, it is necessary to treat other potential injuries also. The first aider must decide which injury is more urgent.

   Providing CPR when the victim does not breathe, or treating a severe bleeding is more urgent and should be handled on priority.
6. There may be more than one fracture in the same patient or even in the same limb.
7. Try not to move the broken or dislocated limb unnecessarily.

   Try not to move the casualty until the injured part has been secured.

   If you need to move the victim, be careful when moving or turning him. It is better to ask assistance by bystanders.
8. Reassure the casualty.
9. Advice the person to keep calm.



10. If the casualty is able to support the injured part, ask him to do so; else, support the injured part with your hands or ask a bystander to do so.

    You can immobilize the injured part with a bandage or a splint (if the first aider is experienced in these techniques). If you applied a splint or bandage, check the circulation below the bandage or splinting (e.g. at finger or toe level).

11. Arrange appropriate transport to the nearest healthcare facility.
12. Continuously observe the casualty.
13. Do not give the casualty anything to eat or drink.

#### E.4.4.3.1 WHAT DO I DO WHEN THERE IS ALSO A SEVERE BLEEDING?

Press on the bleeding to stop it and put a pressure bandage on the wound.

#### E.4.4.3.2 WHAT DO I DO WHEN THE PERSON BECOMES UNCONSCIOUS, BUT IS STILL BREATHING?

1. Put the person in the recovery position.
2. Continue to observe the victim and check his breathing.

#### E.4.4.3.3 WHAT DO I DO WHEN THE PERSON STOPS BREATHING?

Perform CPR.

Do not interrupt the resuscitation until:

- the victim starts to wake up, moves, opens his eyes and breathes normally;
- help (trained in CPR) arrives and takes over;
- you become too exhausted to continue; or
- the scene becomes unsafe for you to continue.

### *E.4.4.4 HYGIENE*

Always wash your hands after taking care of a person. Use soap and water to wash your hands. If no soap is available, you can use ash to wash your hands. Alcohol-based sanitizers can also be used, if available.

## E.4.5 WHEN TO REFER TO A HEALTHCARE FACILITY?

| | |
|---|---|
| | Always transport or refer a person suffering a (potential) fracture to a nearby healthcare facility. |

A treatment by bonesetters is not recommended.

## E.5 INJURIES AND FRACTURES TO THE HEAD, NECK AND SPINE

Head, neck and spinal injuries can be very serious and should always be managed with caution!

Unblocking the breathing passage takes priority over concerns about a potential spinal injury. When a person needs to be put in the recovery position to keep the airways open, this takes priority over potential spinal injury. If possible, support the person's neck while turning him into the recovery position.

### E.5.1 CAUSES OF HEAD, NECK AND SPINAL INJURIES AND FRACTURES.

Fractures of the skull can be caused by a direct blow or a fall on the head.

Fractures of the base of the skull can be caused by an indirect injury, e.g. a fall on the feet, a fall on the lower part of the spine (buttock) or a severe blow to the side of the head.

Fractures of the lower jaw are mostly the result of a direct force. Usually one side of the jaw is affected; however, both sides might be fractured. In most cases, the fracture is an open (compound) fracture as there is usually a wound inside the mouth also.

Spinal fractures can happen indirectly when landing on the feet or buttocks in a heavy fall, when being thrown forward suddenly (like in a car accident during a collision) or when lifting a very heavy weight. A whiplash injury is a specific neck injury caused by a fast movement of the head forward and backwards (e.g. during a car collision).

Direct spinal fractures can be caused by falling from a height on the back across a bar or a fall of a heavy weight on the back (e.g. during an earthquake or landslide)

### E.5.2 WHAT DO I SEE AND ENQUIRE?

You should suspect a potential serious injury if the person:

- fell from a height greater than his own standing height;
- was involved in a road accident and suffered a hard blow;
- is feeling nausea or is vomiting (throwing-up);
- does not remember exactly what has happened;
- is behaving in an irritated or unusual way after the accident;
- complains of blurring vision;
- feels pain or tenderness in the head, neck or back;
- has serious wounds or injuries to the head;
- has serious injuries on the legs and does not complain about pain;
- feels like he has been cut in half;
- is sleepy, drowsy or loses (has lost) consciousness;
- has a fit; or
- has an unequal pupil size.

Blood and brain fluid (CSF) may flow from the ear and/or nose in case of fracture of base of skull.

## E.5.3 WHAT DO I DO?

### *E.5.3.1 SAFETY FIRST AND CALL FOR HELP*

1. Make sure there is no danger to you and the person.
2. The injured person urgently needs help. Shout or call for help if you are alone but do not leave the person unattended. Ask a bystander to seek help or to arrange urgent transport to the nearest healthcare facility. Tell him to come back to you to confirm if help has been secured.

### *E.5.3.2 PROVIDE FIRST AID*

3. Tap him on the shoulders and ask if he is okay. Do not shake the person too roughly.
4. Check if the injured is conscious or unconscious and act accordingly.

   To do so:

   Check if the person opens his eyes and responds to simple questions:

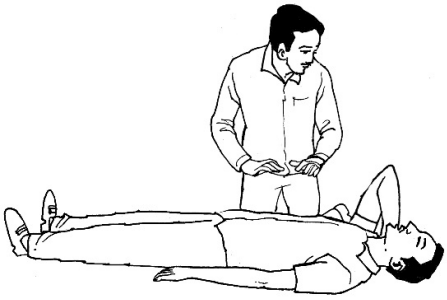
   - 'What is your name?'
   - 'Where do you live?'
   - 'How old are you?'

   Check if the injured person responds to simple commands:

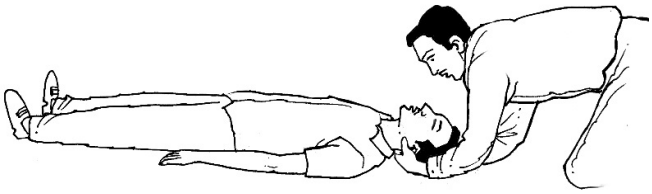
   - "Squeeze my hand?"
   - "Move your arm/leg/foot/hand"

   If there is no response, pinch the person and check if he opens his eyes or moves.

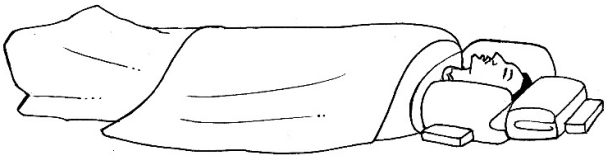
   If the injured person responds, do not try to change the position of the person when there is a head, neck, back and leg or arm injury.



5. Tell the person to stay calm and not to move.
6. Assure the person that you will stay with him and help is being arranged.



7. To keep the head still, place your hands or tightly folded clothing on each side of the injured person's head. Keep the head and neck of the person still only if the person allows you to do so.
8. If the injured does not allow you to hold his head, do not enforce.
9. If the spinal cord injury is suspected, try to ensure that:
    a. The injured person continues to lie still until transported to a hospital.
    b. The injured person is not made to sit or stand.
    c. At least 3 people assist in moving the person 'like a log of wood' to transport him to the nearest healthcare facility or hospital.



10. Keep the injured person warm by taking off wet clothing, covering him with a blanket or other covering, taking care not to overheat him.
11. If not done yet, arrange transport to a healthcare facility.
12. Do not leave the person alone and keep on checking his breathing.
13. Do not give the casualty anything to drink or eat.

#### E.5.3.2.1 WHAT DO I DO WHEN THE PERSON LOSES CONSCIOUSNESS, BUT IS STILL BREATHING?

1. Put the person in the recovery position.
2. Be careful when moving and turning the victim. It is better to ask assistance by bystanders.
3. Do not leave the person alone and continue to observe the breathing.

#### E.5.3.2.2 WHAT DO I DO WHEN THE PERSON STOPS BREATHING?

Perform CPR.

Do not interrupt the resuscitation until:

- the victim starts to wake up, moves, opens his eyes and breathes normally;
- help (trained in CPR) arrives and takes over;
- you become too exhausted to continue, or
- the scene becomes unsafe for you to continue.

### *E.5.3.3 HYGIENE*

Always wash your hands after taking care of a person. Use soap and water to wash your hands. If no soap is available, you can use ash to wash your hands. Alcohol-based sanitizers can also be used, if available.

## E.5.4 WHEN TO REFER TO A HEALTHCARE FACILITY?

Always urgently transport the injured person suspected of having head, neck or spinal injury (injuries) to the nearest healthcare facility.

## E.6 INJURIES AND FRACTURES TO THE CHEEKBONE, NOSE AND LOWER JAW

### E.6.1 FRACTURE OF THE CHEEKBONE OR NOSE

#### *E.6.1.1 CAUSES OF INJURIES AND FRACTURES OF THE CHEEKBONE OR NOSE*

Injuries and fractures of the cheekbone or nose are often the result of deliberate blows to the face.

#### *E.6.1.2 WHAT DO I SEE AND ENQUIRE?*

You might observe following signs and symptoms:

- There might be swelling or bruising.
- There might be deformity of the nose or face.
- The nose might be bleeding.
- There might be bleeding from the mouth.
- The casualty complains of pain at the site of injury.
- The casualty might be having difficulty in breathing due to bleeding or swollen tissues.

#### *E.6.1.3 WHAT DO I DO?*

##### E.6.1.3.1 SAFETY FIRST

1. Make sure there is no danger to you and the person.

##### E.6.1.3.2 HYGIENE

2. If possible, wash your hands before taking care of the injured. Use soap and water to wash your hands. If no soap is available, you can use ash to wash your hands. Alcohol-based sanitizers can also be used, if available.
3. Use gloves to protect yourself. If no gloves are available, you can use a clean plastic bag.

   Try not to come in contact with the person's blood.

##### E.6.1.3.3 PROVIDE FIRST AID

4. Apply a cold compress gently on the affected area. This helps to reduce the swelling and pain.

5. If the nose is bleeding, ask the victim to gently press the nostrils with the head tilted forward to stop the bleeding.
6. Never try to put a deformed nose back into its normal position.
7. Advise the casualty to go to a healthcare facility.

#### E.6.1.3.4 HYGIENE

Always wash your hands after taking care of a person. Use soap and water to wash your hands. If no soap is available, you can use ash to wash your hands. Alcohol-based sanitizers can also be used, if available.

### *E.6.1.4 WHEN TO REFER TO A HEALTHCARE FACILITY?*

| | |
|---|---|
| | Always immediately transport a casualty who has sustained an injury to the head or face, or who is suspected having fracture(s) in the face or head to the nearest healthcare facility. |

## E.6.2 FRACTURES OF THE LOWER JAW

### *E.6.2.1 CAUSES OF INJURIES OR FRACTURES OF THE LOWER JAW*

Injuries and fractures of the lower jaw are usually the result of a direct force, such as a heavy blow to the chin. The force might have been applied to one side of the chin and cause a fracture on the other side by indirect force.

Fall on the chin might result in fractures of both sides of the jaw.

In some cases the jaw might also be dislocated.

### *E.6.2.2 WHAT DO I SEE AND ENQUIRE?*

You might observe following signs and symptoms:

- The casualty has difficulty in speaking and/or opening his mouth.
- His saliva becomes blood-stained.
- The casualty complains of pain, which is increased by speaking and swallowing.
- The face and lower jaw is swollen.
- The teeth look irregular, some teeth might have fallen out.
- Some crepitus might be felt by the victim, or when steadying the jaw.
- There might be an injury to the tongue that bleeds profusely and might block the air passage.

### *E.6.2.3 WHAT DO I DO?*

#### E.6.2.3.1 SAFETY FIRST

1. Make sure there is no danger to you and the person.

#### E.6.2.3.2 HYGIENE

2. If possible, wash your hands before taking care of the injured. Use soap and water to wash your hands. If no soap is available, you can use ash to wash your hands. Alcohol-based sanitizers can also be used, if available.

   Use gloves to protect yourself. If no gloves are available, you can use a clean plastic bag. Try not to come in contact with the person's blood.

#### E.6.2.3.3 PROVIDE FIRST AID

3. Ask the casualty not to speak.
4. Do not give the casualty anything to drink or eat.
5. Ask the casualty to remove his false teeth (if any).
6. Observe the respiration of the casualty as the airway might be obstructed by the tongue or blood.

7. With the victim leaning forward, place the palm of his or your hand on the chin and gently press the jaw upwards against the upper jaw (the upper jaw will act as a splint for the fracture).
8. Apply a bandage on the head to support the jaw fracture (see chapter on bandages).
9. If the casualty shows signs of vomiting, remove the bandage and apply it again after the vomiting stops.
10. If the injured is able to sit, ask him to bend his head forwards to make sure the tongue does not slip backwards or the blood does not choke him.
11. If the casualty loses consciousness, but is still breathing, put him in the recovery position.
12. If the casualty stops breathing, start CPR.
13. If one or more teeth have fallen out, you can put them in a clean closed container in fresh egg white, fresh coconut water or fresh whole milk. If none of these are available, ask the casualty to put saliva in the container. Mark the container with the name of the casualty and the time of collection. Make sure the container is transported to the hospital together with the casualty.

14. Arrange transport to the nearest healthcare facility.

#### E.6.2.3.4 HYGIENE

Always wash your hands after taking care of a person. Use soap and water to wash your hands. If no soap is available, you can use ash to wash your hands. Alcohol-based sanitizers can also be used, if available.

### *E.6.2.4 WHEN TO REFER TO A HEALTHCARE FACILITY?*

Always immediately transport a casualty who has sustained an injury to the head or face, or who is suspected having fracture(s) in the face or head to the nearest healthcare facility.

# E.7 INJURIES TO THE SHOULDER, RIBS OR BREASTBONE

## E.7.1 INJURIES OR FRACTURES OF THE SHOULDER

### *E.7.1.1 CAUSES OF INJURIES OR FRACTURE OF THE SHOULDER*

Shoulder injuries often happen due to a fall on the shoulder or on the stretched arm.

Shoulder fractures are rare; they might be caused by a crush injury or a direct blow.

#### E.7.1.1.1 WHAT DO I SEE AND ENQUIRE?

You might observe following signs and symptoms:

- The casualty complains of severe pain, increased by movement. The pain might make the casualty reluctant to move.
- The casualty tends to relieve the pain by supporting the arm of the injured side and by inclining his head towards the injured side.
- An abnormal position of the shoulder blade might be noticed.

### *E.7.1.2 WHAT DO I DO?*

#### E.7.1.2.1 SAFETY FIRST

1. Make sure there is no danger to you and the person.

#### E.7.1.2.2 HYGIENE

2. If possible, wash your hands before taking care of the injured. Use soap and water to wash your hands. If no soap is available, you can use ash to wash your hands. Alcohol-based sanitizers can also be used, if available.
3. Use gloves to protect yourself. If no gloves are available, you can use a clean plastic bag.

   Try not to come in contact with the person's blood.

#### E.7.1.2.3 PROVIDE FIRST AID

4. Tell the person to immobilise the arm on the injured side by holding that arm close to his body.
5. Do not remove clothing.
6. Support the arm on the injured side with the help of a sling.
7. Arrange transport to the nearest healthcare facility.

#### E.7.1.2.4 HYGIENE

Always wash your hands after taking care of a person. Use soap and water to wash your hands. If no soap is available, you can use ash to wash your hands. Alcohol-based sanitizers can also be used, if available.

### *E.7.1.3 WHEN TO REFER TO A HEALTHCARE FACILITY?*

A casualty with a suspected shoulder fracture or dislocation should be transported or referred to a healthcare facility.

## E.7.2 INJURIES AND FRACTURES OF THE COLLAR BONE

### *E.7.2.1 CAUSES OF FRACTURES OF THE COLLAR BONE*

The collar bone can be fractured when the person falls on the tip of the shoulder or on the palm of the outstretched hand.

### *E.7.2.2 WHAT DO I SEE AND ENQUIRE?*

You might observe following signs and symptoms:

- The arm on the injured side is partially incapable. The casualty usually supports it at the elbow with the other hand.
- The casualty's head may be inclined towards the injured side (drops on one side).
- Swelling and a deformity of the shoulder might be noticed.
- The broken ends of the clavicle bone might be visible or felt.

### *E.7.2.3 WHAT DO I DO?*

#### E.7.2.3.1 SAFETY FIRST

1. Make sure there is no danger to you and the person.

#### E.7.2.3.2 HYGIENE

2. If possible, wash your hands before taking care of the injured. Use soap and water to wash your hands. If no soap is available, you can use ash to wash your hands. Alcohol-based sanitizers can also be used, if available.

   Use gloves to protect yourself. If no gloves are available, you can use a clean plastic bag. Try not to come in contact with the person's blood.

#### E.7.2.3.3 PROVIDE FIRST AID

3. Tell the person to immobilise the arm on the injured side by holding that arm close to his body.
4. Do not remove clothing.
5. Place a pad in the arm pit on the affected side.
6. Provide the sling with a triangular bandage.
7. Bandage the upper arm to the side of the chest with a triangular bandage, leaving the forearm free. Tie the knot on the opposite side of the injury.
8. Arrange transport to the nearest healthcare facility.

#### E.7.2.3.4 HYGIENE

Always wash your hands after taking care of a person. Use soap and water to wash your hands. If no soap is available, you can use ash to wash your hands. Alcohol-based sanitizers can also be used, if available.

### *E.7.2.4 WHEN TO REFER TO A HEALTHCARE FACILITY?*

A casualty with a suspected collar bone fracture should be transported or referred to a healthcare facility.

## E.7.3 RIB INJURIES AND FRACTURES

### *E.7.3.1 CAUSES OF INJURIES OR FRACTURES OF THE RIBS*

Ribs injuries and fractures can be caused by a direct force, like a blow, a fall upon the chest or a hit against something e.g. the steering column of a car during a car accident. These fractures may cause underlying injuries to the lungs.

Indirectly, a crush caused by a pressure over the front and back of the chest can also cause rib fractures. In this case the fracture ends are pushed outwards and may cause lesser injuries to the lungs.

### *E.7.3.2 WHAT DO I SEE AND ENQUIRE?*

Following signs and symptoms may be observed:

- The casualty complains of pain at the injury area. The pain increases when coughing and or taking deep breaths.
- The casualty takes short, shallow breaths to limit the movement of the ribs.

- *Crepitus* (a crackling or popping sensation) may be felt if a hand is placed flat over the chest, particularly over the broken rib.
- Paleness of the face and lips might indicate a bleeding.
- There might be an open wound in the chest.
- Air may escape from the wound during breathing.
- Blood in the sputum indicates injury to the lung.

### *E.7.3.3 WHAT DO I DO?*

#### E.7.3.3.1 SAFETY FIRST

1. Make sure there is no danger to you and the person.

#### E.7.3.3.2 HYGIENE

2. If possible, wash your hands before taking care of the injured. Use soap and water to wash your hands. If no soap is available, you can use ash to wash your hands. Alcohol-based sanitizers can also be used, if available.

   Use gloves to protect yourself. If no gloves are available, you can use a clean plastic bag. Try not to come in contact with the person's blood.

#### E.7.3.3.3 PROVIDE FIRST AID

3. Bandage first any open wound.
4. If there is no wound on the chest or the wound is bandaged:
   a. Help the casualty to sit in the most comfortable position (usually half sitting position).
   b. Support the arm on the injured side with the help of a sling.
   c. Arrange transport to the nearest healthcare facility.
5. If there is a penetrating wound in the chest, air might be sucked into the chest cavity. See the section on 'chest injuries' in the chapter 'Heart and circulation' for further detail.

#### E.7.3.3.4 HYGIENE

Always wash your hands after taking care of a person. Use soap and water to wash your hands. If no soap is available, you can use ash to wash your hands. Alcohol-based sanitizers can also be used, if available.

### *E.7.3.4 WHEN TO REFER TO A HEALTHCARE FACILITY?*

Always transport a casualty with potential rib injury or factures to the nearest healthcare facility for further medical follow up. Fractures of the ribs may injure internal organs such as the lungs, liver and spleen and cause internal bleeding.

## E.7.4 FRACTURES OF THE BREAST BONE (STERNUM)

### *E.7.4.1 CAUSES OF BREAST BONE FRACTURES*

Breast bone fractures are common in crush injuries. These fractures can be dangerous as the heart and underlying blood vessels might be injured as well.

### *E.7.4.2 WHAT DO I SEE AND ENQUIRE?*

You might observe following signs and symptoms:

- The casualty complains of pain in the area of the fracture.
- The casualty breathes with difficultly.
- The breast bone feels irregular (when running your fingers along it).

### *E.7.4.3 WHAT DO I DO?*

#### E.7.4.3.1 SAFETY FIRST

1. Make sure there is no danger to you and the person.

#### E.7.4.3.2 HYGIENE

2. If possible, wash your hands before taking care of the injured. Use soap and water to wash your hands. If no soap is available, you can use ash to wash your hands. Alcohol-based sanitizers can also be used, if available.

   Use gloves to protect yourself. If no gloves are available, you can use a clean plastic bag. Try not to come in contact with the person's blood.

#### E.7.4.3.3 PROVIDE FIRST AID

3. Loosen tight clothing.
4. Support the casualty into his most comfortable position.
5. Cover the casualty with light material.
6. Arrange transport to the nearest healthcare facility.

#### E.7.4.3.4 HYGIENE

Always wash your hands after taking care of a person. Use soap and water to wash your hands. If no soap is available, you can use ash to wash your hands. Alcohol-based sanitizers can also be used, if available.

### *E.7.4.4 WHEN TO REFER TO A HEALTHCARE FACILITY?*

Always urgently transport a casualty with a suspected breast bone fracture to the nearest healthcare facility.

# E.8 INJURIES TO THE ARM, ELBOW, WRIST, HAND OR FINGERS

## E.8.1 INJURIES AND FRACTURES OF THE ARM (UPPER ARM, FORE ARM, WRIST)

### *E.8.1.1 CAUSES OF INJURIES AND FRACTURES OF THE ARM*

Fractures and injuries of the upper arm, forearm and wrist can be caused by direct impact or by falls.

### *E.8.1.2 WHAT DO I SEE AND ENQUIRE?*

You might observe following signs and symptoms:

- The casualty complains of pain that increases with movement.
- There might be tenderness and deformity over the site of the fracture.
- There might be swelling of the affected area.
- There might be bruising observed (though this might develop slowly).
- If there is an open fracture, a wound and bleeding can be observed.

### *E.8.1.3 WHAT DO I DO WHEN I SUSPECT A BROKEN ARM?*

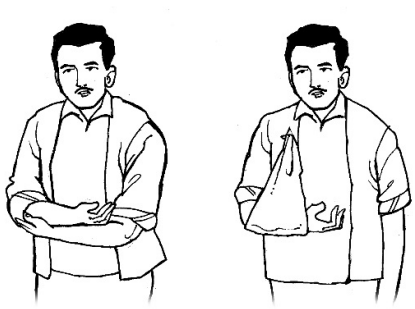
#### E.8.1.3.1 SAFETY FIRST

1. Make sure there is no danger to you and the person.

#### E.8.1.3.2 HYGIENE

2. If possible, wash your hands before taking care of the injured. Use soap and water to wash your hands. If no soap is available, you can use ash to wash your hands. Alcohol-based sanitizers can also be used, if available.
3. Use gloves to protect yourself. If no gloves are available, you can use a clean plastic bag.
4. Try not to come in contact with the person's blood.

#### E.8.1.3.3 PROVIDE FIRST AID



5. Tell the person to immobilise the affected arm by holding his arm close to his body until he obtains medical care.
6. If the person cannot support the arm, provide a sling with a triangular bandage or improvise by turning up the lower end of the clothing and pining it above the arm to form a sling.

7. You might also immobilize the arm using a triangular bandage (see the chapter on bandages) to support the wrist and arm. Provide suitable padding between arm and chest.

   In case of a suspected upper arm fracture, you might bandage the upper arm to the chest.

   - Do not apply the bandage on the immediate site of the fracture.
   - Always tie the knots (reef knot) on the opposite side of the thorax and not on the fractured forearm.
   - The bandaging should be fairly firm so there is no movement of the fracture ends, but it should not be too tight in which case the circulation of blood might be stopped.
   - Always check that the fingers are not too cold and the splint is not too tight. There might be further swelling of the injured area and readjustment of the bandages might be necessary.

   In case of a suspected forearm fracture, you might apply a splint (only when the necessary expertise is available):

   - A splint is a rigid piece of wood, plastic or metal that is applied to the fractured limb to support it and to prevent further movement of the broken bone(s).
   - Reasonably wide splints are better than narrow ones.
   - In emergency cases splints can be improvised: a folded newspaper, a piece of wood or a book can be used.
   - The splint should be long enough to immobilize the elbow and the wrist of fractured forearm.
   - The splint should be padded with cotton or cloths to make it fit softly and snugly on the injured forearm.
   - The splint is best applied over the clothing.

8. If the broken arm looks deformed or dislocated, do not try to reset it. This might make the injury worse and will cause pain.
9. Do not raise an injured arm to ensure that there is no further damage or increase in pain.
10. Refer the injured to the nearest healthcare facility.

#### E.8.1.3.4 HYGIENE

Always wash your hands after taking care of a person. Use soap and water to wash your hands. If no soap is available, you can use ash to wash your hands. Alcohol-based sanitizers can also be used, if available.

### *E.8.1.4 WHEN TO REFER TO A HEALTHCARE FACILITY?*

Always transport or refer a casualty with a suspected upper or lower arm fracture to a nearby healthcare facility.

### *E.8.1.5 CAUSES OF INJURIES AND FRACTURES OF THE ELBOW*

Injuries and fractures of the elbow are usually caused by a fall on to the hand, or by the direct impact on the elbow.

### *E.8.1.6 WHAT DO I SEE AND ENQUIRE?*

You might observe following signs and symptoms:

- The casualty complains of pain that increases with movement.
- There might be swelling of the affected area.
- There might be bruising observed (though this might develop slowly).
- There is no movement in the elbow or arm.

#### E.8.1.6.1 SAFETY FIRST

1. Make sure there is no danger to you and the person.

#### E.8.1.6.2 HYGIENE

2. If possible, wash your hands before taking care of the injured. Use soap and water to wash your hands. If no soap is available, you can use ash to wash your hands. Alcohol-based sanitizers can also be used, if available.
3. Use gloves to protect yourself. If no gloves are available, you can use a clean plastic bag. Try not to come in contact with the person's blood.

#### E.8.1.6.3 PROVIDE FIRST AID

4. If the elbow can be bent, provide broad or narrow triangular bandage in figure of eight and strap the arm to the chest and support the forearm in a triangular sling.
5. If the elbow cannot be bent:
    a. Help the casualty to lie down

b. Place paddings under and between the elbow and the body to immobilise the elbow.

c. Strap the arm and forearm on the side of the body using three folded (narrow) triangular bandages. Knots are tied on the opposite side of the body.

6. Transport the casualty to the nearest healthcare facility.

#### E.8.1.6.4 HYGIENE

Always wash your hands after taking care of a person. Use soap and water to wash your hands. If no soap is available, you can use ash to wash your hands. Alcohol-based sanitizers can also be used, if available.

### *E.8.1.7 WHEN TO REFER TO A HEALTHCARE FACILITY?*

A casualty with an expected elbow fracture should always be transported or referred to a nearby healthcare facility.

## E.8.2 INJURIES AND FRACTURES OF HAND OR FINGERS

### *E.8.2.1 CAUSES OF INJURIES AND FRACTURES OF HAND OR FINGERS*

Injuries and fractures of the hand and fingers are mostly due to direct force injuries. There might be a severe bleeding in the palm.

Hand crush injuries often result in multiple hand fractures.

### *E.8.2.2 WHAT DO I SEE AND ENQUIRE?*

You might observe following signs and symptoms:

- The casualty complains of pain, increased by movement.
- Swelling, bruising and deformity might occur.
- If an open fracture: a wound and external bleeding appear.

### *E.8.2.3 WHAT DO I DO?*

#### E.8.2.3.1 SAFETY FIRST

1. Make sure there is no danger to you and the person.

#### E.8.2.3.2 HYGIENE

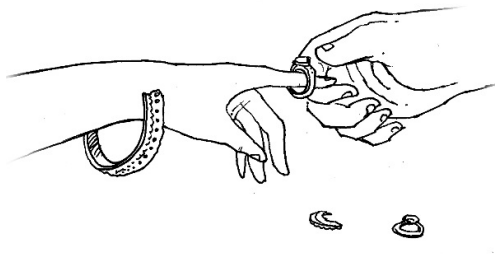
2. If possible, wash your hands before taking care of the injured. Use soap and water to wash your hands. If no soap is available, you can use ash to wash your hands. Alcohol-based sanitizers can also be used, if available.

3. Use gloves to protect yourself. If no gloves are available, you can use a clean plastic bag.

   Try not to come in contact with the person's blood.

#### E.8.2.3.3 PROVIDE FIRST AID

4. If there is a bleeding, stop the bleeding by direct pressure.



5. If possible, remove any rings, bangles etc. before the hand begins to swell.
6. Protect and support the hand by soft padding.
7. Keep the hand in a suitable sling (cuff and collar).
8. Eventually, apply a splint to broken fingers.
9. Arrange transport to the nearest healthcare facility.

#### E.8.2.3.4 HYGIENE

Always wash your hands after taking care of a person. Use soap and water to wash your hands. If no soap is available, you can use ash to wash your hands. Alcohol-based sanitizers can also be used, if available.

### *E.8.2.4 WHEN TO REFER TO A HEALTHCARE FACILITY?*

| | |
|---|---|
| | A casualty with an expected hand or finger fracture(s) should always be transported or referred to a nearby healthcare facility |

# E.9 INJURIES TO THE PELVIS, LOWER LIMBS, KNEE, ANKLE OR FEET

## E.9.1 INJURIES AND FRACTURES OF THE PELVIS

### *E.9.1.1 CAUSES OF PELVIS INJURIES AND FRACTURES*

Pelvis injuries and fractures are often caused by indirect impact, such as a car crash or by crushing, or by fall on hips.

Pelvis fractures often are complicated by internal injuries to the tissues and organs located inside the pelvis.

The internal bleeding caused by the pelvis injury might be severe!

### *E.9.1.2 WHAT DO I SEE AND ENQUIRE?*

You might observe following signs and symptoms:

- The casualty is unable to walk or even stand, although his legs appear to be uninjured.
- The casualty complains of pain and tenderness in the region of the hip, groin or back. The pain increases with movement.
- Signs of internal bleeding and shock.
- The casualty might have difficulty in passing urine and there might be traces of blood in the urine.

### *E.9.1.3 WHAT DO I DO?*

#### E.9.1.3.1 SAFETY FIRST

1. Make sure there is no danger to you and the person.

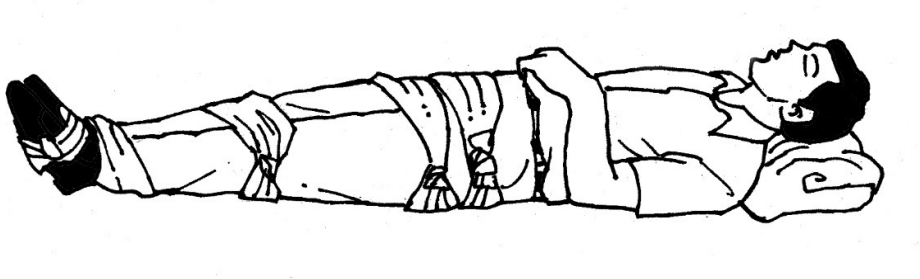
#### E.9.1.3.2 HYGIENE

2. If possible, wash your hands before taking care of the injured. Use soap and water to wash your hands. If no soap is available, you can use ash to wash your hands. Alcohol-based sanitizers can also be used, if available.
3. Use gloves to protect yourself. If no gloves are available, you can use a clean plastic bag.

   Try not to come in contact with the person's blood.

#### E.9.1.3.3 PROVIDE FIRST AID

4. Help the casualty to lie down in the position most comfortable to him.
5. Ask the casualty to avoid passing urine.
6. Transfer the casualty to the healthcare facility:
   - If the healthcare facility is nearby, transport the casualty on a stretcher in the most comfortable position.



- If the travel distance is long or the road is rough:
    a. Place the center of a broad bandage on the hip joint at the injured side. Pass one end around the pelvis and tie it on the other side.
    b. Tie another broad bandage so that it overlaps with the first by half its breadth and tie similarly. Place some padding between the thighs. This bandage should be firm, but not too tight.

7. Avoid pressing the broken bone parts.
8. Check if the bandages are not too tight.
9. Observe the casualty for signs of shock.
10. Keep the person warm by putting a blanket over him, but do not overheat him.
11. Transport the casualty to the nearest healthcare facility.

#### E.9.1.3.4 HYGIENE

Always wash your hands after taking care of a person. Use soap and water to wash your hands. If no soap is available, you can use ash to wash your hands. Alcohol-based sanitizers can also be used, if available.

### *E.9.1.4 WHEN TO REFER TO A HEALTHCARE FACILITY?*

| | |
|---|---|
| | Always urgently transport a casualty with an expected pelvis fracture to the nearest healthcare facility. |

## E.9.2 INJURIES AND FRACTURES OF THE LEG (THIGH OR LOWER LEG) OR ANKLE

### *E.9.2.1 CAUSES OF INJURIES AND FACTURES OF THE LEG*

It takes a strong force to fracture the thigh bone (*femur*).

A fracture of the neck of the thigh bone occurs quite frequently in elderly, mostly as a result of a fall. Always assume a fracture and not a simple bruising in these cases. Deal it as a case of fracture of pelvis.

Fractures of the thigh bone are a serious injury. There will be bleeding into the surrounding tissues and this might result in shock. The healing of the bone takes long time and is even more prolonged in older people.

Fractures of the lower leg include fractures of the shin bone (*tibia*) and the splint bone (*fibula*). Shin bone fractures are mostly the result of a heavy blow. The splint bone and ankle fractures can result because of twisting of ankle.

### *E.9.2.2 WHAT DO I SEE AND ENQUIRE?*

You might observe following signs and symptoms:

- The casualty complains of pain at the injury site.
- There might be swelling.
- There might be bruising.
- The leg might look shortened, turned or deformed.
- The casualty can't walk.
- There might be signs of shock (i.e. in case of pelvis or femur fractures).
- In case of an open fracture: a wound and external bleeding.

### *E.9.2.3 WHAT DO I DO WHEN I SUSPECT A BROKEN LEG OR BROKEN ANKLE?*

#### E.9.2.3.1 SAFETY FIRST

1. Make sure there is no danger to you and the person.

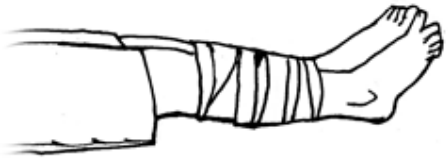
#### E.9.2.3.2 HYGIENE

2. If possible, wash your hands before taking care of the injured. Use soap and water to wash your hands. If no soap is available, you can use ash to wash your hands. Alcohol-based sanitizers can also be used, if available.
3. Use gloves to protect yourself. If no gloves are available, you can use a clean plastic bag.

   Try not to come in contact with the person's blood.

#### E.9.2.3.3 PROVIDE FIRST AID

4. Tell the injured person not to try to stand/move.
5. If the broken leg looks deformed or dislocated, do not try to reset it. This might make the injury worse and will cause pain.

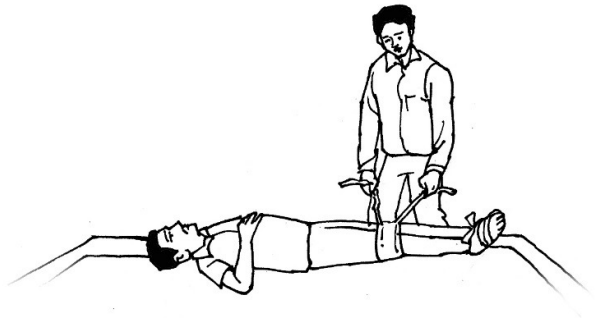


6. To transport the injured person, keep the leg still by bandaging or splinting one leg to the other non-broken/non-dislocated one.

   To do so:

   a. Carefully move the uninjured leg to the injured leg.
   b. Use suitable padding to fill in the hollow areas (between the legs).
   c. Use bandages or strips of cloth to attach both legs together.
   d. Do not apply the bandages on the immediate site of the fracture.

e. The bandaging should be passed through the natural hollows such as knees or just above the ankles to avoid unnecessary movement of the bones.



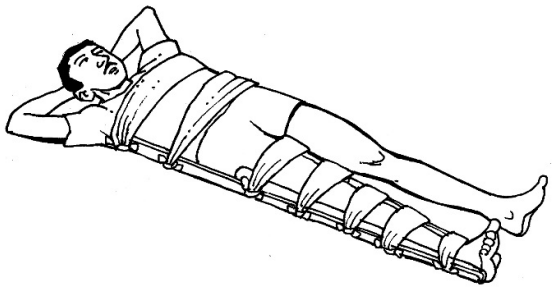
f. Always tie the knots on the uninjured leg side.

g. The bandaging should be fairly firm so that there is no movement of the fracture ends, but it should not be too tight in which case the circulation of blood might be stopped.

Always check that the toes are not too cold and the splint is not too tight.

There might be further swelling of the injured area and readjustment of the bandages might be necessary.

7. Eventually you can apply a splint (only when the first aider has the necessary expertise):



- A splint is a rigid piece of wood, plastic or metal that is applied to the fractured limb to support it and to prevent further movement of the broken bone(s).
- Reasonably wide splints are better than narrow ones.
- In emergency cases splints can be improvised: a walking stick, an umbrella or a piece of wood can be used.
- Splints should be long enough to immobilize the joints above and below the fractured bone.
- Splints should be padded with cotton or cloths to make them fit softly and snugly on the injured limb.
- Splints are best to be applied over the clothing.
- Splints are only obligatory to be used when both legs are broken.

8. Ask the person to keep still.

9. Do not raise the injured leg as it may further worsen the injury and increase the pain.
10. Arrange transport to the nearest healthcare facility.

#### E.9.2.3.4 HYGIENE

Always wash your hands after taking care of a person. Use soap and water to wash your hands. If no soap is available, you can use ash to wash your hands. Alcohol-based sanitizers can also be used, if available.

### *E.9.2.4 WHEN TO REFER TO A HEALTHCARE FACILITY?*

Always urgently transport a casualty with a suspected fracture to the thigh to the nearest healthcare facility. A fracture of the thigh is a serious injury and can result in shock.

Always transport or refer a casualty with suspected lower leg fracture(s) to a nearby healthcare facility.

## E.9.3 FRACTURE OF THE KNEE CAP (PATELLA)

### *E.9.3.1 CAUSES OF FACTURES OF THE KNEE CAP*

Knee cap fractures are often the result of direct fall on the knee or blow, violent twists or strains.

### *E.9.3.2 WHAT DO I SEE AND ENQUIRE?*

You might observe following signs and symptoms:

- The casualty complains of pain at the injury site.
- There might be swelling.
- There might be bruising.
- The casualty can't walk.
- In case of an open fracture: a wound and external bleeding.
- The knee might appear 'locked', the casualty complains of acute pain when trying to straighten the leg.
- Deformity can be felt by a simple touch.

### *E.9.3.3 WHAT DO I DO WHEN I SUSPECT A BROKEN KNEE CAP?*

#### E.9.3.3.1 SAFETY FIRST

1. Make sure there is no danger to you and the person.

#### E.9.3.3.2 HYGIENE

2. If possible, wash your hands before taking care of the injured. Use soap and water to wash your hands. If no soap is available, you can use ash to wash your hands. Alcohol-based sanitizers can also be used, if available.
3. Use gloves to protect yourself. If no gloves are available, you can use a clean plastic bag.

   Try not to come in contact with the person's blood.

#### E.9.3.3.3 PROVIDE FIRST AID

4. Help the person to lie down in the most comfortable position.
5. Do not attempt to straighten the knee forcibly. Displaced cartilage or internal bleeding might make it impossible to straighten the knee joint.
6. Place a soft padding, like a pillow, under the knee to support it in the most comfortable position.
7. Apply a padded splint (if the first aider has sufficient technical knowledge to do so) under the limb from the buttocks to the heel. The ankles should be raised from the splint by padding.
8. Fix the splint by:
    a. a broad bandage around the upper part of the thigh;
    b. a narrow bandage in a figure-of-eight bandage around the knee. Place the center of the narrow bandage above the upper part of the fractured piece, cross it behind the knee and bring it up crossing the lower fractured bit to the back of the knee. Tie it off at a point just below the knee cap.
    c. a broad bandage around the lower leg.
9. Transport the injured to the healthcare facility.
10. If possible, keep the injured limb a little raised, e.g. on a blanket.

#### E.9.3.3.4 HYGIENE

Always wash your hands after taking care of a person. Use soap and water to wash your hands. If no soap is available, you can use ash to wash your hands. Alcohol-based sanitizers can also be used, if available.

### *E.9.3.4 WHEN TO REFER TO A HEALTHCARE FACILITY?*

A casualty with a suspected fracture to the knee should be transported or referred to a nearby healthcare facility.

## E.9.4 INJURIES AND FRACTURES OF FOOT OR TOES

### *E.9.4.1 CAUSES OF INJURIES AND FACTURES OF THE FOOT OR TOES*

Foot injuries and fractures are often caused by direct injury as a crush injury (e.g. a wheel driving over the foot).

### *E.9.4.2 WHAT DO I SEE AND ENQUIRE?*

You might observe following signs and symptoms:

- The casualty complains of pain at the injury site.
- There is stiffness of movement or loss of power in the foot.
- There might be swelling.
- There might be bruising.
- The casualty can't walk.

### *E.9.4.3 WHAT DO I DO WHEN I SUSPECT A BROKEN FOOT OR TOES?*

#### E.9.4.3.1 SAFETY FIRST

1. Make sure there is no danger to you and the person.

#### E.9.4.3.2 HYGIENE

2. If possible, wash your hands before taking care of the injured. Use soap and water to wash your hands. If no soap is available, you can use ash to wash your hands. Alcohol-based sanitizers can also be used, if available.
3. Use gloves to protect yourself. If no gloves are available, you can use a clean plastic bag.

   Try not to come in contact with the person's blood.

#### E.9.4.3.3 PROVIDE FIRST AID

4. Help the person to sit down in the most comfortable position.
5. Raise the injured foot to reduce the blood flow.
6. If the casualty wear shoes and no wound is visible or expected, leave the shoes on.
7. If a wound is visible or expected,
   a. Remove carefully the footwear and remove (or cut) the socks.
   b. Stop the bleeding and cover the wound.
8. Apply an open triangular bandage to the injured foot:
   a. Place the center of the open bandage over the injured foot.
   b. Cross the ends over the foot and carry them to the back of the ankle and tie the knot on the front side.
9. Use the other foot as a splint. Tie both feet and legs together below the knee using figure of 8.
   a. Put padding between knees, ankles and feet.
   b. Tie both feet and legs together below the knee.
10. Transport the injured to the healthcare facility.
11. If possible, keep the injured foot raised, e.g. on a rolled blanket.

#### E.9.4.3.4 HYGIENE

Always wash your hands after taking care of a person. Use soap and water to wash your hands. If no soap is available, you can use ash to wash your hands. Alcohol-based sanitizers can also be used, if available.

### *E.9.4.4 WHEN TO REFER TO A HEALTHCARE FACILITY?*

A casualty with a suspected fracture(s) to the foot should be transported or referred to a nearby healthcare facility.

## E.10 DISLOCATIONS (INJURIES TO JOINTS)

A dislocation is a displacement of a bone at a joint, like the knee or shoulder. The supporting tendons at the joint (the ligaments) might be damaged.

The response of an injured person to a dislocated limb can be very different.

If you are not sure whether a bone is dislocated, always seek medical help.

### E.10.1 CAUSES OF DISLOCATIONS

Dislocations are mostly the result of an external force that impacts the body.

For example: a dislocation of a shoulder can happen by a heavy fall on the hand. A dislocation of the jaw can happen due to wide/violent yawning or blows on the chin.

### E.10.2 WHAT DO I SEE AND ENQUIRE?

If a person has dislocated bone, you might observe the following signs and symptoms:

- The lower jaw may limp downwards when dislocated.
- The joint looks deformed.
- The person has pain.
- The casualty cannot move the joint.
- There might be swelling and bruising in the area of the injury in due course of time.

### E.10.3 WHAT DO I DO?

- Do not try to reset the dislocated bone back into in place.
- Verify the colour of the nails of the hand of a dislocated elbow as the dislocation might traumatize an artery.
- Provide first aid as follows:

| Dislocation of: | Treat the same as: |
|---|---|
| Jaw | Fracture of jaw |
| Shoulder | Fracture of shoulder |
| Elbow | Fracture of elbow |
| Fingers | Fracture of fingers |

### E.10.4 WHEN TO REFER TO A HEALTHCARE FACILITY?

A casualty with a suspected dislocation should be transported or referred to a nearby healthcare facility.

## E.11 STRAINS AND SPRAINS (INJURIES TO LIGAMENTS, MUSCLES AND TENDONS)

A muscle can be strained by overstretching it. Muscles can also be ruptured (a tear): the muscle itself or the tendon is then torn. A sprain is when the ligaments of a joint or the tissues surrounding the joint are torn.

### E.11.1 CAUSES OF STRAINS AND SPRAINS

Strains might happen as the result of a twist or sudden effort, like lifting a heavy object.

Sprains might be caused by a sudden wrenching or twisting of the joint. Ankle sprains are quite a common example of this.

### E.11.2 WHAT DO I SEE AND ENQUIRE?

In case of a strain you might observe following signs and symptoms:

- pain in the affected muscle,
- swelling,
- bruising, or
- loss of movement.

In case of a sprain you might observe following signs and symptoms:

- The casualty complains of pain around the affected joint.
- The casualty reports having felt a sudden sharp pain in the muscle.
- The casualty is unable to use or put weight on the joint.
- There might be:
  - swelling,
  - bruising, or
  - tenderness.

### E.11.3 WHAT DO I DO?

#### *E.11.3.1 SAFETY FIRST*

1. Make sure there is no danger to you and the person.

#### *E.11.3.2 HYGIENE*

2. If possible, wash your hands before taking care of the injured. Use soap and water to wash your hands. If no soap is available, you can use ash to wash your hands. Alcohol-based sanitizers can also be used, if available.

   Use gloves to protect yourself. If no gloves are available, you can use a clean plastic bag. Try not to come in contact with the person's blood.

#### *E.11.3.3 PROVIDE FIRST AID*

3. The application of a crepe bandage or a compression bandage is not recommended and not necessary in case of injuries to muscles or joints.