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FIRST AID NOTES

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USER NOTES

First Aid



AIMS OF FIRST AID

First aid is the first assistance or treatment given to a casualty or a sick person for any injury or sudden illness before the arrival of an ambulance, the arrival of a qualified paramedical or

medical person or before arriving at a facility that can provide professional medical care.

As a consequence of disaster or civil strife people suffer injuries which require urgent care and transportation to the nearest healthcare facility.

First Aid is the immediate and temporary, emergency medical care provided to an injured person or one who suddenly becomes ill. It includes recognizing and evaluating the seriousness of injuries and providing appropriate, effective treatment.

The safety of the rescuer(s) must always be the first and foremost consideration and to the extent possible, preserving safety of the patient(s).

A primary survey is conducted first to evaluate and treat life-threatening problems, including airway, breathing, circulation, and bleeding. A

secondary survey is conducted to administer and treat wounds, fractures, shock, dislocations, stabilization, transportation, etc.

AIMS OF FIRST AID

The aims of first aid are:

- ꝝ to preserve life,
- ꝝ to prevent the worsening of one's medical condition,
- ꝝ to promote recovery, and
- ꝝ to help to ensure safe transportation to the nearest healthcare facility.

THE FIRST AIDER

A first aider is the term describing any person who has received a certificate from an authorised training body indicating that he or she is qualified to render first aid.

FIRST AID AND THE LAW

INDIAN GOOD SAMARITAN PROTECTION GUIDELINES

A Good Samaritan in legal terms refers to "someone who renders aid in an emergency to an injured person on a voluntary basis".

DEALING WITH AN EMERGENCY

Emergency situations vary greatly but there are four main steps that always apply:

1. Make the area safe.
2. Evaluate the injured person's condition.
3. Seek help.
4. Give first aid.

STEP 1: MAKE THE AREA SAFE

Your own safety should always come first.

As a first aider, you should:

- ꝝ try to find out what has just happened;
- ꝝ check for any danger: is there a threat from traffic, fire, electricity cables, etc.;
- ꝝ never approach the scene of an accident if you are putting yourself in danger;
- ꝝ do your best to protect both the injured person(s) and other people on the scene;
- ꝝ be aware that the property of the injured person is at risk. Theft can occur. So mind

- your safety, and
- seek police or emergency help if an accident scene is unsafe and you cannot offer help without putting yourself in danger.

An important part of safety also includes washing your hands and wearing gloves or a protection when coming in contact with the injured or sick person's blood or body fluids.

STEP 2: EVALUATE THE CONDITION OF THE SICK OR INJURED PERSON

If it is safe, you can evaluate the sick or injured person's condition. Always check that he is conscious and breathing normally. Situations in which consciousness or breathing are impaired are often life threatening. Bleeding can also happen inside the body and can be life-threatening although the loss of blood is not seen. Techniques of resuscitation (CPR), the recovery position, etc. are explained in this manual.

STEP 3: SEEK HELP

- Once you have evaluated the sick or injured person's condition you can decide if help is needed urgently.
- If help is needed, ask a bystander to call for help. Ask him to come back and confirm that help is underway.

If you call for help, be prepared to have the following information available:

- the location where the help is required (address, street, specific reference points, location; if in a building: floor, room);
- the telephone or mobile number you are calling from;
- the nature of the problem;
- what happened (car accident, fall, sudden illness, explosion, ...);
- how many injured;
- nature of the injuries (if you know);
- what type of help is needed:
- ambulance,
- police,
- fire brigade, or
- other services;
- and any other information that might help.



STEP 4: PROVIDE FIRST AID

Do not give anything to eat or drink to a person who is:

- severely injured,
- feeling nausea,
- becoming sleepy, or
- falling unconscious.

To support him through the ordeal, follow these simple tips:

- tell the sick or injured person your name, explain how you are going to help him and reassure him. This will help to relax him;
- listen to the person and show concern and kindness;
- make him as comfortable as possible;
- if he is worried, tell him that it is normal to be afraid;
- if it is safe to do so, encourage family and loved ones to stay with him; and
- explain to the sick or injured person what has happened and what is going to happen.

MANAGING AN EMERGENCY SCENE

I Managing Dangers at an Emergency Scene

A - Some emergency scenes are immediately dangerous.

B - Some emergency scenes may become dangerous while you are providing care.

II Personal Safety

A - Personal safety and the safety of all others assisting in rescue efforts must always be the first and foremost consideration. To the extent possible within rescuer safety, action should be taken to preserve the safety of patients. *Example* – Setting additional roof support in an area where a patient is entrapped by a roof fall to help prevent more roof from falling on the patient.

B - Approach all emergency scenes cautiously until you have fully evaluated the situation for your personal safety and the safety of others helping you.

C - If at any time the scene appears unsafe, retreat to a safe location.

D - Never enter a dangerous scene unless you have qualified personnel, such as a mine foreman or electrician, to assist you.

E - Follow these guidelines when arriving on an emergency scene:

- 1) Take time to evaluate the scene and recognize existing and potential dangers;
- 2) Never attempt to do anything you are not trained to do;
- 3) Get the help you need to ensure your safety, safety of others assisting you, and to the extent possible, the patient.

III Safety of Others

A- Discourage other people from entering an area that appears unsafe.

B - Never move patients until you treat and stabilize unless immediate dangers threaten the patient or yourself. If necessary to move a patient, do so safely and quickly.

FIRST AID TECHNIQUES: DRESSINGS, BANDAGES AND TRANSPORT TECHNIQUES

In this chapter you will learn about:

- _ Dressings.
- _ Bandages.
- _ Fast evacuation techniques (single rescuer).
- _ Transport techniques.

DRESSINGS

A dressing is a protective covering applied to a wound to:

Definition

Dressing means:

A dressing is a sterile pad or compress applied to wound to promote healing and protect the wound from further harm.

Dressing is used to have direct contact with a wound but bandage is used to hold a dressing in place.

- ✓ _ prevent infection,
- ✓ _ absorb discharge,
- ✓ _ control bleeding,
- ✓ _ avoid further injury, and
- ✓ _ reduce pain.

An efficient dressing should be sterile (germ free) and have a good degree of porosity to allow for oozing and sweating.

TYPES OF DRESSINGS

ADHESIVE DRESSINGS (BAND AID)

These sterile dressings consist of a pad of absorbent gauze of cellulose held in place by a layer of adhesive material.

Sterile adhesive dressings are supplied in

paper or plastic covers. The surrounding skin must be dry before application and all the edges of the dressing pressed firmly down.

NON ADHESIVE DRESSING

READY-MADE STERILE DRESSING The dressing consists of layers of gauze covered by a pad of cotton wool and with an attached roller bandage to hold it in position. The dressing is enclosed and sealed in protective covering

(which is only broken while applying) and is supplied in various sizes.

Dressings for Debridement

Gauze	Foams	Hydrocolloid	Alginate	Honey	Collagenase
Non-Selective					
Mechanical		Debridement Continuum		Selective	
Gauze		Autolytic		Enzymatic	
Saline Gauze	Monofilament Fiber	Hydrogel	Hydrocolloids	Alginates	Collagenase
				Honey	Papina
				Cellulose	Honey
				Transparent Films	
				Amorphous Gel	

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GAUZE DRESSING

Gauze in layers is commonly used as a dressing for large wounds, as it is very absorbent, soft and pliable. It is liable to adhere to the wound; however, it may assist the clotting of blood. The dressing should be covered by one or more layers of cotton wool.

IMPROVISED DRESSING

These can be formed from any clean soft absorbent material such as a clean handkerchief, a piece of linen, a clean paper, or cellulose tissue. They should be covered and retained in position.

HOW DO I APPLY A DRESSING?

You should cover a wound with a dressing as this helps to prevent infections.

Hygiene always comes first! Always wash your hands.

Wash your hands before and 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.

Put on gloves if available. You can also use a clean plastic bag. Try not to come in contact with the person's blood and other body fluids.

The dressing must be covered with adequate pads of cotton wool, extending well beyond them and retained in position by a bandage or strapping.

BANDAGES

What is a Bandage

The term “bandage” and “dressing” are often mistaken for one another. While dressing refers to the primary layer to put in the wound, and bandage, on the other hand, is used to hold dressings in place.

A bandage is a piece of soft and absorbent material. Aside from holding dressings in place, it helps immobilize a body part, support an injury, eliminate cavities, and prevent hemorrhages. There is a specific bandage made for each task.

4 Main Types of Bandages

Here are four different kinds of bandages available and which first aid situations are ideal for use.

- *Roller Bandages*

A roller or gauze bandage is the most common type found in most first aid kits. It is a simple wide strip material with an absorbent barrier that helps prevent it from sticking to the wound. It comes in different sizes, widths, and lengths and is also helpful for any bandage application, including holding a dressing in place.



In most cases, roller or gauze bandages are available in sterile plastic packets. The package usually provides details on the type of bandage, the density of the weave, and the degree of elasticity of the material.

How to Use:

In an open wound, start by applying a suitable pad or dressing to the injury site. Take the bandage while holding the rolled end up and wrap it gently around the pad. Start from the bottom and work up. Do not forget to add a few centimetres to keep the bandage tight and compressed.

Triangular Bandages

A triangular or cravat bandage is a piece of cloth put into a right-angled triangle, with safety first aid pins to protect it from moving. It can double as a sling (unrolled), a regular bandage (folded) and can also use for head injuries and other specialised occasions.

How to Use:

Cross the victim's arm near the chest while putting the bandage around the back of the neck and across. Bring together the end of each side to meet and tie into a knot.

Tubular Bandages

A tubular bandage is perhaps the least versatile of all conventional bandages available in pharmacies and supermarkets. Tubular bandages are made with elastic tubes of thick gauze to use for a single body part. It can provide compression and can immobilize or support the knee and elbow joints.

How to Use:

Wear it over an extremity to secure a dressing in place. It does not require the use of pins, tape, wrapping, or fastening as it easily fits on the affected limb without constricting blood circulation.

- ***Compression bandage***

Also known as an elastic or tensor bandage. It is a long strip of stretchable cloth that can wrap around a sprain or strain. It provides gentle pressure that helps reduce swelling, making

the injury feel better. It is inexpensive, and you can easily purchase one from the drug store or online.

How to Use:

Circle the bandage around the injury and cross it back over to the opposite side. Secure the end of the dressing not to bother the skin. Make sure to keep it in a wrap but not too tight.

A bandage is a fairly long strip of material such as gauze used to protect, immobilize, compress, or support a wound or injured body part.

There are a number of different first aid uses for bandages: they can be used to secure dressings, control bleeding, support and immobilize limbs, reduce pain, and control swelling in an injured part.

Types of Bandages

✓ Triangular

Triangular bandages could be used on many parts of the body to support and immobilize.



✓ Crape Bandage

Type of woven gauze which has the quality of stretching.



✓ Gauze/Cotton Bandage

Lightly woven, cotton material. Frequently used to retain dressings on wounds of fingers, hands, toes, feet, ears, eyes, head.



✓ Adhesive Bandage

Use to retain dressing and also used where application of pressure to an area is needed.



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example,

you can fold a square of fabric, such as a headscarf, diagonally to make a triangular bandage, and a roller bandage if further folded. A belt, tie or some other materials can also be used as an improvised bandage.

Bandages should be applied firm enough to keep dressing and splints in position, but not as tight as to cause injury to the part or to impede the circulation of the blood. A bluish tinge of the finger or nails may be a danger sign indicating that the bandage is too tight. Loss of sensation is another sign; such bandages should be loosened or removed quickly.

These are made from flannel, calico and elastic net or special paper. If you have no bandage available, you can improvise one from an everyday item; for

BANDAGING

DEFINITION:

- Bandaging is the process of covering a wound or an injured part.

USES:

Bandages are used for following purposes:

- To prevent contamination of wound by holding dressings in position.
- To provide support to the part that is injured, sprained or dislocated joint.
- To provide rest to the part that is injured.
- ~~To prevent & control hemorrhage.~~
- To restrict movement / immobilize a fracture or a dislocation.
- To correct deformity.
- To maintain pressure e.g. elastic bandages applied to the improve venous return.

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TYPES OF BANDAGES:

- Triangular Bandage.
- Roller Bandage.
- Special Bandages E.g. Many tail bandage

TYPES OF BANDAGES

There are several types of bandages.

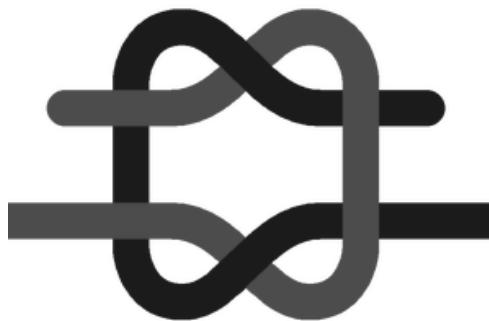
Types of Bandages

- Adhesive compresses
- Adhesive tape rolls
- Tubular
- Elastic
- Self-adhering
- Gauze roller
- Triangular
- Improvised

_ Triangular bandages (also referred to as "*master bandage*") can be used as large dressings, or as slings, to secure dressings or to immobilize limbs.
_ Roller and crepe bandages secure dressings and support injured limbs.
_ Tubular bandages hold dressings on fingers or toes or support injured joint

TRIANGULAR BANDAGES

A triangular bandage is made by cutting a piece of calico about 100 cm square from corner to corner giving two triangular bandages.



It has three borders. The longest is called the "base" and the other two the "sides". There are three corners. The one opposite the base is called the "point" and the other two are called the "ends". While applying a triangular bandage, the point always moves first.

Also a "reef knot" is always tied to enable easy loosening, tightening or opening.

SLINGS

Slings are used to:

- _ support injured arms;
- _ prevent pull by upper limb to injuries of chest, shoulder and neck, and
- _ secure splints when applied.

ARM SLING (LARGE ARM)

SLING, TRIANGULAR ARM SLING WITH UNDERARM HORIZONTAL)

The large arm sling is used in cases of injuries of arm, wrist and hands after application of dressing and/or splints, plaster casts and bandaging.

To apply an arm sling:

1. Face the casualty, hold the bandage point firmly, put one end of the spread triangular bandage over the uninjured shoulder with point towards the elbow of the injured side.

SLINGS

Definition:-

Slings are used to provide support and protection for injured arms, wrists and hands or for immobilising an upperlimb when there are arm or chest injuries.

Types of Slings:-

- 1 . Arm sling
2. Elevation sling
3. Improvised sling

2. Pass the end around the neck and bring it over the injured side shoulder. The other

end will now be hanging down over the chest.

3. Place the forearm horizontally across the chest at 90° and bring the hanging end up. The forearm is now covered by the bandage.

4. Tie the two ends in such a way that the forearm is horizontal or slightly tilted upward and the knot (reef knot) is placed in the pit above the collar-bone.

5. Hold the point with one hand & the bandage at little finger with the

BROAD ARM SLING



BROAD ARM SLING

Step 1

Open triangular bandage and orientate as show
Triangular 'point' at elbow of patient's affected arm



Step 2

Bring bandage underneath affected arm
wrap top of bandage around shoulder of opposite arm



Step 3

Bring bottom of bandage up and over shoulder of affected arm

Tie both ends behind neck
Can wrap knot in softban for added comfort



Step 4

Fold in loose bandage around elbow

Secure with tape

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other and stretch it tight to check for any object like Bangle, watch or metal ring etc. beneath the bandage.

6. Tuck the part of the sling point which is loose at the elbow behind the elbow and bring the fold to the front and pin it up to the front of the bandage.

7. Place the free base of the bandage in such a way that its margin is just at the base of the nail of the little finger. The nails of all the fingers should be exposed.
8. Inspect the nails to find if there is any bluish colour. **A bluish colour shows that there is a dangerous tightening of splints or plasters** and therefore, free flow of blood is not possible.

Collar 'n' Cuff can be used for a wide variety of applications including

- > **Wrist Fixation**
- > **Balanced arm support**
- > **Wrist support**



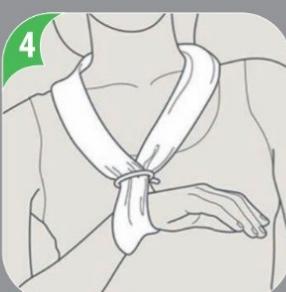
Take approx.75cm of collar 'n' cuff and place arm in required position.



Support the wrist with one end of the Collar 'n' Cuff, the other end being taken round the neck.



Bring the two ends together and fasten with ties provided, ensuring sufficient room for the hand to be withdrawn from the Collar 'n' Cuff.



Excess tie can be cut off and cut edge tucked into the Collar 'n' Cuff to make a neat finish.

COLLAR 'N' CUFF SLING
This sling is only used to support the wrist.

To apply a collar-N-cuff sling:

1. The elbow is bent; the forearm is placed across the chest in such a way



Cuff N' Collar

- Provides effective support at the elbow and wrist, without obscuring the affected limb and without applying any force to the injured side.
- Manufactured from soft foam covered by a sleeve of stockinette • The soft foam in its sleeve provides strong, but comfortable, support when fastened in position with the plastic strips supplied • Versatile and economical material -can be made into a variety of slings and braces

Product code FA-CFNC
Sizes 1M | 1.5M | 3M | 5M (Roll)

that the fingers point the opposite shoulder. In this position the sling is applied.

2. A clove hitch is made with narrow bandage. Two loops are made and are laid on top of the other, the front loop is laid behind the back loop without turning.

3. A clove-hitch is passed round the wrist and the ends tied in the neck pit above the collarbone on the injured side.

TRIANGULAR SLING (WITH UNDERARM UPWARDS)

A triangular sling is used to support the fracture of the collar bone, arms or injured shoulder, and also crushed or badly burned palms. It helps to keep the hand raised high up giving relief from pain due to the fracture.

To apply a triangular sling:

1. Place the forearm across the chest with the fingers pointing towards the opposite shoulder, touching the collar bone and the palm over the breast-bone.
2. Place an open bandage over the arm/chest, with one end over the hand and the point beyond the elbow.
3. Tuck the base of the bandage comfortably under the forearm and hand.
4. Fold the lower end also around the elbow and take it up and across the back of the shoulder (uninjured side) and tie it into the hollow above the collar bone by using a reef knot.

5. Tuck the fold so formed backwards over the lower half of the arm and fix it with a safety pin.

BANDAGES

A triangular bandage can be used as:

- _ a whole cloth (spread out fully) or called "open bandage"
- _ one fold"
- _ a broad bandage (two folds):

Bring the point to the center of the base and then fold again in the same direction to create a broad bandage. Fold the bandage once again to make it a narrow bandage.

A broad bandage can also be used as a roller bandage of approximately 6 inches (about 14 cm) size.

- _ a narrow bandage (three or more folds):

When a smaller size bandage is needed fold the original so as to bring the ends together. The size is now reduced by half the original.

A narrow bandage can also be used as a roller bandage.

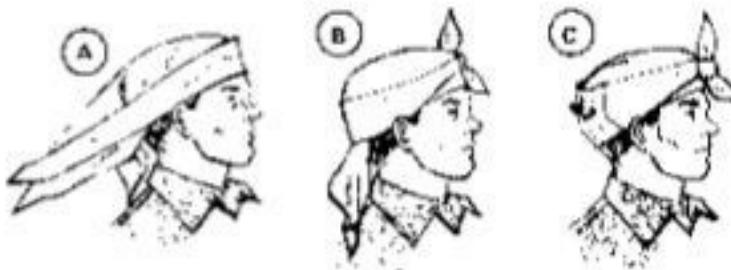
SCALP BANDAGE

Use an open triangular bandage.

1. Fold a narrow hem of the base of an open bandage and place it on the forehead just above the level of the eye-brows.

Triangular Bandage to the Head

- Turn the base (longest side) of the bandage up and center its base on center of the forehead, letting the point (apex) fall on the back of the neck.
- Take the ends behind the head and cross the ends over the apex.
- Take them over the forehead and tie them.
- Tuck the apex behind the crossed part of the bandage and/or secure it with a safety pin, if available.



2. Take the two ends backwards, after placing the body of the bandage over the head, the point hanging near the nape of the neck.

3. Cross the two ends and take them forward above the ears to meet on the forehead, where they are tied.

4. Press on the head of the patient, draw the point firmly downwards and pin it to the bandage after taking it upwards.

5. A suitable sized ring pad, also made from a triangular bandage, can be placed beneath the head bandage at an appropriate place to put pressure around any depressed fracture of skull.

FOREHEAD, EYE, CHEEK/JAW FRACTURE BANDAGE OR BANDAGE FOR ANY PART WHICH IS ROUND IN SHAPE

Use two triangular bandages folded as a broad or narrow bandage.

1. Use narrow or broad bandage depending upon the size of the wound.
2. Apply the center of the bandage over the injury and wind the bandage round the part.
3. Tie in a suitable place.

Eye Injury & Bandaging

A penetrating eye injury is usually caused by a sharp object which has gone in, or is protruding from the eye.

Warning:

- Do not touch the eye or any contact lens.
- Do not allow casualty to rub eye.
- Do not try to remove any object which is penetrating the eye.
- Do not apply pressure when bandaging the eye.

Bandaging:

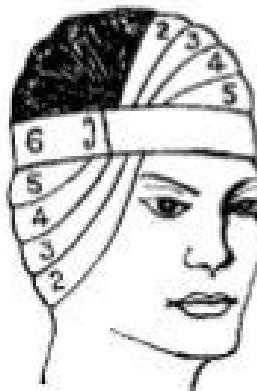
- Support casualty's head to keep it as still as possible.
- Ask casualty to try not to move eyes.
- Place sterile pad or dressing over injured eye.
- Ask casualty to hold this in place.
- Bandage dressing in place, covering injured eye.
- If penetrating eye injury, lie casualty on back, place pad around object and bandage in place.



If chemical or heat burn, or smoke in eyes, flush with water

Ear bandage

- Lay the outer surface of the bandage against forehead and carry the bandage round the head in one circular turn, bandaging away from the injured ear.
- Towards the sound side, carry the bandage round to the back of the head, low down in the nape of the neck again, repeat these.
- Each turn being slightly higher than the previous one as it cover the dressing, but slightly over as it cover the hair.
- Continue until the whole is covered and complete the bandage by one straight turn around the forehead, pinning where all the turns cross one another some people prefer to take the bandage around the forehead between each turn covering the dressing, but this makes a heavy bulk around the head which is not really necessary.



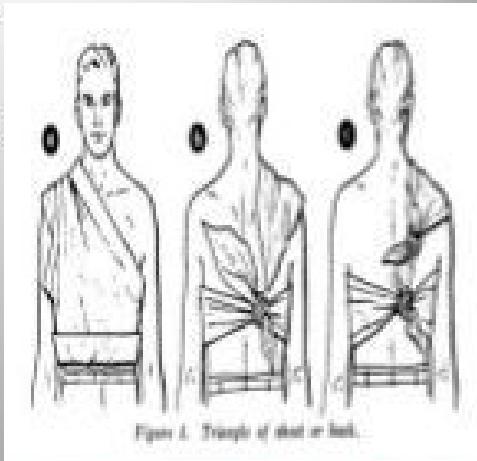
4. May apply a narrow bandage to keep the first bandage in place.

FRONT OR BACK OF THE CHEST BANDAGE

BANDAGING

Chest Bandage

- Apex at the shoulder of the injured part.
- Pull back folded base and secure with square knot at the center indentation of the back.
- Knot tie longer with apex.



Use an open triangular bandage.

1. Place the center of the open bandage over the dressing point over the sound shoulder.
2. Carry the ends of the bandage around the body and tie it

in such a way that one end is longer than the other.

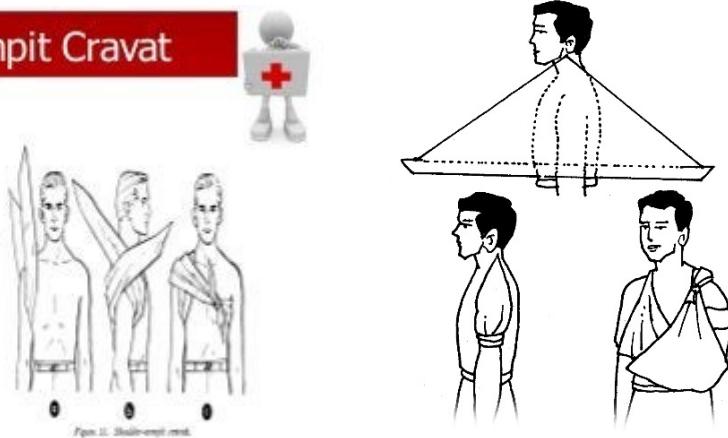
3. Draw the "point" over shoulder and tie to the longer end.
4. If back of chest has the wound-reverse all the steps.

SHOULDER BANDAGE

Use a broad bandage.

Shoulder Armpit Cravat

- Start at the armpit.
- Cross-over at injured shoulder.
- Tie at the opposite armpit (side of front).

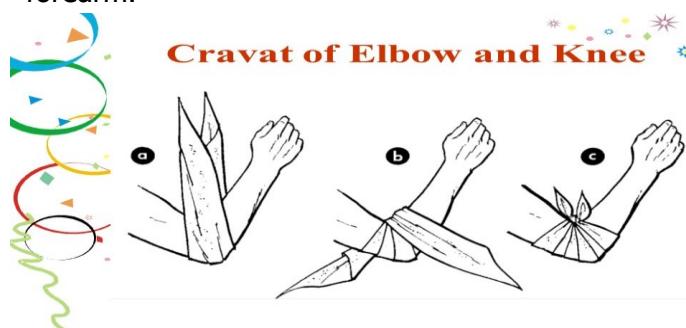


- Stand facing the injured side.
- Place the center of the open bandage on the shoulder with the point over the side of the neck reaching the ear.
- Carry the ends crossed, after hemming the base inward around the middle of the arm and tie the knot on the outer side so that the lower border of the bandage is in fixed position.
- Thereafter apply also a sling to rest the arm of the injured side in.
- Turn down the point of the bandage over the sling knot draw it tight and pin it.

ELBOW BANDAGE

Use an open triangular bandage.

1. Bend the elbow to a right angle if it is feasible to do so.
2. Folding a suitable hem of the base of a triangular bandage and apply it as follows:
 - a. Lay the point on the back of the upper arm and the middle of the base on the back of the forearm.



Use an open triangular bandage.

Elbow Bandage



1. Bend the arm at the elbow and place the middle of the cravat at the point of the elbow bringing the ends upward.
2. Bring the ends across, extending both downward.
3. Take both ends around the arm and tie with a square knot at the front of the elbow.
4. CAUTION: If an elbow fracture is suspected, DO NOT bend the elbow bandage it in the position found.

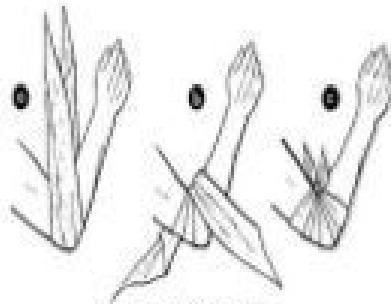


Figure 11. Cravat of elbow.

- b. Cross the ends in front of the elbow, then round the arm and tie the ends above the elbow.
- c. Turn the point down and pin it low down.

When the elbow cannot be bent use a roller bandage with figure of eight technique.

HAND BANDAGE

Hand Bandage

- Place the hand in the middle of the triangular bandage with the wrist at the base of the
- Place the apex over the fingers and tuck any excess material into the pleats on each side of the hand
- Cross the ends on top of the hand, take them around the wrist, and tie them with a square knot.



Figure 12A. Triangular bandage applied to hand (Illustrated Aids).

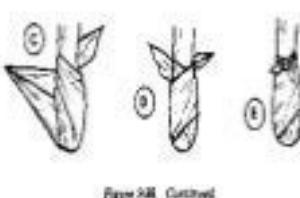


Figure 12B. Continued.

- Place the open bandage in such a way that the injury is uppermost.
- The point should be towards the fingers and the base across the wrist.
- Now bring the point over to the wrist.
- Make a narrow inward hem as usual, pass the ends around the wrist, cross over and tie it up over the point.
- Turn the point over the knot and pin it.

HIP AND GROIN BANDAGE

Use an open triangular and a narrow bandage.

1. Kneel facing the hip and tie a narrow bandage around the waist with the knot on the uninjured side.
2. Take a second open bandage and pass its point under the knot bring it over the knot and pin it.
3. Make a suitably broad hem of the base, bring the ends round the thigh, cross and tie a knot on the outer part, so as to hold the lower hemmed border in position.

KNEE BANDAGE

Use an open triangular bandage.

- ✓ Bend the knee to a right angle.
- ✓ With a narrow inward hem, place the open bandage in front of the knee with the point upon the thigh.
- ✓ Cross the ends, take them upwards on the back of the thigh, bring them to the front of the thigh and tie up.
- ✓ Bring the point down over the knot and the knee and pin it up.
- ✓ In case the knee is not to be bend, a figure of eight bandage using a narrow or a broad bandage is applied.

FOOT BANDAGE

Use an open triangular bandage.

Cravat for the Knee



Figure 16. Cravat of knee.

- Start on top of the knees.
- Cross over and twist 2-3 times under the knee.
- Cross over on top/pull ends to opposite sides.
- Secure with a square knot under the knee

Figure of Eight Turn

Application of Bandages on Elbow, Ankle & Knee

- Begin the bandage with two circular turns.
- Carry the bandage above the joint, around it, and then below it, making a figure eight—continue above and below the joint, overlapping the previous turn by two-thirds the width of the bandage.
- Terminate the bandage above the joint with two circular turns, and secure the end appropriately.



The figure-of-eight method permits flexibility of the elbow, knee & ankle without disturbing the dressing

Ankle/Foot Spica

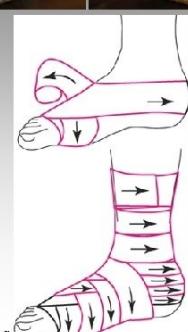
Uses: compression, hold pad or dressing, stabilization



Size: 2- or 3-inch wrap (single)
Position: sitting with foot extended over table edge

Steps:

1. Anchor at metatarsal arch
2. Across instep (top of foot), around heel, back to start
3. Repeat several times & overlap bandage about $\frac{1}{2}$ way moving up the foot and toward the calf

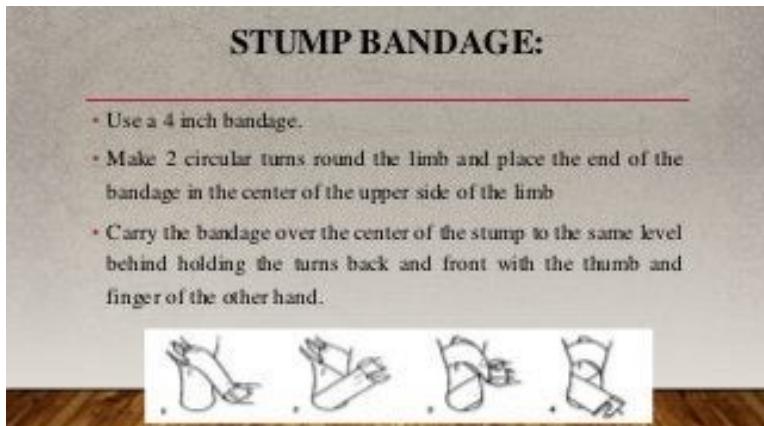


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- ✓ Place the foot in the centre of an open bandage with the point beyond the toes.
- ✓ Draw the point over the foot on to the leg.
- ✓ Cover the heel with the ends.
- ✓ Cross the ends around the ankle at the back.

- ✓ Bring the ends forward and tie them in front of the ankle.
- ✓ Bring the point down and pin it up.

STUMP BANDAGE



4. Draw the point firmly downwards over the knot and secure with a safety pin.

Use an open triangular bandage.

1. Place the base of a bandage well up on the inside of the stump, the point hanging downwards.
2. Draw up the point over the stump and cross the ends in front, over the point.
3. Carry the ends behind the stump, cross them and bring them forward, tying off in front.

ROLLER BANDAGES

Roller bandages are used in hospitals and first aid posts. They are made out of cotton material with loose mesh. They are of various lengths and widths.

Used for Width in cm in inch	Used for Width in cm in inch	Used for Width in cm in inch
Finger 2 1	Finger 2 1	Finger 2 1
Hand 5 2	Hand 5 2	Hand 5 2
Arm 5 or 6 2 or 2.5	Arm 5 or 6 2 or 2.5	Arm 5 or 6 2 or 2.5
Leg 7.5 or 9 3 or 3.5	Leg 7.5 or 9 3 or 3.5	Leg 7.5 or 9 3 or 3.5
Trunk 10 or 15 4 to 6 inch	Trunk 10 or 15 4 to 6 inch	Trunk 10 or 15 4 to 6 inch

Roller bandages are also meant to keep dressings in position. The rolled part is called the "drum" or "head", the unrolled portion the "tail".

Roller bandages should be applied firmly and evenly.

To apply a roller bandage, always:

- ❖ Face the patient.
- ❖ Always keep the "tail" of the bandage towards the patient and the "head or drum" towards you.
- ❖ When bandaging left limb, hold the head of the bandage in the right hand and vice versa.
- ❖ Apply the outer surface of the bandage over the pad and wind it around the injury twice so that it is firm.
- ❖ Bandage from below upwards over the limb. Also make it a rule to apply bandage from the inner side to the outer side.
- ❖ Check that the bandage is neither too loose nor too tight.
- ❖ Roll bandage so that each layer covers two thirds of the earlier layer.
- ❖ Fix the bandage by pinning it up or using adhesive plaster. The usual practice of tearing the final end into two long tails and tying them up is quite satisfactory and practical.

There are four methods of applying roller bandages as follows:

SINGLE OR SIMPLE SPIRAL

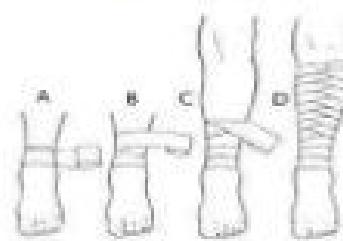
The roller bandage is applied in a simple spiral. This is used on fingers or other uniform surfaces. The bandage is just carried around in spirals.

REVERSE SPIRAL

5. Reverse spiral bandage is a spiral bandage where the bandage is folded back on itself by 180° after each turn

This V-shaped fold allows the bandage to fit to the tapered shape of the body part all the way along.

This type of bandaging is required when using non-elasticated bandages. The development of elasticated fixing bandages, which are applied to tapered body parts using the spiral technique, means that the reverse spiral technique is far less commonly used nowadays.



This is a modified spiral in which the roll is reversed downwards on itself at each round. This technique should be used where the thickness of the part

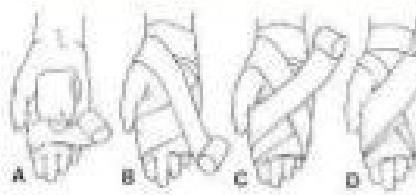
varies such as a leg, forearm, etc.

FIGURE OF EIGHT

In this, the bandage is applied obliquely alternative up and down, so that the loops appear

3. Figure-of-eight bandage

Figure-of-eight bandage involves two turns, with the strips of bandage crossing each other at the side where the joint flexes or extends. It is usually used to bind a flexing joint or body part below and above the joint.



like the figure of eight. It is used for joints like the elbow, knee etc.

SPICA

This is a modified figure-of-eight, and is useful for bandaging the hip, shoulder, groin or thumb.

CREPE BANDAGES

These are roller bandages made of elastic cotton weaving material. These are used to support sprains or other soft tissue injuries where there is no wound. These serve the purpose of supporting the injured joints and also help in reducing the pain and swelling. These can be applied directly on the skin. The techniques of application are same as a roller bandage. These should not be applied too tightly.

20 TYPES OF BANDAGES AND THEIR USES

- 1) **Tubular Bandage:** It is used to dress injured joints and fingers
- 2) **Roller Bandage:** To help keep dressing right at its place.
- 3) **Elastic Bandage:** It is used to create localized pressure.
- 4) **Double-Spica Bandage:** It is used on thigh injuries.
- 5) **Compression Bandage:** It is used to protect injuries on one's hands e.g. fingers.
- 6) **Hallus Valgus Bandage:** it helps to keep big toe aligned and held in place and also used for post-operative trauma or for wound care treatment.
- 7) **Paste Bandage:** It is used to treat atopic eczema.
- 8) **Strip Bandage:** It is used for any small wound on a flat surface.
- 9) **Fingertip Bandage:** It is used for fingertip, to wrap around the finger.
- 10) **Butterfly Closure Bandage:** It is used to pull both side of a cut back together to promote healing and prevent infection.
- 11) **Donot Bandage:** It is used to put pressure around impale object without putting pressure on the object itself.
- 12) **Pressure Bandage:** It is described as a contorming gauze roll bandage that contain an inner layer of porous cotton to be applied to a wound site to hold it in place.
- 13) **Sterile Burn Sheet Bandage:** They are non-woven, and are made of laminated tissue fibre that provide a sterile environment. They are used to prevent infection without sticking to the burned area. Used as a wet or dry dressing.
- 14) **Steri-Strips Bandage:** They are used in place of stitches and they are great to close superficial wounds until you can get to place where you can receive stitches.
- 15) **Tensor Bandage:** They are elastic stretch bandages that provide compression and a controlled pressure. Metal clips hold them in place, great to stop bleeding.
- 16) **Eye Patch Bandage:** They are placed over wounded eye wrapped around the head. It is a good way to hold it place.
- 17) **Spiral Reverse Turn Bandage:** It is used to bandage the lower forearm and the calves.
- 18) **Figure Eight Wrap Bandage:** It is used for joint such as the knee and elbow.
- 19) **Orthopaedic Bandage:** It is used for rectifying bone damages and dislocations
- 20) **Liquid Bandage:** It is a topical skin treatment for minor cuts and sores.

SPLINT

What is splint?

A splint is a supportive device used to keep in place any suspected fracture in one's arm or leg.

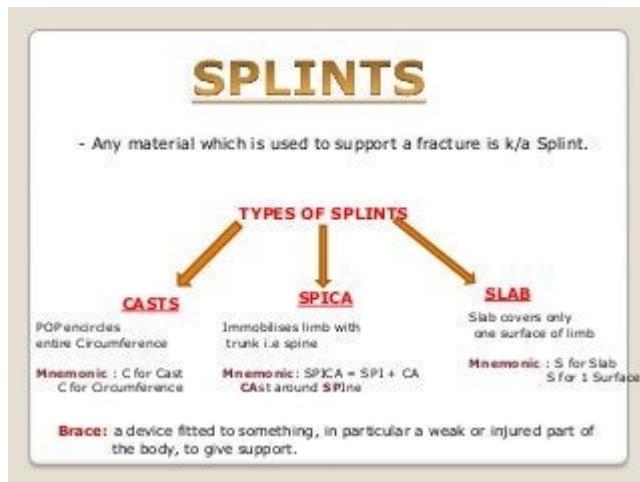
Splint is used to:

- Provide pain relief of the fractured limb.
- Support bone ends of the fracture site. Bones ends of the fracture site are very sharp. A splint helps prevent bone protruding through the skin, soft skin and tissue damage, as well as bleeding.
- Facilitate safe and seamless causality transport.

Splints are placed to **immobilize musculoskeletal injuries, support healing, and to prevent further damage**. The indications for splinting are broad, but commonly include: Temporary stabilization of acute fractures, sprains, or strains before further evaluation or definitive operative management

Splints are used to immobilize an extremity that has been injured. The injury can be a broken bone or a severe sprain. Splinting provides stabilization of the injury, some amount of pain relief and prevention of further injury. Splints are often applied as a temporary measure until more definitive orthopedic care is initiated.

In emergency cases, anything can be used for splinting, yet there are two types of splints:



1. Flexible
2. Rigid

Rigid Splint: Any rigid object, such as wood or plastic boards, broomstick, book or a rolled-out newspapers, which can be used to splint a fractured arm or leg.

Flexible Splint: Any flexible object, like a pillow or a bed sheet with several folds. This type is used for foot, ankle and joint fractures.

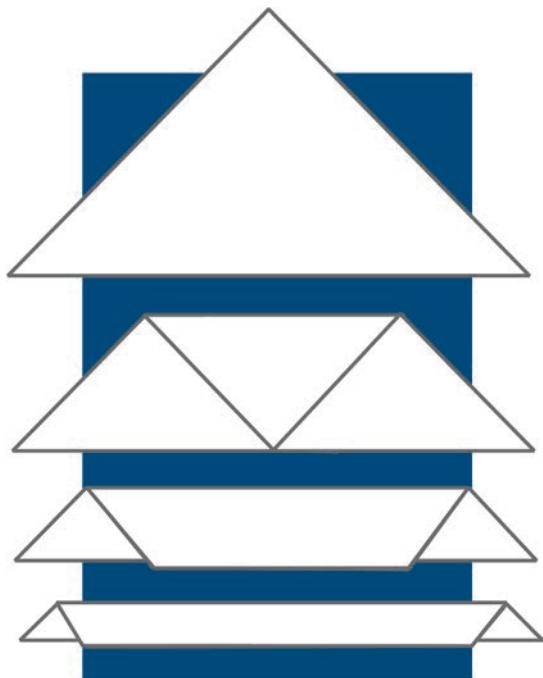
Splinting

Splinting is a way to prevent movement of an injured bone or joint. It can also help reduce pain. However, you should only apply a splint if you *must* move the person to get medical help, and if splinting does not cause the person more pain or discomfort.

Splinting involves securing the injured body part to the splint to keep it from moving. Commercial splints are available. You can also make a splint using soft materials (such as blankets, towels or pillows) or rigid materials (such as a folded magazine or a board). You can even use an adjacent part of the body as a splint (for example, you can splint an injured finger to the uninjured finger next to it). This is called an anatomic splint.

Triangular bandages are handy to keep in your first aid kit in case you need to make a splint. A triangular bandage can be used to make a sling (a special kind of splint that is used to hold an injured arm against the chest) and to make ties to hold other kinds of splints in place. A "cravat fold" is used to turn a triangular bandage into a tie

A triangular bandage can be folded into a tie



The general rules for applying a splint are the same no matter what type of splint you use:

Splint the body part in the position in which you found it. Do not try to straighten or move the body part.

Make sure the splint is long enough to extend above and below the injured area. If a joint is injured, include the bones above and below the joint in the splint. If a bone is injured, include the joints above and below the bone in the splint. If you are not sure what is injured, include both the bones and the joints above and below the injured area in the splint.

Check for feeling, warmth and color beyond the site of injury before and after splinting to make sure that the splint is not too tight.

What Are the Different Types of Splints?

- [Soft Splints](#)
- [Hard Splints](#)
- [Air or Vacuum Splint](#)
- [Traction Splints](#)

Soft Splints

Splinting often starts either at home or by emergency medical providers. The simplest form of splinting is soft splinting, which can be provided with the use of a pillow or blankets. The splint is secured around the area of injury and held in place with tape or ties. Even the soft splint will provide the patient some support for the injured extremity and comfort. Pre-made soft splints, which are occasionally used in hand or wrist injuries, will slide on like a glove and are adjusted with the use of laces to tighten and conform the splint.



The slide titled "Lesson 4 - Splints" from HealthCenter21 contains two sections: "Soft Splint" and "Anatomical Splint".
- **Soft Splint:** Splints made of blankets, pillows, jackets. Secure splint above and below injury with bandages.
- **Anatomical Splint:** Made by using another body part as the splint. Ex. Buddy taping one finger to the next.

- Splinting often starts either at home or by emergency medical providers.
- Pre-made soft splints, which are occasionally used in hand or wrist injuries, will slide on like a glove and are adjusted with the use of laces to tighten and conform the splint.

Hard Splints

Hard splints are another type of splint used for extremity injuries. Hard splints can be as simple as using a cardboard box or a padded board. Some hard splints can be made out of fiberglass or plaster that can be molded to fit the patient's extremity. Splints made from plaster or fiberglass are named according to the area of injury they are being applied to. A splint specifically used to treat **a thumb injury is called a thumb spica. For a wrist or forearm injury, the volar splint is used, and for injuries to the hand and fist area, a boxer splint is applied.** Pre-made aluminum splints are often used to stabilize fingers.

- Hard splints are another type of splint used for extremity injuries.
- Some hard splints can be made out of fiberglass or plaster that can be molded to fit the patient's extremity.

Air or Vacuum Splint

Pressure (air/pneumatic) splints

- Soft and pliable before inflation; rigid once applied and inflated
- Cannot be sized
- May impair circulation
- May interfere with ability to assess pulses
- May lose or gain pressure with changes in temperature/altitude
- Seek medical direction regarding use



Air or vacuum splints are a type of splint available and used by some providers for treating orthopedic injuries. Air or vacuum splints conform well to the injured extremity. According to "Sheehy's Emergency Nursing Principles and Practice," excessive pressure from these type splints can compromise circulation [1](#). The air splints also stick to the skin and can cause irritation.

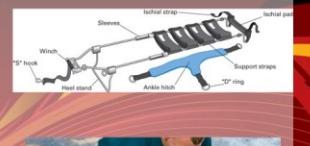
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- According to "Sheehy's Emergency Nursing Principles and Practice," excessive pressure from these type splints can compromise circulation [1](#).

Traction Splints

Traction splints are used to support a broken bone, decrease the amount of deformity and provide traction to keep the bones aligned and to prevent them from moving. Traction splints are often used for injuries in either the femur or mid-shaft lower leg.

Traction Splints

- Provide a counterpull that alleviates pain, reduces blood loss, and minimizes further injury
- Purpose is to immobilize bone ends, reduce diameter of thigh, and prevent further injury
- Many types available



Types of Finger Splints

- [Buddy Splints](#)
- [Static Splints](#)
- [Stack Splints](#)
- [Dynamic Splints](#)

Finger splints are sometimes used to hold your finger in place to keep it from moving, such as when it is sprained or broken. They can also be used to increase the range of motion of a finger that is stuck in a bent position and needs constant stretching. A variety of splints are available to treat finger injuries [1](#).

Is This an Emergency?

If you are experiencing serious medical symptoms, seek emergency treatment immediately.

Buddy Splints

A buddy splint is just two adjoining fingers taped together -- like buddies. This basic splinting technique is commonly used when your finger is strained -- such as a jamming injury. The fingers should be taped at a point above and below the injured joint. For a sprained joint on the ring finger, the little finger should act as the buddy, as it will otherwise be exposed and vulnerable to injury. Buddy splinting should not be used if your finger is fractured, unless your doctor tells you otherwise.

- A buddy splint is just two adjoining fingers taped together -- like buddies.
- This basic splinting technique is commonly used when your finger is strained -- such as a jamming injury.

Static Splints

Static splints are designed to hold a joint in a specified position, whether completely straight or slightly bent. Some basic metal and foam static splints can be purchased over the counter at drug stores. Static splints can also be custom made from moldable plastics or other casting material. These splints are used to treat repetitive use injuries, to immobilize a fracture or for certain types of tendon damage.

- Static splints are designed to hold a joint in a specified position, whether completely straight or slightly bent.
- Static splints can also be custom made from moldable plastics or other casting material.

Stack Splints

These specialized preformed splints are frequently used to treat injuries only affecting the tip of your finger. Stack splints come in various sizes -- they are designed to fit over the end of the finger to just past the first joint, preventing that joint from bending. Stack splints are made of plastic, often with holes in them to allow for air flow.

Dynamic Splints

These complex splints are made from combinations of plastic, foam and metal. They are designed to provide a prolonged stretch for a joint that is stiff. Dynamic splints feature various spring-loaded systems that are adjustable to provide the desired degree of movement of the joint. Dynamic splints are often worn at night or while you are resting and not involved in other activities.

- These complex splints are made from combinations of plastic, foam and metal.
- Dynamic splints feature various spring-loaded systems that are adjustable to provide the desired degree of movement of the joint.

What are Medical Sling and Bandage?

A Medical Sling is a piece of cloth used to immobilize the fractured arm to the rigid splint, in 90° of elbow flexion. The sling usually takes the shape of a big triangle. It can be used along

with or instead of a rigid splint. If used alone, the sling should be supported with an additional bandage which is actually a folded drape of 5-6 inches width.

General Principles of Splinting:

Several ways are adopted for splinting, which may seem highly complicated - at first sight - yet they are very simple. Here are some general principles to be applied when splinting as follows:

- Identify the fracture site.
- Stop the bleeding using bandages, but avoid pressing on the fractured painful and deformed site.
- In case of bone fractures where bone ends protrude through the skin, do not push these ends back in place as this will cause inflammation and acute bleeding.
- Keep the fractured bone (including the joints above and below the fracture site) motionless as indicated hereunder:
 - If the lower-arm is fractured, keep the wrist and elbow joints motionless.
 - If the upper-arm is fractured, keep the shoulder and elbow joints motionless.
 - If the lower-leg is fractured, keep the knee and ankle joints motionless.
 - If the upper-leg is fractured, keep the knee and femoral joints motionless.
- Splint should be tied firmly to immobilize the fractured limb, then check for blood circulation to ensure the splinting is not too tight. Correct splinting provides pain relief.
- If the fractured limb is bent with a sharp bone end protruding through the skin, keep it motionless. Splint a limb as you find it to make it as comfortable to the patient as you possible.
- If an ambulance is called and is on its way, do not splint the fractured limb and wait for the ambulance team to use their specialized medical splints.

Why keep upper and lower joints motionless?

Each bone end in limbs is connected to a joint. Moving that joint dislocates the fractured bone. So, joints should remain motionless to immobilize fractured bones.

What if the joint itself is broken?

This is the most difficult fracture to handle. Yet, follow the same instructions of applying a splint. Make sure to maintain joints, upper and lower bones as well as the fracture site motionless. For example, the elbow joint connects both upper- and lower-arms. If broken, the joint and bones should be immobilized. Hence, both shoulder and wrist joints should remain motionless.

In most cases, joint fractures are very painful. In this case, never try to relocate the joint least you should damage the nerves and blood vessels around the joint, let alone the acute pain resulting.

You should have an overactive imagination when dealing with such injury. You can splint the joint as you find it.

What Materials are Needed for Splinting?

You will need:

- A splint (rigid or flexible).
- A thick bandage to apply under the splint for maximum comfort. (Optional).

- Robe - or the like - to wrap the splint to the fractured limb.

What if these materials are not available?

No worries. You can use the patient's body as a splint as follows:

- You can tie the fractured arm to the patient's body using a dressing.
- You can tie the fractured leg to the patient's other leg using a dressing.
- You can tie the fractured finger to the patient's other fingers using a dressing.

FAST EVACUATION TECHNIQUES (SINGLE RESCUER)

Emergency evacuation is **the urgent immediate egress or escape of people away from an area that contains an imminent threat, an ongoing threat or a hazard to lives or property.**

In case the casualty is in a dangerous situation following are possible one-rescuer evacuation techniques to move an unconscious casualty over a very short distance to get him into safety.

Only attempt to rescue a casualty if the scene is safe for yourself!

SHOULDER PULL

Shoulder Pull

The shoulder pull is preferred to the ankle pull. It supports the head of the victim. The negative is that it requires the rescuer to bend over at the waist while pulling.

- Grasp the victim by the clothing under the shoulders.
- Keep your arms on both sides of the head.
- Support the head.
- Try to keep the pull as straight and in-line as possible.



1. Grasp the casualty by both ankles and pant cuffs.
2. Pull the casualty. Use your legs to apply force to pull, not your back. Keep your back as straight as possible.
3. Pull the casualty in a straight line if possible.
4. If the casualty is lying on a sheet, a plastic or a blanket, pull the same as per convenience.

TRANSPORT TECHNIQUES

After appropriate first aid has been given, the patient may need to be transported. Keep following guidelines in mind when transporting a casualty:

One Person Arm Carry

Single rescuer to lift a victim safely by arm carry

- Rescuer holding the victim around the victim's back and under the knees



1. Grasp the casualty by the clothing under the shoulders.
2. Keep your arms on both sides of the head and support the head.
3. Try to pull the casualty in a straight line, if possible.

ANKLE PULL

This method is the fastest method to move a casualty over a short smooth distance. However it is not a preferred method as the head is unsupported and may bounce over the surface bumps.

Ankle Pull

The ankle pull is the fastest method for moving a victim a short distance over a smooth surface. This is not a preferred method of patient movement.

- Grasp the victim by both ankles or pant cuffs.
- Pull with your legs, not your back.
- Keep your back as straight as possible.
- Try to keep the pull as straight and in-line as possible.
- Keep aware that the head is unsupported and may bounce over bumps and surface imperfections.



- _ The position assumed by the casualty or in which he has been placed, should not be disturbed unnecessarily.
- _ Throughout the transport a careful watch must be kept on:
- _ the general condition of the casualty (breathing, consciousness);
- _ any dressing that may have been applied;
- _ any recurrence of haemorrhage, and
- _ any signs of changes or worsening of the casualty's condition.
- _ The transport must be safe, steady and speedy.

The injured or sick person may be moved to a shelter, medical facility or hospital by:

- _ a single helper;
- _ hand seats and the 'kitchen-chair' carry technique by multiple helpers;
- _ blanket lift by multiple helpers;
- _ stretcher by multiple helpers;
- _ wheeled transport (ambulance, car, ...); or
- _ air and sea travel (with specially trained staff).

The method to be used (and it may be necessary to use more than one technique) may depend on:

- ✓ _ the nature and severity of the injury;
- ✓ _ the number of helpers and facilities available;
- ✓ _ the distance to the shelter, medical facility or hospital; and
- ✓ _ the nature of route to be covered.

SINGLE HELPER TRANSPORT.

If you are the only person available, following techniques can be used to transport a casualty:

- _ the cradle technique,
- _ the human crutch technique,
- _ the pick-a-back technique, or
- _ the fire man's lift and carry technique

Methods of carrying an injured / affected person

- Cradle method
- Human crutch method
- Piggy back method
- Fireman's lift
- Four-hand seat
- Two-hand seat
- Fore and aft method
- Blanket method
- Stretcher-carry method

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CRADLE TECHNIQUE

This technique is only to be used in the case of light casualty or children.



1. Cradle method

- Carrying or lifting the victim in hands



Fig: 15.36 • Cradle Method

putting your arm round his waist, grasping the clothing at him and placing his arm round your neck, holding his hand with your free hand.

If his upper limbs are injured and his other hand is free, the casualty may gain additional help from a staff or walking stick.

If both legs are injured, another first aider might hold the other side in a similar way (see human crutch technique with two helpers).

Lift the casualty by passing one of your arms well beneath his two knees and the other round his back.

HUMAN CRUTCH TECHNIQUE

Standing at his injured side except where there is injury to an upper limb, assist the casualty by



Human Crutch Method

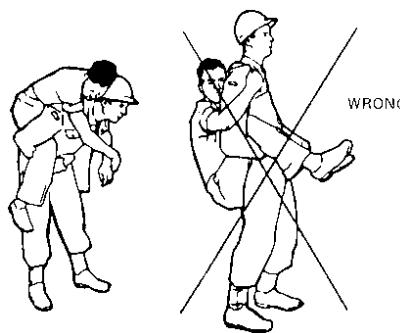


Required person : One

Used to assist conscious casualty having injury in one foot.

SEEDS

PICK-A-BACK TECHNIQUE



position.

2. Grasp his right wrist with your left hand.
3. Bend down with your head under his extended right arm so that your right shoulder is level with the lower part of his abdomen and place your right arm between or around his legs.
4. Taking his weight on your right shoulder come to the erect position.
5. Pull the casualty across both shoulder and transfer his right wrist to your right hand, so leaving your left hand free. This allows the helper also to move up or down a ladder whilst carrying the casualty.

If the casualty is conscious and able to hold, he may be carried in the ordinary "pick-a-back" fashion.

FIREMAN'S LIFT AND CARRY TECHNIQUE

To be used only when the casualty is not heavy for the bearer.

1. Help the casualty to rise to upright

FIREFIGHTERS CARRY

This technique is for carrying longer distance. It is very difficult to get the person up to this position from the ground.

-The victim is carried over one shoulder
- The rescuer's arm, on the side that the victim is being carried, is wrapped across the victim's legs and grasps the victim's opposite arm.



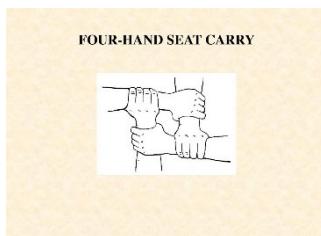
MULTIPLE HELPER TRANSPORT.

When multiple helpers are available, following transport techniques can be used.

HUMAN CRUTCH TECHNIQUE

Standing at both sides of the casualty, both helpers assist the casualty by putting their arm round his waist, grasping the clothing at him and placing each of his arm on their side around their neck, holding his hand with their free hand.

HAND SEAT TECHNIQUES

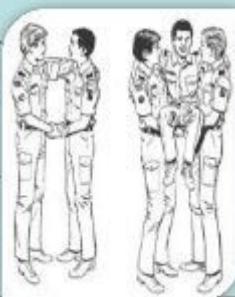


Also known as the four-handed seat technique. This seat is used when the casualty can assist the bearer by using one or both arms.

1. Two bearers face each other behind the casualty and grasp their left wrists with their right hands and each other's right wrist their left hands.

TWO HANDED SEAT

- Pick up the victim by having both rescuers both squat down on either sides of the victim
- reach under the victim's shoulder and under their knees
- grasp the other rescuer's wrists
- walk in the direction that the victim is facing.



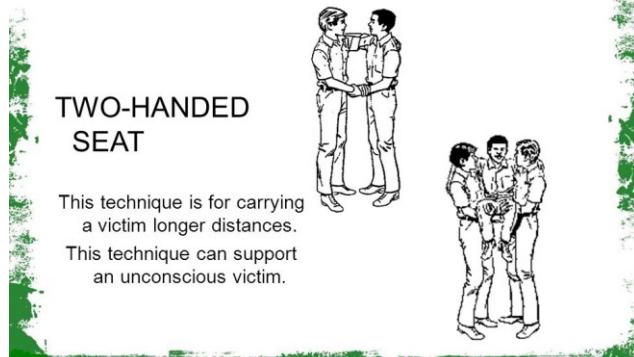
2. The casualty is instructed to place one arm around the neck of each bearer so that he may raise himself to sit on their hands and steady himself during transport.
3. The bearers rise together and step off, the bearer on the right hand side of the casualty with the right foot and the left hand bearer with the left foot.
4. The bearers walk with the cross-over step and not by side paces.

THE TWO-HANDED SEAT TECHNIQUE

This seat is mostly used to carry a casualty who is unable to assist the bearers by using his arms.

1. Two bearers face each other and stoop down (not kneel) one on each side of the casualty.
2. Each bearer passes his forearm nearest the casualty's head under his back just below the shoulders and if possible takes hold of his clothing.
3. They slightly raise the casualty's back and then pass their other forearms under the middle of his thighs and grasp their hands, the

SEARCH AND RESCUE DRAGS AND CARRIES

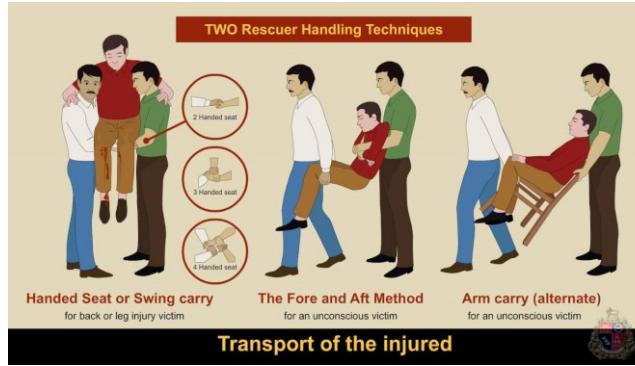


- bearer on the left of the casualty with his palm upwards and holding a folded handkerchief to prevent hurting by the finger nails; the bearer on the right of the casualty with his palm downwards, as shown in ("hook grip").
4. The bearers rise together and stoop off, the right-hand bearer with the right foot and the left-hand bearer with the left foot.
 5. The bearers walk with the cross-over step and not by side paces.

THE FORE AND AFT METHOD TECHNIQUE

This method of carrying should be used only when space does not permit a hand seat.

- One bearer stands between the casualty's legs, facing the feet with hands down and grasps the casualty under his knees.



- The other bearer takes a position behind the casualty and after raising his trunk passes his hands under the casualty's armpits and grasps his own wrists on the casualty's chest.
- The casualty is then lifted.

- The bearers walk in step.

- A chair can be used also to carry the casualty when negotiating a narrow passage or moving up/down the stairs (see kitchen-chair carry technique).

THE KITCHEN-CHAIR CARRY TECHNIQUE

The bearers walk in step by carrying the patient in a chair. Use this method when the casualty is light weight and the distance is small.

This technique allows to climb up or down steps or stairs whilst carrying the casualty.

BLANKET LIFT TECHNIQUE

- Place the casualty on to a blanket:



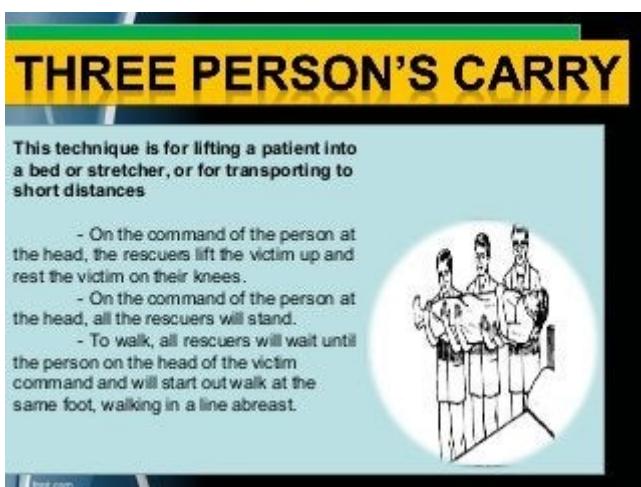
- Place the blanket or rug on the ground in line with the casualty, and rolled lengthwise for half its width.
- Place the roller portion of the blanket or rug close to the casualty's back and gently rolls him over the roll until he is lying on his opposite side.
- If the casualty is suspected to have suffered a head, neck or spine injury or a fracture, two bearers maintain control of the head and lower limbs. The other 4-6 bearers very carefully turn the casualty on to his side every precaution being taken against movement at the site of the fracture. The bearers at the head and at the lower limbs conform to the rolling of the casualty throughout.
- Unroll the rolled portion of the blanket or rug gently lowering the casualty on his back so that he lies on the centre of the open blanket or rug.

- During lifting by a blanket, the edges are rolled up close to the casualty's sides and lifted by two or three persons on either side.

THREE PERSON CARRY AND STRETCHER LIFT

- Each person kneels on the same knee nearest the victim's feet.

2. On the command of the person at the head, the rescuers lift the victim up and rest the victim on their knees.



person at the head, all the rescuers will stand.

6. To walk, all rescuers will start out on the same foot, walking in a line abreast.

7. Special care has to be taken in case of suspected backbone or neck injuries (see also section O.6).

3. If the patient is being placed on a low stretcher or litter basket: On the command of the person at the head, the patient is placed down on the litter basket/stretcher.

4. If the victim is to be carried: At this point, the rescuers will rotate the victim so that the victim is facing the rescuers, resting against the rescuers' chests.

5. On the command of the

STRETCHERS

Stretchers are of two patterns viz. "ordinary" and "telescopic-handled". In general principle they are similar.

► A stretcher consists of following parts



- _ poles,
- _ handles,
- _ jointed traverses,
- _ runners,
- _ bed,
- _ pillow-sack, and
- _ slings.

The '*head*' and '*foot*' of a stretcher correspond to the head and feet of the casualty.

At the head of the stretcher may be a canvas overlay (the pillow sack) which can be filled with straw, hay, clothing etc. to form a pillow. The pillow- sack opens at the head and its contents can therefore be adjusted without due disturbance of the casualty.

The traverses are provided with joints for opening or closing the stretcher.

The telescopic-handled pattern is similar but its length can be reduced to 6 feet by sliding the handles underneath the poles. This is of a great value when working in confined space, or when a casualty has to be taken up or down a narrow stair-case with sharp turns.

When closed, the poles of the stretcher lie close together, the transverse bars being bent inwards, the canvas bed neatly folded on the top of the poles and held in position by the slings, which are laid along with canvas and secured by a strap which is placed transversely at the end of each sling and passed through the large loop of the other, and round the poles and bed.

LOADING A STRETCHER

Two methods are used to load a patient on a stretcher:

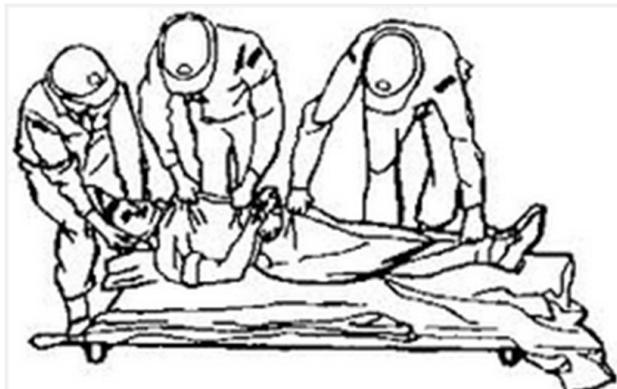
- ✓ _ blanket lift, and
- ✓ _ emergency lift.

BLANKET LIFT

- ✓ In the blanket lift, a blanket is placed under the casualty (as described earlier).
- ✓ If poles of good length and rigidity are available, roll the blanket over the poles until
 - ✓ the poles are pressed to the sides of the casualty. If poles are not available, the blanket itself is rolled up tightly to the sides of the casualty.
- ✓ If necessary, broad bandages are places around the body, one at the level of the
 - ✓ thigh, another at the level of the shoulders.
- ✓ Lift the casualty and place the stretcher exactly under the casualty.
- ✓ In case of potential injuries to head, neck, spine or legs, two bearers should support
 - ✓ the neck and ankle.
- ✓ Lower the casualty on the stretcher.
- ✓ Secure the casualty on the stretcher.

EMERGENCY LIFT

- If no blanket is available, the following method is used: Open the casualty's coat or bush-coat and roll the free ends firmly close up to the side of the casualty's body.
- Lift the casualty and put him on the stretcher as described above.



LIFTING AND LOWERING A STRETCHER



1. At the command "Lower Stretcher", the two or four bearers will stoop, gently lower the stretcher to the ground and rise together.
2. At the command "Lift Stretcher", they will then rise steadily together keeping the stretcher level.

CARRYING A LOADED STRETCHER

Depending on the availability of manpower one can decide whether the stretcher is to be carried by four or two persons.



alamy

TRANSPORTING OF CASUALTY WITH THE STRETCHER

- Moving up the steps
(Move off with casualty's **head first**)



In case of four helpers, each helper takes one

handle of the stretcher and walks on the outside of the stretcher.

In case of two helpers carrying, one helper takes the head side, the other the opposite side. They are positioned between the handles and take the both handles to hold the stretcher. They may decide to use a sling well over their shoulders and on the handles of the stretcher to help them to carry the stretcher.

LOADING A STRETCHER INTO AN AMBULANCE

The stretcher is lowered with its head one pace from the door of the ambulance. The casualty will be loaded head first. While loading, take side pace to the ambulance raising the stretcher

evenly to the level of the berth to be loaded. The front bearers place the runners in the grooves and then assist the rear bearers to slide the stretcher into its place and secure it. If slings have been used these should be kept with their stretcher.

BODY SYSTEMS

A - Body systems depend on each other to operate properly.

Example: Nervous, respiratory and circulatory systems that work together to allow for breathing and consciousness.

Vital organs - Brain, Heart and Lungs.

B - Anatomical terms

Lateral, medial, anterior, posterior, superior, inferior, proximal, distal.

C - Body cavities

Cranial cavity, spinal cavity, thoracic cavity, abdominal cavity, pelvic cavity.

D - Body systems

1) Respiratory system - Responsible for breathing air/oxygen enters the lungs when you inhale and leaves the lungs when you exhale.

- Respiratory arrest - Condition when a person stops breathing
- Cyanosis - Indicates a lack of oxygen in the blood (blue skin color of lips, nailbeds, etc.)
- Rescue breathing - Breathing for a patient

2) Circulatory System - Responsible for circulation of blood and oxygen to all body organs.

- Consists of the heart, blood vessels and blood
- Contraction - pumping action of the heart
- Pulse - Feeling the heart's contractions at an artery that lies near the skin and over a bone
- Cardiac arrest - The heart and breathing have stopped
- CPR - Cardiopulmonary Resuscitation

3) Nervous System - Most complex and delicate of all body organs.

- Consists of the brain, spinal cord and all nerves
- Brain - Master organ of the body
- Brain regulates all body systems including the respiratory and circulatory systems
- Nerves extend from the brain, through the spinal cord to every muscle and every organ in the body
- Brain - Center responsible for consciousness, breathing and heartbeat
- Normal state of consciousness - 3 W's - who, where, what

A patient knowing who they are, where they are and what is happening around them

- Brain cells cannot regenerate or grow back Damaged brain cells are not replaced
- Paralysis - Loss of feeling or movement below (distal) to an injury

4) Musculoskeletal System - Consists of bones, muscles, ligaments and tendons.

- Musculoskeletal System performs the following:
 - a - Supports the body
 - b - Protects vital organs
 - c - Allows body movement
 - d - Stores minerals and produces blood cells
 - e - Produces heat

5) Integumentary System - Consists of skin, hair and nails.

- Skin is most important because it protects the body from germs and keeps body fluids within

6) Endocrine System - Consists of glands that release fluid into other body systems.

- Most well known - pancreas which produces insulin

RESUSCITATION (BASIC CPR)

Reviving someone who is unconscious and/or not breathing or not breathing normally is called **resuscitation**.

To maintain life, we need our hearts to pump oxygenated blood to our vital organs. To achieve this we need to be breathing and our hearts need to be pumping. Should either of these functions stop, our brain and other vital organs will start to deteriorate (**brain cells usually die within 3-4 minutes due to lack of oxygen**) which will eventually lead to death.

'**Ventricular fibrillation**' is the most common result of cardiac arrest, caused by heart attack. When this happens, the best chance of survival for the patient is to have their heart 'restarted' with a defibrillator. These are carried on all ambulances, and can also be found in some public places (shopping centres, etc.). These **days' defibrillators** are very sophisticated, and will talk you through the process, but you should be trained in the use of them before attempting to use one. However, even if you are trained to use one, you must call an ambulance first, as this will give the casualty the best chance of survival.

If the victim is not breathing or is not breathing normally, any source of suffocation should be removed and resuscitation is to be started.

Chest compressions with or without rescue breathings are performed by an individual during **cardio pulmonary resuscitation (CPR)** in an attempt to restore spontaneous circulation.

HOW TO OBSERVE RESPONSIVENESS AND CONSCIOUSNESS?

Unconsciousness occurs when a person is suddenly unable to respond to stimuli like sound or pain, and appears to be asleep. A person may be unconscious for a few seconds (as is the case with fainting) or for longer periods of time.

The AVPU scale (an acronym from "alert, voice, pain, unresponsiveness") is a system by which a first aider can measure and record a patient's responsiveness, indicating the level of consciousness. It is based on the casualty's eye opening, verbal and movement (motor) responses.

The AVPU scale has only four possible outcomes:

— A – Alert.

The person is fully awake (although not necessarily oriented). The person will spontaneously open eyes, will respond to voice (although may be confused) and will have bodily motor function.



— V – Responding to voice.

The person makes some kind of response when you talk to him. It could be opening his eyes, responding to your questions or initiating a move. These responses could be as little as a grunt, moan, or slight movement of a limb when prompted by the voice of the rescuer.

— P – Responding to pain.

The patient makes a response of any kind on the application of pain stimulus, such as a

central pain stimulus like a rub on his breastbone or a peripheral stimulus such as squeezing his fingers. Patients with some level of consciousness (a fully conscious patient would not require any pain stimulus) may respond by using their voice, moving their eyes, or moving part of their body (including abnormal posturing).

_ U - Unresponsiveness also noted as 'Unconsciousness'.

This outcome is recorded if the patient does not give any eye, voice or motor response to voice or pain.

To check a person's responsiveness/consciousness state check the following:

1. A person who looks around, speaks, responds clearly to questions, feels touch and moves or walks around, is considered alert (A).

2. The person opens his eyes and responds to simple questions:

_ "What is your name?"

_ "Where do you live?"

_ "How old are you?"

The person responds to simple commands:

_ "Squeeze my hand."

_ "Move your arm/leg/foot/hand."

If the person responds, he is responsive to voice (V).

3. If there is still no response, pinch the person and see if he opens his eyes or moves. If the person responds to pain, he is responsive to pain (P)

If the person does not react to any of these stimuli, he is in an unconscious state (U).

Note that a person might only partially respond to the stimuli you provide (sound, touch, pain) and might be in an in-between (groggy) state.

Checking if a casualty is conscious or unconscious should only take a few seconds and should not delay checking for the breathing.

HOW TO OBSERVE THE BREATHING?

The airway may be narrowed or blocked making breathing noisy or impossible. Reasons for blockage may be:

- _ Loss of muscular control in the throat may allow the tongue to sag back and block the air passage.
- _ When the reflexes are impaired, saliva may lie in the back of the throat, blocking the airway.
- _ Any foreign body in the throat may block the air passage e.g. vomit, blood, dentures etc.

✓ **It is essential to establish a clear airway immediately. Unless you can clearly see that the person is breathing normally, an unconscious person must be turned onto his back to unblock the breathing passage and to check for breathing. Unblocking the breathing passage takes priority over concerns about a potential**

To observe the breathing do following:

1. If the person is unconscious and is not on his back, turn him on to his back.
2. Kneel beside the casualty.
3. Lift the chin forwards with the index and middle fingers of one hand while pressing the forehead backwards with the palm of the other hand. This manoeuvre will lift the tongue forward and clear the airways.
4. Observe breathing by listening, feeling and looking
5. After opening the victim's airway, check to see if the victim is breathing.

To do this, place your cheek in front of the victim's mouth (about 3-5 cm away) while looking down his chest (towards his feet). If desired, you can also gently place a hand on the center of the victim's chest. This allows you to observe whether the victim is breathing in the following ways:



- a. *look* for chest/abdominal movement,
- b. *listen* to breathing sounds,
- c. *feel*/the air coming out of the nose or mouth.

In the first minutes after cardiac arrest it often appears as if the person is trying to breathe. It can appear as if the person is barely breathing or is taking infrequent noisy gasps. It is important not to confuse this with normal breathing and you should start resuscitation immediately.

6. If the casualty's chest still fails to rise, first assume that the airway is not fully open. Once the airway is cleared the casualty may begin breathing spontaneously.

Else, clear the airway by removing any visible item that is blocking the airway:

- a. Hook your first two fingers covered with clean cloth/gloves.
- b. Sweep round inside the mouth/ throat.
- c. Check again the breathing.

- One should not spend time searching for hidden obstructions. Care should be taken not to push any object further down the throat.
- Be careful: do not put your fingers in somebody's closed mouth.

HOW TO OBSERVE THE PULSE?

Feeling the pulse is not always easy. Feeling the pulse during an emergency at the wrist is often unreliable. The pulse can be felt by placing the finger tips gently on the voice box and sliding them down into the hollow between the voice box and the adjoining muscle.



RESUSCITATION OF A PERSON WHO IS NOT BREATHING OR NOT BREATHING NORMALLY

SAFETY FIRST AND CALL FOR HELP

1. Make sure there is no danger to you, the person who needs help and bystanders before giving help.

- The 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.

SECURE AN OPEN AIRWAY

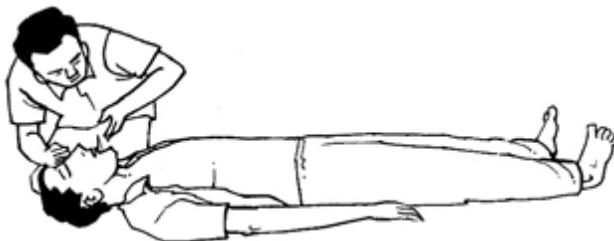
. The airway may be narrowed or blocked making breathing noisy or impossible. It is essential to establish a clear airway immediately. Unblocking the breathing passage takes priority over concerns about a potential spinal injury

- If the person is not on his back, turn him on to his back.

- Kneel beside the casualty.

- Lift the chin forwards with the index and middle fingers of one hand while pressing the forehead

palm of the other will lift the tongue
will lift the tongue
airways.



backwards with the hand. This manoeuvre forward and clear the airways.

chin lift pic

- Check for

breathing.

a. Look for chest/abdominal movement.

b. Listen to breathing sounds.

c. Feel the air coming out of the nose or mouth.

- If the casualty's chest still fails to rise, first assume that the airway is not fully open. Once the airway is cleared the casualty may begin breathing spontaneously.

- Else, clear the airway by removing any visible item that is blocking the airway: Hook your first two fingers covered with clean cloth/gloves and sweep round inside the mouth/ throat.

➤ One should not spend time searching for hidden obstructions. Care should be taken not to push any object further down the throat.

➤ Be careful: do not put your fingers in somebody's closed mouth.

- If the breathing restarts, place the patient in the recovery position (see recovery position).

CPR: HOW TO GIVE CHEST COMPRESSIONS?

- Turn the casualty on his back on a hard surface, if not already.



- Kneel next to the casualty, beside his upper arm.

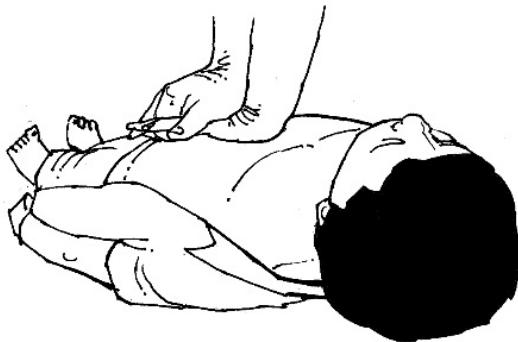
- Place the heel of one hand in the center of the person's chest.

- Place the heel of the other hand on top of your first hand.

If the person's age is below puberty, only use one hand. If the victim is a baby, do not use this technique but apply the technique of CPR for babies and children under the age of one year.

- Lock your fingers of both hands together.

Do not apply pressure to the person's ribs. Nor should you press the upper part of the stomach or the bottom end of the breast bone



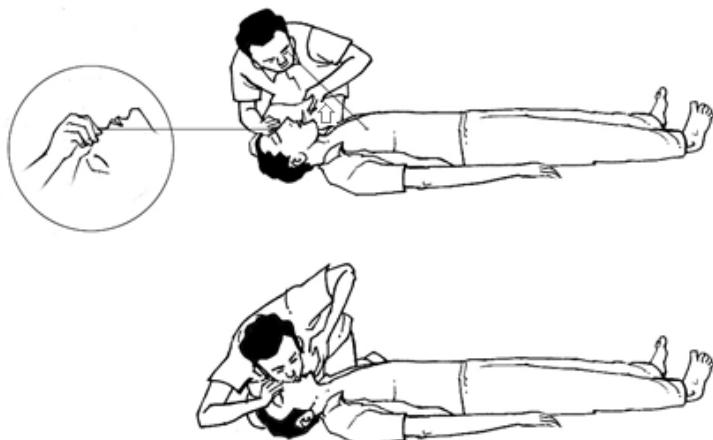
6. Make sure your shoulders are directly above the person's chest.
7. With outstretched arms, push five to maximum six centimetres downwards.
8. Release the pressure and avoid leaning on the chest between compressions to allow full chest recoil. The compression and release

Each time you press down allow the chest to rise fully again. This will let blood flow back to the heart.

9. Do not allow your hands to shift or come away from the breastbone.
10. Give 30 chest compressions in this way at a rate of 100 compressions a minute (**you may go faster, but not more than 120 compressions a minute**). This equates to just fewer than two compressions a second.

A.5.2.4 CPR: HOW TO GIVE RESCUE BREATHS?

If for some reason you cannot or do not want to give rescue breaths, you can just continue giving chest compressions (five to maximum six centimetre deep at a rate of 100 compressions a minute).



1. Put one hand on the person's forehead and tilt back his head.
2. Put your other hand on the bony part of the chin and lift the chin.
3. Then pinch the person's nose with one hand that is on his forehead.
4. Take a normal breath and then put your mouth completely over the person's mouth and seal with your lips. Calmly blow your air into the mouth of the person's for one second. Check if the person's chest rises.
5. If the chest does not rise, take the following steps:
 - a. Check if anything is in the person's mouth.
If so, remove any visible items that may block the airway.

- b. Check that the head is well tilted and the chin is lifted properly.
In any case, make no more than two attempts to blow air into the person.
 - 6. Start another series of 30 chest compressions prior to trying to blow air into the person's mouth again.
 - 7. To ensure that the quality of the chest compressions remains optimal, the rescuers should switch every two minutes:
 - _ The first rescuer gives 30 chest compressions followed by two ventilations and another set of 30 chest compressions and two ventilations.
 - _ Then another rescuer takes over and repeats the above steps and switch again.

The switches should happen with minimal interruption and as quickly and smoothly as possible.
8. 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 area becomes unsafe for you to continue.

HYGIENE

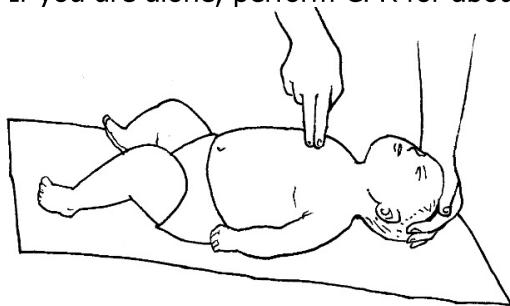
Wash your hands after taking care of the person. Use soap and water to wash your hands. If no soap is available, you can use ash to wash your hands. Alcohol-based sanitizers can also be used, if available.

Resuscitation for babies and children:

Understandably, some people are reluctant to perform CPR on a child or baby for fear of causing further harm to them. However, a child in this state is likely to suffer far worse consequences if CPR is not administered. Please keep that in mind should the situation ever arise.

CPR on a child is very similar to CPR on an adult. There are only a few minor modifications to the process, which are detailed below:

- Give the child **5 rescue breaths** before starting CPR, then switch back to 30 chest compressions to 2 rescue breaths.
- If you are alone, perform CPR for about a minute before going for help.



Chest compressions on a child should be about one-third of the depth of the chest. For a baby under 1 year old, only use **two fingers** to administer CPR. For a child over 1 year use either one or two hands to compress the chest, again one third of the depth of the chest.

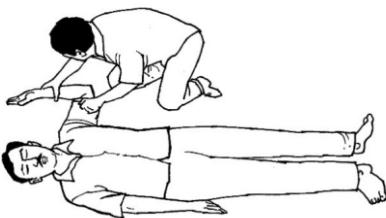
RECOVERY POSITION

The recovery position refers to a **lateral prone position** of the body, in to which an unconscious but breathing normally casualty can be placed as part of the first aid treatment. In an unconscious person, the muscles are relaxed. This causes **the tongue to obstruct** the airway. This risk can be eliminated by carefully tilting the **head back and lifting the chin**. The position of the **casualty's arms and legs provide** the necessary **stability to keep the body in a safe and comfortable position**.

HOW TO PUT A PERSON INTO THE RECOVERY POSITION?

HOW TO PUT A PERSON INTO THE RECOVERY POSITION

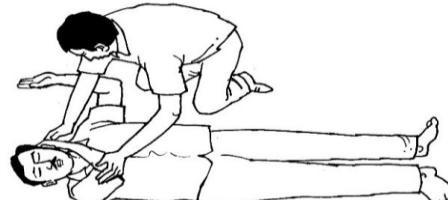
- Put the person on the floor if he is not there already.
- Remove the person's spectacles if necessary.
- Kneel down by the side of the casualty.
- Make sure both of his legs are outstretched.
 - Place the nearest arm (the one on the side you are kneeling next to) at right angles to his body.
 - Bend the forearm upwards with palm facing up.



- Lay the person's other arm across his chest.
- Hold the back of this hand against his cheek on the side at which you are kneeling.
- Keep that hand in that position.



- With your other free hand, grasp the leg on the other side of the person's body under the knee.



- Raise that leg, but leave the person's foot on the ground.
- Pull the raised leg towards you.
- In the meantime, keep the back of the person's hand held against his cheek. Roll the person towards you so he turns on his side.
- Position the person's upper leg in such a way that his hip and knee are at right angles.
- The person is now in a turned position and will not turn on his back.
- Tilt the head of the person backwards to keep the airway open.

Pull leg fig ↓

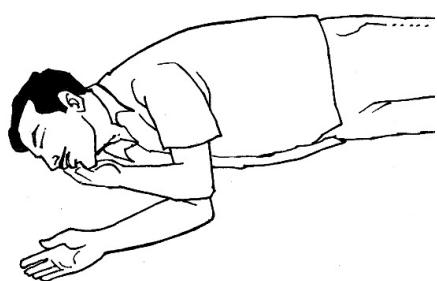




- Make sure the mouth is angled towards the ground. This will prevent the risk of choking on blood or vomit.
- Adjust the hand under the cheek if necessary so that the head remains tilted backwards and the mouth remains at a downward angle.

A casualty lying position is commonly referred to in the 'recovery position'

➤ Do not leave a casualty alone and continue observing his condition and monitoring his breathing. If the person stops breathing, start resuscitation (see resuscitation).



SUMMARY:

The casualty is	Procedure
Conscious and breathing normally	Give appropriate first aid.
Unconscious, and breathing normally	Put the casualty in recovery position.
Unconscious and not breathing or not breathing normally	Start CPR.

TOP TO TOE ASSESSMENT

The 'history of the case' is the story of the accident, i.e. how the accident actually occurred. The casualty will give the history if conscious. If he is unconscious, someone who saw the accident will help. The surroundings will add to the information, like an abandoned vehicle or a damaged area near the place and its condition.

THE INITIAL TOP TO TOE ASSESSMENT

A general assessment can be carried out to assess any imminent threats to life and whether the casualty is conscious or unconscious. It should be executed quickly.

Resuscitation, the stopping of bleedings and the treatment of any life- threatening issues have priority. If the condition of the casualty worsens during the examination, the necessary first aid measures should be taken immediately.

During assessment, movement should be as little as possible to avoid further injuries.

Assess from head toward feet and compare one side of the casualty's body with the other as this helps you to detect any swelling or irregularities that require first aid.

Check consciousness



Check breathing



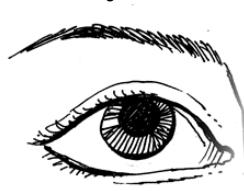
Check Pulse



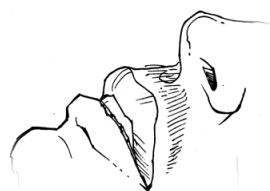
Check Head Injury



Check Eyes



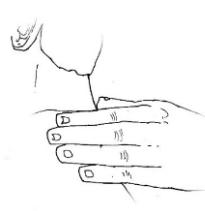
Check Mouth



Check Ear



Check Neck



Check Chest



Check Arm



Check abdomen



Check Hips and Groin



Check Legs



RESPIRATORY SYSTEM AND BREATHING

RESPIRATION

Oxygen is essential to life. Every time we breathe in, air containing oxygen enters the lungs. When we breathe out air containing waste products is removed from the lungs. In each **inspiration we take approximately 500 cc of air in.**

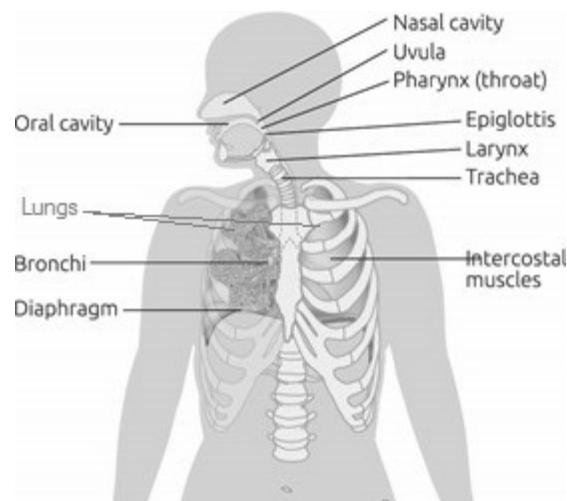
Respiration is defined as the transport of oxygen from the outside air to the cells within the body tissues, and the transport of carbon dioxide (a waste product) in the opposite direction.

THE RESPIRATORY SYSTEM

THE AIR PASSAGES

The air passages consist of the nose, throat (pharynx), wind pipe (trachea) and air-tubes

(bronchi). The bronchi divide into minute branches (bronchioles) which end in the lung substance (alveoli).



THE LUNGS

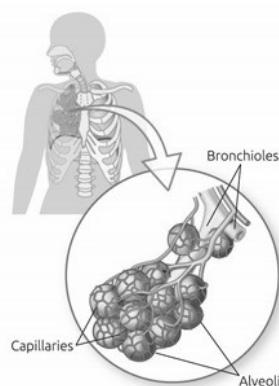
The lungs (two in number) are situated on the right and left sides of the chest cavity.

Each lung is **made up** of a **number of small sacs, called alveoli**. The lungs are covered by a **membrane called 'pleura'** which lines the inner wall of the chest cavity.

THE RESPIRATORY MUSCLES

The respiratory muscles, diaphragm, **intercostal and abdominal muscles** help to **contract and expand the lungs** to facilitate the **breathing**.

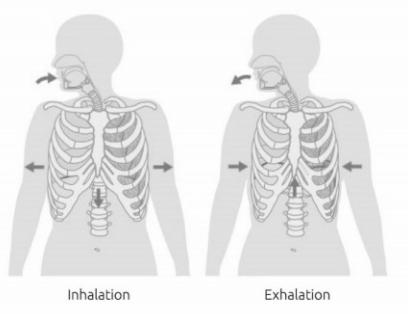
MECHANISM OF RESPIRATION



During inspiration (breathing in), the diaphragm (the muscle separating the chest from the abdominal cavity) flattens and increases the chest capacity from above downwards. The ribs move upwards and forwards increasing the capacity of the chest cavity from front to back by the action of the muscles situated between the ribs; the lungs thus expand and air enters them. This is an active process.

During expiration (breathing out) the reverse process takes place. The diaphragm comes back to its original state and the ribs fall back thus forcing the air out of the lungs. This is a passive process.

Small blood vessels (capillaries) surround the alveoli. The exchanges of oxygen and carbon dioxide take place through the blood circulating in these capillaries. Oxygen is absorbed by the red blood corpuscles of the blood; water vapour and carbon dioxide are let out from the blood plasma into the alveoli and expelled out. The lungs are also supplied with nerves which are connected to an area in the brain called respiratory centre. This centre controls the respiration.



NO BREATHING OR DIFFICULT BREATHING

Asphyxia is a condition in which the lungs do not get **sufficient supply of air for breathing**. If this continues for some minutes, the breathing and heart action stop and death occurs. A person can only survive a **few minutes without breathing and a beating heart**.

CAUSES OF NO BREATHING

CONDITIONS AFFECTING THE AIR PASSAGE

Following reasons can cause no breathing:

OBSTRUCTION OF THE AIR PASSAGE

- ✓ foreign body inhalation- as a coin inhaled by a child or artificial tooth by an adult;
- ✓ food going down the air passage;
- ✓ sea weeds, mud or water getting into air passage during drowning;
- ✓ bronchial asthma;
- ✓ tongue falling back in an unconscious person;
- ✓ swelling of tissues of the throat as a result of scalding (burning by steam or boiling fluids or corrosives) or allergic reactions;
- ✓ inhaling irritant gases (coal gas, motor exhaust fumes, smoke, sewer and closed granary gas or gas in a deep unused well, etc.).

COMPRESSION OF THE AIR PASSAGE (USUALLY DELIBERATE, SOMETIMES ACCIDENTAL)

- ✓ Smothering such as covering of the face and nose of an infant or an unconscious person lying face downwards on a pillow, or having a plastic bag covering the face of the victim,
- ✓ tying a rope or scarf tightly around the neck causing strangulation,
- ✓ hanging or throttling (applying pressure with fingers on the windpipe).

CONDITIONS AFFECTING THE RESPIRATORY MECHANISM

- Epilepsy, tetanus, rabies, etc.;
- nerve diseases causing paralysis of the chest wall or diaphragm;
- poisonous bites (e.g. snake bites like the cobra).

CONDITIONS AFFECTING RESPIRATORY CENTRE

- ✓ Overdose of morphia or similar products such as barbiturates (sleeping tablets),
- ✓ electric shock,
- ✓ stroke.

COMPRESSION OF THE CHEST

- ✓ Caving in of earth or sand in mines, quarries, pits or compression by grain in a silo or by beams or pillars in house-collapse;
- ✓ crushing against a wall or a barrier or pressure in a crowd (stampede).

LACK OF OXYGEN AT HIGH ALTITUDES

- Low atmospheric pressure where the oxygen level in the atmospheric air is low due to lack of acclimatization.

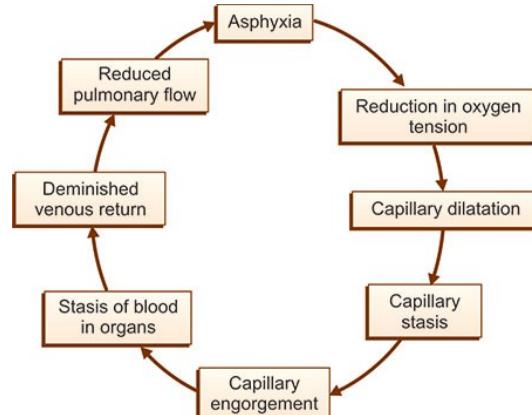
The signs of no breathing are:

- there is no flow of air out of the nose or mouth (listen, feel the airflow); and
- the chest of the victim does not move up and down.

Note that even after breathing has stopped the heart may continue to beat for a short while. If you find a person who is not breathing or not breathing normally, you can increase his chances of staying alive by pushing hard and fast in the middle of the person's chest and by giving rescue breaths (CPR).

The signs of ASPHYXIA are:

- ✓ *difficulty in breathing and signs of restlessness;*
- ✓ *the rate of breathing increases;*
- ✓ *the breaths get shorter;*
- ✓ *the veins of the neck become swollen;*
- ✓ *the face, lips, nails, fingers and toes turn blue; and*
- ✓ *the pulse gets faster and feebler.*



Remove any cause of suffocation, but do not place yourself into any danger doing so.

- If the person is not on his back, turn him on his back.
- Kneel down by the side of the person.
- Start CPR
- Do not interrupt the resuscitation until:
 - ☺ the victim starts to wake up, moves, opens 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.
- Cover the casualty.
 - If the breathing starts again:
 - Keep the victim covered to keep him warm.
 - Arrange urgent transport to a hospital.
 - Do not leave the victim alone and continue to observe him.
 - If the breathing stops, restart CPR.

SUMMARY:

Unconscious

+

Breathing

=

RECOVERY POSITION

Unconscious

+

Not breathing or not breathing normally

=

CPR

DROWNING

Drowning causes **asphyxia by water, weeds and mud entering into the lungs**. When **the lungs' alveoli are filled with water**, they **cannot exchange oxygen to and from the blood**.

In case of '**dry drowning**' the water never reaches the lungs. Instead, breathing in water causes the **vocal cords spasm that shuts off his airways, making it hard to breathe**.



'**Secondary drowning**' happens differently. **The swimmer often appears fine immediately after swimming. But over time, water left in the swimmer's lungs begins to cause oedema, or swelling.**

If a casualty has been immersed in cold water, there is also the danger of hypothermia.

It is important to keep the victim warm.

If the casualty was diving there could be trauma to the head, neck or spine.

WHAT DO I SEE AND ENQUIRE?

- _ A victim is in the water and is in distress.
- _ Following signs of drowning may be observed:

- no breathing;
- difficulty in breathing and signs of restlessness;
- the rate of breathing increases;
- the breaths get shorter;
- the veins of the neck become swollen;
- the face, lips, nails, fingers and toes turn blue;
- the pulse gets faster and feebler; and
- water may gush from the mouth.



This water is from the stomach and should be left to drain of its own accord. Do not attempt to force the water to come out of the stomach as the victim may inhale it.

WHAT DO I DO?

SAFETY FIRST AND CALL FOR HELP

1. Make sure there is no danger to you of drowning.
2. The 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.

REMOVE THE VICTIM OUT OF THE WATER

3. Remove the person rapidly and safely from the water, but do not place yourself into any danger by doing so.
4. Try to throw a rope or something that the drowning person can hold onto (if he is still conscious and able to grasp the helpline).
5. Once the person has been rescued from the water, do not try to remove water from his lungs.

WHAT DO I DO IF THE VICTIM IS BREATHING?

1. If the person is breathing, put him in the recovery position and cover him with a blanket or coat to keep him warm.
2. Do not leave the victim alone and continue to observe him.

WHAT DO I DO IF THE VICTIM IS NOT BREATHING OR NOT BREATHING NORMALLY?

1. Remove any cause of suffocation.
 2. If the person is not on his back, turn him on his back.
 3. Kneel down by the side of the person.
 4. Start CPR.
- ✓ Do not interrupt the resuscitation until:
- the victim starts to wake up, moves, opens 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.

If the breathing starts again:

- a) Cover the victim.
- b) Arrange urgent transport to a hospital.
- c) Do not leave the victim alone and continue to observe him.
- d) If the breathing stops again, restart CPR.

STRANGULATION AND HANGING

The airway is squeezed if pressure is exerted on the outside of the neck and by such act the flow of air into the lungs is cut off.

Strangulation is a constriction or squeezing around the neck or throat. Hanging is the suspension of the body by a noose around the neck. Hanging or strangulation may occur accidentally - for example, by ties or clothing becoming caught in machinery. **Hanging may cause a broken neck. For this reason the casualty must be handled extremely carefully.**

WHAT DO I DO?

SAFETY FIRST AND CALL FOR HELP

1. Make sure there is no danger to you.
 2. The 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.
 3. Cut or remove the band constricting the throat. If the victim is suspended, raise the body and loosen or cut the rope.
 4. Lay the person on the ground.
- Be careful while moving the victim as he may suffer neck injuries.



WHAT DO I DO IF THE VICTIM IS BREATHING?

1. If the person is breathing, put him in the recovery position and cover him with a blanket or coat to keep him warm.
2. Do not leave the victim alone and continue to observe him.

WHAT DO I DO IF THE VICTIM IS NOT BREATHING OR NOT BREATHING NORMALLY?

1. Remove any cause of suffocation, but do not place yourself into any danger doing so.
2. If the person is not on his back, turn him on his back.
3. Kneel down by the side of the person.
4. Start CPR

Do not interrupt the resuscitation until:

- ✓ the victim starts to wake up, moves, opens eyes and breathes normally;
- ✓ help (trained in CPR) arrives and takes over;
- ✓ you are too exhausted to continue; or
- ✓ the scene becomes unsafe for you to continue.
- ✓ If the breathing starts again:
 - Cover the victim to keep him warm.
 - Arrange urgent transport to a hospital.
 - Do not leave the victim alone and continue to observe him.
 - If the breathing stops again, restart CPR.

CHOKING

When a person is having severe difficulty in breathing because of an obstructed airway or lack of air, he is choking.\|



Coughing is the natural way of clearing the airway when the person experiences mild choking. It is also a sign that he still gets air through the windpipe. **Severe choking** happens when the **foreign object or a local swelling blocks the airway**. This is a life-threatening emergency.

Infants and children often choke after swallowing non-edible objects such as coins, marbles, seeds, buttons or small toys. Most **adult cases of choking occur while eating**. Since choking often occurs while eating, there are usually people present near the casualty. This means there is a good chance that someone will be able to give help quickly.



WHAT DO I SEE AND ENQUIRE?

❖ When a person is choking, you may observe the following:

- the person has difficulty in breathing,
- the tries to cough something out but it does not help,
- he cannot speak or make any sound,
- he puts his hands on his throat,
- the lips and tongue turn blue,

- the veins in the face and neck stick out, or
- the person becomes dizzy and might lose consciousness.

WHAT DO I DO IN CASE A PERSON IS CHOKING?

Follow these guidelines if the choking person's age is more than one year.

APPROACH AND HELP THE CHOKING PERSON

Ask the person 'Are you choking?' (Only if the person can understand and answer the question).

WHAT DO I DO IF THE PERSON CAN ANSWER THE QUESTION, CAN COUGH OR BREATHES?

Ask the person to keep coughing. Do not do anything else, but stay with the person until he breathes normally again.

WHAT DO I DO IF THE PERSON CANNOT SPEAK, COUGH OR BREATHE?

1. Stand to the side and a little behind the choking person or child (aged older than one year).
2. Support the person's chest with one hand and bend him forward.
3. Give five firm blows between the person's shoulder blades. To do so, use the heel of your free hand. Verify if the object has come out and the person can breathe again.



WHAT DO I DO IF THE OBJECT DID NOT COME OUT AND THE PERSON IS STILL CHOKING?



1. Stand behind the choking person and put both hands around him, so your hands meet in front of the person.

2. Make a fist and place it between the navel and lower tip of the breastbone of the person. Hold onto this fist with your other hand.

3. Bend the choking person forward and pull your fist firmly towards you and upwards.

4. Give **five** abdominal thrusts.

This method of abdominal thrusts can only be used on people older than one year.

5. If the passage of air is free, stop giving further abdominal thrusts. But always stop **after five** abdominal thrusts.

6. If the object does not come out and the person is still choking, give **another five blows on the back followed by five abdominal thrusts.**

7. Repeat this until the object is released or until the choking person loses consciousness.

WHAT DO I DO IF THE PERSON LOSES CONSCIOUSNESS?

1. Carefully place the unconscious person on the floor.
2. The 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.
3. Kneel down by the side of the person.
4. If the person is not on his back, turn him on his back.
5. Start CPR.

Do not interrupt the resuscitation until:

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

SWELLING WITHIN THE THROAT

A swelling in the throat may occur as a result of:

- trying to drink a very hot liquid,
- swallowing corrosive poisons,
- due to an inflammation, or
- due to an allergic reaction.

The swelling may obstruct the free airway to the lungs.

WHAT DO I DO IN CASE OF A VICTIM WITH A SUSPECTED SWELLING WITHIN THE THROAT?

PROVIDE FIRST AID

1. Make the victim sit up.
2. If the breathing continues normally, or is restored to normal, you can give ice to suck on or some cold water to sip.
3. If the breathing stopped:
 - a. Call for help.
 - b. Start CPR.
4. Always refer the victim to a healthcare facility for further follow up.

SUFFOCATION BY SMOKE OR GASES

Asphyxia can occur in an environment where sufficiently oxygenated air is present, but cannot be adequately breathed because of air contamination such as excessive smoke, or can occur in case of breathing in the oxygen-depleted air.

An **asphyxiant gas** is usually a **nontoxic or minimally toxic gas** which **reduces or displaces** the normal oxygen concentration in **breathing air**. Because asphyxiant gases are relatively **inert and odourless**, their **presence** in high concentration may **not be noticed**, except in the case of carbon dioxide.

Toxic gases, by contrast, cause death by other mechanisms, such as competing with oxygen at the cellular level (e.g., carbon monoxide) or directly damaging the respiratory system. Even smaller quantities of these gasses can be deadly.

Carbon monoxide (CO) is a **colourless, odourless, and tasteless** but highly toxic gas which takes **the space in haemoglobin** that normally carries oxygen, thus makes it **ineffective** in delivering oxygen to body tissues. Carbon monoxide is produced when there is not enough oxygen to produce carbon dioxide (CO_2), such as when operating a stove or an internal combustion engine in an enclosed space. Carbon monoxide is lighter than air.

Carbon dioxide (CO₂) is a **colourless, odourless gas** which is heavier than normal air. It can be pocketed in high concentrations in wells, sewerages and mines .Other gases like refrigerator gases, compressed gases for cooking or lighting can also cause suffocation.

WHAT DO I DO IN CASE OF A VICTIM SUFFERING SUFFOCATION BY SMOKE?

SAFETY FIRST

1. Shout or call for help if you are alone but do not leave the person. Ask a bystander to seek help. Tell him to come back to you to confirm if help has been secured.
2. Make sure there is no danger to you. Do not take any risk that could endanger you. The fire brigade has specialized teams and equipment to handle these situations safely.
3. Protect yourself by a towel or a cloth (preferably wet) over your mouth and nose.

- Crawl on the floor and stay as low as possible.

MOVE THE VICTIM OUT OF THE SMOKE

- ✓ Move the victim as quickly as possible away from the area.
- ✓ Loosen the victim's clothes at neck and waist.
- ✓ If the breathing stopped, call for help and start CPR.
- ✓ Always arrange transport for the victim to a healthcare facility for further follow up.

WHAT DO I DO IN CASE OF A VICTIM SUFFERING SUFFOCATION BY CARBON MONOXIDE (CO) OR GASES LIGHTER THAN AIR?

B.7.2.1 SAFETY FIRST



- Shout or call for help if you are alone but do not leave the person unattended. Ask a bystander to seek help. Tell him to come back to you to confirm if help has been secured.
- Make sure there is no danger to you. Do not take any risk that could endanger you. The fire brigade has specialized teams and equipment to handle these situations safely.
- Ensure the circulation of fresh air by opening doors and windows.
- Before entering the enclosed space, take two or three deep breaths and hold your breath as long as you can. Use a gas mask if available.
- Crawl on the floor and stay as low as possible.
- Move the victim to an area of fresh air away from the affected area.
- Loosen the victim's clothes at neck and waist.
- If the breathing has stopped, call for help and start CPR.
- Always arrange transport for the victim to a healthcare facility for further follow up.

WHAT DO I DO IN CASE OF A VICTIM SUFFERING SUFFOCATION BY CARBON DIOXIDE (CO₂) OR GASES HEAVIER THAN AIR?

SAFETY FIRST

- Shout or call for help if you are alone but do not leave the person unattended. Ask a bystander to seek help. Tell him to come back to you to confirm if help has been secured.
- Make sure there is no danger to you. Do not take any risk that could endanger you. The fire brigade has specialized teams and equipment to handle these situations safely.

If the gas is expected to be a deadly poisonous gas, do not enter the affected area!

- Ensure the circulation of fresh air before entering the area if possible.
- Use a gas mask. If not available, before entering the enclosed space, take two or three deep breaths and hold your breath as long as you can.
- Enter in upright position and stay as high as possible.

MOVE THE VICTIM TO AN AREA OF FRESH AIR

- ✓ Move the victim as quickly as possible away from the area.
- ✓ Loosen the victim's clothes at neck and waist.
- ✓ If the breathing stopped, call for help and start CPR.
- ✓ Always arrange transport for the victim to a healthcare facility for further follow up.

WHEN TO REFER PERSON EXPOSED TO SMOKE OR GASSES TO A HEALTH CARE FACILITY?

Always urgently transport the casualty who was exposed to smoke or gasses to the nearest healthcare facility,

ASTHMA

Asthma is a condition in which the person's **airways become narrow and swell and produce extra mucus**. This can make **breathing difficult** and trigger coughing, wheezing and **shortness of breath**.

For some people, asthma is a minor nuisance. For others, it can be a major problem that interferes with daily activities and may lead to a life-threatening asthma attack.

Asthma may not be cured, but its symptoms can **be controlled**. Person may be known to have asthma and prescribed medications. This can be established by taking history from the casualty.

WHAT DO I SEE AND ENQUIRE?

Following signs can be seen in a person having an asthma attack:

- ✓ The person has difficulty in breathing.
- ✓ The person experiences as if he does not get enough air.
- ✓ Sometimes the person breathes rapidly or coughs. In some cases he coughs up mucus.
- ✓ The breathing makes a whistling or wheezing sound when exhaling.
- ✓ The person complains of tightness or pain in the chest.
- ✓ The person has troubled sleeping due to the shortness of breath.
- ✓ Symptoms of asphyxia (**grey blue tinge of lips and nail-beds**).
- ✓ If the attack lasts long, exhaustion may occur.

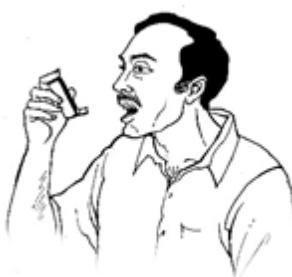
WHAT DO I DO?

SUPPORT THE PERSON WITH THE ASTHMA ATTACK

1. Stay calm and reassure the person.
2. Let the person adopt a position that he finds most comfortable. In many cases this is sitting up in bed or on a chair, leaning forward on a couple of pillows or a small table on which he rests his head.

Do not make the person lie down. Important however it is important the person adopts the position he finds best.

3. If the person is used to take inhaler puffs for his condition, let him take the medication.
4. Ensure fresh air by opening a window. Loosen any tight clothing.
5. If it is the first attack or the attack is severe or the inhaler puffs have no effect, seek urgent medical help in a healthcare facility.
6. If the person loses consciousness, make sure the airway remains open and check the breathing.
7. If the person stops breathing, start CPR.



WHEN TO REFER PERSON WITH ASTHMA TO A HEALTHCARE FACILITY?

Always urgently transport the person with an asthma crisis to the nearest healthcare facility if the asthma crisis continues even after the person took his medication or if his condition deteriorates.

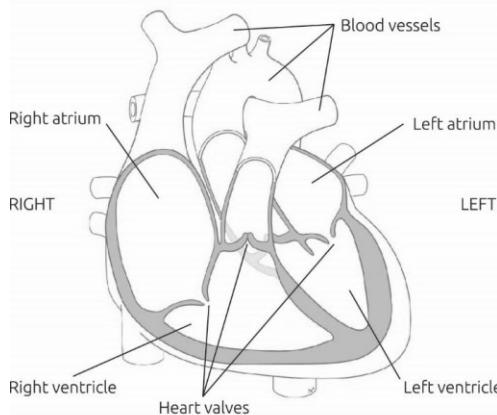
Always advise the person known to be treated for asthma to visit the healthcare facility

as soon as possible after the asthma crisis for further follow-up and treatment.

THE HEART AND THE BLOOD CIRCULATION

HEART AND BLOOD CIRCULATION

The **heart** is a **muscular organ** situated at the centre of the chest cavity. It acts as a pump. It is divided into four chambers. The right upper chamber called the **right atrium** receives impure blood from all parts of the body through blood vessels called veins.

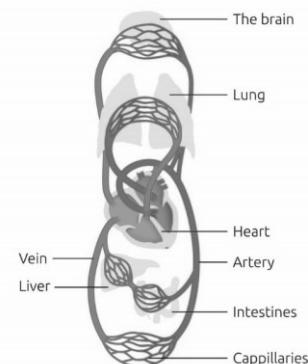


When the heart muscle contracts (the heart beats) this impure blood is passed into the right lower chamber, called **right ventricle**, and finally finds its way to the lungs where it is purified. During the process of purification, it gives up carbon-dioxide and takes a fresh quantity of oxygen.

The purified blood finds its way into the left upper chamber called **left atrium**. It then passes to the left lower chamber, called **left ventricle**, and from there, in the course of the beating of the heart the purified blood is

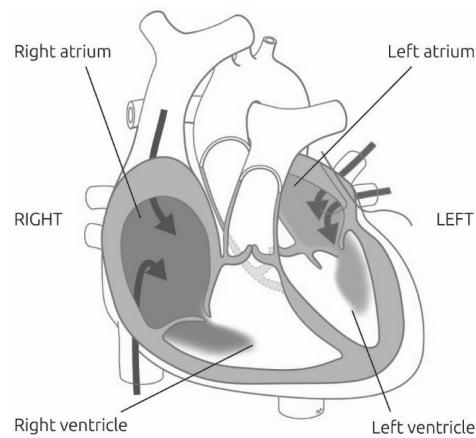
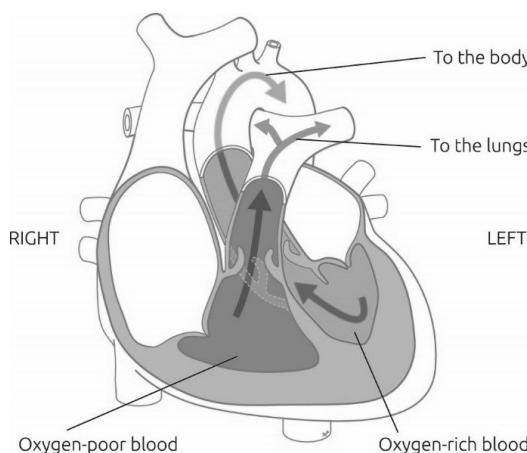
discharged into various blood vessels called **arteries and capillaries**

which convey this purified blood for the nourishment for the body as a whole including the heart muscles. Thus each heart is in fact two pumps put together.



C.1.2 BLOOD PRESSURE

The pressure in the arteries varies with the beating of the heart. When the **heart contracts** the **pressure in the arterial system increases**; when the **heart relaxes**, the **pressure in the arteries decreases**. The **pressure exerted** on the **main arteries** is known as the **blood pressure** and is recorded by a blood pressure measuring instrument.



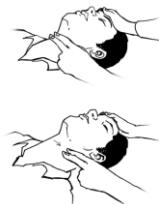
PULSE

With each heartbeat blood is ejected into the arterial system. Most of the arteries are placed deep in the body except on the wrist, elbow, neck, groin and ankle. So arterial pulse is normally felt over the lateral side of the wrist, in the neck, temples, and groin and near the ankle. You may not be able to feel arteries even at these sites (except carotid artery in the neck which is a major artery near to the heart) when the person is in shock. Nevertheless, feeling the pulse correctly is not always easy and requires training. Pulse rate in a normal resting adult is between 60 and 100 beats per minute. Tachycardia refers to the heart beating too fast at rest - over 100 beats per minute.

Wrist



Neck



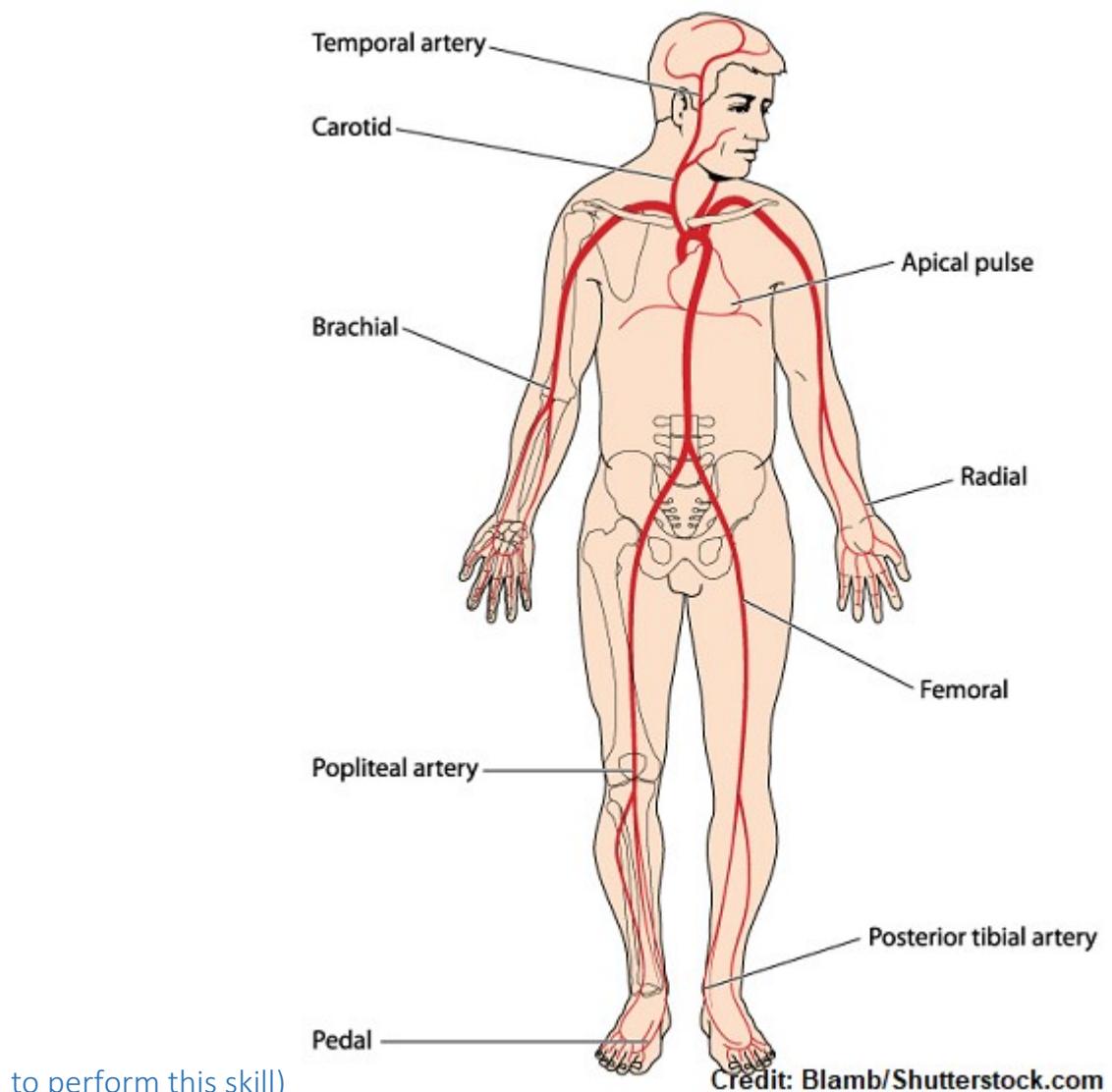
Elbow



Ankle



9 Common Pulse Points (start from head-to-toe...this makes it easier when you have



to perform this skill)

Pulse Points Nursing Assessment

Learn how to **check pulse points** in this *nursing assessment review*.

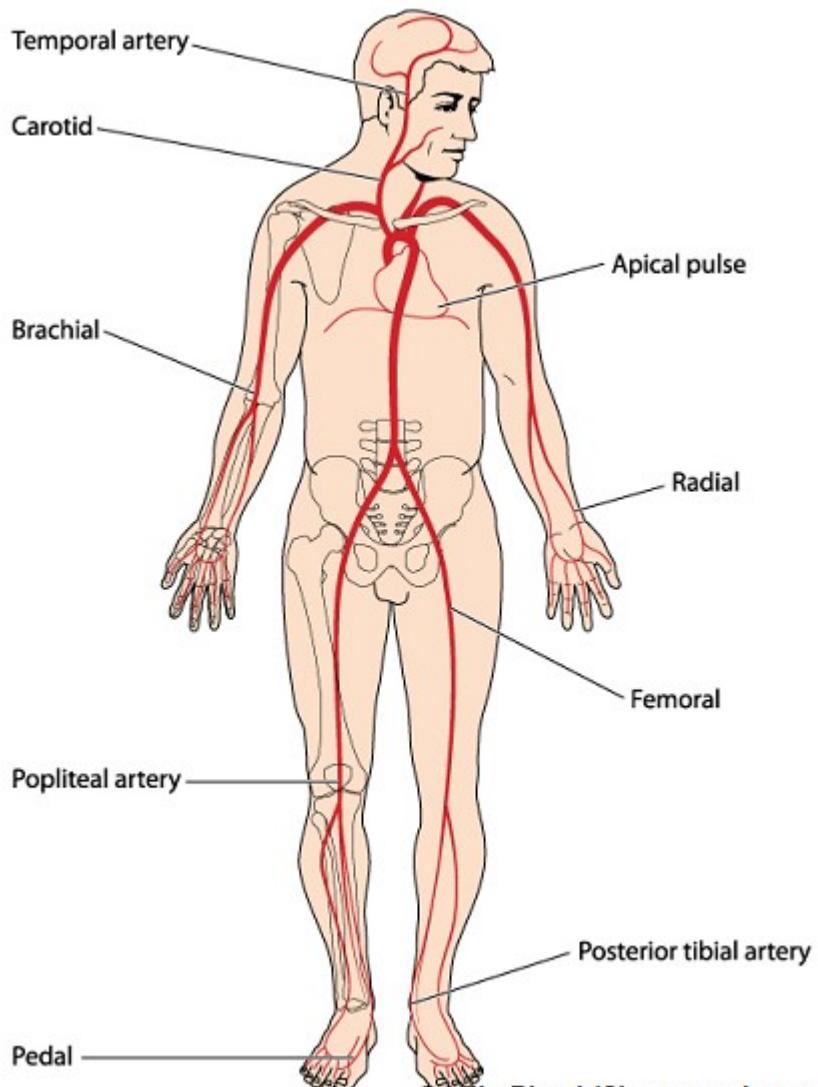
We will review 9 common pulse points on the human body. As a nurse you will be assessing many of these pulse points regularly, while others you will only assess at certain times.

When you assess a pulse point you will be assessing:

- **Rate:** count the pulse rate for 30 seconds and multiply by 2 if the pulse rate is regular, OR 1 full minute if the pulse rate is irregular.
 - Always count the apical pulse for 1 full minute.

- A normal pulse rate in an adult is 60-100 bpm.
- **Strength:** grade the strength of the pulse and check the pulse points bilaterally and compare them. NOTE: always check the carotid pulse points individually (not at the same time) to avoid stimulating the vagal response.
 - 0: absent
 - 1+: weak
 - 2+: normal
 - 3+: bounding
- **Rhythm:** is the pulse regular or irregular

9 Common Pulse Points (start from head-to-toe...this makes it easier when you have



to perform this skill)

Credit: Blamb/Shutterstock.com

1. Temporal
2. Carotid
3. Apical
4. Brachial
5. Radial
6. Femoral

7. Popliteal
8. Posterior Tibial
9. Dorsalis Pedis

Pulse Points Demonstration

Temporal

This artery comes off of the external carotid artery and is found in front of the tragus and above the zygomatic arch (cheekbone). This pulse point is assessed during the [head-to-toe assessment](#) of the head.



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Carotid

This site is most commonly used during CPR in an adult as a pulse check site. It is a major artery that supplies the neck, face, and brain. As noted above, palpate one side at a time to prevent triggering the vagus nerve, which will decrease the heart rate and circulation to the brain. To find the carotid pulse point, tilt the head to the side and palpate below the jaw line between the trachea and sternomastoid muscle.



[Digoxin](#). The pulse rate should be 60 bpm or greater in an adult before the administration of Digoxin. Always count the pulse rate for 1 full minute with your **stethoscope** at this location.

The apical pulse is the point of maximal impulse and is found at the apex of the heart. It is located on the left side of the chest at the 5th intercostal space midclavicular line.

To find the pulse point:

- Locate the sternal notch
- Palpate down the Angle of Louis
- Find the 2nd intercostal space on the left side of the chest
- Go to the 5th intercostal space at the midclavicular line and this is the apical pulse point



Brachial

This is a major artery in the upper arm that divides into the radial and ulnar artery.



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This site is used to measure blood pressure and as a pulse check site on an infant during CPR.

To find this pulse point, extend the arm and have the palms facing upward. The pulse point is found near the top of the cubital fossa, which is a triangular area that is in front of the elbow.

Radial

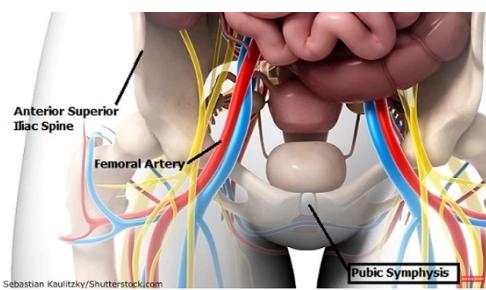
This is a major artery in the lower arm that comes off of the brachial artery. It provides circulation to the arm and hand. It is most commonly used as the site to count a heart rate in an adult.

To find this pulse point, extend the arm out and have the palms facing upward. It is found below the thumb in the wrist area along the radial bone.



Femoral

This is a major artery found in the groin and it provides circulation to the legs. This artery is palpated deeply in the groin below the inguinal ligament between the pubic symphysis and anterior superior iliac spine.



Popliteal

This artery is found behind the knee and comes off of the femoral artery. It is a rather deep artery like the femoral.



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To find the artery, the knee should be flexed. It is located near the middle of the popliteal fossa, which is a diamond-shaped pitted area behind the knee. Use two hands to palpate the



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...one hand assisting to flex the knee and the other to palpate the artery.

Posterior Tibial

This pulse point, along with the dorsal pedis, is assessed during the head-to-toe assessment and is particularly important in patients who have peripheral vascular disease or a vascular procedure (example: heart catheterization when the femoral artery was used to assess the heart).

The posterior tibial pulse point is found on the inside of the ankle between the medial malleolus (bony part of the ankle bone) and Achilles tendon.



Dorsalis Pedis

To find this artery, locate the EHL (extensor hallucis longus) tendon by having the patient

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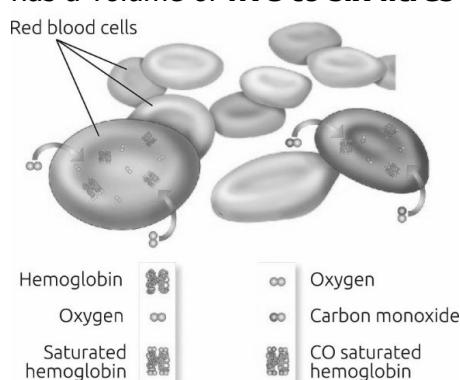


extend the big toe. Then palpate down this tendon and when you come to end of it, go to the side of the tendon and you will find this pulse point.

THE BLOOD

A living human body contains different types of fluids. Blood is one of them. It circulates in a closed system formed by

the heart, the arteries, capillaries and the veins. An average adult has a volume of **five to six litres blood which constantly circulates**.



The blood is a thick viscous liquid of bright red or scarlet colour when it flows from the heart to the arteries and takes a dark red or purple hue when it comes back to the heart via the veins. It has a saline taste.

← Figure c02 ipv C0 ...Blood consists of varieties of cells:

➤ The blood cells which carry **haemoglobin** (**which enables the cells to carry oxygen**) are red in colour and are known as **red blood corpuscles** (RBC).

➤ The other cells are **white blood corpuscles** (WBC) (**which play a role in the defence of the body against infections**) and **platelets** (**which help the blood to clot**). The remainder **yellowish liquid** portion of the blood is **called plasma** which contains **proteins, enzymes and other important ingredients**.

- Whenever blood comes in contact with some external material it tends to solidify, forming a clot to stop further bleeding. When the blood clots inside the arteries, veins or the heart it is referred to as a thrombus.

HOW BLOOD CLOTS

When a blood vessel is severed or damaged, it constricts (narrows) in order to prevent excessive amounts of blood from escaping. At a first stage, specialized blood cells called **platelets come into contact with the damaged vessel wall**, become **sticky and start to clump at the site of the injury**.

Injured tissue cells at the site of the wound together with the clumped *platelets*, trigger a series of **complex chemical reactions** that result in the formation of a substance called **fibrin**. Strands (filaments) of fibrin come together to form a **mesh**, which traps blood cells to make a blood clot. The clot releases a **pale-coloured fluid, called serum**, which contains **antibodies and specialised cells**. The serum begins the process of repairing the damaged area. At first the **blood clot is a jelly-like mass**. Later it **dries out into a crust (scab) that seals and protects the site of the wound until the healing process is complete**.

CHEST DISCOMFORT

Like all body organs, the heart also needs blood to function properly. If someone complains of chest discomfort, it may be a sign that not enough blood is flowing to the heart muscles. This is very serious and can indicate that the person may suffer from a heart attack. A heart attack happens when there is a blockage of the blood flow to some parts of the heart muscle. In that case, a part of the heart muscle starts to die as soon as that region does not get any blood supply. It is serious even if the sick person says that nothing is wrong with him.

When a person complains of chest pain, always suspect an impending heart attack. However, not every chest discomfort or pain is a heart attack. Several other less problematic health problems present with similar symptoms.

Diagnosing a heart attack may not be easy, even for a trained medical staff!

Extra alarm bells to make you consider a **heart-related problem are:**

- _ The pain remains longer than 15 minutes.
- _ The pain is provoked by effort (exertion pain).
- _ There is relief when resting.
- _ The person is known to have cardiac problems or has been prescribed cardiac medicines.

WHAT DO I SEE AND ENQUIRE?

You might observe the following **signs and symptoms** when a person is having a heart attack:

- ❖ discomfort, tightness or pain in the chest;
- ❖ pain spreading to the shoulder, neck, jaw, arm or stomach;
- ❖ the pain might be described as of a dull, heavy or tight character;
- ❖ dizziness and fainting;
- ❖ sweating;
- ❖ difficulty in normal breathing;
- ❖ nausea and vomiting; or
- ❖ distress.

WHAT DO I DO?

SAFETY FIRST AND CALL FOR HELP

1. Make sure there is no danger to you and the person.
2. The 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 or hospital. Tell him to come back to you to confirm if help has been secured.

PROVIDE FIRST AID

- ✓ Make the person lie down in a comfortable position, or propped up position if lying down is not possible. A semi-reclined position is often the most comfortable for such cases.
- ✓ Ask him to rest and not move. He should rest wherever he is at that moment.
- ✓ Loosen tight clothing for more comfort.
- ✓ Reassure the person and tell him what is happening.
- ✓ Ask if the person is taking medication for his heart condition. If so, allow the person to
 - take the prescribed medication.
 - If the patient has prescribed nitro-glycerine with him, it is safe for him to take up to three doses.
- ✓ If there is aspirin available, ask the person to chew on an aspirin tablet and swallow it
 - with some water afterwards. Tell him that this will help the blood flow to the heart.
- ✓ Arrange urgent transport to a nearby healthcare facility or hospital.
- ✓ Keep observing the person in case he collapses.

WHAT DO I DO WHEN THE PERSON BECOMES UNCONSCIOUS, BUT IS STILL BREATHING?

- Put the person in the recovery position.
- Do not leave the victim alone and continue to observe him.

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.

WHEN TO REFER THE PERSON TO A HEALTHCARE FACILITY?

Always urgently seek urgent medical assistance or transport the person to the nearest healthcare facility when you suspect that he is suffering from a heart attack. A heart attack is a life-threatening condition.

A. SIGNS/SYMPOTMS OF A HEART ATTACK

- 1) Chest pain and discomfort (most notable symptom)
- 2) Unbearable crushing type pain felt in the chest and/or back

- 3) Uncomfortable pressure, squeezing, tightness, aching, constricting or heavy sensation in the chest and or back
- 4) Pain that may spread to the shoulder, arm, neck or jaw
- 5) Pain that is constant and usually not relieved by resting, changing position, or taking oral medication
- 6) Breathing difficulty
- 7) Pale or bluish skin color around the face
- 8) Sweating (may be profuse in some patients)
- 9) Changes in pulse rate
- 10) Patient denial of the seriousness of the signs/symptoms

Example: I'm too young or healthy to have a heart problem, or it's just indigestion, something I ate.

ANGINA PECTORIS - Pain that a patient has that has coronary artery disease. This pain usually lasts less than 10 minutes. Patients with angina usually are known to have such disease and have it diagnosed by a doctor.

Nitroglycerin is usually prescribed for these patients. This medication is usually placed under the tongue when these patients have chest pain.

SPECIAL NOTE: The key symptom of a heart attack is chest pain and or back pain.

B. TREATMENT FOR A HEART ATTACK

- Recognize the signals of a heart attack
- Have the patient stop what they are doing and rest (try to make as comfortable as possible)
- Help the patient rest comfortably
- Attempt to obtain information about the patient's condition from other people at the scene
- Call for advanced medical help (Rescue Squad, etc.)
- Assist with medication, if prescribed
- Conduct a secondary survey and monitor vital signs

Ask the following questions to a conscious patient that has persistent chest pain:

- When did the pain start?
- What brought the pain on?
- Does anything lessen the pain?
- What does it feel like?
- Where does it hurt?
- Have you ever had this pain before?
- Have you ever had any type of heart problems?
- What type of medication do you take?

NOTE: Angina patients are often treated by doctors with nitroglycerin. Some patients may not know the name of the medicine but they may only know and have been instructed to place it under their tongue when they have chest pain. Be prepared to give CPR if the patient's heart stops beating.

CARDIAC ARREST

Cardiac arrest - When the heart stops for whatever reason (heart attack, accident, trauma, electrocution, etc.) The most common cause of heart attacks is cardiovascular disease. The primary sign of cardiac arrest is no signs of life(breathing, movement, etc.).

TREATMENT OF CARDIAC ARREST

NOTE: A patient's heart will continue to beat for 3 to 4 minutes when a patient stops breathing. Blood and oxygen will still be getting to the brain.

NOTE: A patient will breathe only a couple times if the heart stops. Blood and oxygen stop flowing to the brain immediately.

CLINICAL DEATH - A patient's breathing and heart have stopped. The brain and other vital organs will continue to live for a few minutes until the oxygen in the blood is used up.

CPR - Keeps the patient's brain supplied with oxygen until the patient receives advanced medical care (EMT's, paramedics, doctors, hospital). Without CPR, the brain will begin to die within 4 to 6 minutes, except in some special situations (cold environment, drowning, etc.)

BLEEDING

Blood circulates in blood vessels (arteries, veins, and capillaries). When a blood vessel is damaged, several mechanisms are activated to control blood loss: the vessel constricts, and a series of chemical reactions occur to form a blood clot as a "plug" over the damaged area. If blood vessels are torn or severed, uncontrolled blood loss may occur before clotting can take place, and *shock* may develop.

TYPES OF BLEEDING

A **bleeding** can be classified by the type of the **blood vessel** that has been **damaged**:

Arterial bleeding.

Arteries carry bright red oxygen rich blood under pressure from the heart. If an artery is damaged, the bleeding may be profuse. The blood will spurt out of it in time with the heartbeat. If a main artery is severed, the blood may jet several feet high. In this case, the volume of the circulating blood will fall rapidly.



Venous bleeding.



The blood in the **veins**, having **given up its oxygen** **into the tissues**, is **dark red**. The blood flows under less pressure than arterial blood, but the vein walls can widen greatly and the blood can 'pool' inside them. If a **major vein** is damaged, the blood may gush from it profusely.

Capillary bleeding.

Bleeding from the capillaries occurs with any wound. At first the bleeding may be brisk, but blood loss is usually slight. A blow may rupture capillaries under the skin, causing bleeding into the tissues (bruising).



A bleeding can also be classified by its location:

➤ **External bleeding.**

If the bleeding is from the **surface of the body**, it is called an **external bleeding**.

➤ **Internal bleeding.**

If the bleeding is **within** the skull, chest and abdomen **or inside the body**, it is called an **internal bleeding**. These bleedings might not have been noticed immediately. At a later stage, blood might ooze out of the **nose or ears (bleeding inside the head)**, be **coughed up (bleeding inside the lungs)**, vomited or defecated (**bleeding inside the digestive tract**) or urinated out (**bleeding inside the urinary tract**).

	10% Blood loss	20% Blood loss	30% Blood loss	40% + Blood loss
Consciousness	Normal	Could feel dizzy while standing	Lowered levels of consciousness. Restless & anxious	Unresponsive
Skin	Normal	Pale	Cyanosis (blue/grey tinge of skin & lips), cold and clammy	Severe cyanosis, cold and clammy
Pulse	Normal (this is the usual amount taken when donating)	Slightly raised	Rapid (over 100 bpm), hard to detect	Undetectable
Breathing	Normal	Slightly raised	Rapid	Deep sighing breaths (air hunger)

FIRST AID FOR BLEEDING (IN GENERAL)

WHAT DO I SEE AND ENQUIRE?

A person who has an injury which is bleeding severely is in a life-threatening situation and needs immediate help. Therefore, stopping the bleeding is a core first aid activity. In addition, bleeding in the face or neck may impede the air flow to the lungs.

There might be an open wound that is bleeding.

 _ The bleeding might be profuse.

 _ There might be an object stuck in the wound. Even if you cannot see an object, there might be something stuck in the wound if:

- ✓ _ the injured feels pain in a specific area;
- ✓ _ the injured person reveals a painful lump;
- ✓ _ the injured person feels there is something stuck in the wound;
- ✓ _ there is a discoloured area where the pain is.

Suspect bleeding inside the body if the injured person:

- is losing blood from body cavities (nose, ear(s), mouth, sex organs, anus);
- is breathing rapidly;
- has a cold and clammy skin that is pale or turns blue;
- has a rapid heartbeat (pulse);
- is behaving in an irritated or unusual way;
- _ has pain or complains about tenderness; sometimes there is also swelling in the abdomen or chest at the place of the suspected internal bleeding;
- _ becomes sleepy or falls unconscious.

Do not raise an injured person's legs if you suspect an injury to the legs or moving the legs is painful. The effect of raising the leg is only limited and moving the legs

WHAT DO I DO?

SAFETY FIRST AND CALL FOR HELP

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

HYGIENE

3. Wash your hands before and 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.
- 4. Put on gloves if available. You can also use a clean plastic bag. Try not to come in contact with the person's blood.**

STOP THE BLEEDING



✓ Ask the injured to sit or lie down or put him in comfortable position.

✓ Comfort the person and explain what is happening to him. Tell the person



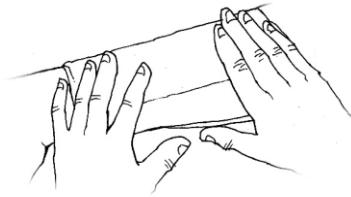
to relax and rest. He should not try to exert.

✓ Try to stop or slow down the bleeding; press with both hands on the wound with a clean cloth or bandage.



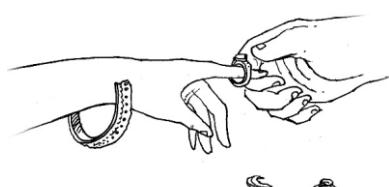
Alternatively, if possible, ask the injured to press on the bleeding wound himself to stop the bleeding.

- ✓ If you have a piece of clean (cotton) cloth, then cover the wound with it.
- ✓ If you have no bandages, improvise with other materials.
- ✓ You can also wrap a bandage



around the wound to slow down the bleeding, but continue to apply pressure until the bleeding stops.

- ✓ Make sure the bandage is firm enough so it stops the bleeding but doesn't cut off all the blood flow.
- ✓ If the part of the body below the bandage changes colour or is swelling or the injured person says he is losing any feeling there, loosen the bandage a little but do not remove it. If the blood flow to a limb is stopped an injured person can lose his limb.
- ✓ Do not apply a tourniquet or fix a bandage above the wound, except in special situations (as specified below)!
- ✓ Only apply a tourniquet:
 - if the bleeding of an external limb cannot be stopped by putting direct pressure on the wound, or
 - if there are many casualties you have to give help to, and the first aider has been well trained on how to apply a tourniquet.
- ✓ If a tourniquet is applied on a bleeding limb:
 - apply it above the wound,
 - note down the time when the tourniquet is applied,
 - maximally have a tourniquet applied for 2 hours,
 - transfer the casualty as quickly as possible to a healthcare facility for further treatment.
- ✓ If the bandage becomes soaked in blood, do not remove it, but add another bandage on top of it and continue to apply pressure.
- ✓ Take off jewels or anything else in the area of the wound that may cut off blood flow because of swelling. Keep the jewels and belongings with the owner or in a safe place.



- ✓ Keep the injured person warm by taking off wet clothing, covering him with a blanket or other covering, taking care not to overheat him.



- ✓ Keep checking for the bleeding and also check that the person is conscious and breathing properly.
- ✓ Stay with the person until medical help is available.
- ✓ Do not give the injured person anything to eat or drink.
- ✓ Arrange transport to the nearest healthcare facility.

WHAT DO I DO IF THE VICTIM LOSES CONSCIOUSNESS, BUT IS STILL BREATHING?

1. If the person is breathing, put him in the recovery position and cover him with a blanket or coat to keep him warm.
2. Continue to put pressure on the wound to stop the bleeding.
3. Do not leave the victim alone and continue to observe the breathing.

WHAT DO I DO IF THE VICTIM STOPS BREATHING?

Start CPR.

Do not interrupt the resuscitation until:

- _ the victim starts to wake up, moves, opens 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.

C.4.2.4 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.

C.4.3 WHAT DO I DO IF AN OBJECT IS STUCK IN THE WOUND?

1. Do not remove the object.



2. Check if the object caused an additional exit wound if it passed through; try to stop the protruding object from moving (do not remove the object) with bulky material and bandages.
3. Build up padding around the object until

you can bandage over it without pressing down.

4. Bandage the material above and below the object

with a piece of clean (cotton) cloth or improvise with other materials.

Make sure the bandage is firm enough so it stops the bleeding but doesn't cut off all the blood flow.

If the part of the body below the bandage changes colour or is swelling or the injured person says he is losing any feeling there, loosen the bandage a little but do not remove it. If the blood flow to a limb is stopped an injured person can lose his== limb.

5. Do not apply a tourniquet or fix a bandage above the wound, except in special situations (see below) Only apply a tourniquet:

- if the bleeding of an external limb cannot be stopped by putting direct pressure on the wound, or
- if there are many casualties you have to give help to, and
- the first aider has been well trained on how to apply a tourniquet.
- If a tourniquet is applied on a bleeding limb:
 - apply it above the wound,
 - note down the time when the tourniquet is applied,
 - maximally have a tourniquet applied for 2 hours,
 - transfer the casualty as quickly as possible to a healthcare facility for further treatment.

6. If the bandage becomes soaked in blood, do not remove it, but add another bandage on top of it and continue to apply pressure.

7. Take off jewels or anything else in the area of the wound that may cut off blood flow because of swelling. Keep the jewels and belongings with the owner or in a safe place.

WHAT DO I DO WHEN I SUSPECT AN INTERNAL BLEEDING?

- Ask the injured person to sit or lie down or make him comfortable.
- Check the airway, breathing and circulation.
- If there is also external bleeding: try to stop or slow down the external bleeding; press with both hands on the wound with a clean cloth or bandage.
- Keep the injured person warm by taking off wet clothing, covering him with a blanket or other covering, taking care not to overheat him.
- Keep checking that the person is conscious and breathing properly.
- If the person stops breathing, start CPR.
- Do not apply hot water bottles or ice bags to the chest or the abdomen.
- The person needs to be transported urgently to the nearest healthcare facility.

WHEN TO REFER TO A HEALTHCARE FACILITY?

Always urgently transport the casualty to the nearest healthcare facility when you suspect he may be suffering an internal bleeding.

After giving first aid, a casualty should always be referred to the healthcare facility for further follow-up or treatment.

However, you also must seek medical help in the following situations:

- ❖ _ the wound is large and/or bleeding profusely;
- ❖ _ you cannot stop the bleeding;
- ❖ _ the injured person lost a lot of blood;
- ❖ _ an object is in the wound;
- ❖ _ the wound has an irregular shape;
- ❖ _ the wound is open;
- ❖ _ the injured person is losing feeling or has problems moving the body part;
- ❖ _ the injured person feels sick, has fainted or lost consciousness;
- ❖ _ the condition of the person worsens;
- ❖ _ the wound is on the face, is on or near the eyes, or in the area of the sex organs;
- ❖ _ the wound has dirt in it and cannot be cleaned properly;

- ❖ _ the colour of the wound or limb changes;
- ❖ _ the person experiences a problem with movement;
- ❖ _ the wound has faeces or urine in it;
- ❖ _ the wound was caused by a bite (from a human or an animal);
- ❖ _ the wound was caused by a stabbing or a bullet;
- ❖ _ the injured person has diabetes or immunity affecting disease;
- ❖ _ the injured person is 65 years old or older; or
- ❖ _ it is more than 10 years since the injured person last had a tetanus toxoid injection or if there is any doubt about when the injured person last had a tetanus toxoid injection. Even small wounds can cause tetanus and it is a very safe injection.

WOUNDS AND INJURIES

A wound is an injury in which the skin or another surrounding surface is torn, pierced, cut or otherwise broken. Wounds can be external or internal in the body. Each type of wound carries specific risks associated with the surrounding tissue damage and infection.

Closed Wounds

When a person has a **closed wound**, the surface of the skin is intact but the underlying tissues are injured. A **bruise (contusion)** is a very common type of closed wound, usually caused by blunt trauma. Bruises occur when the small blood vessels under the surface of the skin are damaged and blood leaks into the surrounding tissues.

Signs and Symptoms of Closed Wounds

The area may appear red or purple, and there may be swelling. The bruised area is often painful.

First Aid Care for Closed Wounds

Applying a cold pack to the bruised area can help to decrease the bleeding and reduce pain and swelling. To make a cold pack, fill a sealable plastic bag with a mixture of ice and water. Before applying the cold pack to the person's skin, wrap it in a thin, dry towel to protect the skin from injury. Hold the cold pack in place for no more than 20 minutes, and then wait at least 20 minutes before applying the cold pack again. If the person is not able to tolerate a 20-minute application, apply the cold pack for periods of 10 minutes on and off. Elevating the injured area may help to reduce swelling, but do not elevate the injured area if doing so causes pain.

Open Wounds

In an **open wound**, the skin's surface is broken and blood may come through the tear in the skin, resulting in **external bleeding** (bleeding that is visible on the outside of the body).

TYPES OF WOUNDS

✓ **Abrasions**

- These wounds are superficial wounds in which the top most layers of the skin are scraped off, leaving a raw, tender area. These wounds appear often when experiencing a sliding fall (e.g. of a bike). The wounds often contain embedded foreign particles which may result in infections. Abrasions do not bleed much, but are usually very painful.



- An **abrasion** occurs when something rubs roughly against the skin, causing **damage to the skin's surface**. You may hear abrasions referred to as "**scrapes**," "**rug burns**," "**road rash**," or "**turf burns**." If you have ever had an abrasion, you know how painful these injuries can be! This is because scraping of the outer skin layers exposes sensitive nerve endings. **Abrasions are shallow wounds that do not bleed much.** However, because of the mechanism of injury (usually a sliding fall), abrasions are often contaminated with dirt and debris. To remove the dirt and debris, rinse the abrasion thoroughly with running water, and then wash the area with soap and water to lower the risk for infection.

✓ **Incisions**



- Incised wounds are caused by sharp instruments such as a knife, razor, etc. The blood vessels show a straight cut and bleeding may be profuse. Other structures such as tendons and nerves may be damaged too.

✓ **Contusions (bruises)**

- Contused wounds are caused by blows, by blunt instruments or by punching. The capillaries are ruptured by the punch and blood leaks into the tissues. Severe contusion might be an indication of a deeper damage, like a fracture or internal injury.



✓ **Laceration**

- Lacerated wounds are caused by crushing, ripping forces by machinery, or clawing of animals resulting in tears or lacerations. The edges are mostly irregular in shape. There is usually more underlying tissue damage. These wounds are often contaminated with germs; the risk of infection is high. This type of wound sometimes has less bleeding, but is usually very painful.



- ✓ A **laceration** is a cut, commonly caused by a sharp object such as broken glass or a knife. A laceration can also occur when blunt force splits the skin. Deep lacerations may extend through layers of fat and muscle, damaging nerves, blood vessels and tendons. If nerves are damaged, the laceration may not be painful. Bleeding may be heavy or there may be none at all.

- **Puncture wounds** Puncture wounds are caused by stabs or sharp instruments like knives, daggers or nails. These wounds typically have a smaller opening, but may reach deep into the tissue. These may not be very painful.

- ✓ A **stab wound** is a puncture wound by a knife or sharp blade. A **gunshot wound** is the wound caused by a bullet or missile driven into the body. The entry wounds of





gunshot wounds are mostly small and neat. If the projectile also exits the body, the exit wound may be large and ragged.

Amputations

- Amputation is the removal of a limb by trauma. Re-attachment of amputated limbs, fingers or toes might be possible if the injured and the amputated part(s) arrive at the hospital as soon as possible.



COMPLICATIONS OF WOUNDS

Wounds can cause two great dangers:

- ✓ _ Bleeding, and
- ✓ _ Infection

BLEEDING

Bleeding is the immediate complication of a wound and must be treated immediately.

INFECTION

Germs are tiny, not visible to the human eye, organisms that can cause diseases. Germs are *bacteria, viruses, fungi* and *protozoa*.

An *infection* is caused by germs getting into the body through the broken skin. The germs multiply in the wound and make it '**infected**', also called as '**septic**'. Germs may later get into the bloodstream and cause a *septicaemia*.

A wound is initially not infected, even though it may be contaminated by dirt or materials that contain germs. An infection occurs after a lapse of time when the germs have time to multiply and invade the tissues. This time varies with the number of germs and their virulence and the body's resistance to fight back. Pus formation is part of the body's method to fight an infection.

The prevention of infection is very important. The first step consists of personal hygiene and the washing of your hands prior and after taking care of a person.

SMALL CUTS AND ABRASIONS

Even if the injured person has a small cut or abrasions, you will still need to take care of the wound to stop the bleeding and to prevent infection.

WHAT DO I SEE AND ENQUIRE?

You might observe the following signs on a person with a cut or abrasions:

- ✓ _ the skin or the tissue is damaged,
- ✓ _ open skin or tissue might be bleeding,
- ✓ _ the bleeding might be minor or profuse,
- ✓ _ the skin might be discoloured, or
- ✓ _ the casualty might feel pain.

WHAT DO I DO?

HYGIENE

- Wash your hands before giving care. 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.

➤ **STOP THE BLEEDING AND BANDAGE THE WOUND**

- Try to stop or slow down the bleeding: press on the wound with a clean cloth or bandage. If possible, ask the injured person to press on the cut or graze himself to stop the bleeding.
- Rinse out the wound with clean water. You can also use boiled and cooled water.



- Pour water on the wound until you cannot see any foreign material left in the wound. If necessary, wash out the wound under running water. Foreign material means dirt or anything else that comes from outside the injured person's body.



In the event the wound is bleeding profusely, do not waste time cleaning it. Your priority is to stop the bleeding by applying pressure on the wound

- If you have a piece of clean (cotton) cloth, then cover the wound with it. Use adhesive strips to close a clean cut. If no strips are available, use a bandage. Bandage the dressing to the wound.
- Do not apply the bandage too firmly. If the part of the body below the bandage changes colour, is swelling or is feeling numb, loosen the bandage a little bit.
- Tell the injured person or the person caring for him to keep the wound dry after cleaning with water or getting wet. Every 2 or 3 days, the wound should be cleaned and the dressing changed.
- If a dressing needs to be changed, do not tear the old one off as this can damage the healing wound. Instead, put enough water (preferably saline water if available) on the old dressing so that it comes off easily.
- If the wound is infected, then always refer him to a healthcare facility for further care.



Even small wounds need attention to prevent infection. Even if the injured person has received appropriate medical care, there is a need to watch out for infection in the wound.

The following signs might indicate an infection:

- _ pain that is getting worse;
- _ swelling, hot or red skin around the wound;
- _ the wound shows discharge, or
- _ person having fever or feeling unwell.

In these cases the injured should seek further medical help.

HYGIENE

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.

First Aid Care for Open Wounds

Many open wounds are minor and can be cared for effectively using first aid. However, if the wound is deep or extensive, bleeding heavily or uncontrollably, or carries a high risk for infection (e.g., a puncture wound), medical care will be needed

Minor Open Wounds

To care for a minor open wound, put on latex-free disposable gloves and other personal protective equipment (PPE) as necessary. **Apply direct pressure with a gauze pad to stop the bleeding.** It may take several minutes for the bleeding to stop. After the bleeding stops, wash the area **with soap and warm water.** **Rinse under warm running water** for about **5 minutes** until the wound appears clean and free of debris, and then dry the area. Apply a small amount of antibiotic ointment, cream or gel to the wound if the person has no known allergies or sensitivities to the ingredients. **Then cover the area with a sterile gauze pad and a bandage, or apply an adhesive bandage.** When you are finished providing care, wash your hands with soap and water, even if you wore gloves.

Depending on the cause of the wound and the nature of the injury, it may be necessary to see a healthcare provider for treatment.

Tetanus Prophylaxis

When a wound is deep or dirty, you should seek care from a health care provider, especially if you do not know or cannot remember when you last had a tetanus booster shot, or if it has been more than 5 years since your last tetanus booster shot. **Tetanus** is a severe bacterial infection that can result from a puncture wound or a deep laceration. The bacteria that cause tetanus are commonly found in soil and animal manure. Once introduced into the body via a deep or dirty wound, they produce a powerful toxin that can cause muscle paralysis and death. Signs and symptoms of tetanus infection include muscle spasms and stiffness. The spasms and stiffness begin in the jaw and neck, leading to difficulty swallowing (a classic sign of tetanus). As the infection progresses, the muscle spasms and weakness spread to the abdomen and then to the rest of the body. Although the effects of the tetanus toxin can be managed through administration of an antitoxin, prevention through immunization is a better strategy. The initial tetanus vaccine series is usually given during childhood, and then immunity is maintained through a booster shot given at least every 10 years. Death rates from tetanus infection are highest among those who were never immunized against tetanus and those who fail to maintain adequate immunization through regular booster shots.

Placement of Stitches

Suturing a wound closed can speed the healing process, reduce the chance for infection and minimize scarring. Stitches should be placed within the first few hours after the injury. If you think that a wound needs stitches, it probably does. If in doubt, have the wound evaluated by a healthcare provider.



In general, the following types of wounds often require stitches:

- ■■ Wounds that are deep or longer than ½ inch
- ■■ Wounds on parts of the body where scarring could impair appearance or function (for example, the face, hands or feet)
- ■■ Wounds caused by human or animal bites
- ■■ Wounds with jagged edges that gape open
- ■■ Wounds that are bleeding heavily and uncontrollably

Treatment of Infection

Proper wound care helps to lower the risk for infection, but sometimes infections develop anyway. An untreated wound infection can cause complications, including delayed wound healing; infection of nearby skin (cellulitis) or bone (osteomyelitis); or infection throughout the body (sepsis, which can be fatal). See your healthcare provider if you notice signs and symptoms of infection or if the wound does not seem to be healing.

Signs and symptoms of an infected wound may include:

- ✓ ■■ Increased pain, swelling, redness or warmth in the area of the wound.
- ✓ ■■ Red streaks extending from the area of the wound.
- ✓ ■■ Pus (a thick yellow or green fluid) draining from the wound.
- ✓ ■■ Fever.

The healthcare provider may use advanced wound-care strategies, antibiotics or both to eliminate the infection and promote wound healing.

Major Open Wounds

A major open wound (for example, one that involves extensive tissue damage or is bleeding heavily or uncontrollably) requires prompt action. Call 9-1-1 or the designated emergency number immediately and then take steps to control the bleeding until help arrives.

Applying Direct Pressure

Put on latex-free disposable gloves and other personal protective equipment (PPE) as necessary (for example, if blood is spurting, you may need to wear eye and face protection). Cover the area with **a sterile gauze pad or other clean dressing and apply direct pressure** with your gloved hand until the bleeding stops. This may take as long as **15 minutes**. If **blood soaks through the first dressing, place another dressing on top of the first and apply additional direct pressure (press harder than you did before, if possible)**. Repeat with **additional dressings as needed**, always maintaining direct pressure. Do not remove the blood-soaked dressings because disturbing them may disrupt clot formation and restart the bleeding.

When the bleeding stops, check the skin on the side of the injury farthest away from the heart (e.g., the hand or foot) for feeling, warmth and color. Then apply a bandage over the dressing to maintain pressure on the wound and to hold the dressing in place. To apply a

roller bandage, hold one end of the roller bandage in place while you wrap the other end around the wound and dressing several times, using overlapping turns. Make sure the dressing is completely covered and allow a margin of several inches on all sides. Tie or tape the bandage to secure it. **The bandage should be snug but not too tight. Check for feeling, warmth and color again. If there is a change in feeling, warmth or color from your first check** (for example, the skin is cooler or paler than it was before, the area is swollen, or the person complains of a numb or tingly feeling), **then the bandage is too tight and needs to be loosened.**

Have the person rest comfortably and provide care for shock, if necessary, until help arrives. Remember to wash your hands with soap and water after providing care, even if you wore gloves. Skill Sheet 6-1 describes step by step how to use direct pressure to control external bleeding.

Applying a Tourniquet

A **tourniquet** is a device placed around an **arm or leg to constrict blood vessels and stop blood flow to a wound**. In some life-threatening circumstances, you may need to use a tourniquet to control bleeding as the first step instead of maintaining direct pressure over several minutes.

Examples of situations where it may be necessary to use a tourniquet include:

- ✓ Severe, life-threatening bleeding that cannot be controlled using direct pressure.
- ✓ A physical location that makes it impossible to apply direct pressure to control the bleeding (e.g., the injured person or the person's limb is trapped in a confined space).
- ✓ Multiple people with life-threatening injuries who need care.
- ✓ A scene that is or becomes unsafe.

If you find yourself in a situation where you need to apply a tourniquet, a commercially manufactured tourniquet is preferred over a makeshift device. Follow the manufacturer's instructions for applying the tourniquet. Although tourniquets may have slightly different designs, all are applied in generally the same way.

First, place the tourniquet around the **wounded extremity about 2 inches above the wound**, avoiding the joint if possible. Secure the tourniquet tightly in place according to the manufacturer's instructions. **Twist the rod (windlass) to tighten the tourniquet until the bright red bleeding stops**, then secure the rod in place. Note and record the time that you applied the tourniquet and be sure to give EMS personnel this information when they arrive. **Once the tourniquet is applied, it should not be removed until the person reaches a healthcare facility.**

If it is necessary to use a tourniquet and a commercially manufactured **tourniquet is not available, make a tourniquet using a strip of soft material that is 2 to 4 inches wide (such as a triangular bandage that has been folded into a tie)** and a short, sturdy stick or other rigid object. Tie the stick or other rigid object into the material and twist it to tighten the makeshift tourniquet.

Using Hemostatic Dressings

A **hemostatic dressing** is a dressing **treated with a substance that speeds clot formation**. As is the case with tourniquets, hemostatic dressings **are used when severe life-threatening bleeding exists and standard first aid procedures fail or are not practical**. Typically, hemostatic dressings are used on parts of the body **where a tourniquet cannot be applied, such as the neck or torso**. A hemostatic dressing can also be used to control bleeding from an open wound on an arm or a leg if a tourniquet is ineffective. The hemostatic dressing is applied at the site of the **bleeding (possibly inside of the wound) and is used along with direct pressure**.

Open Wounds with Embedded Objects

In some cases, the object that caused the wound may remain in the wound. If the embedded object is large (for example, a large piece of glass or metal), do not attempt to remove it. Instead, place several dressings around the object to begin to control blood loss, and then pack bulk dressings or roller bandages around the embedded object to keep it from moving. Bandage the bulk dressings or roller bandages in place around the

Tourniquets can be extremely painful. If you must apply a tourniquet, make sure the person understands the reason for the tourniquet, and warn the person that it may be painful.

object and seek medical care. Remember to monitor the person for signs and symptoms of shock.

A small partially embedded object, such as a splinter, can usually be removed using first aid techniques; however, medical care should be sought if the splinter is deep, completely embedded in the skin, or located under the nail or in the eye. To remove a simple shallow splinter, grasp the end of the splinter with clean tweezers and pull it out. Then provide care as you would for any minor open wound.

Traumatic Amputations

Traumatic amputation is the loss of a body part as a result of an injury. Common causes of **traumatic amputations include injuries involving power tools, farming or manufacturing equipment; motor-vehicle collisions; explosions and natural disasters**. In a traumatic amputation, the body part might be severed cleanly from the body or ripped away as a result of being **subjected to violent tearing or twisting forces**. Crushing forces can also result in mangled tissue and traumatic amputations. The body part may be completely detached from the body, or it may still be partially attached. Bleeding may be minimal or severe, depending on the location and nature of the injury.

When a person has experienced a traumatic amputation, call 9-1-1 or the designated emergency number. If the body part is **completely detached from the body**, try to locate it because surgeons may be able to reattach it. **Wrap the amputated body part in sterile gauze or other clean material**. Put the wrapped body part in a **plastic bag** and seal the bag. Keep the bag containing **the body part cool by placing it in a larger bag or container filled with a mixture of ice and water**. **Do not place the bag containing the body part directly on ice or dry ice**. Give the bag containing the body part to EMS personnel so that it can be taken to the hospital along with the person.

AMPUTATION

Amputation is defined as the full or partial severing of a limb, and is extremely traumatic for the casualty. The priority here is to stop the bleeding, then preserve the amputated limb and reassure the casualty.

Re-attachment of amputated limbs, fingers or toes might be possible if the injured and the amputated part(s) arrive at the hospital as soon as possible.

In case of an amputation:

- Control the bleeding by providing direct pressure to the wound. Put a clean cotton bandage on the wound.



- Place the amputated part in a clean plastic bag.
- If possible, place the packed amputated part in a container of ice. Do not put ice directly on the amputated part – the amputated part should always be packed in a clean plastic bag.
- Do not put liquids or antiseptic products on the amputated part.
- Mark the package clearly with the casualty's name and the time the amputation occurred.
- Arrange urgent transport of the

casualty and the amputated part to the nearest hospital.

- 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.
- Always urgently transport the casualty suffering an amputation injury to the nearest healthcare facility, If the amputated part has been recovered, do not forget to send it together with the casualty.

SHOCK

This life-threatening condition occurs when **the circulatory system fails and as a result vital organs such as the heart and the brain are deprived of oxygen**. It requires emergency treatment to prevent permanent organ damage and death.

Shock can be made worse by fear and pain. Whenever there is a risk of shock developing, reassuring the casualty, making him comfortable and keeping him warm may be sufficient to prevent him from deteriorating.



CAUSES OF SHOCK

- ✓ **_ Hypovolemic shock**

The most common cause of shock is severe blood loss. If the blood loss exceeds **1.2 litres (this is about one-fifth of the normal blood volume of an adult)**, **shock may occur**. The blood loss may occur due to external and/or internal bleedings. Loss of other body fluids can also result in shock. Conditions that cause heavy fluid losses include diarrhoea, severe burns, etc.

- ✓ **_ Cardiogenic shock**

In addition, shock may occur when an adequate volume of blood is available, but the heart is unable to pump the blood around. This problem can be due to severe heart diseases, heart attack or acute heart failure.

✓ **_ Other types of shock**

Other causes of shock include overwhelming infections (*septic shock*), lack of certain hormones, low blood sugar level (*hypoglycaemia*) (*metabolic shock*), under-cooling (*hypothermia*), injuries to the respiratory track or lungs (*respiratory shock*) and severe allergic reactions (*anaphylactic shock*), drug overdose or spinal cord injuries (*neurogenic shock*).

WHAT DO I SEE AND ENQUIRE?

You might observe following symptoms:

⊕ **_ Initially:**

- **_ rapid pulse;**
- **_ pale looks;**
- **_ cold clammy, sweaty skin.**

⊕ **_ As shock develops:**

- ⊕ **_ rapid, shallow breathing;**
- ⊕ **_ cold, clammy skin;**
- ⊕ **_ rapid, weak pulse;**
- ⊕ **_ dizziness or fainting;**
- ⊕ **_ weakness;**
- ⊕ **_ eyes appear to stare;**
- ⊕ **_ anxiety or agitation;**
- ⊕ **_ seizures;**
- ⊕ **_ confusion or unresponsiveness;**
- ⊕ **_ low or no urine output;**
- ⊕ **_ bluish lips and fingernails;**
- ⊕ **_ sweating;**
- ⊕ **_ nausea and vomiting might occur.**

⊕ **_ The casualty might feel thirsty.**

⊕ **_ The casualty might become restlessness and aggressive.**

⊕ **_ The casualty might complain of chest pain.**

WHAT DO I DO?

1. Reassure the casualty (when conscious)
2. Treat the possible cause of shock that you can detect, such as a severe bleeding.
3. Lay the casualty comfortably on his back on a blanket.
However, in cases of injury of the head, chest or of the abdomen, lower the head slightly and turn it to a side.
In cases of vomiting put the casualty in the recovery position.
4. You may raise and support the legs. However, do not do this when you suspect a fracture or spinal injuries.
5. Loosen the tight clothing.
6. Keep the injured person warm by taking off wet clothing, covering him with a blanket or other covering, taking care not to overheat him.

**Never use hot water bottles or very warm rugs.
Do not rub any part of the body to get him warm.**

7. In case of major injuries nothing should be given by mouth as he may later need an operation or blood transfusion.

The general principle is never to give food or drink to a casualty. Important exceptions include hypothermia (low body temperature), hypoglycaemic shock (low blood sugar in a diabetes patient), diarrhoea and fever leading to dehydration and in case of heat exhaustion or heatstroke when the person remains conscious.

8. Observe the casualty's consciousness and breathing.
9. If the casualty loses consciousness, put him in the recovery position.
10. If the casualty stops breathing, start CPR.
11. Arrange urgent transport to the nearest healthcare facility or hospital.
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.

WHEN TO REFER TO A HEALTHCARE FACILITY?

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

AN ELECTRIC SHOCK

An electric shock occurs when a person comes into contact with an electrical energy source. When an electric current touches or flows through the body, this is known as an electric shock. Exposure to electrical energy may result in a life-threatening situation as there may be damage to internal organs. It can happen wherever there is live electricity. The effects of an electric shock range from none at all to severe injury and death.

Anyone who receives a high voltage shock or an electrical burn should seek medical advice immediately.

Effects on the body

A person may get an electric shock due to faulty household wiring.

Electrical currents cause [four Trusted Source](#) main types of injuries:

- **Flash:** A flash injury typically causes superficial burns. These occur due to the heat of an arc flash, which is a type of electrical explosion. The current does not penetrate the skin.
- **Flame:** These injuries occur when an arc flash causes a person's clothes to ignite. The current may or may not pass through the skin.
- **Lightning:** These involve short but high voltage electrical energy. The current flows through a person's body.
- **True:** The person becomes part of the circuit, and the electricity enters and exits the body.

The symptoms of electric shock depend on many factors. Injuries from low voltage shocks are most likely to be superficial, whereas prolonged exposure to electrical current may cause deeper burns.

Secondary injuries can occur following an electric shock. A person may respond by jerking away, which might cause them to lose balance or fall and injure another part of their body.

Short-term effects

Depending on the severity of the electrical injury, its immediate effects may include:

- [burns](#)
- [irregular heartbeat](#)
- [seizures](#)
- [tingling](#) or prickling sensations
- [loss of consciousness](#)
- [headaches](#)

Some people may notice unpleasant sensations but not have apparent physical damage, whereas others may experience a lot of pain and have obvious tissue damage. Those who have not experienced a significant injury or cardiac abnormalities within [24–48 hours](#)Trusted Source of the electric shock are unlikely to develop them.

More severe outcomes can include:

- [coma](#)
- [heart attack](#)
- respiratory arrest

Long-term effects

One study found that people who had received an electric shock were no more likely to develop heart problems within [5 years](#) of the incident than those who had not.

A person may experience a variety of symptoms, including [neuropsychological](#) and [physical](#)Trusted Source symptoms.

The symptoms may include:

Psychological	Neurological	Physical
post-traumatic stress disorder (PTSD)	memory loss	pain
depression	concentration difficulties	fatigue
anxiety	tingling sensations	headaches
insomnia	fainting	night sweats
reduced attention span	loss of balance	muscle spasms
panic attacks	sciatica	stiff joints

Anyone who has experienced an electric shock, regardless of whether it has caused a burn, should seek advice from a healthcare professional.

Electric shocks can result from contact with:

- faulty electrical appliances or machinery
- household wiring
- electrical power lines
- lightning
- electricity outlets

The domestic electricity running through a typical household is appliances needing 240 V. Industrial and power lines may carry more than 100,000 V. High voltage currents of 500 V and more can cause deep burns, while low voltage currents consisting of 110–120 V can result in muscle spasms.

A person can get an electric shock through contact with an electric current from a small household appliance, wall outlet, or extension cord. These shocks rarely cause severe trauma or complications.

About [halfTrusted Source](#) of electrical injuries occur in the workplace. [High risk](#) occupations for nonfatal electrocutions include:

- construction
- leisure and hospitality
- education and health services
- accommodation and food services
- manufacturing

Several factors can affect the severity of electric shock injuries, including:

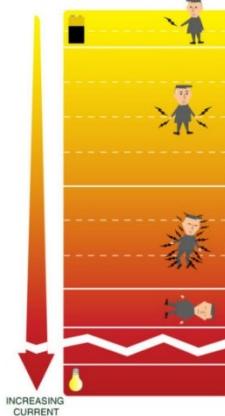


Effects can range from a tingle to cardiac arrest. There is no exact way to predict the injury from any given amperage. The table below shows generally how degree of injury relates to current passing through a body for a few seconds.



The effect of electric shock on the human body is determined by three main factors:

- 1 How much current is flowing through the body (measured in amperes and determined by voltage and resistance)
- 2 The path of current through the body
- 3 How long the body is in the circuit.



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- the intensity of the current
- the type of current — alternating current (AC) or direct current (DC)
- which part of the body the current reaches
- how long a person has exposure to the current
- resistance to the current

The let-go threshold

The let-go threshold is the level where a person's muscles contract, meaning someone safely removes it. This [table](#) shows the body's response to different intensities of current, using millamps (mA) as the measurement:

that they are unable to let go of the electrical source until someone safely removes it. This [table](#) shows the body's response to different intensities of current, using millamps (mA) as the measurement:

Current (mA) Response

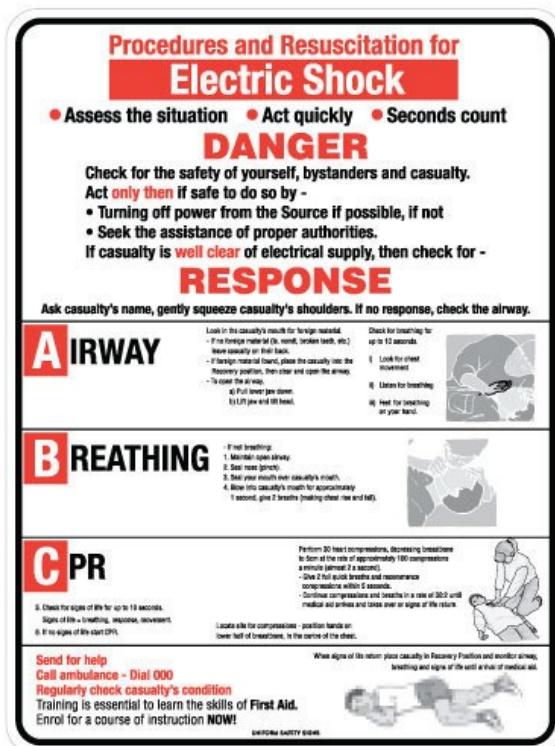
0.2–2	an electrical sensation
1–2+	a painful shock
3–5	let-go threshold for children
6–10	minimum let-go threshold for adults
10–20	possible seizure at the contact point
22	inability to let go, for 99% of adults
20–50	possible seizures
50–100	possible life threatening heart rhythms

First aid

Minor electric shocks, such as those from small household appliances, do not typically need medical treatment. However, a person should see a doctor if they have experienced electrocution.

First Aid for Electric Shock Victims

- Don't touch them!



determine whether they are breathing.

- Unplug the appliance or turn off the power at the control panel.
- If you can't turn off the power, use a piece of wood, like a broom handle, dry rope or dry clothing, to separate the victim from the power source.
- Do not try to move a victim touching a high voltage wire. Call for emergency help.
- Keep the victim lying down. Unconscious victims should be placed on their side to allow drainage of fluids. Do not move the victim if there is a suspicion of neck or spine injuries unless absolutely necessary.
- After removing the electrical source, check the person for a pulse, and

- If the victim is not breathing, apply mouth-to-mouth resuscitation. If the victim has no pulse, begin cardiopulmonary resuscitation (CPR). Then cover the victim with a blanket to maintain body heat, keep the victim's head low and get medical attention.
- If the person is faint or pale, lay them down with their head lower than their body and elevate their legs.
- A person should neither touch any burns nor remove burned clothing.

A person can perform CPR by:

1. **Administering compressions:** Place one hand on top of the other in the middle of the chest. Using body weight, push down hard and fast to administer compressions that are 2 inches deep. The aim is to deliver 100–120 compressions per 60 seconds.
2. **Delivering rescue breaths:** First, make sure that the person's mouth is clear. Then, tilt their head back, lift their chin, pinch their nose closed, and blow into their mouth to make their chest rise. Perform two rescue breaths and continue administering compressions.
3. **Repeating the process:** It is important to carry on until help arrives or the person begins breathing.

Diagnosis

At the emergency department, the doctor will perform a thorough physical exam to assess potential external and internal damage. They will likely order tests, which may include:

- electrocardiogram (EKG) to monitor the heart's rhythm
- pregnancy test, which is for pregnant people only, to assess any impact on the developing baby
- CT scan to check the health of the brain, spine, and chest
- blood tests to check for rhabdomyolysis

A medical professional will only order CT scans and blood tests if they suspect internal injury.

First Aid for Electrical Burn Victims

Electrical burns vary in severity depending upon:

- how long the body is in contact with the electric current;
- the strength of the current;
- the type of current; and
- the direction the current takes through the body. Often these burns are deep.

There may be more than one area burned. One area may be where **the current entered the body and another may be where it left**. Electrical burn wounds may look minor on the outside, but could be severe on the inside.

If a person has received an electrical burn, check for shock and follow the steps outlined above. If the person is conscious and there are no signs of shock (such as being cold, clammy, pale and having a rapid pulse), begin treating the burned area.

Do not apply grease or oil to the burn.

Cover the burn with a dry, sterile dressing, but do not cool the burn.

Keep the victim from getting chilled.
Seek medical attention as soon as possible.

Summary

- ❖ Electric shocks range from minor to severe, as do the injuries they can cause. Many electric shocks occur in the home, so it is important to check household appliances regularly for signs of damage.
 - ❖ People working in proximity to the installation of electrical systems should take particular care and always follow safety regulations.
 - ❖ If a person has experienced a severe electric shock, a bystander should call 911 and administer first aid if it is safe to do so.
-

MUSCLES BONES AND JOINTS

Injuries to the muscles, bones and joints include sprains, strains, dislocations and fractures.

A **sprain** occurs when a ligament is stretched, torn or damaged. Ligaments connect bones to bones at the joints. Sprains most commonly affect the ankle, knee, wrist and finger joints.

A **strain** occurs when a tendon or muscle is stretched, torn or damaged. Tendons connect muscles to bones. Strains often are caused by lifting something heavy or working a muscle too hard. They usually involve the muscles in the neck, back, thigh or the back of the lower leg. Some strains can reoccur, especially in the neck and back.

A **dislocation** occurs when the bones that meet at a joint move out of their normal position. This type of injury is usually caused by a violent force that tears the ligaments, allowing the bones to move out of place.

A **fracture** is a complete break, a chip or a crack in a bone. Fractures can be open (the end of the broken bone breaks through the skin) or closed (the broken bone does not break through the skin).

Muscle, bone and joint injuries can be extremely painful. Sometimes the injury will be very obvious—for example, you may see the ends of a broken bone protruding through the skin, or the injured body part might appear bent or crooked (deformed). If a joint is dislocated, you may see an abnormal bump, ridge or hollow formed by the displaced end of the bone. Other times, signs and symptoms of injury may be more subtle, such as swelling or bruising. Usually, the person will try to avoid using the injured body part because using it causes pain. In some cases, the person may be unable to move the injured body part. The person might also report feeling or hearing “popping” or “snapping” at the time of the injury, or “grating” when moving the injured part.

Sometimes when a person has a muscle, bone or joint injury, you will be able to tell right away that you need to call 9-1-1 or the designated emergency number. But not all muscle, bone or joint injuries result in obvious injuries, and some are not serious enough to summon emergency medical services (EMS) personnel. In general, call 9-1-1 or the designated emergency number if:

- A broken bone is protruding through the skin.
- The injured body part is bent, crooked or looks deformed.
- There is moderate or severe swelling and bruising.

- The person heard or felt “popping” or “snapping” at the time of the injury.
- The person hears or feels “grating” when he or she moves the injured body part.
- The person cannot move or use the injured body part.
- The injured area is cold and numb.
- The injury involves the head, neck or spine.
- The person is having difficulty breathing.

The cause of the injury (for example, a fall from a height or getting hit by a vehicle) makes you think that the injury may be severe, or that the person may have multiple injuries.

It is not possible to safely or comfortably move the person to a vehicle for transport to a healthcare facility.

First Aid Care for Muscle, Bone and Joint Injuries

If you have called 9-1-1 or the designated emergency number and are waiting for EMS personnel to arrive, have the person rest without moving or straightening the body part. If the person can tolerate it, apply a cold pack wrapped in a thin, dry towel to the area to reduce swelling and pain.

RICE

In some cases, it may only be necessary for the person to see his or her healthcare provider to have the injury evaluated. If calling EMS is unnecessary, the mnemonic RICE can help you remember how to care for a muscle, bone or joint injury:

R stands for *rest*. Limit use of the injured body part.

I stands for *immobilize*. Stabilize the injured body part with an elastic bandage or a splint to limit motion.

C stands for *cold*. Apply a cold pack wrapped in a thin, dry towel to the area for no more than 20 minutes at a time, and wait at least 20 minutes before applying the cold pack again.

E stands for *elevate*. Propping the injured part up may help to reduce swelling, but do not do this if raising the injured part causes more pain.

Myth-Information. *Myth: Apply heat to a muscle, bone or joint injury to speed healing.* Although applying heat is commonly used to relieve pain associated with chronic muscle, bone and joint conditions such as arthritis, it is not the best treatment for an acute muscle, bone or joint injury. Applying heat causes the blood vessels in the area to dilate (widen), bringing more blood to the area and increasing swelling. Cold, on the other hand, causes blood vessels to constrict (narrow), reducing blood flow to the area, helping to reduce swelling. In addition, applying cold slows nerve impulses, helping to reduce pain.

HEAD, NECK AND SPINAL INJURIES

Traumatic accidents (such as falling from a height, getting hit by or being thrown from a vehicle, or sustaining a blow to the head) can cause head, neck or spinal injuries. Head, neck or spinal injuries are serious because they may involve the spinal cord or the brain. Depending on the nature and severity of the injury, the person may be left with a permanent disability (e.g., traumatic brain injury, paralysis). Some head, neck or spinal injuries are fatal.

Spinal cord injuries can result from trauma that causes one or more vertebrae (the bones that surround and protect the spinal cord) to break. The sharp bone fragments can press into the soft tissue of the spinal cord, damaging it. Damage can also occur if the injury causes the soft tissue of the spinal cord to swell, compressing it against the hard bone that surrounds it. Depending on the location and severity of the spinal cord injury, the person may develop **paralysis** (the loss of movement, sensation or both) in body parts below the level of the injury. **Paraplegia** is paralysis that affects both legs and the lower trunk. **Quadriplegia** is paralysis that affects both arms, the trunk and both legs.

Brain injuries can occur as a result of a blow to the head, a penetrating injury to the head (such as a bullet wound), or exposure to acceleration-deceleration forces that cause the head to snap forward and then back. A blow to the head can lead to a **concussion** (a traumatic brain injury that alters the way the brain functions; Box 6-3), a **brain contusion** (bruising of the brain tissue) or a **brain hematoma** (bleeding into the space between the brain and the skull). Acceleration-deceleration forces, such as can occur with a motor-vehicle collision or a fall from a height, can lead to **diffuse axonal injury** (tearing of nerves throughout the brain tissue).

Causes of Head, Neck and Spinal Injuries

Many different types of accidents can lead to head, neck or spinal injuries. You should especially consider the possibility of a head, neck or spinal injury if the person:

Was hit by a vehicle, thrown from a moving vehicle, or was the occupant of a vehicle involved in a motor-vehicle collision.

Was injured as a result of entering shallow water headfirst.

Was injured as a result of a fall from a height greater than his or her own height.

Was participating in a sport and sustained a blow to the head or collided with another player, the ground or a piece of equipment

Signs and Symptoms of a head, neck or spinal injury

The signs and symptoms of a head, neck or spinal injury depend on the nature and location of the injury, but could include:

- Unusual bumps, bruises or depressions on the head, neck or back.
- Heavy external bleeding of the head, neck or back.
- Bruising of the head, especially around the eyes and behind the ears.
- Blood or other fluids in the ears or nose.
- Confusion or disorientation.
- Changes in level of consciousness.
- Seizures.
- Impaired breathing or vision.
- Nausea or vomiting.
- Partial or complete loss of movement of any body part.
- Loss of balance.
- Behavior similar to that of a person under the influence of alcohol or drugs (e.g., confusion, stumbling, repeatedly asking the same questions, memory loss, nausea or vomiting, speech problems).
- Severe pain or pressure in the head, neck or back (reported by the person or indicated by the person holding his or her head, neck or back).
- Back pain, weakness, tingling or loss of sensation in the hands, fingers, feet or toes.
- Persistent headache.
- A broken or damaged safety helmet.

First Aid Care for Head, Neck and Spinal Injuries

Because evaluation by medical personnel is needed to determine the severity of a head, neck or spinal injury, you should always assume that an injury involving the head, neck or spine is serious and provide care accordingly. If you suspect a head, neck or spinal injury, call 9-1-1 or the designated emergency number. As long as the person is breathing normally, have him or her remain in the position in which he or she was found. If the person is wearing a helmet, do not remove it unless you are specifically trained to do so and removing the helmet is necessary to give CPR. Similarly, if a child is strapped into a car seat, do not remove him or her from it unless you need to give the child CPR.

Facial trauma can range from minor injuries (cuts and abrasions, bruises, bloody noses and knocked-out teeth) to more severe injuries, such as a fracture of one or more of the facial bones. A person with a facial injury may also have a head, neck or spinal injury, such as a concussion.

Mouth Injuries

Injuries to the mouth may cause breathing problems if blood or loose teeth block the airway, so make sure the person is able to breathe. If the person is bleeding from the mouth and you do not suspect a serious head, neck or spinal injury, place the person in a seated position leaning slightly forward. This will allow any blood to drain from the mouth. If this position is not possible, place the person on his or her side in the recovery position. Have the person hold a gauze pad at the site of the bleeding and apply direct pressure to stop the bleeding. (If the person is responsive, having the person apply direct pressure to a wound inside his or her own mouth is easier and safer than doing it for the person.)

Lip and Tongue Injuries

For injuries that penetrate the lip, place a rolled gauze pad between the lip and the gum. You can place another gauze pad on the outer surface of the lip. If the tongue is bleeding, apply a gauze pad and direct pressure. Applying a cold pack wrapped in a dry towel to the lips or tongue can help to reduce swelling and ease pain.

Dental Injuries

If a tooth is knocked out, control the bleeding by placing a rolled gauze pad into the space left by the missing tooth and have the person gently bite down to maintain pressure. Try to locate and save the tooth, because a dentist or other healthcare provider may be able to reimplant it. Place the tooth in Hanks' Balanced Salt solution (e.g., Save-A-Tooth[®]), if available. If you do not have Hanks' Balanced Salt solution, place the tooth in egg white, coconut water or whole milk. If these are not available, place the tooth in the injured person's saliva. Be careful to pick up the tooth only by the crown (the part of the tooth that is normally visible above the gumline) rather than by the root. The person should seek dental or emergency care as soon as possible after the injury. The sooner the tooth is reimplanted, the better the chance that it will survive. Ideally, reimplantation should take place within 30 minutes.

THE PROS KNOW.

_____ If you suspect that a person has a head, neck or spinal injury, approach the person from the front so that he or she can see you without turning his or her head. Tell the person to respond verbally to your questions, rather than nodding or shaking his or her head.

Chest Injuries

The chest cavity contains the heart, the major blood vessels that enter and leave the heart, the lungs, the trachea and most of the esophagus. These vital organs are protected by a bony cage formed by the ribs and breastbone (sternum). Chest injuries may involve the organs and major blood vessels housed in the chest cavity, the bones that form the chest cavity, or both.

Traumatic chest injuries are frequently caused by blunt trauma. Penetrating trauma (e.g., a stab or gunshot wound) is also a common cause of traumatic chest injuries. Internal bleeding is likely when a person has sustained significant trauma to the chest.

Rib fractures are a common chest injury associated with blunt trauma. Although painful, a simple broken rib rarely is life threatening. Broken ribs are less common in children than in adults because children's ribs are more flexible and tend to bend rather than break. However, the forces that can cause a broken rib in adults can severely bruise the lung tissue of children, which can be a life-threatening injury.

Flail chest occurs when multiple ribs are broken in more than one place, usually as a result of severe blunt trauma. This interferes with the mechanics of breathing because the injured area is not able to expand properly. (Expansion of the chest is what draws air into the lungs.) Flail chest is also frequently associated with a **lung contusion** (bruising of the lung tissue), which can be life threatening.

Sucking chest wounds can occur as a result of penetrating trauma. The puncture wound can allow air to enter the space between the lung and the chest wall. The abnormal collection of air in this space puts pressure on the lung, causing it to collapse (a condition called **pneumothorax**). In addition to putting the person at risk for pneumothorax, the object that caused the puncture wound can injure the organs or vessels contained within the chest cavity and cause varying degrees of internal or external bleeding.

Signs and Symptoms of Chest Injuries

A person with a broken rib may take small, shallow breaths because normal or deep breathing is uncomfortable or painful. The person usually will attempt to ease the pain by supporting the injured area with a hand or arm.

Signs and symptoms of a more serious chest injury (such as multiple broken ribs, internal bleeding, a lung contusion or a sucking chest wound) could include:

- Difficulty breathing.
- Flushed, pale, ashen or bluish skin.
- Severe pain at the site of the injury.
- Bruising at the site of a blunt injury, such as that caused by a seat belt.
- Deformity of the chest wall.

Unusual movement of the chest wall when the person breathes, which may include **paradoxical breathing** (when the person inhales, the injured area draws in while the rest of the chest expands, and when the person exhales, the injured area expands while the rest of the chest draws in) or movement of only one side of the chest.

Coughing up blood, which may be bright red or dark like coffee grounds.

A "sucking" sound coming from the wound with each breath the person takes (caused by air entering the chest cavity through an open chest wound).

Signs and symptoms of shock, such as excessive thirst; skin that feels cool or moist and looks pale or bluish; an altered level of consciousness; and a rapid, weak heartbeat.

If the person is showing signs and symptoms of a serious chest injury, or you think that the person might also have a spinal injury, call 9-1-1 or the designated emergency number.

First Aid Care for Chest Injuries

First aid care for a chest injury depends on the type of injury.

Rib Fracture

Give the person a pillow or folded blanket to hold against the injured area to provide support and make breathing more comfortable. The person should be evaluated by a healthcare provider, so call 9-1-1 or the designated emergency number if it is not possible to safely or comfortably move the person to a vehicle for transport to a healthcare facility. While you are waiting for help to arrive, have the person rest in a position that will make breathing easier, monitor the person's breathing and give care for shock, if necessary.

Sucking Chest Wound

The care for a sucking chest wound is slightly different from the care for other types of open wounds. If external bleeding is present, apply direct pressure to the wound to control the bleeding, but remove each dressing as it becomes saturated with blood and replace it with a clean one as needed. If there is no external bleeding, do not cover the wound. It is important to avoid sealing an open chest wound because doing so could lead to life-threatening complications. While you are waiting for help to arrive, monitor the person's breathing and care for shock, if necessary.

Abdominal Injuries

As with chest injuries, abdominal injuries can result from blunt or penetrating trauma and may be accompanied by internal bleeding. It is especially difficult to determine if a person has an abdominal injury if he or she is unresponsive and has no visible signs and symptoms of injury. Always suspect an abdominal injury in a person who has multiple injuries. Conversely, if a person has an abdominal injury, be sure to check the person for other injuries because abdominal injuries are often accompanied by injuries to the chest, pelvis or head.

Signs and Symptoms of Abdominal Injuries

Signs and symptoms of a serious abdominal injury could include:

- ✓ Severe pain.
- ✓ Organs protruding from the abdomen.
- ✓ A tender, swollen or rigid abdomen.
- ✓ Bruising over the abdomen.
- ✓ Nausea.
- ✓ Vomiting (sometimes blood).
- ✓ Signs and symptoms of shock, such as excessive thirst; skin that feels cool or moist and looks pale or bluish; an altered level of consciousness; and a rapid, weak heartbeat.

First Aid Care for Abdominal Injuries

Call 9-1-1 or the designated emergency number for any serious abdominal injury. Carefully position the person on his or her back with his or her knees bent, unless that position causes the person pain or the person has other injuries. While you are waiting for help to arrive, monitor the person's condition and give care for shock, if necessary.

Abdominal organs may protrude through a severe open wound. If organs are protruding through the wound, do not push them back in and do not apply direct pressure to try and stop minor bleeding. After putting on latex-free disposable gloves, remove clothing from around the wound. Moisten sterile dressings with clean, warm tap water or saline and apply them loosely over the wound. Then cover the dressings loosely with plastic wrap or aluminum foil, if available.

Pelvic Injuries

The pelvis is a ring-shaped group of bones that provides support for the trunk; connects the trunk to the legs; and protects the bladder, the rectum, several major arteries and, in women, the reproductive organs. The hip joint is formed by the acetabulum (a cup-shaped indentation on the pelvis) and the upper part of the femur (the thigh bone).

Blunt trauma to the pelvic region can result in pelvic fractures and damage to the internal organs, blood vessels and nerves that are normally protected by the pelvic bones. Usually pelvic fractures result from high-energy impacts (for example, a motor-vehicle collision), but in older adults with osteoporosis (a disease in which loss of bone tissue causes the bones to become fragile and prone to breaking), minor trauma or a fall can result in breaking the pelvis or the upper part of the femur where it forms the hip joint with the pelvis. Pelvic injuries are serious and may be life threatening because of the risk of damage to major arteries or internal organs. Fractures of bones in this area may cause severe internal bleeding and are associated with an increased risk for death in older adults.

Signs and Symptoms of Pelvic Injuries

Signs and symptoms of a pelvic injury may include the following:

- ✓ Severe pain at the site of the injury
- ✓ Bruising, swelling or both at the site of the injury
- ✓ Instability of the pelvic bones
- ✓ Blood-tinged urine
- ✓ Loss of sensation in the legs or an inability to move the legs

Signs and symptoms of shock, such as excessive thirst; skin that feels cool or moist and looks pale or bluish; an altered level of consciousness; and a rapid, weak heartbeat

First Aid Care for Pelvic Injuries

Always call 9-1-1 or the designated emergency number if you suspect a pelvic injury. Avoid moving the person unnecessarily because movement can make the pelvic injury worse, and the person may also have injuries to the lower spine. If possible, try to keep the person lying flat, and give care for shock if necessary.

HEAD INJURIES

Head injuries can be a concussion, a cerebral compression, or fracture of the skull. All head injuries are potentially serious and require a proper assessment because they can impair consciousness.

Head injuries can be associated with damage to the brain tissue itself, damage to blood vessels inside the skull, skull fractures, brain concussions, and compression of brain tissue because of built up pressure due to swelling or bleeding. Assume always that casualty suffering from head injury might also be having a neck or spinal injury.

CONCUSSION

A *concussion* is a 'shake-up' of the brain inside the skull. It can be caused by a blow on the head or a fall. There is a brief period of impaired consciousness following the blow to the head.

The casualty might complain of dizziness, headache, blurred vision or nausea. Typically there is a brief loss of memory of any events that occurred at the time of, or immediately preceding, the injury.

CEREBRAL COMPRESSION

Some head injuries may produce a compression of brain tissue. The pressure inside the skull builds up by swelling or bleeding inside the skull. This condition is life threatening.

Casualties show a deteriorating level of consciousness that may progress to unconsciousness. Therefore, it is important to observe continuously the conscious level of a casualty that experienced a head trauma.

Other signs and symptoms you may observe are:

- _ The person complains of an intense headache.
- _ The person complains of dizziness.
- _ The person complains of drowsiness.
- _ The person complains of blurred or double vision
- _ The breathing gets noisy and becomes slow.
- _ A slow but strong pulse (can be felt if the first aider is experienced in the technique of taking the pulse).
- _ Unequal pupil size.
- _ Weakness and/or paralysis on one side of the face and/or body.
- _ A change in the behaviour or the personality of the casualty.

HEAD INJURIES

The scalp has many small blood vessels near the skin surface. Any cut can result in profuse bleeding and may make the wound appear worse than it is. In case of a severe head injury, a watery fluid (cerebrospinal fluid) and blood may flow out of the nose, ear(s) or mouth.

In case of suspecting a severe head injury:

- Ask the injured not to blow his nose.
- Do not pack the ear or nose. You may eventually place a light dressing on the ear or nose.
- If the person is breathing, put him in recovery position. Be aware of the risk of neck (spinal) injury. Urgent transport to the nearest hospital is required.
- 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.
- Always urgently transport the casualty with a suspected head injury to the nearest healthcare facility,

The three main areas of concern with head injuries are concussion, compression and a fractured skull.

➤ Concussion

Concussion occurs when the brain is violently shaken. Our brains are cushioned within our skulls by ‘cerebro-spinal fluid’ (CSF), so any blow to the head can cause the brain to bang against the skull which disrupts its usual functions. A casualty may pass out briefly (**no more than 2-3 minutes**), and when they come round their level of response should return to normal. Concussion casualties should return to normal if no complications arise. However, a concussed casualty should not be left on their own and should ideally be monitored for 24 hours. **No sporting**

activity should be undertaken for at least three weeks after a concussion.

➤ *Compression*

- Compression injuries are very serious, as the brain is under extreme pressure which is caused by bleeding or swelling in the cranial cavity. Compression can arise from a skull fracture or head injury, but can also be brought on by illness (type of stroke, brain tumour, meningitis, etc.).

➤ *Fractured skull*

- Fractures to the skull are very serious as the broken bone of the skull can cause direct damage to the brain which can cause bleeding and therefore compression. Treat any casualty who has had a head injury, and whose response level is low, as having a fractured skull.

➤ **Possible signs and symptoms of head injury**

Concussion	Compression	Fractured Skull
Casualty is unconscious for short period, after which response levels are back to normal, recovery is usually quick.	Possible history of recent head trauma with recovery, followed by deterioration.	Casualty may suffer from concussion or compression also, so symptoms of these may be present.
Short term memory loss, groggy, confused irritable.	Response level deteriorates as the condition develops.	Bleeding, swelling or bruising of the head.
Mild headache.	Severe headache.	Soft, egg shell feeling of the scalp.
Pale, clammy to the touch.	Flushed, dry skin.	Bruising apparent around the eyes. 'Panda eyes'.
Shallow to normal breathing.	Deep, slow and noisy breathing (due to pressure on brain).	Bruising or swelling behind one or both ears.
Rapid, weak pulse.	Slow, strong pulse caused by raised blood pressure.	Blood or fluid coming from an ear or the nose.
Pupils are normal and react to light.	One or both pupils may dilate as pressure on the brain increases.	Deformity or lack of symmetry of the head.
Nausea and vomiting can occur on recovery.	As condition worsens, fits may occur, with no recovery.	Blood visible in the white of the eye.

Treatment of head injuries

Keep in mind that a casualty with any head injury may well be suffering from neck and spine injuries also. Treat the casualty with the utmost care, and call for an ambulance immediately

- □If the casualty is or has been unconscious, you suspect a fractured skull, or their responses deteriorate□Keep their airway clear and

monitor their breathing. □ If the casualty is unconscious, and you don't wish to move them as you suspect a neck injury, you can use the jaw thrust method of keeping the airway clear .

- □ If you are unable to use the jaw thrust method, and you cannot keep the airway clear, put the casualty in the recovery position but **make sure the head, neck and body are in line as you turn them to avoid any further damage to a neck or spinal injury.**
- □ If the casualty is conscious, you can help them lie down, making sure to keep the head and neck in line with the body. You can help stop any movement of their head by placing your hands on either side of the head and keeping it still.
- □ If there is bleeding, help to control it by applying pressure directly to or around the wound. However, if there is blood or fluid coming from an ear, do not try to stop the flow, as the fluid must be allowed to drain.
- □ If there are any other injuries on the casualty, attempt to treat these.
Some tips for treating head injuries:
- □ Monitor the casualty's breathing, pulse and response levels. If the casualty appears to recover, monitor them closely as they may well deteriorate and their response levels drop.
- □ If a casualty has been concussed, try to make sure they are not left alone for the next 24 hours. Advise them to seek medical help as soon as possible.
- □ If a casualty suffers any of the following in the few days after concussion, they should **go to A&E immediately:** worsening headache, nausea or vomiting, drowsiness, weakness in a limb, problems speaking, dizzy spells, blood or fluid from an ear or the nose, problems seeing, seizures or confusion.
- □ If the concussion is received playing sports, do not allow the concussed player to continue until they have seen a doctor. Usually, concussed players are not allowed to participate for up to three weeks after being concussed.

NOSE BLEED

The nose contains small blood vessels that can bleed easily. A nosebleed can be the result of a blow to the nose or a trauma to the face, but can also occur spontaneously because of dryness inside the nose. Other causes include a foreign object in the nose, infection, common cold, allergies, high blood pressure, high altitude, a dry environment, alcohol abuse, disease and the use of certain medication.

During a nosebleed, blood may flow from one or both nostrils. This flow may last from a few seconds to several minutes.

In case of a nose bleed:

1. Ask the person to pinch his nose above the nostrils with index finger and thumb. Tell the injured person to **breathe through the mouth. Ask the injured person**

to lean forward so that he does not swallow or breathe in blood. Swallowing blood can make the person feel sick.

2. Pinch the nostrils for 10 to 15 minutes. If necessary, pinch the injured person's nose yourself.

In a few cases a nose bleed can be serious and lead to death.

The person should seek medical help if:

- ❖ _ blood is still coming from the nose after 20 minutes;
- ❖ _ the nosebleed was caused by a hard punch on the nose; a fall, a road accident, etc.;
- ❖ _ blood spurts from the nose, or
- ❖ _ the injured person turns pale, becomes sleepy or falls unconscious.

3. 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.

Nose Injuries

Falling or getting hit in the nose can result in a nosebleed. Other, non traumatic causes of nosebleeds include breathing dry air and changes in altitude. Certain medical conditions (such as hypertension, or high blood pressure) and the use of certain medications (such as blood thinners) can make a person more susceptible to nosebleeds.

In most cases, you can stop a nosebleed by having the person pinch his or her nostrils together while sitting with his or her head slightly forward. (**Sitting with the head slightly forward helps to keep blood from pooling in the back of the throat, which can lead to choking or, if the blood is swallowed, vomiting.**) Keep the **nostrils pinched shut for at least 5 minutes** before checking to see if the bleeding has stopped. If the **bleeding has not stopped after 5 minutes, keep pinching the nostrils shut for another 5 minutes.** If the bleeding is severe or gushing, call 9-1-1 or the designated emergency number.

BLEEDING OF THE GUMS

Bleeding may occur immediately or after some time after a tooth extraction.

In case of a bleeding of the gums:

1. The person may rinse his mouth with water or saline water.
2. A thick cotton ball can be put in the casualty's teeth socket and tell him to bite on the cotton ball to stop the bleeding.
3. Refer the person to a healthcare facility.

CHEST INJURIES

Injuries to the chest are always serious. Without being visible, there might be fractures of the ribs, tear of the lung, injury to the heart and injuries to blood vessels.

In case of a **penetrating injury a condition called 'pneumothorax' may occur.** Air can enter between the lung membranes and exert pressure on the lung and make the lung to collapse.

The pressure may build up effecting the other lung making the injured breathless.

Air may also come out from the wound during breathing.

First aid care for a chest injury depends on the type of injury.

Rib Fracture

Give the person a pillow or folded blanket to hold against the injured area to provide support and make breathing more comfortable. The person should be evaluated by a healthcare provider, so call 9-1-1 or the designated emergency number if it is not possible to safely or comfortably move the person to a vehicle for transport to a healthcare facility. While you are waiting for help to arrive, have the person rest in a position that will make breathing easier, monitor the person's breathing and give care for shock, if necessary.

Sucking Chest Wound

The care for a sucking chest wound is slightly different from the care for other types of open wounds. If external bleeding is present, apply direct pressure to the wound to control the bleeding, but remove each dressing as it becomes saturated with blood and replace it with a clean one as needed. If there is no external bleeding, do not cover the wound. It is important to avoid sealing an open chest wound because doing so could lead to life-threatening complications. While you are waiting for help to arrive, monitor the person's breathing and care for shock, if necessary.

In case of a chest injury:

1. Place him in a **half-sitting position** and control the bleeding by **providing direct pressure to the wound**. Leave the open chest wound exposed. Do not apply an occlusive dressing. Eventually put a light dressing on the wound that is not occlusive.
2. Reassure the casualty.
3. You may also encourage the injured to lean towards the injured side and use his hand to cover the penetration wound.
4. If the casualty becomes unconscious but keeps breathing, put him in the recovery position.
5. If the casualty stops breathing, start CPR.
6. Arrange urgent transport to the nearest hospital.
7. 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.

Always urgently transport the casualty with a chest injury to the nearest healthcare facility,



ABDOMINAL INJURIES

Stab wounds, gun shots or crush injuries to the abdomen cause serious and potentially life threatening wounds.

In case of an abdominal injury:

- Control the bleeding by providing direct pressure to the wound.
- Put a clean cotton bandage on the wound.
- Adjust the position of the victim so the wound does not gap
- If the intestines come out:
 - Cover the intestines with a clean plastic bag or a clean pad.



- Do not touch the intestines that came out.
- Do not give anything to drink or eat.
- If the casualty becomes unconscious but is breathing, put him in the recovery position.
- If the casualty stops breathing, start CPR.
- Arrange urgent transport to the nearest hospital.
- 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.
- Always urgently transport the casualty with an abdominal injury to the nearest healthcare facility,

BLEEDING FROM VARICOSE VEINS

Swollen knobly dilated veins, as often found in the legs, are called varices. Bleeding from varicose veins might be very profuse.

In case of a varicose vein bleeding:

- ✓ Ask the person to lie down on the floor.
- ✓ Raise and support the affected leg (this might help to slow down the bleeding).
- ✓ Apply at the same time direct pressure to the site of the bleeding.
- ✓ Put a bandage on the wound.
- ✓ Refer the person to a healthcare facility. Transport the person to the hospital if the bleeding can't be stopped.
- ✓ 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.
- ✓ Transport the person to the nearest healthcare facility if the bleeding can't be stopped.

CRUSH INJURIES

Traffic accidents, building site accidents, explosions and natural disasters (e.g. landslides, earthquakes) are the most common causes of crush injuries. Crush injuries may include fractures, bleedings and swelling.



If the flow of blood to a limb (*such as an arm or leg*) is restricted by a crushing weight, there is the serious danger of a build-up of toxins in the muscle tissue below the crushing weight.

If the flow of blood is restricted to the limb for more than 15 minutes, the toxins will build to such a level that when the weight is removed, and the toxins released into the body, they may cause kidney failure. This is known as 'crush syndrome' and may well result in the death of the casualty.

In case of a crush injury:

- ❖ Try to keep the head of the victim as low as possible.
- ❖ Monitor the respiration and consciousness of the victim.
- ❖ If the victim stops breathing, start CPR.
- ❖ Arrange urgent transport to the nearest healthcare facility or hospital.
- ❖ 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.
- ❖ Always urgently transport a casualty suffering (potential) crush injuries to the nearest healthcare facility,

MOVING AND TRANSPORTING A CASUALTY SUSPECTED OF HEAD, NECK OR SPINAL INJURY

To prevent further injury, a casualty with a suspected head, neck or spinal injury shall be handled with the greatest care. To transport a casualty suspected of a head, neck or spinal injury:

1. Prepare the stretcher; the soft bed of the canvas type of stretcher must be stiffened, preferably by placing short boards across the stretchers, or long ones lengthwise on the canvas if only these are available. If no stretcher is available, a narrow shutter, door or board of at least the same width and length as the patient may be used.
2. Cover the stretcher with a folded blanket and then blanket the stretcher. Place pillows or pads in readiness on the stretcher in a position to support the neck, and small part of the back. Those should be sufficiently large, but not too large, to preserve the normal curves of the spine.
3. Whenever the casualty is to be moved or lifted he must not be bent, twisted or over extended. One bearer must apply firm but gentle support to the head and face, so as to prevent neck movement and another bearer must steady and support the lower limbs to prevent trunk movement. This must be continued until the casualty has been placed on the stretcher.
4. When the casualty is not already lying on a blanket or rug.
 - a. Place the blanket or rug on the ground in line with the casualty, and rolled lengthwise for half its width.
 - b. While the two bearers maintain control of the head and lower limbs, other bearers very carefully turn the casualty on to his side every precaution being taken against movement at the site of the fracture. Place the roller portion of the blanket or rug close to the casualty's back and gently rolls him over the roll until he is lying on his opposite side. Unroll the rolled portion of the blanket or rug gently lowering the casualty on his back so that he lies on the centre of the open blanket or rug. The bearers at the head and at the lower limbs conform to the rolling of the casualty throughout.
5. Loading the stretcher.

There are two methods of loading a stretcher- a standard method (when there is a blanket under the casualty), and an emergency method (when there is no blanket under the casualty), in which case the stretcher can be pushed under the casualty for that it will be necessary for the bearer at the feet to keep his legs wide apart to allow the stretcher to be placed between them.

a. "Blanket lift" is the standard method for loading cases of fractures of the spine when there is a blanket under the casualty. Roll the two edges of the blanket up against the casualty's side. If poles of sufficient length and rigidity are available the edges of the blanket should be rolled around them. This will make the lifting of the casualty very much easier.

While two bearers maintain support of the head and lower limbs, the remaining bearers distribute themselves as required on each side of the casualty facing one another.

On the word of command they raise him by grasping the rolled edges of the blanket and, acting together, carefully and evenly lift him to a sufficient height to enable the stretcher to be pushed underneath him.

If this is for any reason impossible the stretcher should be brought as near to the casualty as circumstances permit and the bearers should move short even

side paces until the casualty is directly over the stretcher, when he should be gently and cautiously lowered onto it.

Ensure that the pads are in the correct position.

b. The "Emergency method" for loading fractures of the spine is used when there is no blanket under the casualty and none is available. Open out the casualty jacket and roll it firmly so that the rolls are close to each side.

Place the casualty on the stretcher adopting the same procedure as described for the blanket lift method except that the bearers grasp the rolled up jacket and/or the clothing and /or bandage round the casualty's thighs instead of the rolled edges of the blanket. When the clothing is insecure, a broad bandage must be placed round the body just below the shoulder for the bearers to grasp.

6. In the case of cervical injuries, place firm supports such as rolled-up blankets or sandbags on each side of the head to steady it.

7. Place a folded blanket in the hollow above the heels so as to relieve pressure on them.

8. Wrap the casualty.

9. If he is to be carried over rough ground, reduce his body movements to a minimum by binding him firmly but not too tightly to the stretcher, with broad bandages. These should be applied round the pelvis, thighs and calves, and round the body and arms, just above the elbows.

10. On reaching the shelter, medical facility or hospital, do nothing further until the arrival of medical aid.

11. The above method of transportation of spinal injury case is to be used only if hard board is not available.

TRANSPORTING UNCONSCIOUS VICTIMS

After giving emergency first aid, the victim is to be placed on a large hardboard or inverted "*charpal*". Secure him on the board and strap him. The head of the victim is to be secured tightly.

Breathing unconscious victims are to be placed in the recovery position and transported in that position. They should be observed continuously. If they stop breathing, they should be turned back on their back and CPR is to be started.

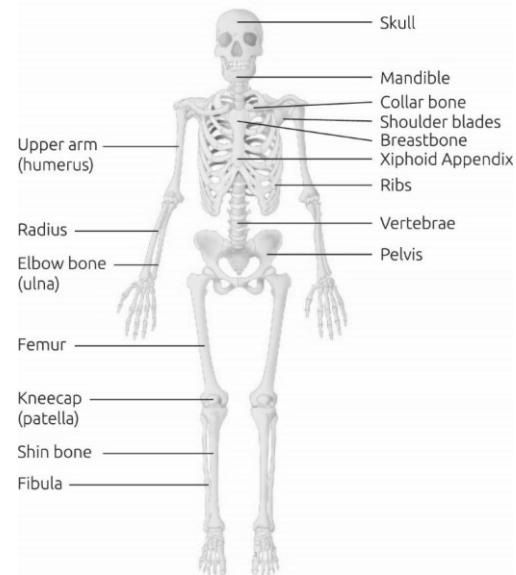
Unconscious non-breathing casualties are transported whilst lying on their back and whilst CPR is continued to be applied.

If due to certain conditions it is not possible to rescue in horizontal position, a vertical position may be required to be used.

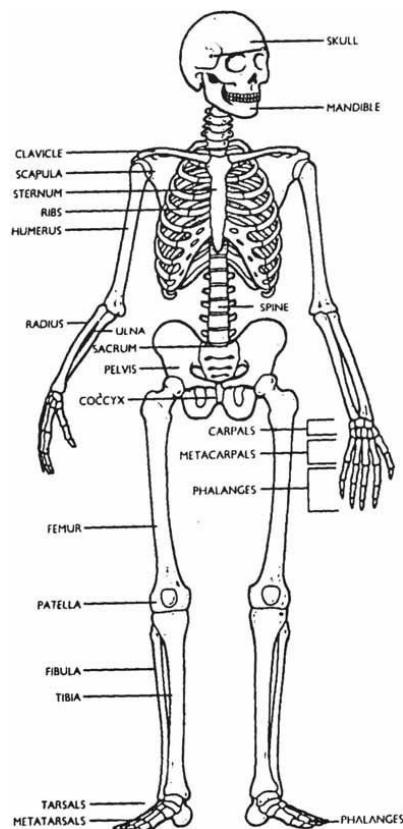
BONES, JOINTS AND MUSCLES

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).



THE SKELETON



The skeletal system

There are 206 bones in the human skeleton, the functions of which are:

- To provide support to the body's soft tissue. This gives the body its shape.
- To provide protection for vital organs such as the brain, lungs and spinal cord.
- To allow movement by incorporating different types of joints and attachment for muscles.
- To produce red blood cells, some white blood cells and platelets within the marrow of bones such as the femur.
- To provide a store of minerals and energy, such as calcium and fats.

Causes of injury

Different types of force can cause injury to the bones, muscles and joints.

Direct force

Damage will result at the location of the force, such as a kick or blow.

Indirect force

Damage will result away from the point where the force was applied, for example a fractured collar bone may result from landing on an outstretched arm.

Twisting force

Damage will result from torsion force on the bones and muscles, for example a twisted ankle.

Violent movement

Damage will result from sudden, violent movements, for example a knee injury from violently kicking.

Pathological

Damage will result from the bones becoming weak or brittle due to disease or old age.

Types of fracture

A fracture is a ‘break in the continuity of the bone’. These are the basic categories for a fracture:

Closed A clean break or crack to the bone with no complications arising.

Open A broken bone will break the skin, and may or may not still be protruding from the wound. Please bear in mind that these types of injury carry a high risk of infection.

Complicated There are usually complications with this type of fracture, such as trapped blood vessels or nerves.

Green stick These are more likely to occur in children who have young, more flexible bones. The bone splits, but is not completely severed. Green stick fractures can easily be mistaken for sprains and strains as only a few of the signs of fracture are present.

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:

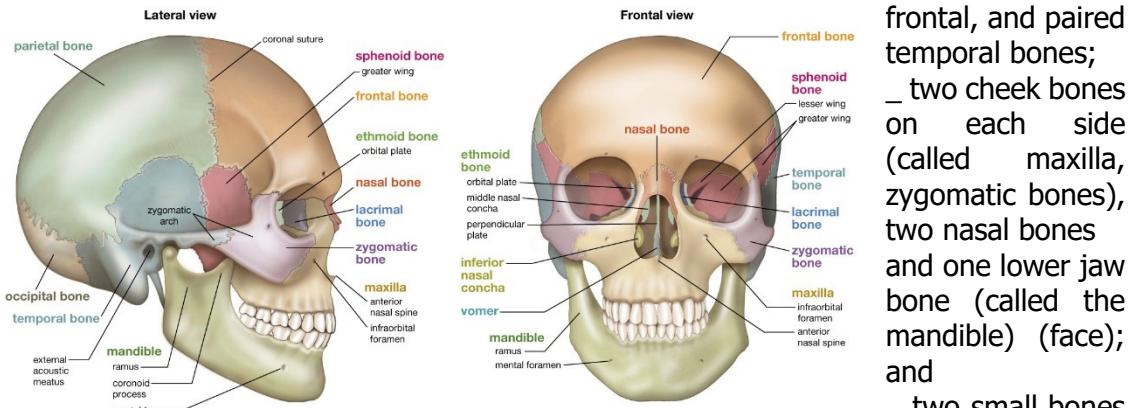
- _ Head and face: skull, two cheek bones and lower jaw bones.
- _ Body: back bone or spine, the ribs and breast bone.
- _ Upper limbs: arm, forearm (long bones), and palm (short bones).
- _ Hip: the pelvis.
- _ Lower limbs: thigh and Leg (long bones), foot (short bones).

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;



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

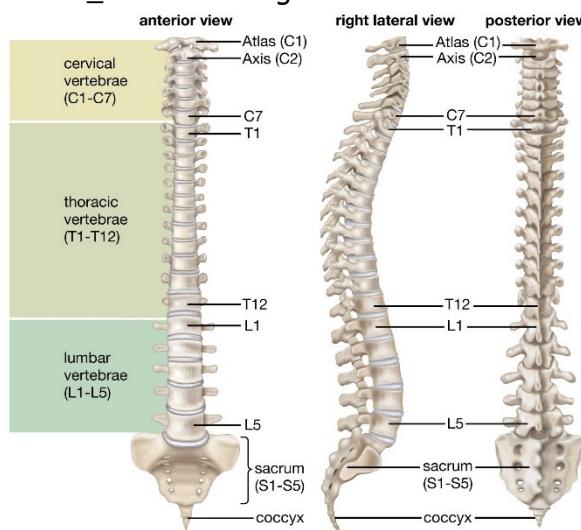
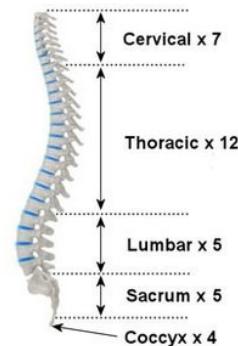
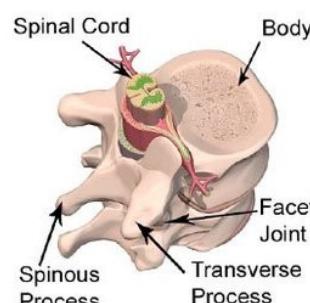
The bones of the skull provide protection for the brain and the organs of vision, taste, hearing, equilibrium, and smell. The bones also provide attachment for muscles that move the head and control facial expressions and chewing.

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.

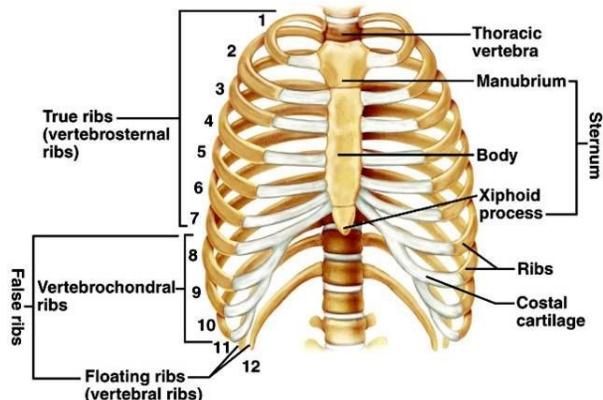


Between each pair of vertebrae is a *disk* of cartilage that acts as a shock absorber and allows movement. Muscles and ligaments attached to the vertebrae stabilize the spine and control the movement of the back. Inside the central canal the *spinal cord* passes which carries impulses from and to the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

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*.

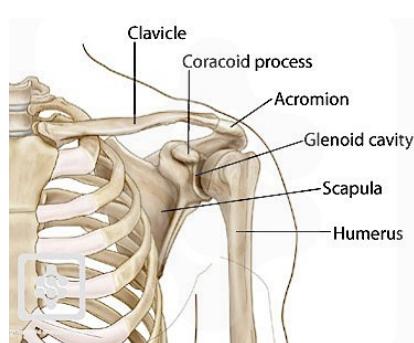
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THE SHOULDERS AND UPPER LIMBS (ARM, ELBOW, WRIST AND HAND)

THE SHOULDER

Each shoulder consists of following bones:



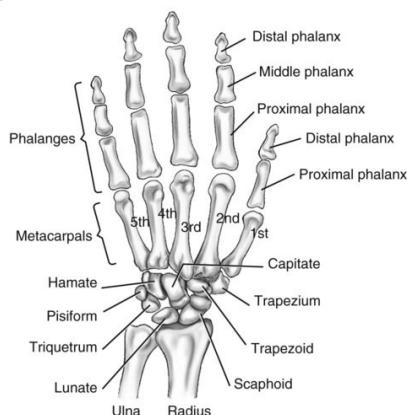
- ❖ _ a collar bone (Clavicle) in the front on each side of the upper part of the breast bone, and
- ❖ _ a shoulder blade (Scapula) on each side at the upper outer back.

THE UPPER LIMB: ARM, ELBOW, WRIST AND HAND

The bones of the upper limbs (arms) are:

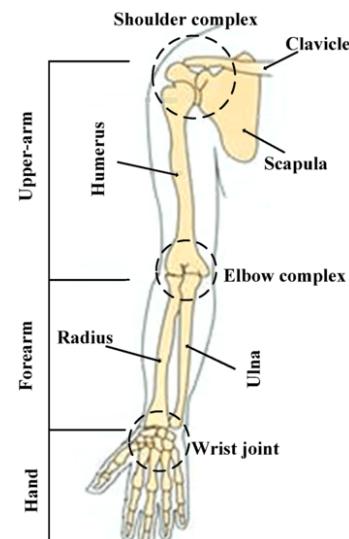
- _ the upper arm, called humerus;
- _ the forearm bones:

- 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).



THE PELVIS AND LOWER LIMBS (LEG, KNEE, ANKLE AND FOOT)

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.

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:

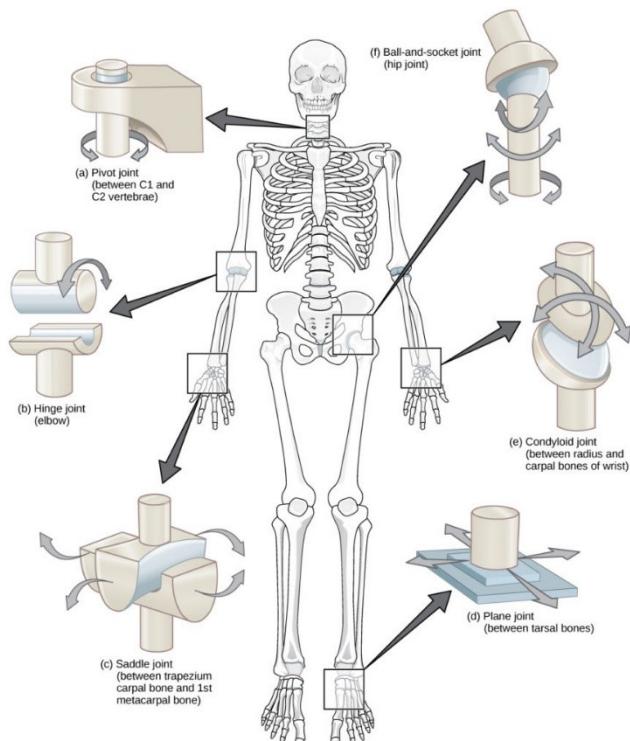
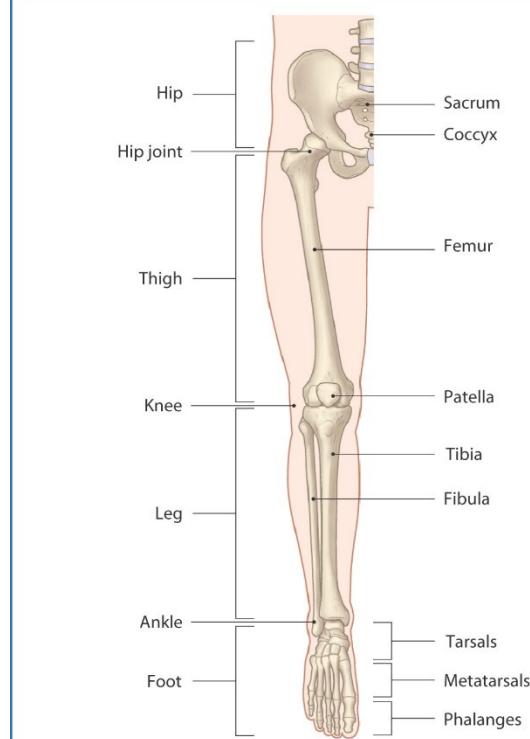
— **Ball and socket joints** as found in the shoulder and hip. The round head of the bone enters the socket of the other bone, allowing movement in several directions and planes.

— **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 vertebrae of the spinal column. These joints allow only limited movements.

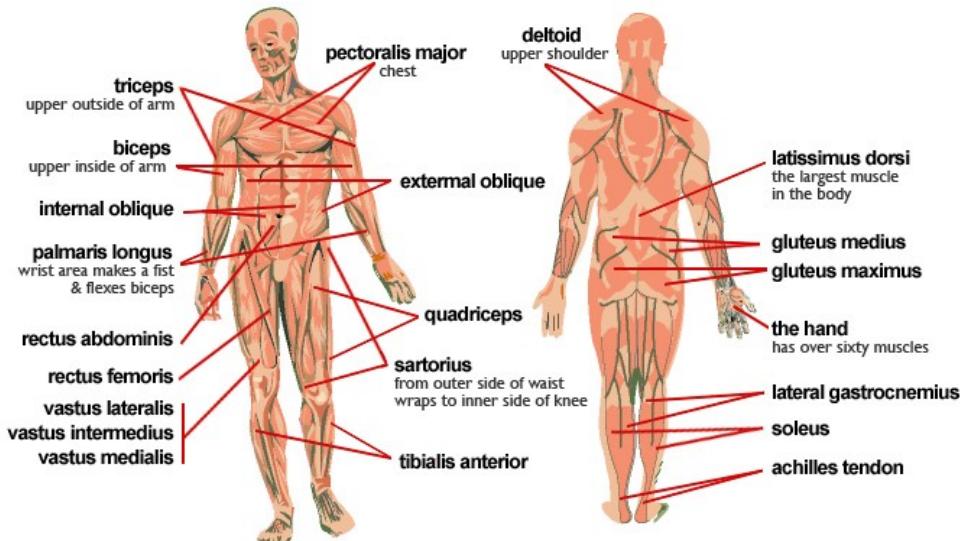
MUSCLES

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 over 630 muscles in body !

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.

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.

CAUSES OF FRACTURES

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

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.

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.

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).

TYPES OF FRACTURES

OPEN AND CLOSED FRACTURES

CLOSED FRACTURES

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

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.

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*'.

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.

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.

WHAT DO I DO?

SAFETY FIRST AND CALL FOR HELP

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

HYGIENE

- ✓ 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 gloves are not available, you can use a clean plastic bag. Try not to come in contact with the person's blood.

PROVIDE FIRST AID

- 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.
- There may be more than one fracture in the same patient or even in the same limb.
- 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.
- Reassure the casualty.
- Advice the person to keep calm.
- 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).
- Arrange appropriate transport to the nearest healthcare facility.
- Continuously observe the casualty.
- Do not give the casualty anything to eat or drink.



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.

WHAT DO I DO WHEN THE PERSON BECOMES UNCONSCIOUS, BUT IS STILL BREATHING?

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

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.

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.

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.

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.

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.
- 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)

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.

WHAT DO I DO?

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.

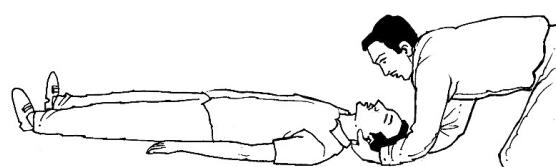
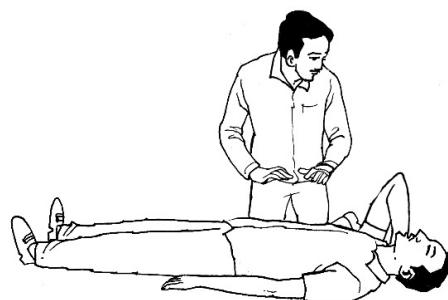
PROVIDE FIRST AID

- Tap him on the shoulders and ask if he is okay. Do not shake the person too roughly.
- 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.

- ✓ Tell the person to stay calm and not to move.
- ✓ Assure the person that you will stay with him and help is being arranged.
- ✓ 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.
- ✓ If the injured does not allow you to hold his head, do not enforce.



- ✓ If the spinal cord injury is suspected, try to ensure that:
 - The injured person continues to lie still until transported to a hospital.
 - The injured person is not made to sit or stand.

- At least 3 people assist in moving the person 'like a log of wood' to transport him to the nearest healthcare facility or hospital.

- ✓ Keep the injured person warm by taking off wet clothing, covering him with a blanket or other covering, taking care not to overheat him.
- ✓ If not done yet, arrange transport to a healthcare facility.



- ✓ Do not leave the person alone and keep on checking his breathing.
- ✓ Do not give the casualty anything to drink or eat.

WHAT DO I DO WHEN THE PERSON LOSES CONSCIOUSNESS, BUT IS STILL BREATHING?

- a) Put the person in the recovery position.
- b) Be careful when moving and turning the victim. It is better to ask assistance by bystanders.
- c) Do not leave the person alone and continue to observe the breathing.

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.

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.

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.

INJURIES AND FRACTURES TO THE CHEEKBONE, NOSE AND LOWER JAW FRACTURE OF THE CHEEKBONE OR NOSE

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.

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.

WHAT DO I DO?

SAFETY FIRST

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

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.

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.



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.

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.

FRACTURES OF THE LOWER JAW

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.

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 steadyng the jaw.
- _ There might be an injury to the tongue that bleeds profusely and might block the air passage.

WHAT DO I DO?

SAFETY FIRST

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

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.

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.

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.

WHEN TO REFER TO A HEALTH CARE 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.

INJURIES TO THE SHOULDER, RIBS OR BREASTBONE

INJURIES OR FRACTURES OF THE SHOULDER

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.

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.

WHAT DO I DO?



SAFETY FIRST

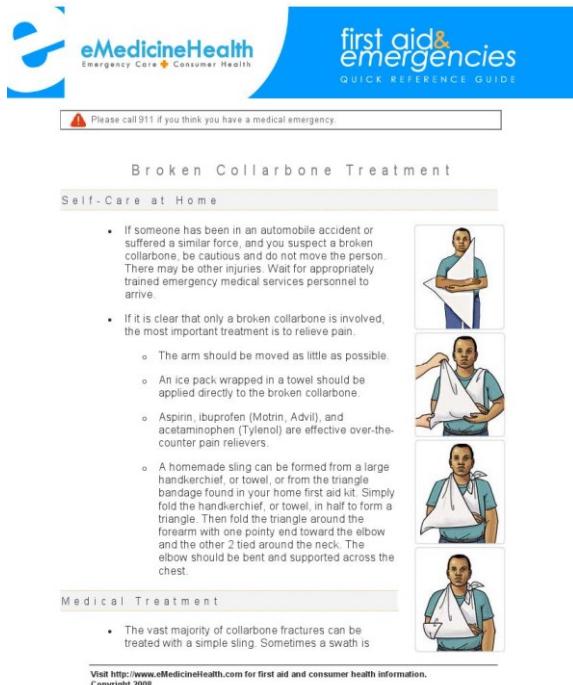
1. Make sure there is no danger to you and the person.

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.

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.

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.

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.

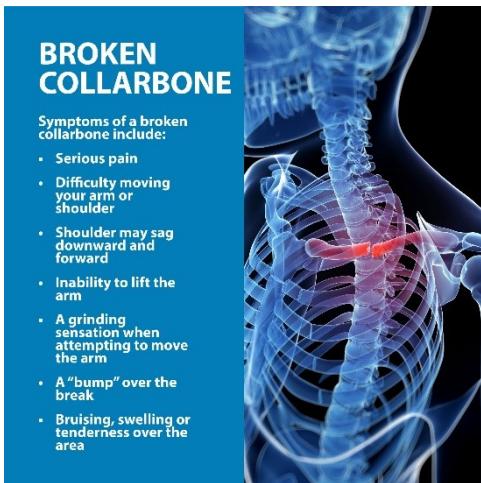
INJURIES AND FRACTURES OF

THE COLLAR BONE

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.

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.

WHAT DO I DO?

SAFETY FIRST

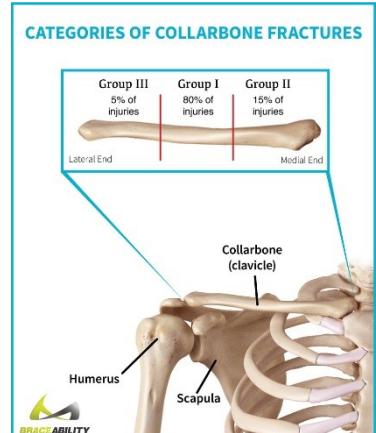
1. Make sure there is no danger to you and the person.

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.

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.



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.

WHEN TO REFER TO A HEALTHCARE FACILITY?

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

RIB INJURIES AND FRACTURES

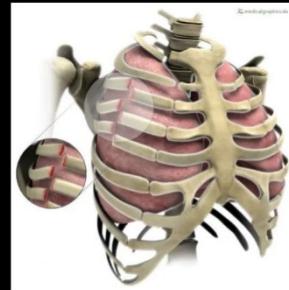
CAUSES OF INJURIES OR FRACTURES OF THE RIBS

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

Causes

- Blunt trauma including motor vehicle crashes, assault, falls, especially down staircases.
- Coughing spells
- Non-accidental trauma in pediatric cases
- Repetitive minor trauma
- Stress #s to the first rib in throwing athletes



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.

WHAT DO I DO? SAFETY FIRST



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

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.

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.

WHEN TO REFER TO A HEALTHCARE FACILITY?

Always transport a casualty with potential rib injury or fractures 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.

FRACTURES OF THE BREAST BONE (STERNUM)

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.

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 difficulty.

Broken Ribs

Signs and symptoms include:

- Severe pain at the fracture site
- Grating sound upon palpation (crepitus)
- Chest deformity
- Shallow, rapid breathing
- Bruising or lacerations at the suspected fracture site
- Frothy blood at the nose or mouth (indicating lung laceration)

First Aid Care

Activate the EMS system immediately, then:

1. Use a sling and swathe to utilize the victim's arm as a splint and support the forearm of the injured side positioned across the chest
2. Position the victim in a supine position.
3. Monitor the victim's ABCDs, watching for signs of internal bleeding that could lead to shock.

9

— The breast bone feels irregular (when running your fingers along it).

WHAT DO I DO?

SAFETY FIRST

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

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.

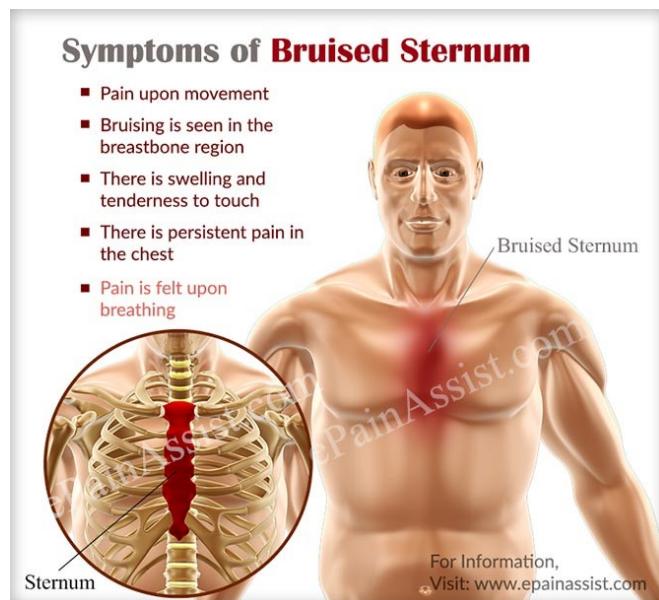
Use gloves to protect yourself. If no gloves are available, you can use a clean plastic bag. Try not to come in contact with the person's blood.

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.

WHEN TO REFER TO A HEALTHCARE FACILITY?

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



INJURIES TO THE ARM, ELBOW, WRIST, HAND OR FINGERS

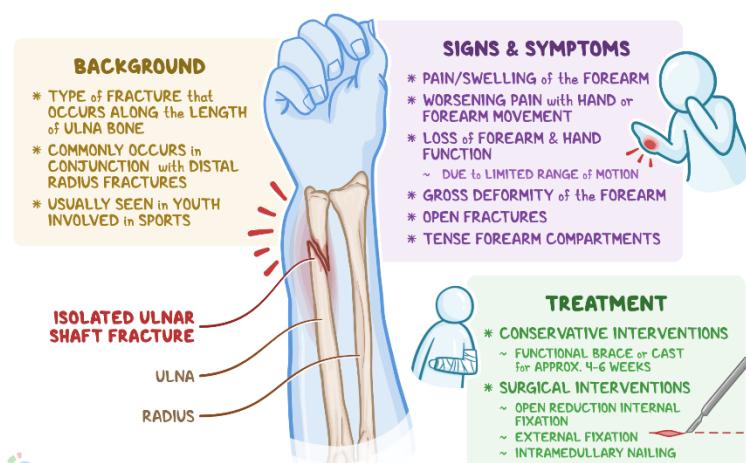
INJURIES AND FRACTURES OF THE ARM (UPPER ARM, FORE ARM, WRIST)

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.

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.



WHAT DO I DO WHEN I SUSPECT A BROKEN ARM?

SAFETY FIRST

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

HYGIENE

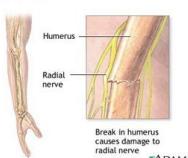
2. If possible, wash your hands before taking care of the injured. Use soap and water to wash your hands. If no soap is available, you can use ash to wash your hands. Alcohol-based sanitizers can also be used, if available.
3. Use gloves to protect yourself. If no gloves are available, you can use a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

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.

Upper Arm Injuries

- Humerus is the longest bone and is usually fractured at the upper (proximal) end.
- Control external bleeding and immobilize the upper arm from the shoulder to elbow.
- If possible, place arm in a sling and bind it to the chest.
- Check circulation before and after splinting.
- Apply ice and minimize shock.



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.

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.

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.

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.

WHAT DO I SEE AND ENQUIRE?



SYMPTOMS OF GROWTH PLATE INJURIES OF THE ELBOW

- Swelling or bruising near the elbow joint.
- Limited elbow movement or inability to move the elbow all together.
- Numbness, tingling and/or shooting pain down the arm.
- Severe pain near the elbow.

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.

SAFETY FIRST

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

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.

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.

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.

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.

INJURIES AND FRACTURES OF HAND OR FINGERS

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.



CAUSES OF FINGER FRACTURES

- A hard fall.
- Athletic competition-related contact.
- Accidentally jamming one's hand inside a doorway.
- Automobile accidents.
- Slamming the hand down in anger or frustration.

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.

WHAT DO I DO?

SAFETY FIRST

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

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.

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.

Symptoms of Broken Finger

- Pain
- Finger Discoloration and Swelling
- Finger Movement
- Lifting or Gripping Objects
- Finger Deformity
- Tingling and Numbness



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.

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

ePainAssist.com

INJURIES TO THE PELVIS, LOWER LIMBS, KNEE, ANKLE OR FEET

INJURIES AND FRACTURES OF THE PELVIS

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!

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.

WHAT DO I DO?

SAFETY FIRST

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

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.

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.

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.

WHEN TO REFER TO A HEALTHCARE FACILITY?

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

INJURIES AND FRACTURES OF THE LEG (THIGH OR LOWER LEG) OR ANKLE

CAUSES OF INJURIES AND FRACTURES 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)**.

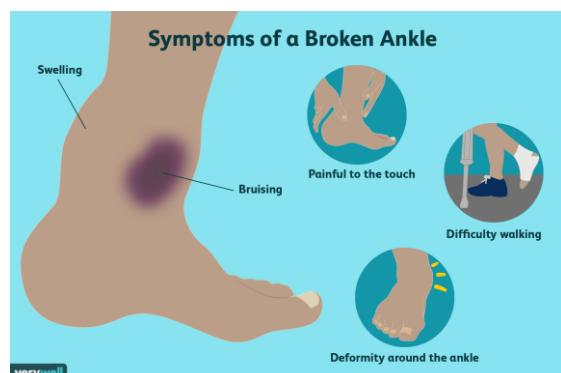


Shin bone fractures are mostly the result of a heavy blow. The splint bone and ankle fractures can result because of twisting of ankle.

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.



WHAT DO I DO WHEN I SUSPECT A BROKEN LEG OR BROKEN ANKLE?

SAFETY FIRST

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

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.

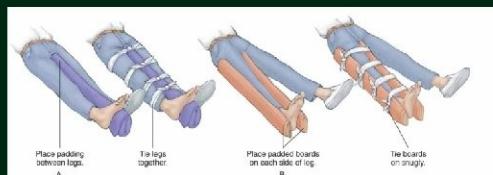
PROVIDE FIRST AID

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

Splinting the Lower Leg

- There are two methods of splinting.



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:

- Carefully move the uninjured leg to the injured leg.
- Use suitable padding to fill in the hollow areas (between the legs).
- Use bandages or strips of

cloth to attach both legs together.

- Do not apply the bandages on the immediate site of the fracture.
- The bandaging should be passed through the natural hollows such as knees or just above the ankles to avoid unnecessary movement of the bones.
- Always tie the knots on the uninjured leg side.
- 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):

AJ HOSPITAL
KAZHAKSTAN

FRACTURE

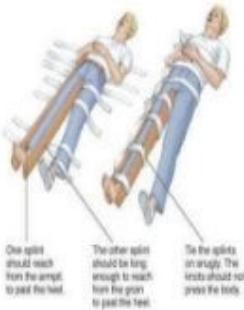
STEP 1- Stop bleeding,don't try to realign the bone.

STEP 2- Immobilize the injured area. Apply splint to the area above and below the fracture sites.This can help to reduce discomfort.

STEP 3- Apply ice packs to limit swelling and help relieve pain.

Femur Splinting

- Two methods (cont'd):
 - Place one board between the person's legs.
- Place another board along the person's side.
- The boards must be well padded.
- Tie the boards to the leg and body securely.



_ 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.

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.

WHEN TO REFER TO A HEALTHCARE FACILITY?

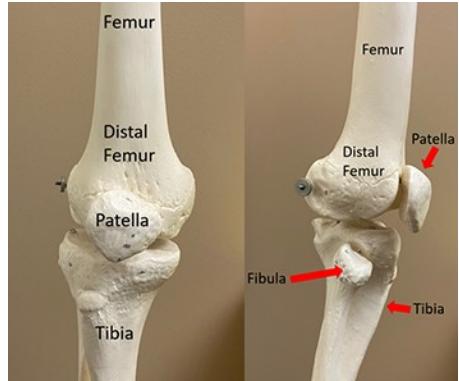
Always urgently transport a casualty with a suspected fracture to the thigh to the nearest healthcare facility. A fracture of the thigh is a serious injury and can result in shock.

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

FRACTURE OF THE KNEE CAP (PATELLA)

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.



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.

WHAT DO I DO WHEN I SUSPECT A BROKEN KNEE CAP?

SAFETY FIRST

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

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.

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
 - c. center of the narrow bandage above the upper part of the fractured piece,
 - d. 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.
 - e. 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.

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.

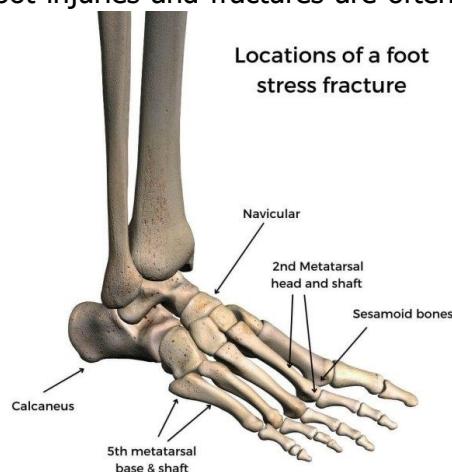
WHEN TO REFER TO A HEALTHCARE FACILITY?

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

INJURIES AND FRACTURES OF FOOT OR TOES

CAUSES OF INJURIES AND FRACTURES 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).



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.



WHAT DO I DO WHEN I SUSPECT A BROKEN FOOT OR TOES?

SAFETY FIRST

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

HYGIENE

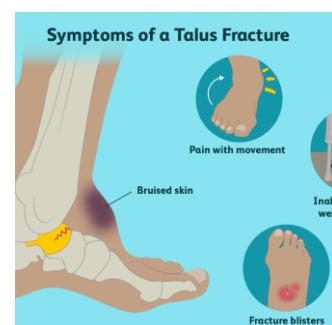
2. If possible, wash your hands before taking care of the injured. Use soap and water to wash your hands. If no soap is available, you can use ash to wash your hands. Alcohol-based sanitizers can also be used, if available.

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.

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.



- 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.

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.

Functional and Structural Classifications of Articulations		
Functional Category	Structural Category and Type	Description
Synarthrosis (no movement) At a synarthrosis, the bony edges are quite close together and may even interlock. These extremely strong joints are located where movement between the bones must be prevented.	Fibrous Suture	 A suture (<i>sutura</i> , a sewing together) is a synarthrotic joint located only between the bones of the skull. The edges of the bones are interlocked and bound together at the suture by dense fibrous connective tissue.
	Gomphosis	 A gomphosis (<i>gom-FÖ-sis; gomphosis</i> , a bolting together) is a synarthrosis that binds the teeth to bony sockets in the maxillae and mandible. The fibrous connection between a tooth and its socket is a periodontal (<i>peri-ē-don-tal</i>) ligament (<i>peri</i> , around + <i>odontos</i> , tooth).
	Cartilaginous Synchondrosis	 A synchondrosis (<i>sin-kon-DRÖ-sis; syn</i> , together + <i>chondros</i> , cartilage) is a rigid, cartilaginous bridge between two articulating bones. The cartilaginous connection between the ends of the first pair of vertebrosternal ribs and the sternum is a <i>synchondrosis</i> .
	Bony fusion Synostosis	 A synostosis (<i>sin-os-TÖ-sis</i>) is a totally rigid, immovable joint created when two bones fuse and the boundary between them disappears. The frontal suture of the frontal bone and the epiphyseal lines of mature long bones are synostoses.
Amphiarthrosis (little movement) An amphiarthrosis permits more movement than a synarthrosis, but is much stronger than a freely movable joint. The articulating bones are connected by collagen fibers or cartilage.	Fibrous Syndesmosis	 At a syndesmosis (<i>sin-dez-MÖ-sis; desmos</i> , a band or ligament), bones are connected by a ligament. One example is the distal articulation between the tibia and fibula.
	Cartilaginous Symphysis	 At a symphysis , the articulating bones are separated by a wedge or pad of fibrous cartilage. The articulation between the two pubic bones (the pubic symphysis) is an example of a symphysis.
Diarthrosis (free movement)	Synovial	 Diarthroses , or synovial (<i>si-NÖ-ve-ul</i>) joints, permit a wider range of motion than do other types of joints. They are typically located at the ends of long bones, such as those of the upper and lower limbs.

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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.

CAUSES OF DISLOCATIONS

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

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.

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.

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.

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.

WHAT DO I DO?

- ✓ _ Do not try to reset the dislocated bone back into 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:

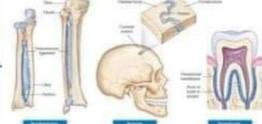
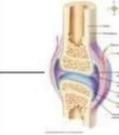
- Jaw Fracture of jaw
- Shoulder Fracture of shoulder
- Elbow Fracture of elbow
- Fingers Fracture of fingers

WHEN TO REFER TO A HEALTHCARE FACILITY?

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

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.

Functional Name	Structural Name	Movement	Example	Description
Synarthroses	Fibrous	Immovable	Syndesmoses	ligaments
			Sutures	skull
			Gomphoses	Teeth to jaw
Amphiarthroses	Cartilaginous (hyaline, fibrocartilage)	Slightly movable	Synchondrosis	Ribs, epiphyseal plate
			Symphyses	Pubis, vertebral discs
Diarthroses	Synovial	Freely movable	Uniaxial	Hinge, pivot
			Biaxial	Saddle, ellipsoidal
			Multiaxial	Ball and socket, gliding

CAUSES OF STRAINS AND SPRAINS

SPRAIN VS STRAIN	
<p>a stretch or tear of a ligament which provides joint stability</p> <p>failing or twisting the wrong way typically causes a sprain</p> <p>ankles, wrists, knees, and fingers are all areas that are frequently sprained</p>	<p>a stretch or tear muscle or tendon in the area where its turning into a muscle</p> <p>commonly occur in the back, shoulder or hamstring</p> <p>lifting too heavy, too strenuous exercise, repetitive movement can cause a strain</p>

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.

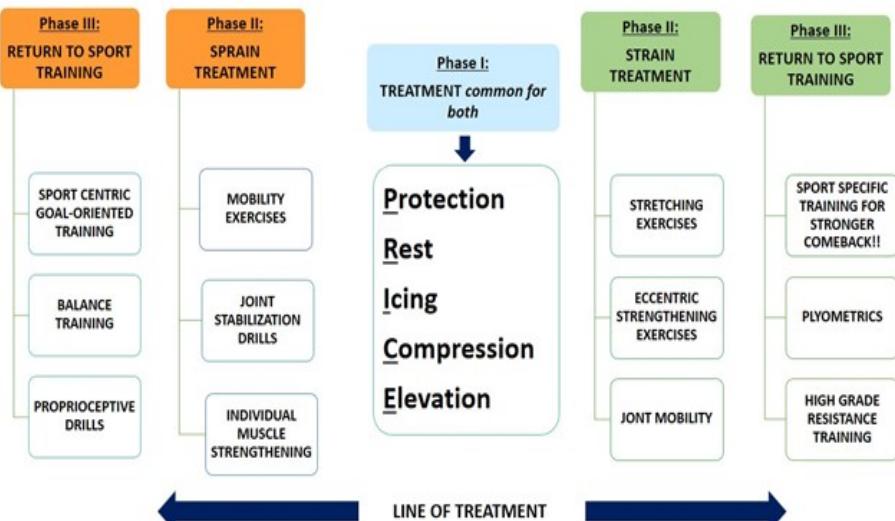
WHAT DO I SEE AND ENQUIRE?

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

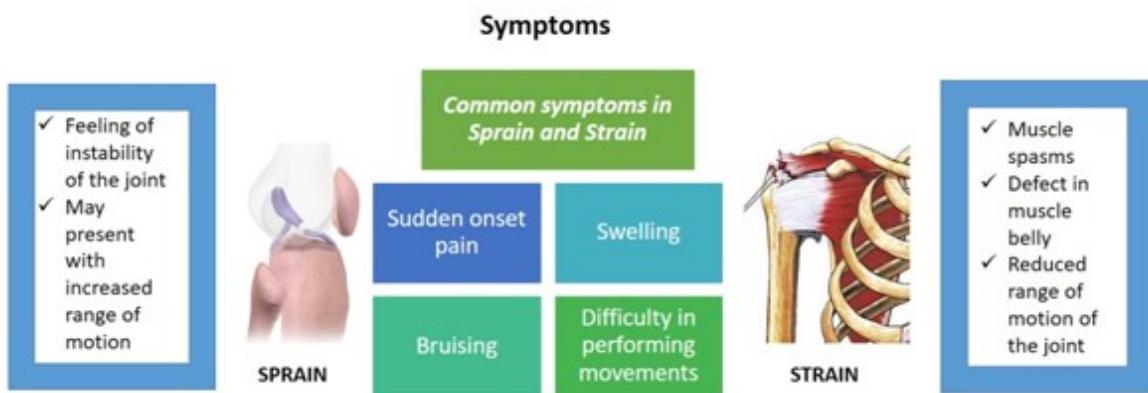
- _ pain in the affected muscle,
- _ swelling,
- _ bruising, or
- _ loss of movement.

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:



SPRAIN VS STRAIN



- _ swelling,
- _ bruising, or
- _ tenderness.

WHAT DO I DO?

SAFETY FIRST

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

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.

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.
4. Wrap ice in a cloth or a towel and apply it on the injury. Ice can reduce the pain and improve the healing.
 - a. The ice should not touch the skin directly!
 - b. If you do not have ice, use cold water and make a cold compress.
 - c. Do not apply for more than 20 minutes
5. Do not massage the injury.
6. Do not put heat on the injury.
7. Do not let the injured person continue the activity – rest is required.
8. Arrange transport to a healthcare facility.

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.

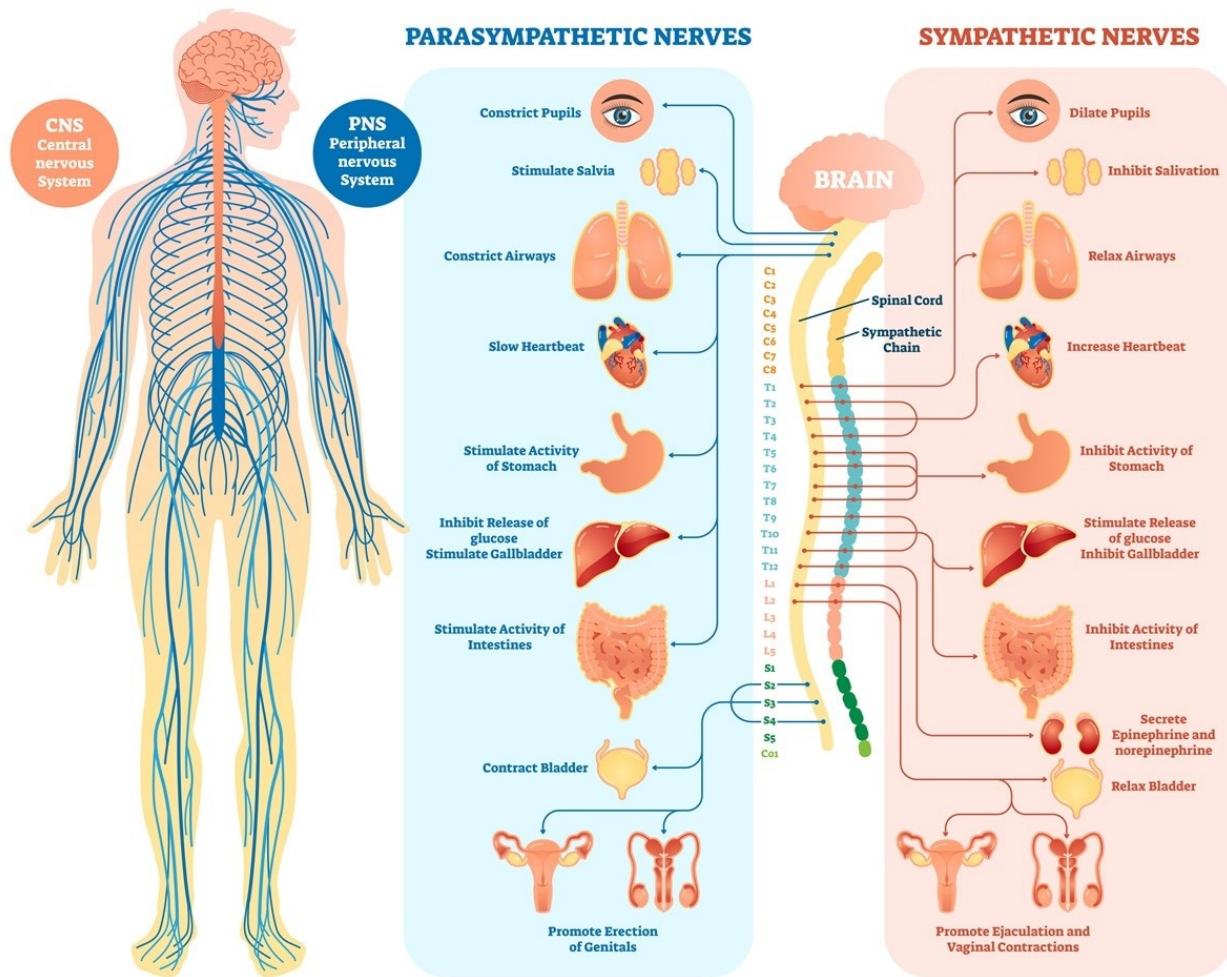
WHEN TO REFER TO A HEALTHCARE FACILITY?

If the pain is severe or the pain does not get better or worsens, the person has difficulty in moving or you think there might be a fracture, always transport the person to a nearby healthcare facility.

NERVOUS SYSTEM AND UNCONSCIOUSNESS

3) Nervous System - Most complex and delicate of all body organs. Consists of the brain, spinal cord and all nerves

HUMAN NERVOUS SYSTEM



- Brain - Master organ of the body
- Brain regulates all body systems including the respiratory and circulatory systems
- Nerves extend from the brain, through the spinal cord to every muscle and every organ in the body
- Brain - Center responsible for consciousness, breathing and heartbeat
- Normal state of consciousness - 3 W's - who, where, what
A patient knowing who they are, where they are and what is happening around them

- Brain cells cannot regenerate or grow back
Damaged brain cells are not replaced
- Paralysis - Loss of feeling or movement below (distal) to an injury

THE NERVOUS SYSTEM

The nervous system consists of:

- the brain,
- the spinal cord, and
- the nerves.

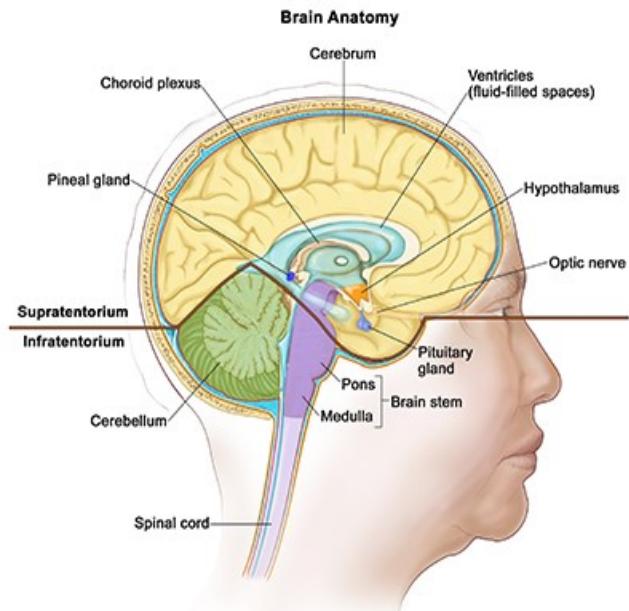
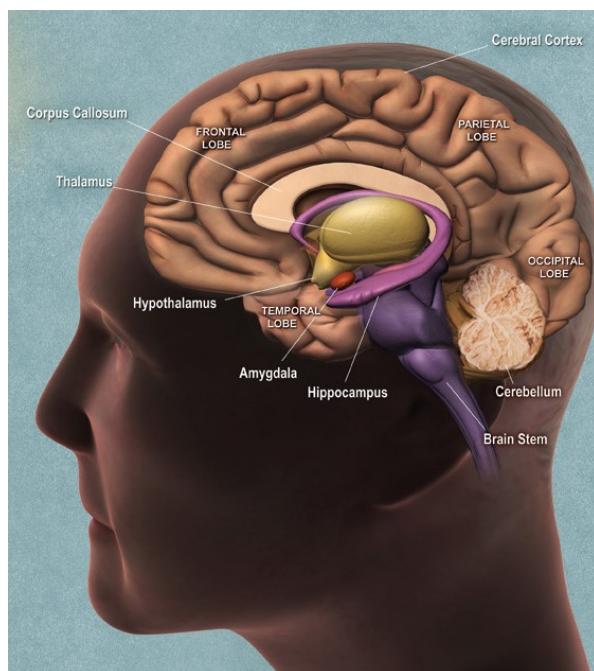
Anatomically the nervous system is divided in a *central* and a *peripheral* nervous system.

THE CENTRAL NERVOUS SYSTEM

The central nervous system (CNS) comprises of the brain and the spinal cord.

THE BRAIN

The brain is an extremely delicate structure made up of a mass of nerve cells. It is



here that sensations are analysed and orders are given to the muscles. The brain is encased in the skull and suspended in a clear fluid, called the *cerebrospinal fluid (CSF)*, which acts as a partial shock absorber. Nonetheless, since the brain is free to move within the skull the brain is sensitive to violent movements or pressure. The brain has three main structures:

- the cerebrum, which is concerned with thought, sensation, and conscious movement;
- the cerebellum, which coordinates movement, balance, and posture; and
- the brain stem, which controls basic functions such as breathing.

THE SPINAL CORD

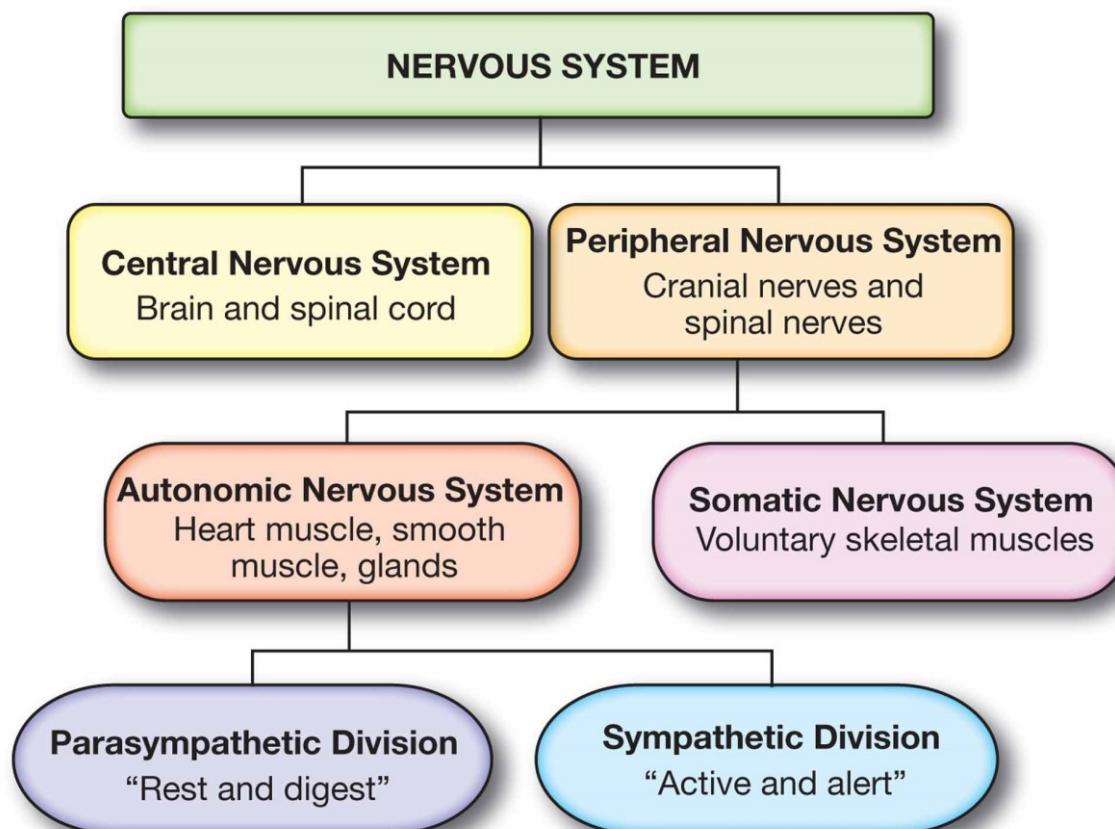
The spinal cord is a mass of nerve fibres extending from the brain through an opening in the base of the skull. The cord runs through the spinal column.

The main function of the spinal cord is to **convey signals between the brain and the peripheral nervous system**.

THE PERIPHERAL NERVOUS SYSTEM (PNS)

The peripheral nerves emerge in pairs, each containing motor and sensory nerves, from the

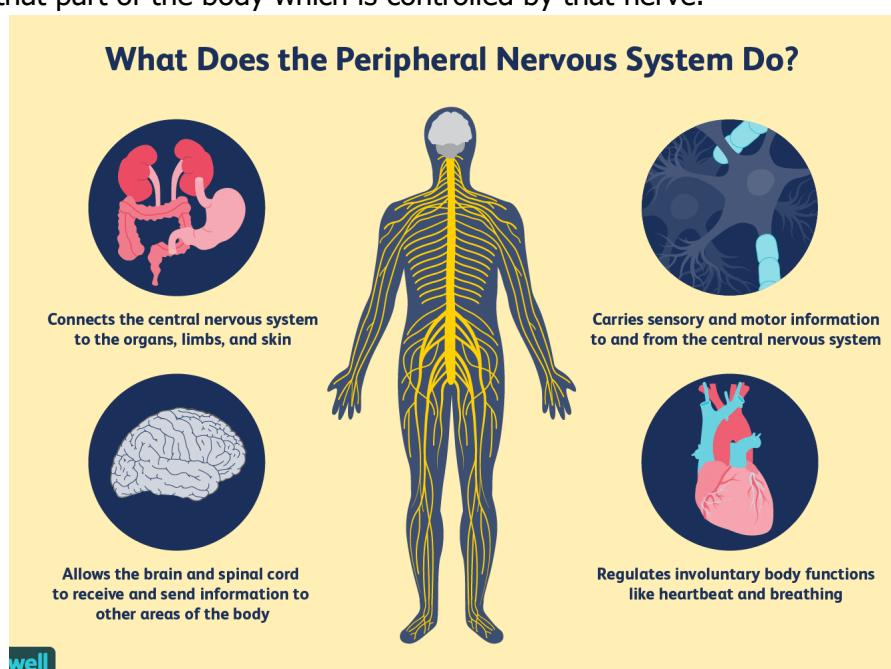
brain and spinal cord. **Sensory nerves transmit impressions received by the senses**



(sight, hearing, touch etc.) to the brain **and motor nerves then transmit the 'orders'** given by the brain to the voluntary muscles. When a nerve is cut there is a loss of feeling, power and movement in that part of the body which is controlled by that nerve.

The peripheral nervous system can be divided in **voluntary or somatic nervous system** and an **autonomic nervous system**.

THE SOMATIC NERVOUS SYSTEM
The somatic system is the part of the peripheral nervous system that is **responsible for carrying motor and sensory information both to and from the central nervous system**. This system is made



up of nerves that connect to the skin, sensory organs and all skeletal muscles. The system is responsible for nearly all voluntary muscle movements as well as for processing sensory

information that arrives via external stimuli including hearing, touch and sight.

THE AUTONOMIC NERVOUS SYSTEM

The *autonomic nervous system* is the part of the peripheral nervous system that regulates key involuntary functions of the body. This system is not controlled by the will and acts continuously whether a person is awake or asleep. **It controls different body functions** including the activity of the heart muscle; the smooth muscles, including the muscles of the intestinal tract; and the glands. The autonomic nervous system has two divisions: the sympathetic nervous system, which accelerates the heart rate, constricts blood vessels, and raises blood pressure, and the parasympathetic nervous system, which slows the heart rate, increases intestinal and gland activity, and relaxes sphincter muscles.

UNCONSCIOUSNESS

Unconsciousness is a state in which the casualty becomes insensible to commands because of an interruption to the normal functioning of the brain. A person has perhaps lost consciousness if he does not react to your action by opening his eyes or answering your questions.

There is no absolute dividing line between consciousness and unconsciousness. People can be **fully conscious (aware and awake) or fully unconscious (no reaction to any stimulus)** or at any level between these two extremes.

Loss of consciousness causes the muscles to relax. During the period of unconsciousness the tongue might fall backwards and block the breathing passage.

In **fainting**, the unconscious state is usually brief as in *vasovagal syncope*. Fainting can occur due to various reasons such as emotional distress, tiredness, hunger, standing up for long period, a sudden change in body position, being a long time in a hot environment, or specific medical conditions.

Pregnant women, children and the elderly can be more vulnerable to these causes.

Longer periods of unconsciousness are more serious. Causes include head injuries, cardiac arrest, stroke or poisoning.

In an unconscious state, the person will be unresponsive to your activities (touching, sounds or other stimulation).

DEFINITION

Unconsciousness is a state of complete or partial unawareness or lack of response to sensory stimuli. Period of unconsciousness may be momentary (faint or syncope) or may last for month.



Fainting

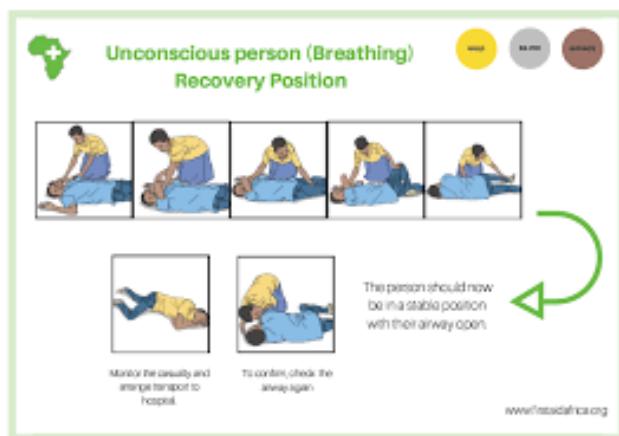
- Definition – a partial or complete loss of consciousness resulting from a temporary reduction of blood flow to the brain
- Signs and Symptoms
 - Lightheaded or dizzy
 - May show signs of shock
 - Numbness or tingling in fingers and toes
 - Sweating
 - Vomiting
 - Everything going dark

Check the following:

- ✓ _ Whether the person opens his eyes and responds to simple questions:
- ✓ _ "What is your name?"
- ✓ _ "Where do you live?"
- ✓ _ "How old are you?"
- ✓ _ Whether the person responds to simple commands:
- ✓ _ "Squeeze my hand."
- ✓ _ "Move your arm/leg/foot/hand."
- ✓ _ If there is no response, pinch the person and see if he opens his eyes or moves.

If the person does not react to any of these stimuli, he is in an unconscious state.

Note that a person might only partially respond to the stimuli you provide (sound, touch, pain); he might be in an in-between state.



When the person becomes conscious again after a period of unconsciousness, he might suffer from:

- ✓ _ confusion,
- ✓ _ drowsiness,
- ✓ _ light-headedness,
- ✓ _ headache,
- ✓ _ loss of bowel and bladder control (incontinence),
- ✓ _ fits, and
- ✓ _ difficulty speaking.

The first aider can measure and record a patient's responsiveness and level of consciousness using the AVPU scale .

CAUSES OF UNCONSCIOUSNESS

There are many causes of unconsciousness and it can occur as a result of a:

- _ head injury resulting in a concussion of the brain or a compression of the brain due to swelling or bleeding;
- _ disturbance of the blood supply to the brain, as in fainting, shock or stroke;
- _ disturbance in the chemical composition of the blood, e.g. lack of oxygen as in asphyxia, abnormal blood sugar levels in diabetes or presence of poisonous substances in the blood; or
- _ disturbance in the electrical activity of the brain, e.g. as in epilepsy.

WHAT DO I DO?

SAFETY FIRST AND CALL FOR HELP

1. Make sure there is no danger to you, the person or bystanders.

PROVIDE FIRST AID

2. Talk loudly to the casualty. Tap him on the shoulders and ask if he is ok. Do not shake the person too roughly.
3. Check if the casualty is conscious or unconscious and act accordingly.

To do so:

- a. Talk loudly to person, shake him gently
- b. Check if the person opens his eyes and responds to simple questions:
 - ✓ _ 'What is your name?'
 - ✓ _ 'Where do you live?'
 - ✓ _ 'How old are you?'
- c. Check if the injured person responds to simple commands:
 - ✓ _ "Squeeze my hand?"

- ✓ _ "Move your arm/leg/foot/hand"
- d. If there is no response, pinch the person and check if he opens his eyes or moves. The first aider can measure and record a patient's responsiveness and level of consciousness using the AVPU scale.

WHAT DO I DO WHEN THE CASUALTY RESPONDS?

- Try not to change the position of the person if there has been a head, neck, back, leg or arm injury.
- Try to find out what happened to the person.
- Tell the person to stay calm and not to move (if at all possible).
- Look and feel for breathing
- Keep checking the casualty to make sure he is not getting worse.
- Verify regularly the level of consciousness and breathing.
- Find medical help for the person if needed.

WHAT DO I DO WHEN THE CASUALTY DOES NOT RESPOND?

1. Try not to change the position of the person if there has been a head, neck, back, leg or arm injury.

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.

3. If you have gloves, put them on. Do not search for gloves if not available and continue

with the next step.

4. You must unblock the breathing passage:

- Gently roll the person over on to his back.
- b . Carefully tilt his head back and lift the chin up with your hand on the bony part of the chin. This simple action lifts the tongue from the back of the throat.

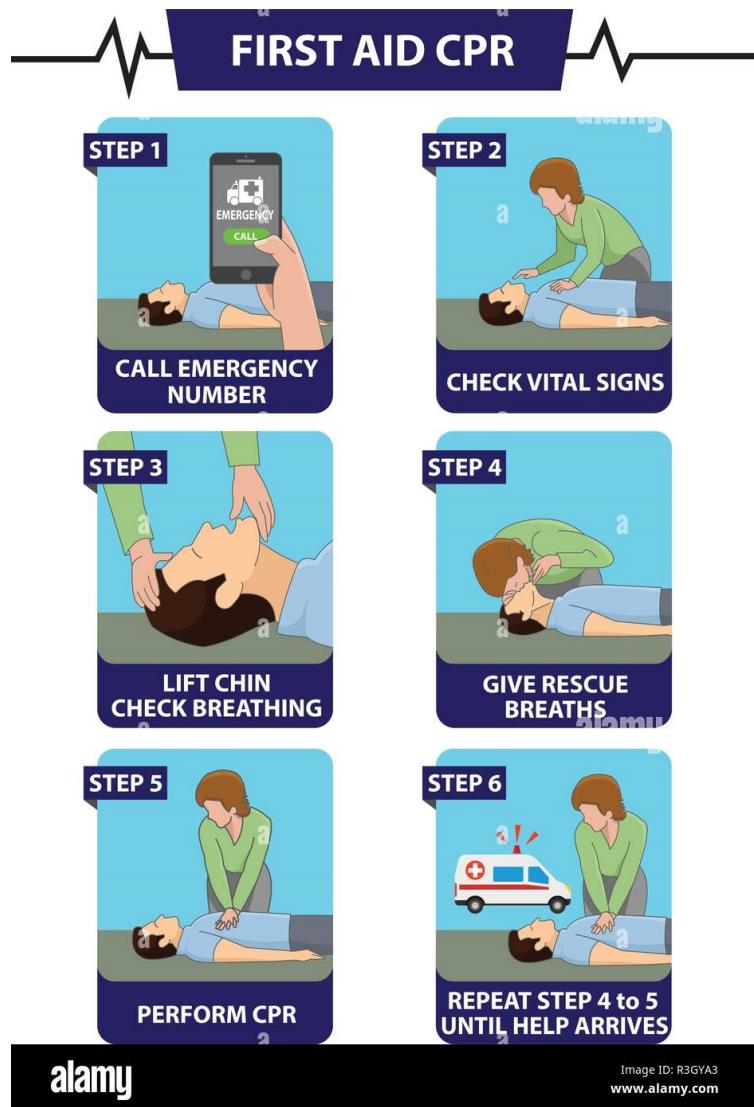


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- c . Do not put your hand on the soft part under the chin to do this!
5. If the person is breathing, put him in the recovery position.
 - a. Be careful when moving and turning the victim. It is better to ask assistance by bystanders.
 - b. Do not leave the person alone and keep checking his breathing.
 - c. Keep the injured person warm by taking off wet clothing, covering him with a blanket or other covering, taking care not to overheat him.
 6. If not done yet, arrange transport to a healthcare facility.

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.

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.

WHEN TO REFER TO A HEALTHCARE FACILITY?

Always urgently transport an unconscious person to the nearest healthcare facility.

Anyone who has become unconscious or who is feeling sick, has pain after fainting (e.g. in the head or heart region, or from trauma resulting from the fall), is on medication or is being treated for a medical condition, should always seek medical help.

SKULL FRACTURES

If the casualty has a head wound or bruise, be alert for a possible skull fracture also. A skull fracture is a serious condition because of the underlying risk of brain damage and bleeding.

- ✓ You might observe following signs and symptoms:
- ✓ _ There is a soft area or a depression on the scalp.
- ✓ _ Asymmetry of the head or skull.
- ✓ _ There is bruising or swelling behind the ear(s).
- ✓ _ Clear watery fluid (CSF) or blood is leaking from the casualty's ear or nose.
- ✓ _ The casualty has a deteriorating level of response which may progress to unconsciousness.

WHAT DO I DO?

1. Approach a casualty who experienced a period of impaired consciousness as described in the chapter on unconsciousness.
2. If there is a risk of fractures of the skull, neck or spine: treat the casualty accordingly as described in the chapter on injuries and fractures to the head, neck and spine.
If there is a risk of fractures of the skull, neck or spine, treat the casualty accordingly (see on Injuries and fractures to the head, neck and spine).

WHEN TO REFER TO A HEALTHCARE FACILITY?

Always urgently transport an unconscious casualty to the nearest healthcare facility. Injured people suspected of having head, neck or spinal injuries should always be examined urgently in the nearest healthcare facility.

Anyone who has become unconscious or who is feeling sick, has pain after fainting (e.g. in the head or heart region, or from trauma resulting from the fall), is on medication or is being treated for a medical condition, should always visit the

healthcare facility for medical check.

F.4 STROKE

'Stroke' is a rapid loss of brain function due to a disturbance in the blood supply to the brain. It can be the result of bleeding or when a blood clot leads to a blockage in a blood vessel to the brain, blocking the blood flow. As a result the affected brain part can't function normally and this might result in difficulty in moving, speaking, understanding, etc. Symptoms occur suddenly and depend on the area of the brain affected.

Strokes occur commonly in later life and in patients that suffer high blood pressure or other circulatory disorder

F.4.1 WHAT DO I SEE AND ENQUIRE?

You might observe following signs and symptoms:

- _ The person complains of numbness;
- _ The person complains of blurred vision;
- _ The person talks with a slurred speech;
- _ The person complains of severe headache;
- _ The person seems confused;
- _ You may observe:
- _ weakness or paralysis of the limbs,
- _ weakness or paralysis in the face.
- _ Sometimes the person might even have loss of consciousness.

The possibility of stroke should always be considered when there is:

- _ a sudden weakness or numbness of the face, arm or leg, especially on one side of the body; and/or
- _ a sudden trouble in speaking, seeing or understanding.

WHAT DO I DO?

1. If you think someone is suffering from a stroke, you can ask the person to perform three simple actions to check.

You can easily remember this via the mnemonic '**FAST**': Face – Arm – Speech and Transport.

F

2. Ask the person to smile or to show his teeth.

Check whether the mouth is crooked or drooping at one corner.

There might be saliva dribbling out of the mouth.

A

3. Ask the person to lift both arms.

Check whether he can do this without one arm dropping or drifting. Can he do this?

Is one arm lower than the other?

A stroke often causes one side of the body to become weak or even paralyzed. The person might also have lost his balance.

S

4. Ask the person to repeat a simple sentence after you. Check whether he can speak

clearly or if he has problems in saying the words.

A stroke is very likely if the person has difficulties with any of the above actions.

T

5. Arrange transport quickly. The earlier the person is treated, the better it is for the outcome. Try to find out when the problem started, note it down and report it.
6. If you think the person suffers from a stroke, the 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.
7. If the person can sit up, make him to sit upright. This helps the person to breathe. If the person cannot sit up, place him in the recovery position.
8. Comfort the person and explain what is happening. Tell the person to relax and rest.
9. He should not try to do anything.
10. Do not give food or drink to the person having a stroke. There is an increased risk of choking or vomiting.
11. Keep checking that the person is awake and breathing properly.
12. Arrange urgent transport to a healthcare facility.
13. 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.

WHAT DO I DO IF THE PERSON IS UNCONSCIOUS, BUT IS STILL BREATHING?

- a. Put the person in the recovery position.
- b. Continue to observe the victim and check his breathing

WHAT DO I DO WHEN THE PERSON STOPS BREATHING?

Start CPR.

Do not interrupt the resuscitation until:

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

WHEN TO REFER TO A HEALTHCARE FACILITY?

Always arrange urgent transport to the nearest healthcare facility. This should be done even if the symptoms improve.

FITS – CONVULSIONS – SEIZURES

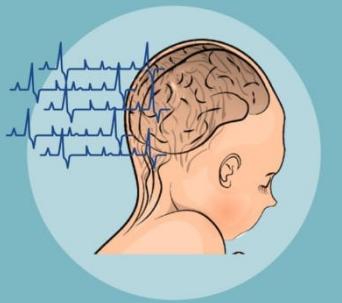
A person has a fit (a seizure or convulsions) if he suddenly shakes uncontrollably. It is

different from normal shivering and trembling. It may manifest in all limbs or just be limited to a single limb. The person having the fit may urinate and defecate without control. A fit can be caused by high fever, diseases (e.g. malaria, epilepsy...), poisoning (e.g. alcohol, drugs...) or a trauma (e.g. brain injury).

WHAT ARE SEIZURES?

Seizures occur when there is an abnormal surge of electrical activity in the brain due to chemical changes in nerve cells.

Typically, there is a balance between **excitatory** and **inhibitory** brain cells. Excitatory brain cells cause activity, and inhibitory brain cells prevent it. Seizures can occur when this balance is disrupted and there is either too much or too little activity.



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Epilepsy is a central nervous system disorder (neurological disorder) in which nerve cell

activity in the brain becomes disrupted, causing seizures or periods of unusual behaviour, sensations and sometimes loss of consciousness. Epilepsy is usually a disease of the young. In the beginning the frequency of convulsions is usually less, but they become more and more frequent later.

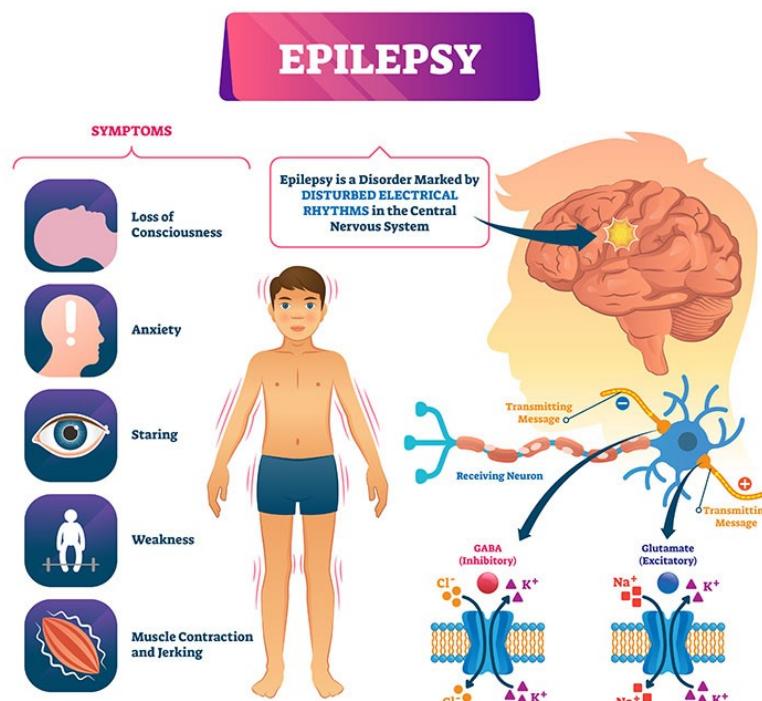
Epilepsy seizures may be of a 'minor' or 'major' kind. In minor epilepsy seizures, the casualty becomes pale, his eyes become fixed and staring and he becomes unconscious for a few seconds. He resumes his

work soon as though nothing had happened. A major epilepsy seizure (also known as '*grand mal* seizures') is serious. The attack follows a headache, restlessness or a feeling of dullness. The casualty is usually aware that he is going to get an attack of an epileptic fit.

Children under the age of four often develop fits as a result of high temperature (fever) caused by infectious diseases. A child having a fit should be brought to a nearby healthcare facility for urgent examination by a doctor.

WHAT DO I SEE AND ENQUIRE?

You may observe following signs and symptoms:
_ sudden uncontrollable shaking;



- _ falling down on the floor;
 - _ loss of consciousness;
 - _ foaming at the mouth; or
 - _ the person might have earlier mentioned that he smelled, felt, tasted, heard or saw things differently.
- If the fit is due to high temperature (fever):
- _ the skin might then feel hot and look reddish.

WHAT DO I DO?

SAFETY FIRST

1. Make sure there is no danger to you, the person or bystanders.

PROVIDE FIRST AID

2. Remove objects that could hurt the person.
 3. Do not hold the person down (do not restrain the person).
 4. If possible, put something soft (cushion, clothing) under the head if the person is lying on the floor.
 5. Make sure the person can breathe freely by loosening tight clothing around the neck (collar, tie).
 6. Do not put anything into the person's mouth.
 7. Do not put your fingers in the person's mouth.
- A person cannot swallow his saliva during a convulsion. A person might bite his own tongue,
- Convulsion.
 - An intense paroxysm of involuntary repetitive muscular contractions.
 - Seizure (is a generic term)
 - Convulsive seizure or motor seizure.
 - Non convulsive seizure
 - sensory seizure.
 - Psychic seizure.
 - Autonomic seizure.
 - All seizures are not convulsions.
 - Not all seizures are convulsions.

but this normally heals in a few days.

An object or a hand placed in the mouth of someone having a convulsion is dangerous for the victim and yourself.

8. For a child with high fever:

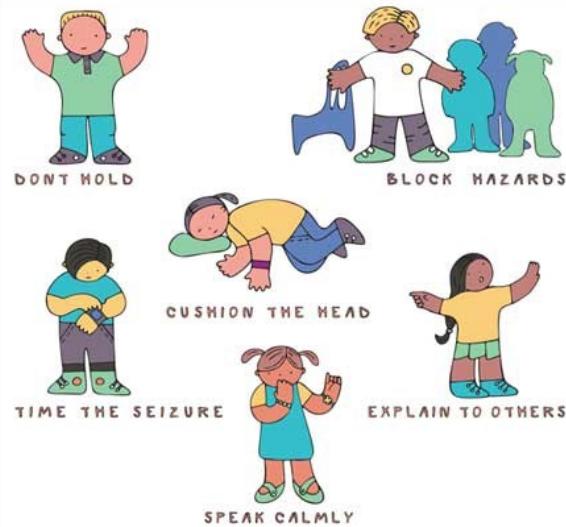
- a. Remove clothing and blankets and ensure there is enough fresh air.
- b. Do not make the child too cold.
- c. Put pillows and soft padding around the child so that he cannot hurt himself.
- d. If possible, put the child in the recovery position.
- e. Sponge the child with water at room temperature.

9. When the fit stops: put the person in the recovery position if he is not yet in this position. This will keep the breathing passage open and prevent vomit from entering the lungs.

10. Stay with the person till he gets better.

11. Reassure the person, parents and bystanders.

DOs & DONTs During a Seizure



DOs:

- ▶ Stay calm
- ▶ Carefully turn the patient to their sides
- ▶ Loosen the tight clothes around the neck
- ▶ Cushion the head
- ▶ Note the time of seizure
- ▶ Seek medical help if seizure doesn't stop

DONTs:

- ▶ Do not restrain the patient
- ▶ Do not give anything by mouth until the patient regains consciousness
- ▶ Avoid crowding and any sharps or hazards

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12. Do not give food or drinks to a child or person that has just had a fit.
13. Arrange urgent transport to the nearest healthcare facility if:
 - a. The person has high fever.
 - b. The person did not wake up between fits.
 - c. The person stopped breathing, or the situation worsens.
 - d. This was the person's first fit (and he has no fever).
 - e. The person is under influence of drugs or alcohol.

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.

WHEN TO REFER TO A HEALTHCARE FACILITY?

Always arrange urgent transport to the nearest healthcare facility if the person has more than one fit and he did not wake up in between; the person has high fever, or the person's condition deteriorates further.

Always refer the person who has suffered a fit to a healthcare facility for further treatment.

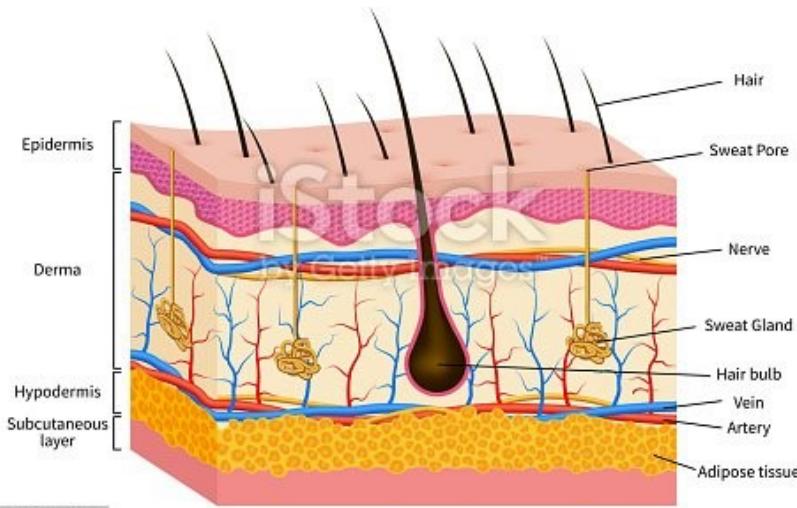
SKIN, BURNS, HEAT EXHAUSTION, FEVER AND HYPOTHERMIA

Skin is the largest organ on our body, made up of several different components including water, protein, lipids and different minerals and chemicals.

Throughout life the skin changes and regenerates itself approximately every 27 days.

Proper care and treatment is essential for maintaining the health and vitality of this crucial protection.

The skin consists of three layers: *epidermis*, *dermis* and *hypodermis*.



THE OUTER LAYER: EPIDERMIS

It's the thinnest layer, but it's responsible for protecting you from the harsh environment, with five layers of its own:

stratum germinativum, stratum spinosum, stratum granulosum, stratum lucidum, and stratum corneum.

The epidermis also hosts different types of cells:

keratinocytes, melanocytes and Langerhans

cells. Keratinocytes produce the protein known as keratin, the main component of the epidermis. Melanocytes produce the skin pigment, known as melanin.

Langerhans cells

prevent things from getting into the skin.

Definition

- Skin is a soft outer covering of an animal, in particular a vertebrate. It is continuous with the mucous membrane at the orifices of the body.
- It is having many functions , so it is regarded as an organ of the body.

THE MIDDLE LAYER: DERMIS

The dermis is a complex combination of blood vessels, hair follicles, and *sebaceous* (oil) glands. Here, you'll find *collagen* and *elastin*, two proteins offering the skin's support and elasticity. *Fibroblasts* are the cells that synthesize collagen and elastin. This layer also contains pain and touch receptors. It is this layer that is responsible for wrinkles.

THE FATTY LAYER: HYPODERMIS

This layer is also known as the *sub cutis*. It hosts sweat glands, and fat and collagen cells, and is responsible for conserving your body's heat and protecting your vital inner organs. The main functions of the skin are protection, sensation, temperature regulation, immunity, allowing movement and growth, excretion and synthesis of vitamins.

1 PROTECTION

The skin is a natural barrier between the inside of the body and its surrounding environment.

The skin protects against dehydration, UV light, microorganisms and physical trauma.

2 SENSATION

The pain and touch receptors in the dermis allow us to feel touch, pressure, heat, cold and pain.

3 TEMPERATURE REGULATION

The optimal temperature for the human body is **36 to 37 degrees Celsius (or 97 to 99 degrees Fahrenheit)**. A section of the brain called the **hypothalamus** controls the body's thermoregulation. It issues instructions to muscles, organs, glands, and nervous system when it senses the core internal temperature is becoming too low or too high. One of the major functions of the skin is to help to maintain the body temperature.

HOW THE SKIN HELPS TO KEEP THE BODY WARM?

When the body becomes too cold, blood vessels at the body's skin surface narrow (*constrict*) to keep the warm blood in the core of the body. The activity of the sweat glands in the skin is reduced and the hairs stand on end to keep warm air close to the skin. Shivering is a method to generate heat by involuntary muscle activity.

HOW THE SKIN HELPS TO KEEP THE BODY COLD?

When the body becomes too hot, blood vessels at the body's skin surface widen (*dilate*) to loose heat by the increased blood flow. The activity of the sweat glands in the skin is turned up to create more sweat, which cools down the skin as it evaporates.

IMMUNITY

Several types of skin cells (e.g. *Langerhans cells, phagocytic cells, epidermal dendritic cells*) are responsible for the destruction of microorganisms or are involved in the interaction of the skin with the body's immune system.

ALLOWS GROWTH AND MOVEMENT

The elasticity of the skin allows growth, movement and adaptation of the contours of the body during movement.

EXCRETION

The body releases waste products from the body via the surface of the skin, regulated by the volume and composition of sweat (e.g. excretion of water, urea, ammonia and uric acid).

SYNTHESIS OF VITAMINS

The skin plays an important role in the synthesis of vitamin D.

Functions of the Skin

There are 7 main functions of the skin and these are:

- Sensation
- Heat regulation
- Absorption
- Protection
- Excretion
- Secretion
- Vitamin D production



A **burn** is a traumatic injury to the skin (and sometimes the underlying tissues as well) caused by contact with extreme heat, chemicals, radiation or electricity.

Burns range in severity from minor to critical. A critical burn is one that is life threatening or potentially disfiguring or disabling, and it requires immediate medical attention. When evaluating whether a burn is critical or not, consider the following factors:

The depth of the burn. Burns can be classified according to depth (Figure 6-4). Superficial burns only involve the epidermis (the top layer of skin). Partial-thickness burns involve the epidermis and the dermis (the layer of skin underneath the epidermis that contains blood vessels, nerves, hair follicles and glands). Full-thickness burns involve both layers of skin and may extend into the subcutaneous tissue, muscle or bone underneath. Generally speaking, the deeper the burn, the greater the severity.

The percentage of the body's surface area that is burned. A burn that covers more than one part of the body or covers a large percentage of the person's total body surface area requires medical attention. Even a superficial burn can be a critical burn if it affects a large percentage of the person's total body surface area.

The location of the burn. Burns that affect the hands, feet or groin; those that involve the head, neck, nose, or mouth or affect the person's ability to breathe; and circumferential burns (i.e., those that go all the way around a limb) are considered critical burns.

The age of the person. If the person is younger than 5 years or older than 60 years, the burn should be considered critical, unless it is very minor.

The cause of the burn. Burns caused by electricity, exposure to chemicals, exposure to nuclear radiation or an explosion are considered critical burns.

Signs and Symptoms of Burns

Burned areas can appear red, brown, black (charred) or white. The burned area may be extremely painful or almost painless (if the burn is deep enough to destroy the nerve endings). There may be swelling, blisters or both. The blisters may break and ooze a clear fluid. Burns involving blistering or broken skin should be evaluated by a healthcare provider.

First Aid Care for Burns

Myth-Information. *Myth: Soothe a burn with butter.* Not a good idea! Putting butter, mayonnaise, petroleum jelly or any other greasy substance on a burn is not effective for relieving pain or promoting healing. In fact, applying a greasy substance to the burn can seal in the heat and make the burn worse.

First aid for burns involves three general steps—stop, cool and cover:

Stop. First, after sizing up the scene, stop the burning by removing the source of the injury if it is safe for you to do so. Depending on the cause of the burn, this may involve removing the person from the source or removing the source from the person.

Cool. Next, cool the burn and relieve pain using clean, cool or cold water for at least 10 minutes. Use water that you could drink. Never use ice or ice water to cool a burn because doing so can cause more damage to the skin. If clean cool or cold water is not available, you can apply a cool or cold (but not freezing) compress instead. Cooling a burn over a large area of the body can bring on hypothermia (a body temperature below normal), so be alert to signs and symptoms of this condition .

Cover. Finally, cover the burn loosely with a sterile dressing. Make sure that whatever you use to cover the wound is sterile or at least clean, because burns leave the person highly susceptible to infection.

Burns of all types, especially if they cover a large percentage of the body, can cause a person to go into shock, so monitor the person closely. When caring for a burn, do not remove pieces of clothing that are stuck to the burned area, do not attempt to clean a severe burn and do not break any blisters.

FIRST, SECOND AND THIRD DEGREE BURNS

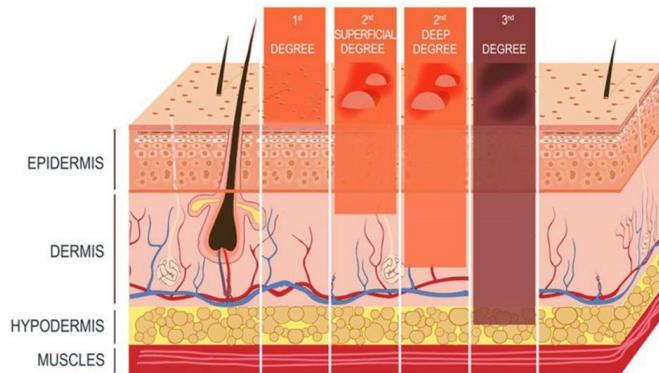
Burns are classified by the degree of skin and underlying tissues that are damaged. You will observe different signs and symptoms according to the severity of the burn wound.

FIRST DEGREE BURNS

Superficial first degree burns show following signs and symptoms:

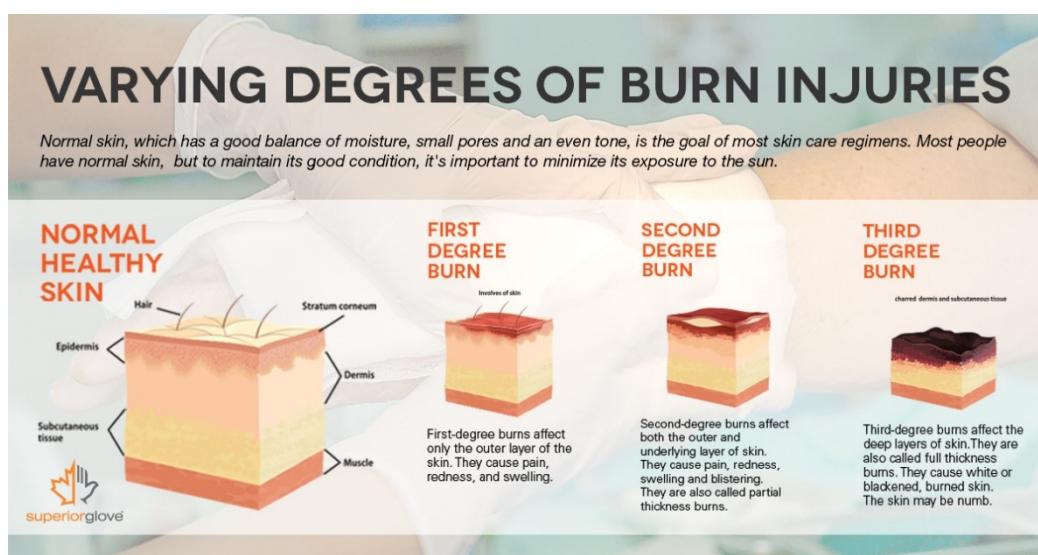
- _ red or darker than usual skin;
- _ slightly swollen skin;
- _ painful, but mostly bearable.

These burns usually extend only into the epidermis.



SECOND DEGREE BURNS

Intermediate second degree burns show following signs and symptoms:



- _ blistering,
 - _ swelling,
 - _ very painful.
- These burns usually involve the epidermis and the dermis.

THIRD DEGREE BURNS

Deep third degree burns show following signs and symptoms

- _ black, parchment-like or white-looking burn wound;
- _ mostly dry;
- _ no pain inside the third degree area, but very painful in the surrounding second and first degree burned parts of the skin.

TYPE OF BURNS BY ORIGIN

Burns can be differentiated by their origin:

DRY BURNS

Dry burns are burns from flames, contacts with hot objects (e.g. hot cigarettes, hot domestic appliances) or friction (e.g. rope burns).

SCALDS

Scalds are burns by steam or hot liquids (e.g. tea, coffee, hot fat).

ELECTRICAL BURNS

Electrical burns are burns caused by electrical current. These burns can result from low voltage current (e.g. home appliances) or high voltage current (e.g. transformers) or by lightning strikes.

CHEMICAL BURNS

Exposure to chemical substances like industrial chemicals, corrosive gases or inhaled chemical fumes can cause chemical burns. Also, the exposure to domestic chemicals and agents as paint stripper, caustic soda, weed killers, bleach, oven cleaners or strong acids or alkali can cause burns.

RADIATION BURNS

Exposure to radioactive sources, e.g. X-rays or radiotherapy-rays, can result in radiation burns.

FROST BITES (COLD BURNS)

Cold burns like frost bites originate from exposure to cold wind, cold temperature or contact with cold freezing materials (e.g. cold metal), or can happen from contact with freezing vapours (e.g. liquid oxygen or liquid nitrogen).

SUN BURNS

Intensive exposure to sunlight, an over-exposure to ultraviolet light (UV) from a sunlamp or the sun result in sun burns.

Long exposure to heat or hot weather can also lead to heat exhaustion and heat stroke.

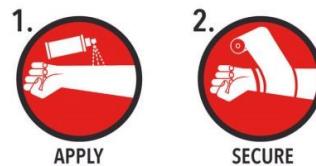
DANGER OF BURNS

Severe or large burn injuries can pose serious problems. However, any burn injury can lead to complications. The danger from burns usually depends more on the area of the burns rather than the degree. Superficial burns over a large area of the body are more dangerous than the complete charring of a part of the limb. It must be noted that a burn is mostly a mixture itself of different degrees of burns, and that in the same person different degrees of burns may show on different parts of the body.

The most important dangers are:

_ Infection

APPLY BURNSHIELD HYDROGEL



TYPES OF BURNS



COOL THE BURN

CHEMICAL BURNS

- Flush the contaminated / chemical burn for 20 minutes with saline or cool running water
- For facial burns, flush for an additional 5 - 7 minutes
- Apply Burnshield to the affected area

ELECTRICAL BURNS

- Switch off the power source
- Look for ENTRY and EXIT points
- Treat all areas in between the 2 points
- Thereafter treat as a normal heat burn
- Apply Burnshield to the affected area

SEEK MEDICAL ATTENTION

Burn injuries leave the skin open and susceptible to infection. Burn injuries also increase your risk of sepsis, which is a life-threatening infection that rapidly travels through the bloodstream. Sepsis can cause shock and organ failure.

_ Low blood volume

Burn injuries damage the skin and the blood vessels, causing fluids to escape the body. This can result in **low blood volume, known as hypovolemia**. A severe loss of fluid and blood can prevent the heart from pumping enough blood through the body (resulting in shock).

_ Low body temperature

The skin helps to control the body's temperature. When a large portion of the skin is injured, the body loses heat. This increases the risk of hypothermia — i.e. when the body loses heat faster than it can produce — resulting in a dangerously low body temperature.

_ Breathing difficulties

One of the most common dangers that accompany burn injuries is the inhalation of smoke or hot air. This can burn the airways, making it difficult to breathe. Smoke can permanently damage the lungs and lead to respiratory failure.

_ Pain

Burn wounds are very painful.

_ Disability

Burn injuries form scar tissue once healed. When the skin is burned, the surrounding skin starts to pull together resulting in a post-burn contracture that prevents movement. Deeper burns can limit movement of the bones or joints when skin, muscles or tendons shorten and tighten, permanently pulling joints out of position.

DRY BURNS AND SCALDS (BURNS FROM FLAMES, HOT SURFACES, STEAM, ...)

WHAT DO I SEE AND ENQUIRE?

Following signs and symptoms may be observed:

- _ The casualty has first, second and/or third degree burn wounds.
- _ In case of burns to the face or inhalation of hot air or smoke, you may also observe:
 - _ soot around the mouth or nose, or
 - _ scorched eyebrows, eyelashes, moustache, beard or hair

WHAT DO I DO?

SAFETY FIRST AND SEEK HELP

1. Make sure the situation is safe for yourself and (if possible) for the victim.
2. 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 or hospital. Tell him to come back to you to confirm if help has been secured.

RESCUING A PERSON FROM A FIRE:

The fire brigade is equipped and trained to rescue people from fires. It is their duty and is not the primary duty of a first aider. However, in the exceptional case you need to rescue a person from a fire yourself, follow these guidelines:

- Make sure you have already called for help prior entering the location.
- Have a wet handkerchief/cloth around your face. Crawl along the floor to reach and pull out the casualty as most clean air will be at lower level.
- Act swiftly and quickly because there might be some amount of carbon monoxide also in the room. A wet handkerchief and crawling on the floor will not protect you from it.
- Do not open other doors or windows when there is fire in the room. The rush of air will increase the fire.

PROVIDE FIRST AID

If the person's cloths are on fire:

- stop him from running around;
 - douse the fire with water;
 - approach the person whilst holding a rug, heavy blanket, coat or cotton table cover in front of you and wrap him in it to smother the flames, or
 - make the person roll on the ground to smother the flames.
- ✓ Cooling with water will prevent the burn from going deeper and will reduce the pain.
 - ✓ Pour water on the burn for 10-15 minutes or until the burn stops hurting.
 - ✓ Do not use very cold water for cooling the burns. Burn victims can easily become hypothermic.
 - ✓ Protect the burn victim by wrapping him in clean blankets.
 - ✓ If possible, wash your hands before 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. Put on gloves if available. You can also use a clean plastic bag.
 - ✓ Try not to touch the person's wounds.
 - ✓ Cover burn wounds with a clean cotton cloth.
 - ✓ Do not open blisters – leave them intact.
 - ✓ Remove any clothing or jewellery that is not stuck to the burned skin.
 - ✓ Do not remove parts of clothing or jewellery that are attached to the burn wounds.
 - ✓ If possible, remove the person's belt, shoes or boots as the limb might swell.
 - ✓ Keep the casualty warm, but do not overheat him.
 - ✓ If possible, keep burned hands, legs or feet in an elevated position.
 - ✓ Do not leave the casualty alone, and keep observing him.
 - ✓ Observe the casualty's breathing, especially when the person is burned in the face and exposed to heat or has breathed in a lot of smoke or hot air.
 - ✓ In case of severe burns, transport the casualty as quickly as possible to the nearest healthcare facility or hospital.

WHAT DO I DO IF THE PERSON IS UNCONSCIOUS, BUT IS STILL BREATHING?

- ✓ Put the person in the recovery position, if possible.
- ✓ Continue to observe the victim and check his breathing

WHAT DO I DO WHEN THE PERSON STOPPED BREATHING?

- ✓ Perform CPR.
- ✓ Do not interrupt the resuscitation until:
 - _ the person 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.

HYGIENE

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.

WHEN TO REFER A BURN VICTIM TO A HEALTHCARE FACILITY OR HOSPITAL?

Always arrange urgent transport to the nearest healthcare facility and seek medical help straight away in a healthcare facility or hospital if:

- _ the injured person is under five years old or over 65 years old;
- _ the burn is on the face, eyes, ears, hands, feet, the sexual organs or joints;
- _ the burn circles the entire limb, body or neck;
- _ the burn is equal or larger than the injured persons hand size;
- _ the burn looks black, white, papery, hard and dry;
- _ the injured person has a decreased or no sense of feeling in or around the wound;
- _ the burns were caused by electricity, chemicals or high pressure steam;
- _ the injured person has inhaled flames or hot air, or breathed in a lot of smoke;
- _ clothing or jewellery is stuck to the skin;
- _ the victim suffers any other serious trauma due to the accident;
- _ the victim suffers from a medical condition, like diabetes; or
- _ the person's condition is getting worse.

CARE OF MINOR BURNS (SMALL FIRST AND SECOND DEGREE BURNS)

For minor burns (small first and second degree burns) you can use fresh aloe vera or honey if available to cover the burn wound. This will help the wound to heal faster.

HYGIENE

- Wash your hands before taking care of the sick 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.
- 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 vomit, stools or fluids.

PROVIDE FIRST AID

- After cooling down the burn wound (see above on how to approach the casualty):
 - Dress the wound with a clean cotton cloth.
 - Do not apply any medicine to the burns.
- Do not apply cotton wool to cover the burns.
- Do not use Vaseline to cover the burns.
- Do not apply any pastes or creams to the burns.
- Make sure the burned casualty has sufficient fluids to drink.
- Refer the victim to a healthcare facility for further management.

WHEN TO REFER A BURN VICTIM TO A HEALTHCARE FACILITY OR HOSPITAL?

Always refer the victim to a healthcare facility for further management.

Advise the injured person to seek medical care if in the days after:

- _ the burn smells bad,
- _ there is any discharge from the wound or the wound is soaked with pus,
- _ the pain remains or increases,
- _ there is swelling, or
- _ if he gets fever.

SPECIFIC BURN LOCATIONS

BURNS TO THE FACE

The casualty having burned in the face or breathed in hot air or smoke, may experience difficulty in breathing:

- ❖ _ Approach the casualty as described for burns and scalds.
- ❖ _ Allow the casualty to take a position that allows him to breathe best and is most comfortable.

- ❖ _ Loosen clothing that might hinder easy breathing.
- ❖ _ Especially observe the casualty's breathing and start CPR, if required.
- ❖ _ Always transport these burn victims urgently to a healthcare facility or hospital.

BURNS TO THE EYE

Flames or hot substances may have burned the eye(s).

Following signs and symptoms may be observed:

- _ scorched eyebrows, eyelashes;
- _ burn wounds around the eye; or
- _ red eyes with burning and itching sensation.

In case of burns to the eye:

- 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 or hospital. Tell him to come back to you to confirm if help has been secured.
 - Rinse the eye immediately with plenty of water for 10-15 minutes, preferably from the nose outwards. Use clean water or water that has been boiled and cooled. Be careful: Room temperature water is more comfortable than cold water. Very warm water might burn the eye. Make sure no liquid or rinsing water runs into the other eye.
 - If the person wears contact lenses, ask the person to take them out and keep them in a safe place.
 - Arrange transport to the nearest healthcare facility or hospital.
 - Do not put medication into the eye.
 - Eye injuries have to be managed always with great care. Always refer these victims to the nearest healthcare facility or hospital.

ELECTRICAL BURNS AND ELECTROCUTION BY ELECTRICITY OR LIGHTNING

- Electrical burns are caused when electricity passes through the body.
- The electricity source may be e.g. lightning or contact with household current, high voltage cables or transformers, or low voltage - high ampere electricity from a car, truck or tractor battery.
- Do not touch the casualty till the power switch has been turned off.
- The electricity enters the body at the point of contact, goes through the body and exits at the point where the body touches the ground or at earth point. Often burn wounds may be observed at these entry and exit points. But inside the body the electricity can cause damage on its track that remains hidden.
- Exposure to electricity can also cause cardiac arrest.

WHAT DO I SEE AND ENQUIRE?

Following signs and symptoms might be observed:

- _ Based on the situation you may be able to detect there has been an electrocution accident (e.g. you notice an electrical appliance connected to the electrical net next to the casualty, a high voltage wire might be next to the casualty, thunderstorm, ...).
- _ The casualty may:
- _ be unconscious,
- _ have difficulty in breathing or have stopped breathing,
- _ be in cardiac arrest (no beating heart) or have an irregular pulse,
- _ have burn wounds, or
- _ have muscle spasms.

WHAT DO I DO?

SAFETY FIRST AND CALL FOR HELP

1. Never touch a casualty that still is connected to an electrical source!
2. Turn off the source of electricity.
 - a. In case of high voltage currents, never try to move the wire or source of electricity away from the victim. **High voltage current (+ 1000 Volt) can jump and kill up to 18 metres.** Wait till the high voltage source has been turned off prior approaching the victim.
 - b. In case of electrocution by home electricity (220V) and if you cannot switch off the electric source, you may try move the source away from both you and the injured person using a dry, non-conducting object made of cardboard, plastic or wood.
 - c. In case of strike of lightning, make sure you and the victim stay safe. If you are at risk from ongoing lightning, wait until danger has passed. If possible stay inside a house or in a car.
3. 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 or hospital. Tell him to come back to you to confirm if help has been secured.

PROVIDE FIRST AID

- Try not to move the casualty, except if he is in immediate danger.
- Cool down the burn wounds. Use clean water. If there is no clean water available,
 - use the available water.
 - Only do this, if there is no danger of further electrocution: make sure the current has been switched off.
- Pour water on the burn for 10-15 minutes or until the burn stops hurting.
- Do not use very cold water for cooling the burns. Burn victims can easily become hypothermic.
- Protect the burn victim by wrapping him in a clean sheet of cloth or blankets.
- If possible, wash your hands before 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.
- Put on gloves if available. You can also use a clean plastic bag. Try not to touch the person's wounds.
- Cover burn wounds with a clean cotton cloth.
- Do not open blisters – leave them intact.
- Remove any clothing or jewellery that is not stuck to the burned skin.
 - Do not remove parts of clothing or jewellery that are attached to the burn wounds.
- If possible, remove the person's belt, shoes or boots as the limb might swell.
- Keep the casualty warm, but do not overheat him.
- If possible, keep burned hands, legs or feet in an elevated position.
- Do not leave the casualty alone, and keep observing him.
- Transport the casualty as quickly as possible to the nearby healthcare facility or hospital.

WHAT DO I DO IF THE PERSON IS UNCONSCIOUS, BUT IS STILL BREATHING?

- ✓ Put the person in the recovery position.
- ✓ Continue to observe the victim and check his breathing

WHAT DO I DO WHEN THE PERSON STOPPED BREATHING?

Perform CPR.

Do not interrupt the resuscitation until:

- ✓ _ the person 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.

HYGIENE

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.

WHEN TO REFER THE VICTIM TO A HEALTHCARE FACILITY?

Always seek medical help straight away in a healthcare facility or hospital if:

- ❖ _ the person got electrocuted by a high voltage source or got struck by lightning;
- ❖ _ the injured person is under five years old or over 65 years old;
- ❖ _ the burn is on the face, eyes, ears, hands, feet, the sexual organs or joints;
- ❖ _ the burn circles the entire limb, body or neck;
- ❖ _ the burn is equal or larger than the injured persons hand size;
- ❖ _ the burn looks black, white, papery, hard and dry;
- ❖ _ the injured person has a decreased or no sense of feeling in or around the wound;
- ❖ _ clothing or jewellery is stuck to the skin;
- ❖ _ the victim suffers from any other serious trauma due to the accident;
- ❖ _ the victim suffers from a medical condition, like diabetes; or
- ❖ _ the person's condition is getting worse.

First aid for electrical burns also follows the general principle of “stop, cool, cover,” but as with chemical burns, there are some special care considerations when electricity is the cause of the burn. As always, check the scene for safety before entering. Make sure 9-1-1 or the designated emergency number has been called, and if possible, **turn off the power at its source**. Do not approach or touch the person until you **are sure he or she is no longer in contact with the electrical current**. Once you have determined that it is safe to approach the person, provide care as needed until help arrives. Because the electrical current that caused the burns can also affect the heart’s rhythm or the person’s ability to breathe (**causing the person to go into cardiac arrest**), be prepared to give CPR and use an AED if you are trained in these skills. Anyone who has experienced an electrical burn should be evaluated by a healthcare provider because the person’s injuries may be more extensive than they appear. Although the person may only have a small burn wound where the electrical current entered or left the body, there may be significant internal injuries caused by the current passing through the body.

CHEMICAL BURNS

Some chemicals may irritate, burn or penetrate the skin and cause damage, sometimes even death. Unlike burns by heat or electrocution, these burns may

develop slowly. Chemical burns are always to be considered serious and always require medical follow up.

WHAT DO I SEE AND ENQUIRE?

Following signs and symptoms may be observed:

- ✓ _ There may be evidence of chemicals in the vicinity of the casualty.
- ✓ _ The victim may

Chemical Burn Symptoms



<p>Symptoms of chemical burns on skin include:</p> <ul style="list-style-type: none"> • Blackened or dead skin • Irritation, redness or burning in the affected area • Numbness or pain in the affected area • Formation of blisters 	<p>Symptoms of chemical burns upon swallowing include:</p> <ul style="list-style-type: none"> • Headaches • Coughing • Dizziness • Seizures • Irregular heartbeat • Muscle twitches
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Source:www.healthline.com

complain of intense stinging pain.

- ✓ _ At the body parts that came into contact with the chemical:
- ✓ _ The skin may be irritated or burned.
- ✓ _ The skin may be discoloured.
- ✓ _ The skin may be swollen.
- ✓ _ The skin may show blisters.
- ✓ _ The skin may peel off.
- ✓ _ There may be signs of poisoning

WHAT DO I DO IF THE VICTIM'S SKIN IS BURNED BY A CHEMICAL?

SAFETY FIRST AND CALL FOR HELP

- Make sure the area is safe for you and the victim and make sure you do not come into contact with the chemical yourself unprotected.

- Shout or call for help if you are alone but do not leave the person alone. Ask bystander to seek help or to arrange urgent transport to the nearest healthcare facility or hospital. Tell him to come back to you to confirm if help has been secured.

PROVIDE FIRST AID

- Wear gloves to protect yourself. If no gloves are available, use a plastic bag to cover your hands.
- Remove the cause of the burn by first brushing off any remaining dry chemical and then rinsing the chemical off the skin surface with cool, gently running water for 10 to 15 minutes.
- Remove clothing or jewellery that has been contaminated by the chemical.
- Wrap the burned area loosely with a clean cloth.
- Rewash the burned area for several more minutes if the person experiences increased burning after the initial washing.
- Arrange transport to the nearest healthcare facility.

WHAT DO I DO WHEN THE CHEMICAL HAS BEEN SWALLOWED OR BREATHED IN?

Approach the casualty as described in the chapter 'Poisoning'.

WHAT DO I DO WHEN HARMFUL LIQUIDS WERE SPILLED IN THE EYE?

Approach the casualty as described in the chapter 'Burns to the eye'.

WHAT DO I DO IF THE PERSON IS UNCONSCIOUS, BUT IS STILL BREATHING?

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

WHAT DO I DO WHEN THE PERSON STOPPED BREATHING?

Perform CPR.
Do not interrupt the resuscitation until:

- _ the person 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.

HYGIENE

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, but may not remove the chemicals from your hands completely.

WHEN TO REFER TO A HEALTHCARE FACILITY?

Always transport the victim of chemical burns urgently to the nearest healthcare facility or hospital.

The general care for a chemical burn is the same as for any other type of burn: stop, cool, cover. However, there are some special considerations for the "stop" step. Because the chemical will continue to burn as long as it is on the skin, you must remove the chemical from the skin as quickly as possible.

Dry chemicals. If the burn was caused by a dry chemical, such as lime, brush off the powder or granules with gloved hands or a cloth, being careful not to get any of the

Chemical Burns

First aid is the same for all chemical burns, except a few specific ones for which a chemical neutralizer has to be used. Alkaline such as drain cleaner causes more serious burns than acid such as battery acid because they penetrate deeper and remain active longer. Organic compounds such as petroleum products are also capable of burning.

Figure 6



Chemical burn from sulfuric acid

Figure 7



Flooding a chemical burn

A chemical burn is the result of a caustic or corrosive substance touching the skin – figure 6. Because chemicals continue to "burn" as long as they are in contact with the skin, they should be removed from the victim as rapidly as possible.

DO NOT apply water under high pressure- it will drive the chemical deeper into the tissue.

DO NOT try to neutralize a chemical even if you know which chemical is involved.

1. **Immediately remove the chemical by flushing the area with water - figure 7.** If available, use a hose or a shower. Brush dried powder chemicals from the skin before flushing unless large amounts of water are immediately available. Water may activate a dry chemical and cause more damage to the skin. Take precautions to protect yourself from exposure to the chemical.
2. Remove the victim's contaminated clothing and jewelry while flushing with water. Clothing can hold chemicals, allowing them to continue to burn as long as they are in contact with the skin.
3. Flush for 20 minutes all chemical burns. Washing with large amounts of water dilutes the chemical concentration and washes it away.
4. Cover the burned area with a dry, sterile dressing or, for large areas, a clean pillowcase.
5. Seek medical attention immediately for all chemical burns.

chemical on your skin or on a different area of the person's skin. Carefully remove, or help the person to remove, any clothing that was contaminated with the chemical. Then flush the area thoroughly with large amounts of cool water for at least 15 minutes or until EMS personnel arrive.

Liquid chemicals. If the burn resulted from a liquid chemical coming into contact with the skin, flush the affected area with large amounts of cool water for at least 15 minutes or until EMS personnel arrive.

If the chemical is in the person's eye, flush the eye with water until EMS personnel arrive. Tilt the person's head so that the affected eye is lower than the unaffected eye as you flush.

SUNBURNS, SNOW/WELDERS EYES, HEAT EXHAUSTION AND HEAT STROKE

SUNBURNS

Direct exposure to sunlight can have ill effects on the skin and eyes. The injury to the skin is known as "sunburn". It is caused by the exposure to ultraviolet rays from the sun. When UV B rays penetrate the deeper skin layers damage to the cells occurs. The skin becomes red and painful. In some cases the damage to the cells is so severe resulting in skin peeling and blistering.

Strong or cool wind or a body covered by water or sweat might give the sunbathing person a falsely reassuring effect of not being sunburned. As clouds have less limiting effect on UV

radiation than they do on temperature, sunburns still can happen on cloudy days. White

surfaces such as snow or sand reflect UV radiation and so increase the risk of sunburn. Rippling water and rough sea reflect more UV radiation than calm open water. Sunlight has a shorter distance to travel in order to reach the earth's surface in areas closer to the tropics; UV radiation levels will therefore, be higher in these areas

because there is less dissipation of the rays as they travel to earth. The level of UV radiation also increases with altitude as the atmosphere becomes thinner and there is less absorption of the radiation.

Signs & Symptoms of Sunburn or Sun Poisoning



WHAT DO I SEE AND ENQUIRE?

Following signs and symptoms may be observed when a person suffers a sunburn:

- ✓ _ reddened skin,
- ✓ _ warm skin, and
- ✓ _ pain of varying degrees.

In more severe cases:

- ✓ _ swelling,

- ✓ blistering, and
- ✓ weeping skin.

WHAT DO I DO?

1. Bring the casualty to a shaded cool place. If this is not possible, cover the skin with light clothing or a towel.
2. Cool down the skin by sponging or by slowly showering for about 10-15 minutes. Be careful not to overcool the casualty: do not use too cold water.
3. Encourage the casualty to have frequent sips of cool water (this is an exception to the standard first aid guideline of not giving a casualty to drink or to eat).
4. For severe burns, refer the casualty to the nearest healthcare facility.
For minor burns, an after-sun cream may be applied.
5. 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.

H.3.9.1.3 WHEN TO REFER TO A HEALTHCARE FACILITY?

Always refer the casualty to the nearest healthcare facility if:

- The burns cover a large body surface.
- There are blisters.
- The casualty is a child or an elderly person.
- When you notice signs of a heat stroke (see chapter on Heat stroke).

SUNBURN OF THE EYE AND SNOW OR WELDERS BLINDNESS

Snow blindness or sunburn of the eye (also known as *photokeratitis* or *ultraviolet keratitis*) is a painful eye condition caused by exposure of insufficiently protected eyes to the ultraviolet rays. Common causes are **looking into welding light** without eye protection; exposure to sunlight reflected from snow and ice without wearing sun glasses, or looking directly into sunlight (e.g. looking at a solar eclipse) without using the appropriate protection.

WHAT DO I SEE AND ENQUIRE?

Following signs and symptoms may be observed when a person suffers a sunburn of the eye(s) or suffers snow or welders blindness:

The casualty complains of intense pain in the affected eye(s).

- The eye(s) is (are) red.
- The eye(s) have tears.
- The casualty may be sensitive to light.
- The casualty may report having stared directly into the sun or into strong light (like welding light or fireworks)

WHAT DO I DO?

1. Reassure the casualty.
2. If the person wears contact lenses, ask the person to take them out and keep them in a safe place.
Ask the casualty to protect his eye(s) by holding a non-fluffy pad to each injured eye. Eventually, the eye pads may have been wetted with clean water. If no eye pad is available, ask him to keep the eyes closed or use sunglasses.
Put no pressure on the eyes.
3. Arrange transport to the nearest healthcare facility or hospital.
4. Do not put medication into the eye.
5. Refer the casualty to a healthcare facility.

6. 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.

WHEN TO REFER TO A HEALTHCARE FACILITY?

Eye injuries have to be managed always with great care. Always refer these victims to the nearest healthcare facility.

HEAT EXHAUSTION

Heat exhaustion is a milder form of heat-related illness that can develop after prolonged exposure to high temperatures and inadequate or imbalanced replacement of fluids. Those most prone to heat exhaustion are elderly people, people with high blood pressure, and

people working or exercising in a hot environment.

WHAT DO I SEE AND ENQUIRE?

Following signs and symptoms may be observed:

- _ heavy sweating;
- _ paleness;
- _ the casualty complains of muscle cramps;
- _ the casualty complains of headache, dizziness or tiredness;
- _ the casualty may act confused;
- _ rapid, weakening pulse; and
- _ fast, shallow breathing.

The infographic is titled "Heat Exhaustion" and is presented by "First Aid for Life™ The First Aid Experts".

PREVENTION:

- Drink lots of water (bottle icon)
- Avoid exercising in heat of day (person running crossed out icon)
- Wear light clothing (t-shirt icon)
- Avoid being outside between 11am-2pm (clock icon)
- No alcohol Or caffeine (beer crossed out icon)

SIGNS AND SYMPTOMS:

- Hot and sweaty (person sweating icon)
- Dizziness and headache (person with headache icon)
- Stomach ache (person with stomach ache icon)
- Vomiting (person vomiting icon)
- Unconsciousness (person unconscious icon)

TREATMENT:

- ✓ Rehydrate with water or dioralyte
- ✓ Get out of the sun to somewhere cool
- ✓ Seek medical attention if concerned

www.firstaidforlife.org.uk

WHAT DO I DO?

PROVIDE FIRST AID

- Help the casualty move to a cool place.
- Help the casualty to lie down with the legs slightly raised.
- Cool the casualty by sponging him or having him to take a cool shower.
- Ask the casualty to rest.
- Ask the casualty to drink plenty of water (this is an exception to the standard first aid guideline of not giving to drink or to eat to a casualty).
- Keep observing the casualty's breathing and consciousness.
- Refer the casualty to a healthcare facility.

WHAT DO I DO IF THE PERSON IS UNCONSCIOUS, BUT IS STILL BREATHING?

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

WHAT DO I DO WHEN THE PERSON STOPPED BREATHING?

Perform CPR.

Do not interrupt the resuscitation until:

- _ the person 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.

HYGIENE

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.

WHEN TO REFER TO A HEALTHCARE FACILITY?

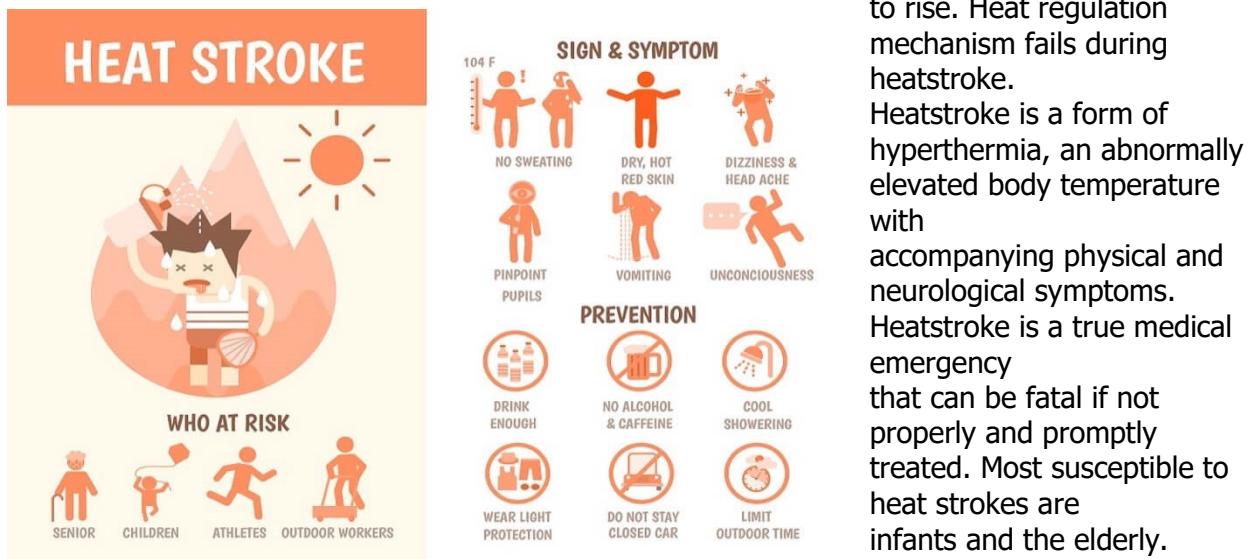
Always refer the casualty to a healthcare facility for further medical follow up.

HEATSTROKE

Normally the body dissipate the heat with the help of sweat glands.

In some cases the body may not be able to dissipate the heat by sweating and the body temperature rises, **sometimes up to 41.1 C (106 F) or higher**. Or a dehydrated person may not be able to sweat fast enough to dissipate heat, which causes the body temperature to rise. Heat regulation mechanism fails during heatstroke.

Heatstroke is a form of hyperthermia, an abnormally elevated body temperature with accompanying physical and neurological symptoms. Heatstroke is a true medical emergency that can be fatal if not properly and promptly treated. Most susceptible to heat strokes are infants and the elderly.



WHAT DO I SEE AND ENQUIRE?

Following signs and symptoms may be observed:

- a hot flushed, red dry skin;
- the casualty complains of headache, dizziness or discomfort;
- the casualty may act confused or is restless;
- a full bounding pulse; and
- a body **temperature above 40 degrees Celsius (>104 F)**.

WHAT DO I DO?

PROVIDE FIRST AID

- Help the casualty move to a cool place.
- Check the casualty's breathing and consciousness.
- Help the casualty to lie down with the legs slightly raised.
- Cool the casualty by sponging him or showering him with cool water.
- Make the casualty to rest.

- If the casualty is conscious, ask the casualty to drink water (this is an exception to the standard first aid guideline of not giving to drink or to eat to a casualty).
- Keep observing the casualty's breathing and consciousness.
- Transport the casualty to the nearest healthcare facility or hospital.

WHAT DO I DO IF THE PERSON IS UNCONSCIOUS, BUT IS STILL BREATHING?

- a. Put the person in the recovery position.
- b. Continue to observe the victim and check his breathing

WHAT DO I DO WHEN THE PERSON STOPPED BREATHING?

Perform CPR.

Do not interrupt the resuscitation until:

- _ the person 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.

HYGIENE

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.

WHEN TO REFER TO A HEALTHCARE FACILITY?

Always transport the casualty suffering a heatstroke to a healthcare facility for further medical treatment and follow up.

TYPES OF HEAT RELATED ILLNESSES

- **Heat exhaustion**: is an acute heat injury with normal or slightly raised temperature caused by dehydration.
- **Heatstroke**: is extreme hyperthermia (Very high fever). The condition is characterized by serious organ damage with universal involvement of the Brain. Heat Stroke is the most serious type of heat related illness.
- **Heat Cramps** :are painful muscle cramps caused by a loss of body salt through excessive sweating. Although all the muscles may be involved, most commonly calf muscles are affected.
- **Heat Syncope**: (pronounced "sin-co-pay") is sudden fainting caused by a reduced blood flow to the head. The victim's skin will be cool and moist and their pulse will be weak. Immediate medical attention is needed in the event of syncope.

HEAT ILLNESS	DEFINITION
Heat cramps	Muscle cramping thought to be secondary to electrolyte deficiencies occurring during exercise
Heat syncope	Fainting due to high ambient temperature causing peripheral vasodilation
Heat exhaustion	Tiredness, weakness, headache, nausea and vomiting are frequent. Significant dehydration may lead to hypotension and collapse. Some authors make a distinction between water-depleted and salt-depleted heat exhaustion. The former occurs more rapidly, especially when associated with exercise. The latter is secondary to lack of dietary electrolyte replacement. Core temperature may not be raised and tissue damage does not occur.
Heat stroke	Core body temperature >40°C due to a failure of the normal thermoregulatory mechanisms. This results in the systemic inflammatory response syndrome and multi-organ failure in which central nervous system dysfunction predominates. Further sub-classified into exertional and non-exertional heat stroke.

Temperature	Condition	Symptoms
109.4-104°F / 43-40°C	Heat stroke	Unconsciousness / fitting. Confused / restless. Headache, dizzy, uncomfortable. Strong, pounding pulse. Flushed, dry skin, hot to the touch.
104-100.4°F / 40-38°C	Heat exhaustion	Cramps in stomach / arms / legs. Pale, sweaty skin. Nausea / loss of appetite.
100.4-96.8°F / 38-36°C	Normal	Normal body temperature.
96.8-89.6°F / 36-32°C	Mild hypothermia	Shivering. Fatigue, slurred speech. Confusion, forgetfulness. Shivering stops, muscle rigidity. Very slow, very weak pulse. Noticeable drowsiness.
87.8-75.2°F / 31-24°C	Severe hypothermia	Severe reduction in response levels. Unconsciousness. Dilated pupils. Pulse undetectable. Appearance of death. Death.

Heat Cramps-painful muscle spasms
that usually occur in the legs and abdomen
due to loss of fluids

■ CARE

- Have the person rest in a cool area
- Lightly stretch cramping muscles
- Give them a cool drink



(Less severe than Heat Exhaustion or Heat Stroke)

HEAT-RELATED ILLNESSES

WHAT TO LOOK FOR

WHAT TO DO

HEAT STROKE

- High body temperature (103°F or higher)
- Hot, red, dry, or damp skin
- Fast, strong pulse
- Headache
- Dizziness
- Nausea
- Confusion
- Losing consciousness (passing out)

- Call 911 right away—heat stroke is a medical emergency
- Move the person to a cooler place
- Help lower the person's temperature with cool cloths or a cool bath
- Do not give the person anything to drink

HEAT EXHAUSTION

- Heavy sweating
- Cold, pale, and clammy skin
- Fast, weak pulse
- Nausea or vomiting
- Muscle cramps
- Tiredness or weakness
- Dizziness
- Headache
- Fainting (passing out)

- Move to a cool place
- Loosen your clothes
- Put cool, wet cloths on your body or take a cool bath
- Sip water

Get medical help right away if:

- You are throwing up
- Your symptoms get worse
- Your symptoms last longer than 1 hour

HEAT CRAMPS

- Heavy sweating during intense exercise
- Muscle pain or spasms

- Stop physical activity and move to a cool place
- Drink water or a sports drink
- Wait for cramps to go away before you do any more physical activity

Get medical help right away if:

- Cramps last longer than 1 hour
- You're on a low-sodium diet
- You have heart problems

SUNBURN

- Painful, red, and warm skin
- Blisters on the skin

- Stay out of the sun until your sunburn heals
- Put cool cloths on sunburned areas or take a cool bath
- Put moisturizing lotion on sunburned areas
- Do not break blisters

HEAT RASH

- Red clusters of small blisters that look like pimples on the skin (usually on the neck, chest, groin, or in elbow creases)

- Stay in a cool, dry place
- Keep the rash dry
- Use powder (like baby powder) to soothe the rash



FROSTBITES

Frostbite is damage to skin and tissues caused by exposure to freezing temperatures – typically any temperature **below minus 0.55°C (31°F)**.

An inadequate blood circulation when the ambient temperature is low leads to frostbites. Causes can be exposure to extreme cold weather, wearing inadequate or wet clothing, or wind chill. The poor blood circulation caused by too tight clothing or boots, staying in a cramped position, fatigue, certain medications, smoking, alcohol use, or diseases that affect the blood vessels, such as diabetes may enhance the process.

Frostbites can affect any part of your body. However, the extremities, such as the hands, feet, ears, nose and lips, are most likely to be affected as the body is constricting circulation to extremities on its own to preserve core temperature and fight hypothermia.

The symptoms of frostbite usually begin with the affected parts feeling cold and painful. If exposure to the cold continues, the person may feel pins and needles before the area becomes numb as the tissues freeze.

Frostbite

Frostbite is damage to the skin and underlying tissues caused by the cold. Here's what to look for and do.

Most Common Sites of Frostbite



Early Signs of Frostbite:

- Skin that is paler than normal, cold, firm and dry
- Pain, tingling, burning or aching
- Swelling
- Blisters in the first 24 hours after exposure

Do

- Drink warm liquids
- Remove any wet clothing
- Immerse area in warm (not hot) water for 30 minutes
- Rewarm face and ears with warm washcloths

Don't

- Try to re-warm skin by rubbing
- Re-warm skin that may freeze again
- Pop any blisters that may develop

Once the skin turns pink and starts to tingle, you can stop heat therapy. If skin remains white and hard or turns black or purple, go to the Urgent Care or ER.

People with a history of severe frostbite often report after effects of frostbite. These can include:

- increased sensitivity to cold;
- numbness in the affected body parts, most commonly the fingers;
- reduced sense of touch in the affected body parts; and
- persistent pain in the affected body parts.

WHAT DO I SEE AND ENQUIRE?

You may observe following signs and symptoms:

- The person complains of feeling pins and needles, throbbing or aching in the affected area.
- The skin feels cold, numb and white.
- The person may feel a tingling sensation.

If the frostbite is more advanced:

- _ the affected area may feel hard and frozen;
- _ when the person is out of the cold:
- _ the tissue is thawed out (defrosted and becomes soft);
- _ the skin will turn red and blister, which can be painful;
- _ there may also be swelling and itching.

If the exposure to the cold continues and the frostbite develops further:

- ✓ _ the skin becomes white, blue or blotchy, and
- ✓ _ the tissue underneath feels hard and cold to touch.

When the person is out of the cold and the skin thaws (defrosts):

- blood-filled blisters form and turn into thick black scabs. At this stage, it is likely that some tissue has died. **This is known as tissue necrosis**, and the tissue may have to be removed to prevent infection.

WHAT DO I DO?

SAFETY FIRST

1. Make sure you are protected sufficiently against the cold, prior helping the other Person

PROVIDE FIRST AID

- If possible, move the victim to a warmer place.
- It is best that the person avoids to walk on frostbitten toes and feet as this can cause further damage, although in emergency situations this may not always be possible.
- Replace wet clothing with soft, dry clothing to stop further heat loss.
- Gently remove gloves, rings, and other constrictions, such as boots.
- The affected areas need to be re-warmed.
- Do not try to do this until you are out of the cold. If the warming process is started and the frozen parts are re-exposed to the cold, it can cause further irreversible damage. You can warm the affected part with your hands, in your lap, or in the person's armpits.
- Do not rub the affected area as this can damage the skin and other tissues and do more harm than benefit.
- Do not apply direct heat (such as from a fire or heater) as this can cause further injury.
- Re-warming should last at least 30 minutes and should only be stopped once the affected body part has a red-purple colour and can be easily moved.
- Do not allow the person to smoke as this can affect blood circulation.
- After the frostbitten area has been thawed, it should be wrapped very gently in clean bandages, with the fingers and toes separated. It is very important to keep the skin clean to avoid infection. Wash your hands prior bandaging the frostbites.
- Too much movement should be avoided, and the limbs should be elevated if possible. Ask the person not to walk on affected parts that have been re-warmed as the tissues will be very delicate.
- Refer the person with frostbites to a healthcare facility. Transport the person to the nearest healthcare facility or hospital in case of advanced frostbites.

HYGIENE

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.

WHEN TO REFER TO A HEALTHCARE FACILITY?

Always urgently transport the person suffering severe frostbites to the nearest healthcare facility. A person with minor frostbites should also always be referred to a healthcare facility.

Signs and Symptoms of Frostbite

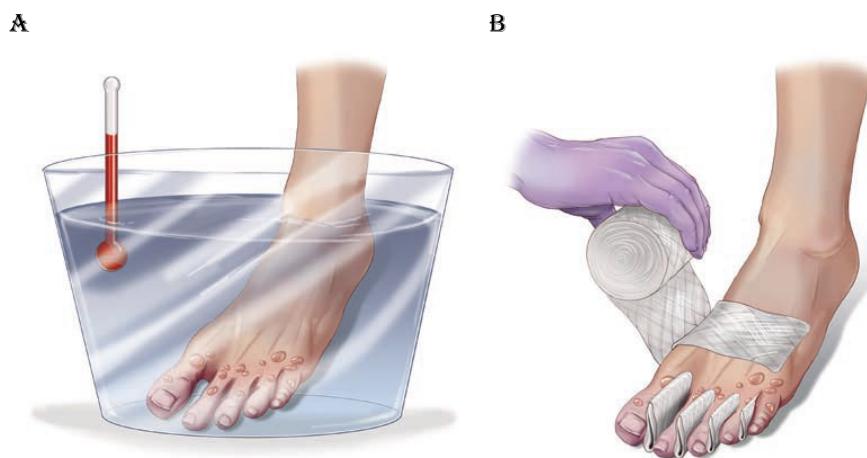
The frostbitten area is numb, and the skin is cold to the touch and appears waxy. The skin may be white, yellow, blue or red. In severe cases, there may be blisters and the skin may turn black.

First Aid Care for Frostbite

If the frostbite is severe or the person is also showing signs and symptoms of hypothermia, call 9-1-1 or the designated emergency number. Give care for hypothermia, if necessary. If the frostbite has caused blisters, do not break them. Monitor the person's condition, and if you see that the person is going into shock, give care accordingly.

If the frostbite is mild, you may be able to care for it using first aid. When providing first aid care for frostbite, handle the affected area gently. Never rub the frostbitten area, because this can cause additional damage to the tissue. Remove wet clothing and jewelry (if possible) from the affected area and care for hypothermia, if necessary.

Do not attempt to rewarm the frostbitten area if there is a chance that the body part could refreeze before the person receives medical attention. Once the rewarming process is started, the tissue cannot be allowed to refreeze because refreezing can lead to tissue necrosis (death). Skin-to-skin contact (for example, cupping the affected area in your hands) may be sufficient to rewarm the frostbitten body part if the frostbite is mild. Alternatively, you can rewarm the affected body part by soaking it in warm water until normal color and warmth returns (about 20 to 30 minutes). The water temperature should not be more than 100° F–105° F (38° C–40.5° C). If you do not have a thermometer, test the water with your hand. It should feel warm (about body temperature), not hot. After rewarming, loosely bandage the area with a dry, sterile bandage. If the fingers or toes were affected, place cotton or gauze between them before bandaging the area.



To care for frostbite, rewarm the body part by immersing it in warm water (A) and then loosely bandage it (B).

FROSTBITE + Management in the Emergency Department

What you need to know

WHO IS AT RISK?

Frostbite often occurs in winter, but it's important to remember that injuries can occur secondary to refrigerant chemicals, dry ice, CO₂ fire extinguishers, etc.

SOCIAL & BEHAVIOURAL FACTORS

- Homelessness
- Psychiatric disturbance
- Alcohol consumption
- Inadequate clothing

MANAGEMENT: FROZEN WOUNDS

 Remove Constrictive Clothing & Jewellery This improves blood flow to the wound	 Rapid Rewarming Submerge wound in circulating water between 37-39°C until thawed	 Reversible NSAIDs Ibuprofen 6mg/kg PO BID for 5+ days
 Consider TPA Candidacy In consultation with plastic surgery, consider for early presentations (<24h) of life-altering injuries. Practice varies by centre	 Tetanus Prophylaxis Standard tetanus prophylaxis. No evidence for prophylactic antibiotics	 AVOID Refreezing Significant morbidity can result - e.g. don't discharge the homeless without a good plan!

HOW TO REWARM

DO ✓	DON'T ✗
<ul style="list-style-type: none"> • Rewarm as soon as possible • Completely submerge wound for faster thaw • Target water temp 37-39°C • Use flowing water (sink/shower) or change water frequently - i.e. keep water warm! • Give analgesics 	<ul style="list-style-type: none"> • Use dry heat; this results in a slower thaw (damage and ischemia) • Use hotter temperatures: this can result in burns! • Allow refreezing

WOUND CARE TIPS

 Clear Blisters De-roof or aspirate clear and milky blisters. These contain inflammatory mediators that can harm underlying tissue.	 Hemorrhagic Blisters Controversial. Some recommend de-roofing hemorrhagic blisters while others recommend leaving intact.
 Dressings Use Polysporin & Adaptic dressings with dressing placed between digits to prevent adherence. Change every other day. Once demarcated & mummified, change to Betadine at margins only.	 Aloe Vera Although Aloe Vera is frequently cited, there is little evidence to support its use.

RESOURCES:

Nguyen, C., Chandler, R., Ratanshi, I., & Logsetty, S. (2019). Frostbite. In Jeschke, M., Kamolz, L., Sjoberg, F., & Wolf, S. (Eds.), *The handbook of burn volume 1*. (pp. 529-547). Switzerland: Springer.

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Created by Dr. Darla Palmer & Dr. Sarvesh Logsetty

KNOW THE SIGNS

HEAT EXHAUSTION

- Headaches
- Nausea and vomiting
- Fatigue, weakness and restlessness
- Thirsty
- Anxiety
- Poor coordination
- Weak, rapid pulse
- Sweating heavily
- Raised body temperature



HEAT STROKE

- Headaches
- Nausea and vomiting
- Rapid pulse
- Extremely thirsty
- Dry, swollen tongue
- Disoriented, dizzy or delirious, slurred speech
- Body temperature more than 40°C
- Convulsions, seizures or coma
- May be sweating, skin may feel deceptively cool

WHAT TO DO

- > Lie down in shade or air-conditioning
- > Drink water
- > Cool compress or tea towel
- > Cool shower or bath

WHAT TO DO

- > Call 000 immediately
- > Reduce temperature until ambulance arrives

HYPOTHERMIA

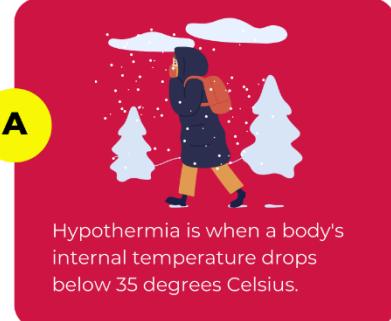
Hypothermia occurs when a person's body temperature **drops below 35 °C (95 °F)** (the normal body temperature is around 37 °C (98.6 °F)). Hypothermia can quickly become life threatening and should be treated as a medical emergency.

FIRST AID FOR HYPOTHERMIA

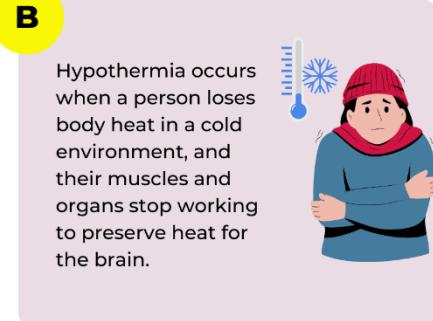


AUSTRALIAWIDE
FIRSTAID

What Is Hypothermia?



What Causes Hypothermia?



Signs And Symptoms For Hypothermia



First Aid For Hypothermia - Step One



First Aid For Hypothermia - Step Two



First Aid For Hypothermia - Step Three



* This information is not a substitute for First Aid Training *

Learn CPR and First Aid with Australia Wide First Aid

www.australiawidefirstaid.com.au

- _ clumsiness or lack of coordination;
- _ drowsiness or very low energy;
- _ confusion or memory loss;
- _ loss of consciousness; or
- _ bright red, cold skin (in infants).

WHAT DO I DO? SAFETY FIRST

It's usually caused by being in a cold environment and can be triggered by a combination of factors, such as being outdoors in cold conditions for a long time, living in a poorly heated house or falling into cold water.

WHAT DO I SEE AND ENQUIRE?

You may observe following signs and symptoms:

- _ shivering, though this may stop as body temperature drops;
- _ slurred speech or mumbling;
- _ slow, shallow breathing;
- _ weak pulse;

1. Make sure you are protected sufficiently against the cold, prior helping the other person

PROVIDE FIRST AID

2. Gently move the person out of the cold.
If going indoors isn't possible, protect the person from the wind, especially around the neck and head and insulate the individual from the cold ground.
3. Gently remove wet clothing. Replace wet things with warm, dry coats or blankets.
4. If further warming is needed, do so gradually. For example, apply warm, dry compresses to the center of the body — neck, chest and groin.
5. Offer the person warm, sweet, non-alcoholic drinks slowly in sips. This is another important exception to general principles of first aid (not giving casualty to eat or drink).
6. Do not apply direct heat. Do not rewarm the person too quickly, such as with a heating lamp or hot bath.
7. Don't attempt to warm the arms and legs. Heating or massaging the limbs of someone in this condition can stress the heart and lungs.

TITLE OF CHAPTER

Do not eat, drink, or smoke.

8. Don't give the person alcohol or cigarettes. Alcohol hinders the rewarming process,
and tobacco products interfere with circulation that is needed for rewarming.

8. Urgently transport the person to the nearest healthcare facility or hospital.

WHAT DO I DO IF THE PERSON IS UNCONSCIOUS, BUT IS STILL BREATHING?

- a. Put the person in the recovery position.
- b. Continue to observe the victim and check his breathing

WHAT DO I DO WHEN THE PERSON STOPPED BREATHING?

Perform CPR.

Do not interrupt the resuscitation until:

- _ help arrives and takes over;
- _ the person starts to wake up, moves, opens his eyes and breathes normally;
- _ you become too exhausted to continue, or
- _ the scene becomes unsafe for you to continue.

HYGIENE

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.

WHEN TO REFER TO A HEALTHCARE FACILITY?

Always urgently transport the hypothermic person to the nearest healthcare facility.

Avoiding HYPOTHERMIA!

Signs and symptoms of hypothermia:

- Shiver
- Slow, shallow breathing
- Slurred speech or mumble
- Weak pulse
- Drowsiness, lethargy
- Clumsiness of movements or poor coordination
- Confused consciousness
- Loss of consciousness
- Babies Have Bright Red, Cold Skin

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Call your local emergency number if you suspect someone has hypothermia!

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Avoiding FROSTBITE!

Signs and symptoms of frostbite:

- Cold skin and a prickling feeling
- Numbness
- Red, white, bluish-white or grayish-yellow skin
- Hard or waxy skin
- In severe cases - blisters after rewarming
- Awkward movements due to stiff joints and muscle stiffness

Urgently seek emergency medical care for frostbite if:

- Symptoms and signs of superficial or deep frostbite
- Fever
- Pain, redness, swelling or discharge in the frostbitten area
- Other unexplained symptoms

When you wait for your emergency medical help:

- Protecting the affected area from further frostbite
- Do not walk on frostbitten legs
- Take an antipyretic if you feel pain

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ANIMAL BITES (DOG, CAT, MONKEY, MONGOOSE, HORSE, COW OR OTHER ANIMAL BITES)

Any bite of an animal (or human) that breaks the skin needs special attention because it carries a high risk of infection!

Many animals including dog, cat, monkey, fox, bat, cow, horse or jackals may carry germ of rabies. Rabies is a viral infection that targets the brain and nervous system. A person can catch rabies when bitten or scratched by an infected animal. If not treated urgently, the disease is lethal. All victims of dog (cat, monkey, jackals etc.) bites or scratches need to be referred immediately for further treatment and follow up.

SNAKE BITES

There are more than 2500 different kinds of snakes. The effects of snake bites vary according to the type of snake. Note that not all snakes are poisonous, not all poisonous ones are lethal, but one should always be careful handling snakes. All snake bites should be treated as if they are poisonous bites. Snakes rarely strike when not disturbed or threatened.

WHAT DO I SEE AND ENQUIRE?

If a person has been bitten by a snake, you might observe:

- _ bleeding,
- _ swelling,
- _ bruising,
- _ pain,
- _ numbness,
- _ weakness,
- _ confusion,
- _ affected vision,
- _ affected speech,
- _ nausea or vomiting,
- _ cardiac arrest, or
- _ difficult breathing.

WHAT DO I DO?

SAFETY FIRST

1. Make sure the area is safe before you assist 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.

PROVIDE FIRST AID

3. Comfort person
4. Help the injured person to lie down and tell him not to move. Offer comfort and keep the person calm, but do not forcibly restrain him. Keeping calm and not moving will slow the spread of the venom. If safe to do so, check what type of snake has bitten the person. If possible, note down the features of the snake. Do not lose time chasing the snake: the person needs urgent help now. It is difficult to assess whether a snake is poisonous or not. Therefore, always assume that the snake is poisonous.
5. Watch the person for any change in his condition (i.e. consciousness and breathing).

6. Put on gloves if they are available. If not available, you can also

use a clean plastic bag to cover your hands.

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

7. Do not suck or cut the venom out of the skin.

Do not rub herbs on the bite.

8. Do not apply a tourniquet.

9. Remove any rings, watches or tight clothing that may cut off the blood flow because of swelling.

10. Try not to move the injured limb and eventually apply a splint to immobilize the affected part.

11. Cover the wound with a clean cotton

cloth or bandage.

12. Once action to obtain help has been taken, stay with the injured person until help is available.

13. Observe the condition of the person (i.e. consciousness and breathing).

14. Arrange urgent transport to the nearest healthcare facility or hospital.

WHAT DO I DO IF THE PERSON IS UNCONSCIOUS, BUT IS STILL BREATHING?

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



SNAKEBITE FIRST AID

Help yourself and others by following these first-aid steps immediately in a snakebite emergency and before reaching a health facility.

DO

DO stay calm and reassure the bitten person.



DO move slowly away from the snake.



DO rinse venom in the eyes with running water in case of spitting snakes.



DO leave the wound area (or bite mark) alone.



DO remove all tight items around the affected area.



DO lay the patient on his/her side and reduce movement of the affected area.



DO rush to the nearest health facility for medical treatment.



DON'T

DON'T panic. Instead, calmly follow these first aid steps.



DON'T attack or kill the snake. If you are close enough to hurt it, it is close enough to bite you to defend itself.



DON'T rub the eyes. Rubbing causes irritation to the eye and spreads the venom.



DON'T wash, cut or suck the wound. It can lead to infections and venom spreading.



DON'T tie the affected area to stop blood circulation. It can lead to infections that cause loss of limbs or even death.



DON'T lay the patient on his/her back. Lying on the back can block the airways.



DON'T use traditional methods or any unsafe treatments. For venomous snakebites, blackstones and herbs don't help and will delay medical treatment.



SNAKEBITE EMERGENCY?

In case of a snakebite emergency, go to a health facility IMMEDIATELY!

8 SIMPLE STEPS TO AVOID SNAKEBITES

1 Wear closed shoes or boots and watch your step in the bush.

2 Use a torch outside at night.

3 Keep food, water and livestock outside your house. Store food and water in closed containers and livestock outside the house to prevent rats and mice entering the house.

4 Store firewood distant from your house. Store firewood distant from buildings to prevent snakes hiding and coming into the building.

5 Sleep off the ground and use mosquito nets to avoid snakes during sleep.

6 Seal holes in your walls to prevent snakes entering the house.

7 Cut grass and clear the ground around your house. Clearing the area gets rid of hiding places for snakes.

8 Find out how to get to the nearest health facility with antivenom.

This poster is an initiative of Health Action International (HAI) and Global Snakebite Initiative (GSI).

HAI: www.haialab.org/what-we-do/snakebite-emergency

GSI: www.global-snakebite.org

To order posters, email bangla@haialab.org, or download from www.haialab.org.

WHAT DO I DO WHEN THE PERSON STOPPED BREATHING?

Perform CPR.

Do not interrupt the resuscitation until:

- _ the person 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.

WHAT DO I DO WHEN VENOM GOT INTO THE EYES?

- ✓ Clean eye with water
- ✓ Rinse the eyes for 10-15 minutes with clean water.
- ✓ Pour the water from the nose outwards.

WHAT DO I DO IF THE PERSON IS BITTEN IN THE LEG?

- ✓ Immobilize the leg by bandaging it to the other leg.
- ✓ Splint leg with snake bite wound

To do so:

- Gently bring the good leg to the bitten leg.
- Use a stick to splint the limb and bandage it into place with cloths or clothing.

WHAT DO I DO IF THE PERSON IS BITTEN IN THE ARM OR HAND?

1. Hold arm still
2. Tell the injured person to immobilize the injured arm himself by holding it close to the body. If it cannot be done due to any reason, immobilize the arm with a triangular bandage.

WHAT DO YOU DO WHEN YOU ARE BITTEN AND YOU ARE ALONE?

1. If possible, try to move as little as possible and shout for somebody to come and help you.
2. Remove rings, watches or jewels from the bitten limb.
3. If you need to move to find help, restrict the movement of the limb that has been bitten as much as possible and try to limit brisk movements.
4. Go to the nearest place where somebody can help you.
5. Always seek medical help.

HYGIENE

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.

WHEN TO REFER TO A HEALTHCARE FACILITY?

Always urgently transport a snake bite victim to the nearest healthcare facility.

CONTENT OF A FIRST AID KIT

SMALL FIRST AID BOX

1 tube silver sulfadiazine ointment 15 g
10 band aid strips
1 roller bandage 5x5 cm
1 package absorbent sterilized cotton 15 g
1 scissor 7cm (sharp/blunt edge)
10 tablets paracetamol
1 plastic mouth-to-mouth resuscitator
1 triangular bandage (90 cm)
10 safety pins
1 adhesive plaster/tape
3-4 ice cream spoons to be used as splints of finger
2 ORS sachets

MEDIUM FIRST AID BOX

10 sterilized finger dressings
10 sterilized foot and hand dressings
10 sterilized large dressings
1 sterilized extra-large dressings
2 sterilized first aid field dressings
2 sterilized shell dressings
4 sterilized small burn dressings
2 sterilized large burn dressings
50 adhesive dressing strips
4 roller bandages 5 cm (5 m)
2 roller bandages 7.5 cm (5 m)
6 triangular bandages (90 cm)
1 package gauze 7.5 cm
4 package sterilized absorbent cotton 25 g
6 sterilized eye pads (st John pattern)
1 spool adhesive plaster 2.5 cm (5 m)
1 tube sliver sulfadiazine skin ointment 15 g
1 bottle savlon, detol or catavelon 112 ml
2 surgical scissors 12.5 cm (sharp/blunt edge)
1 mouth-to-mouth resuscitator
3 inflatable arm splints
3 inflatable leg splints
1 torch (2 battery cells)
10 safety pins
3-4 ice cream spoons to be used as splints of finger
2 ORS sachets
1 writing pad and pen
1 record card in plastic cover
1 first aid leaflet form

LARGE FIRST AID BOX

18 sterilized finger dressings
24 sterilized foot and hand dressings
20 sterilized large dressings
2 sterilized extra-large dressing
4 sterilized first aid field dressings
6 sterilized shell dressings
6 sterilized small burn dressings

4 sterilized large burn dressings
100 adhesive dressing strips
6 roller bandages 5 cm (5 m)
6 roller bandages 7.5 cm (5 m)
12 triangular bandages (90 cm)
1 package gauze 7.5 cm
8 package sterilized absorbent cotton 25 g
6 sterilized eye pads (st John pattern)
2 spool adhesive plaster 2.5 cm (5 m)
1 tube silver sulfadiazine skin ointment 15 g
1 bottle savlon, detol or catavelon 112 ml
2 surgical scissors 12.5 cm (sharp/blunt edge)
1 mouth-to-mouth resuscitator
3 inflatable arm splints
3 inflatable leg splints
3-4 ice cream spoons to be used as splints of finger
2 ORS sachets
2 torch (2 battery cells)
10 safety pins
1 writing pad and pen
1 record card in plastic cover
1 first aid leaflet form

FIRST MEDICAL RESPONDER FIRST AID KIT

1 torch powered by charging dynamo (inbuilt) with battery backup (preferred)
2 pair (latex) surgical gloves non-sterile size 6.5
2 pair (latex) surgical gloves non-sterile size 7.0
2 pair (latex) surgical gloves non-sterile size 7.5
1 bottle savlon 50 ml
2 4' crepe bandage
2 6' crepe bandage
5 triangular bandage (cotton)
4 compressed roller bandage non-sterile 5 cm by 5 m
4 compressed roller bandage non-sterile 10 cm by 5 m
4 compressed roller bandage non-sterile 15 cm by 5 m
2 rolls surgical cotton 100 g
25 adhesive bandaged (band aid) 2.5 by 5 cm
1 roll leucoplast tape or Micropore adhesive plaster 4"
6 sterile gauze 10 by 10 cm
6 sterile eye pads
5 sterile small finger dressing pads
5 sterile large finger dressing pads
4 pieces sterile paraffin gauze
TITLE OF CHAPTER
1 tube silver sulfadiazine ointment
1 mouth to mouth resuscitator
1 set inflatable splints for arms and legs
2 small scissors (s/s)
1 package glucose powder 100 g
1 small forceps
1 medium forceps
1 large forceps
12 safety pins
1 small permanent marker pen (black)
1 pencil 1 first aid kit checklist
1 first aid pamphlet 1 small pocket diary.