

INDIAN FIRST AID MANUAL

2016 (7th edition)

AUTHORIZED MANUAL – ENGLISH VERSION



Indian Red Cross Society

St. John Ambulance Association (India) – Indian Red Cross Society National Headquarters

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PREFACE

First aid training is a low cost, but highly effective strategy to reduce morbidity and mortality. With the help of Belgian Red Cross Centre for Evidence Practice (CEBaP), Belgian Red Cross-Flanders and a multi-disciplinary expert panel, Indian Red Cross Society prepared the evidence-based Indian First Aid Guidelines (IFAG) in 2014 which were used to update the sixth edition of first aid Manual prepared for the general public by the St. John Ambulance (India) and the Indian Red Cross Society.

First aid has been practised in the world since antiquity. There is enough evidence that it was used to give relief to the injured and sick persons in wars and calamities in India since the times of Mahabarata. The use of first aid techniques expanded and improved with time, but it got the real fillip when the Red Cross Movement started in the world about 150 years ago. Consequently, The Indian Red Cross Society was established in 1920 through an Act of the Parliament. Until then, the St. John Ambulance carried out Red Cross work in addition to its normal activities.

To provide the right and effective help before a trained health worker is available or the victim reaches a health facility, it needs to be given by the laypersons who happen to be present wherever a person suffers from an injury or illness. This will only be possible when a large number of laypeople are trained in evidence-based first aid techniques. Presently, about 6 lakh persons are trained in India every year in the basic first aid. The number looks impressive, but is not adequate considering the huge population and vast area not having good communication facilities.

This seventh edition of the Indian First Aid Manual (IFAM) has several new and updated features. A brief on anatomy and physiology has been provided on each system. The chapter on cardio pulmonary resuscitation (CPR) has been completely revised. More emphasis has been put on chest compression to ensure improvement in the blood supply to heart and brain, and use of direct pressure to the site of bleeding to control further bleeding. A chapter on handwashing has been added to prevent the transmission of infections between the victim and first aiders. Guidelines related to snake bites have been totally revised considering the after effects of tourniquet binding. Useful guidelines have been added for important public health problems such as diarrhoea, fever, diabetes, emergency childbirth etc. which still claim many lives.

I hope, the new Manual will be immensely useful for the laypersons as well as healthcare workers to understand the evidence-based techniques of first aid which are becoming more and more crucial in saving life in this era when the country is facing an epidemic of roadside accidents.

Dr. S.P. Agarwal

Secretary General

Indian Red Cross Society &

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USING THIS MANUAL

This manual is offered by the Indian Red Cross Society and the St John Ambulance Association India for use by their members and the general public. Being laymen in the field of medicine, it is expected that they will practice the basic principles of first aid and render such aid needed by the casualty (casualties) till medical aid arrives or the person(s) has (have) been transported to the hospital. The basic characteristic of this manual is to make the layman fully competent practically in the subject.

The first aid guidelines in this manual have been based on the latest available and accessible scientific and medical knowledge. In 2014, a team of Indian medical and first aid specialists publicised the Indian First Aid Guidelines (IFAG). These guidelines are developed using a rigorous and transparent methodology to overcome potential biases; are based on extensive research, data analysis and reviews; and are specifically adapted to be implemented within the Indian context. These guidelines are further complemented by the 2015 guidelines on resuscitation and first aid as published by International Liaison Committee on Resuscitation (ILCOR) and the American Heart Association (AHA). The editorial board reviewed the applicability of available first aid guidelines into the specific Indian context and rephrased or adapted them accordingly. For interventions where neither IFAG nor international first aid guidelines existed, or in case sufficient or scientifically evidence was not available, the editorial board decided to include the commonly applied first aid practices.

In the first chapter, this manual specifies in detail what "first aid" is about and how to deal with an emergency. It further includes basic first aid techniques the first aider should master, i.e. observing vital signs and consciousness; cardiopulmonary resuscitation (CPR); recovery position, the first assessment of a casualty; and handwashing.

The subsequent chapters describe a more in-depth first aid approach and techniques.

The structure of these chapters is:

- Each chapter begins with a short overview of the anatomy and physiology.
- For specific situation or condition, a list of signs and symptoms a lay person may observe and recognize are included in the section '*What do I see and enquire?*'
- This section is immediately followed by '*What do I do?*' listing a sequence of first aid guidelines and techniques appropriate for that situation or condition. Drawings support the student/reader in understanding specific positions, techniques or signs.
- The list of guidelines and techniques is completed with a section on '*When to refer the casualty to a healthcare facility?*'
Please note all casualties should best consult a medical caregiver in all cases. If (urgent) patient transport is required, this is indicated by  .
If the casualty normally does not require organized (ambulance) transport for further treatment, it is marked with the sign  .
However, depending on the specific situation, condition of the person and severity of the injury or sickness, (ambulance) transport or even urgent transport might be required: the first aider needs to consider all elements on when and how a casualty needs to seek further medical help. In case of doubt, it is always better to arrange (urgent) transport to the healthcare facility for further medical treatment.

Important remarks are highlighted in grey text box and preceded with a  sign. Supplemental information is marked with  and printed in a smaller font.

- The contents of a first aid box are listed at the last few pages of the manual.

Throughout the manual we opted to use the terms 'injured person', 'casualty' or simply 'the person' as a person who got injured or even killed by some event. If the reason is a disease or illness, the term 'sick person' is used.

The guidelines and instructions are intended to be applied on both male and female casualties. To make the reading easier, and instead of writing 'he/she', we opted to use the pronoun 'he' meaning that the guideline or instruction is applicable both for male and female victims. Only if the intervention is specifically applicable to females, we use 'she' in the instructions.

This manual is limited in describing the guidelines, interventions and techniques in words and pictures only. To acquire a practical knowledge, it is important to practice the specific techniques, i.e. basic first aid techniques e.g. cardiopulmonary resuscitation (CPR), how to put a person into recovery position, etc. First aid course organized by the Indian Red Cross Society and the St John Ambulance Association India are ideal opportunities in achieving a clear insight in the techniques and allows to exercise the theory into practice via simulation and on dummies.

It is advised the trained first aider to refresh their first aid knowledge by reviewing the guidelines and techniques regularly in this manual and to practice them very frequently.

The medical science is constantly in evolution. Newer scientific insights might have an influence on the approach of casualties by lay people and on the first aid guidelines and techniques. This manual is scheduled to be reviewed and updated every five years; the next review is scheduled in 2021.

A. BASIC FIRST AID TECHNIQUES

In this chapter you will learn about:

- Aims of first aid.
- First aid and the law.
- Dealing with an emergency.
- Resuscitation (basic CPR).
- Recovery position.
- Initial top to toe assessment.
- Hygiene and hand washing.
- First aid overview flow chart.

A.1 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 requires urgent care and transportation to the nearest healthcare facility.

A.1.1 AIMS OF FIRST AID

The aims of first aid are:

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

A.1.2 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 certifications issued by St. John Ambulance Association and the Indian Red Cross Society are awarded to candidates who have attended a course of theoretical and practical work and who have passed a professionally supervised examination.

A.2 FIRST AID AND THE LAW

A.2.1 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".

The Ministry of Road Transport and Highways has published the Indian Good Samaritan and Bystanders Protection Guidelines in The Gazette of India in May 2015 (Notification No 25035/101/2014-RS dated 12 May 2015). The guidelines are to be followed by hospitals, police and other authorities for the protection of Good Samaritans.

Following guidelines are included (sub-selection of the guidelines):

1. A bystander or Good Samaritan, including an eyewitness of a road accident may take an injured to the nearest hospital and should be allowed to leave immediately. The eyewitness has to provide his address. No questions are to be asked.
2. The bystander or Good Samaritan shall not be liable for any civil and criminal liability.
3. A bystander or Good Samaritan who makes a phone call to inform the police or emergency services for the person lying injured on the road cannot be compelled to give his name or personal details on the phone or in person. The disclosure of contact details of the Good Samaritan is to be voluntary.
4. The lack of response by a (medical) doctor in an emergency pertaining to road accidents (where he is expected to provide care) shall constitute 'Professional Misconduct'.

A.2.2 DUTY OF GIVING CARE

Usually, if a volunteer comes to the aid of an injured or sick person who is a stranger, the person giving the aid owes the stranger a duty of being reasonably careful.

In relation to the "duty of giving care", there is currently (2015) no legal obligation for first aiders to provide first aid in a general public context, not unless it's part of a job description. First aid officers in workplaces and school teachers have a duty of care.

Once a first aider begins to provide first aid, a duty of care is established and the first aider then has an obligation to fulfil the duty of care.

If a road user is involved in an accident, there is a legal requirement to stay at the scene, assist the injured and report the incident to the police.

Not fulfilling a duty of giving care leaves the first aider open to questions of negligence. Whilst there is no law that forces anyone to treat a casualty this does not mean that one can simply leave a casualty who you know is in danger. To do so may make you liable through your omission to act. If you are not happy to provide first aid there are several things you can and should do including (but not limited to):

- inform someone else, such as the police or the emergency services;
- make the area around the casualty safe for yourself, others and the casualty;
- monitor the casualty and/or find out what happened; and
- comfort the casualty.

A.2.3 CONSENT OF THE PERSON IN NEED

A conscious person has the right to either refuse or accept care. If the person is conscious, you must ask for his consent before commencing any first aid. If he refuses your help, stay nearby and call the police and emergency services, who can then deal with the situation.

If the person is under 18, it is best to obtain consent from his parent or guardian if they are present. If they refuse your help, stay nearby and call the police and the emergency services, who can then deal with the situation.

If the person is unconscious or unable to formally consent, his consent is inferred and you can then give the necessary first aid.

A.2.4 PRIVACY

In any first aid situation, the first aider must take steps to assist the person to maintain personal privacy. This means things like, keeping crowds away, putting up a screen if necessary, and covering any exposed body parts with blankets, or sheets, if available.

The first aider also needs to take steps to maintain confidentiality. This means not talking about the incident to other people, or answering questions from the media, unless you have permission from the person involved in the accident.

A.2.5 NEGLIGENCE

If a volunteer comes to the aid of an injured or sick person who is a stranger, the person giving the aid owes the stranger a duty of being reasonably careful.

Not fulfilling, or breaking a duty of care leaves the first aider open to questions of negligence. It is unlikely that a first aider would be sued as long as not practiced outside the parameters of the techniques taught at the first aid training.

A.3 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.

A.3.1 STEP 1: MAKE THE AREA SAFE

Your own safety should always come first.

As a first aider, you should:

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



In case of road accidents, as a first aider, you should:

- always follow the traffic rules;
- ask other people to warn traffic about the event;
- if possible, place a warning sign at a good distance, at least 30 meters to either side of the accident, to warn traffic. Do not forget to remove the warning signs afterwards;
- seek help from the police or emergency services;
- not allow anybody to smoke near an accident site;
- switch off the engine of every car involved in the accident; and

- try to apply the handbrake of vehicles involved in the accident to prevent them from moving. You can also put something against the tyres to prevent rolling.

As a general rule, the injured person should not be moved from the scene of an accident. Any movement may make the injury worse if there has been a head, neck, back, and leg or arm injury.



Only move injured people if:

- the injured person is in more danger if he is left there,
- the situation cannot be made safe,
- medical help will not arrive soon, and
- you can do so without putting yourself in danger.

A.3.2 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.

A.3.3 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.

You might be asked to give your name. Always stay calm and answer their questions calmly. The call takers are professionals and will give you further guidance.

If an ambulance can be obtained in a short time, it is best to call for one and use it to transport the injured or sick person to the healthcare facility. An ambulance is the best way to transport ill or injured persons, but they are not always and everywhere quickly available.

You can always ask the police for help.

If no help is available, you will have to arrange transport yourself (in a van, a truck, a car, an auto-rickshaw, a motorbike, a scooter, a bike-rickshaw, a bike...). Always move the sick or injured person with great care.

A.3.4 STEP 4: PROVIDE FIRST AID

Give first aid in accordance with the instructions given in the following chapters in this manual. When providing first aid, try to protect an ill or injured person from cold and heat.

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

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

ⓘ In fact, as a general principle, the rule is not to give a casualty anything to drink or eat. 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. The details can be reviewed in the specific chapters on these conditions.

Be aware that experiencing an emergency situation is a very stressful experience for the injured or sick person.

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.

A.3.5 WHEN CAN I STOP PROVIDING FIRST AID?

The question arises when your first aid 'duty' comes to an end?

Within first aid, CPR is a lifesaving activity. But when can you stop giving CPR? There are four reasons allowing you to stop CPR:

- you see a sign of life, such as breathing;
- someone trained in first aid or a medical professional takes over;
- you are too exhausted to continue; or
- the scene becomes unsafe for you to continue.

A.4 STRESS WHEN GIVING FIRST AID

It is only normal to feel stress if you are suddenly faced with the need to give first aid in a real emergency.

Try to bring your emotions under control before you proceed. You may take some time to stand back from the situation and regain your calm. Do not set about the task too hastily and do not under any circumstances place your own safety at risk.

It is not always easy to process a traumatic event emotionally. It is not unusual for first aiders to experience difficulty when working through their emotions afterwards. Talk to your friends, family, fellow first aiders or someone else. If you are still worried, talk to a professional and seek counselling.

A.5 RESUSCITATION (BASIC CPR)

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

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.

For untrained or minimally trained first aid providers treating an adult victim, compression-only CPR is recommended. These chest compressions ensure a small but crucial supply of blood to the heart and brain.

For formally trained first aid providers (and professionals) treating an adult victim, compression with breaths is recommended. If the trained first aid provider is unable or unwilling, or in any other circumstance, compression-only CPR may be substituted for compression with breaths.

For babies and children under one year, compressions with breaths are always recommended.

A.5.1 WHAT DO I SEE AND ENQUIRE?

In case of a cardiac arrest (heart stops functioning) you might notice the following signs:

- sudden collapse,
- loss of consciousness,
- no breathing,
- no pulse (however this is not always easy for laypeople to confirm).

A.5.1.1 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.

People who become unconscious do not respond to loud sounds or shaking. They may even stop breathing or their pulse may become faint. This calls for immediate emergency attention. The sooner the person receives emergency first aid, the better it is.

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.

More information on unconsciousness is given in the respective chapter.

A.5.1.2 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 spinal injury.

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:

- Hook your first two fingers covered with clean cloth/gloves.
- Sweep round inside the mouth/ throat.
- 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.

More information on the breathing can be found in the respective chapter.

A.5.1.3 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.

Do not lose time trying to locate and feel the pulse. The current resuscitation guidelines for laypeople direct that resuscitation (CPR) is to be started when the person is not breathing or not breathing normally and does not require to check the pulse.

More information on the pulse can be found in the respective chapter.

A.5.2 RESUSCITATION OF A PERSON WHO IS NOT BREATHING OR NOT BREATHING NORMALLY

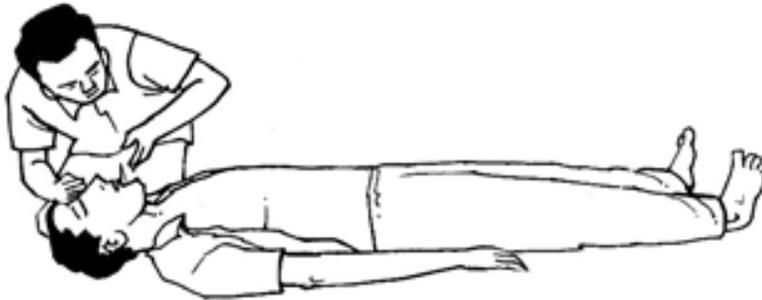
A.5.2.1 SAFETY FIRST AND CALL FOR HELP

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

A.5.2.2 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.

3. If the person is not on his back, turn him on to his back.
4. Kneel beside the casualty.
5. 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.



chin lift pic

6. 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.
7. 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.
8. 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.

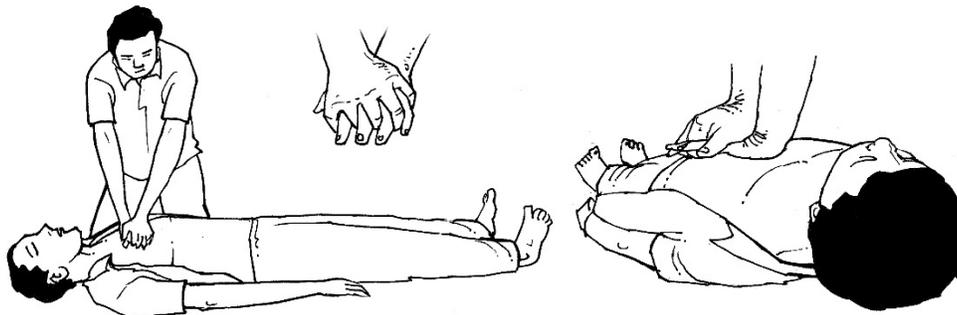
❗ Be careful: do not put your fingers in somebody's closed mouth.

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

If the casualty still does not breathe, start CPR immediately.

A.5.2.3 CPR: HOW TO GIVE CHEST COMPRESSIONS?

1. Turn the casualty on his back on a hard surface, if not already.
2. Kneel next to the casualty, beside his upper arm.



3. Place the heel of one hand in the center of the person's chest.
4. 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.

5. 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.

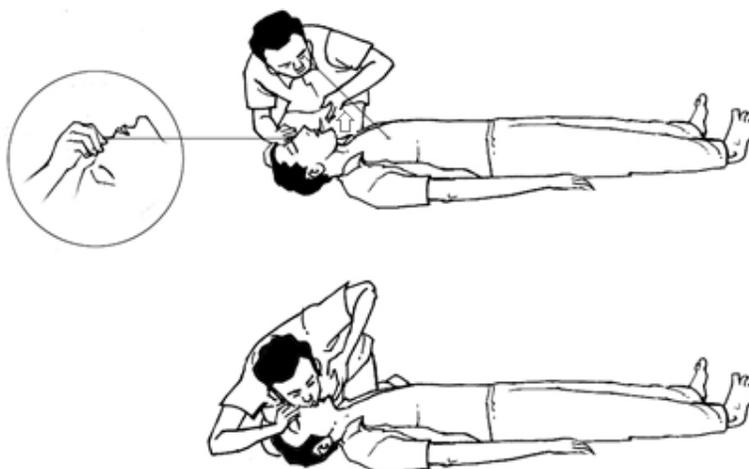
6. Make sure your shoulders are directly above the person's chest.
7. With outstretched arms, push five to maximum six centimetres downwards.
8. Release the pressure and avoid leaning on the chest between compressions to allow full chest recoil. The compression and release should be of equal duration.

❗ 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.
5. 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.
6. 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.
7. Start another series of 30 chest compressions prior to trying to blow air into the person's mouth again.

ⓘ In any case, make no more than two attempts to blow air into the person.

ⓘ Chest compressions and rescue breaths are tiring to administer. If there are a few trained rescuers present, it is best to alternate with each other.

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.

A.5.2.5 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.

A.5.3 RESUSCITATION OF BABY/CHILD (LESS THAN ONE YEAR OLD) WHO IS NOT BREATHING OR NOT BREATHING NORMALLY

A.5.3.1 SAFETY FIRST AND CALL FOR HELP

1. Make sure there is no danger to you before giving help.
2. The child needs urgent 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 that help has been secured.

A.5.3.2 HOW TO SECURE AN OPEN AIRWAY OF A BABY/CHILD LESS THAN ONE YEAR OLD?

❗ 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.

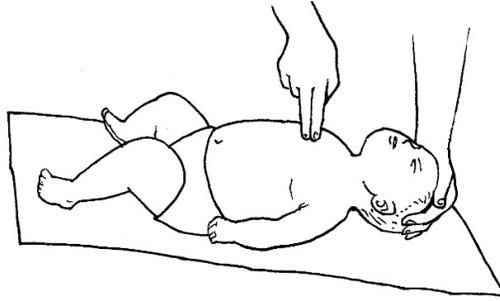
3. Lay the baby/child down on the floor or hard and safe surface.



4. Move the baby's/child head backwards and lift its chin slightly. This manoeuvre will lift the tongue forward and clear the airways.
5. 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 baby still does not breathe, begin CPR immediately.

A.5.3.3 CPR: HOW TO GIVE CHEST COMPRESSIONS ON A BABY/CHILD LESS THAN ONE YEAR OLD?



1. Place three fingers of your hand on the center of the baby's/child's chest on its breastbone (sternum).
2. Remove the bottom finger of the three fingers and compress the chest with the two remaining fingers (middle and index finger) up to one third of the depth from the chest of the baby/child.

ⓘ Do not use the base or palm of your hand. Only use one hand.

3. Repeat these compressions 30 times at a rate of 100-120 per minute.

Release the pressure completely between compressions without removing your fingers from the chest.

Always make sure the chest rises before pressing down again.

A.5.3.4 CPR: HOW TO GIVE RESCUE BREATHS ON A BABY/CHILD LESS THAN ONE YEAR OLD?



1. Move the baby's/child head backwards and lift its chin slightly.
2. Cover the baby's/child's nose and mouth with your mouth and gently puff into his lungs only until you see his chest rise, pausing between rescue breaths to let the air flow back out.

ⓘ Remember that a baby's lungs are much smaller than yours, so it takes much less than a full breath to fill them.

3. Check if the baby's/child's chest rises.

If the chest does not rise, take following steps:

- a. Check if anything is in the baby's/child'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 baby/child.

4. Start another series of 30 chest compressions prior trying to puff air into the baby's/child's mouth again.
5. Do not interrupt the resuscitation until:
 - the child starts to wake up, moves, opens his eyes and breathes normally;
 - help (trained in CPR) arrives and takes over; or
 - the area becomes unsafe for you to continue.

A.5.3.5 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.

A.5.4 WHEN TO REFER TO A HEALTHCARE FACILITY?



Always – urgently: Any person that has stopped breathing or needed CPR should always be transported to the nearest healthcare facility as quickly as possible continuing CPR.

A.6 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 recovery position should be used for unconscious casualties who are breathing.

The position of the casualty's arms and legs provide the necessary stability to keep the body in a safe and comfortable position.

Unblocking the breathing passage takes priority over concerns about a potential spinal injury. 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 breathing.

A.6.1 HOW TO PUT A PERSON INTO THE RECOVERY POSITION?

A.6.1.1 SAFETY FIRST AND CALL FOR HELP

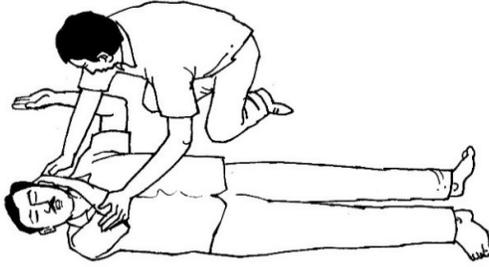
1. Make sure there is no danger to you, the person who needs help and bystanders before giving help.
2. The victim needs urgent help. If not yet done, shout or call for help if you are alone but do not leave the person unattended. Ask a bystander to seek help or to arrange urgent transport to the nearest healthcare facility. Tell him to come back to you to confirm that help has been secured.

A.6.1.2 HOW TO PUT A PERSON INTO THE RECOVERY POSITION

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



9. Lay the person's other arm across his chest.



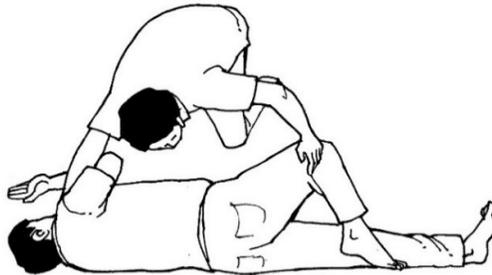
10. Hold the back of this hand against his cheek on the side at which you are kneeling.

11. Keep that hand in that position.



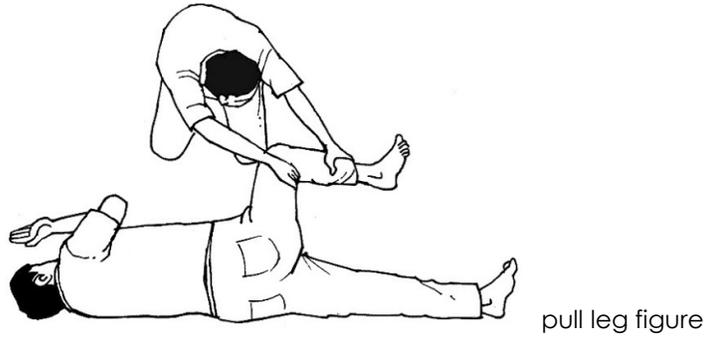
12. With your other free hand, grasp the leg on the other side of the person's body under the knee.

13. Raise that leg, but leave the person's foot on the ground.



14. Pull the raised leg towards you.

15. 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.



16. Position the person's upper leg in such a way that his hip and knee are at right angles.
17. The person is now in a turned position and will not turn on his back.



18. Tilt the head of the person backwards to keep the airway open.
19. Make sure the mouth is angled towards the ground. This will prevent the risk of choking on blood or vomit.



20. 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'
21. 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.

A.7 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.

Symptoms are what the casualty tells the first aider. Examples of symptoms the casualty can report about are:

- feeling pain,
- feeling cold or heat,
- getting thirsty,
- feeling nauseous,
- feeling weak,
- feeling dizzy,
- feeling fainting,
- any loss of normal movement,
- any loss of sensation,
- temporary loss of consciousness,
- loss of memory,
- having felt the sensation of breaking a bone,
- etc.

These symptoms described by the casualty can help to lead the first aider to the region of injury.

Signs are what the first aider feels and finds out by himself.

Examples of these signs are the observed:

- breathing,
- bleeding,
- colour or paleness,
- swelling of injured parts,
- deformities of limbs,
- other observations of any kind.

Training helps in making these observations accurately.

A.7.1 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



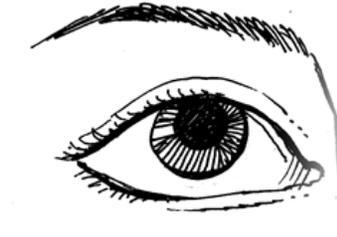
Check breathing



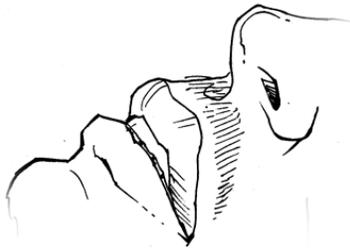
Check pulse



Check head injuries



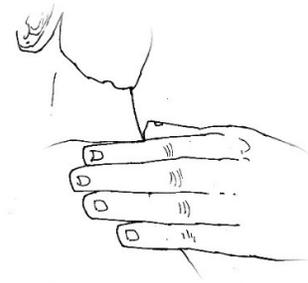
Check eyes



Check mouth



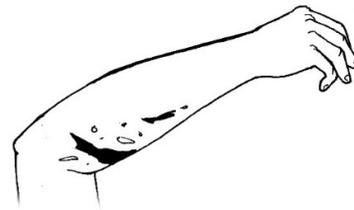
Check ears



Check neck



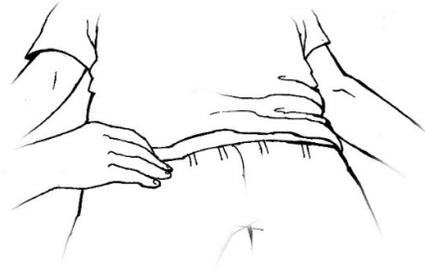
Check chest



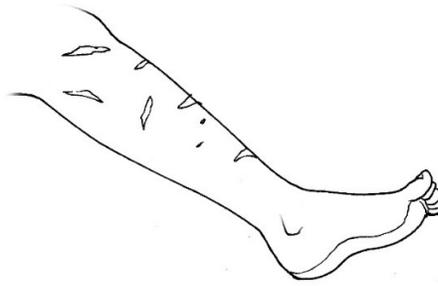
Check arms



Check abdomen



Check hips/groin



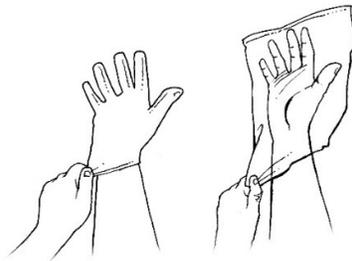
Check legs

A.8 HYGIENE AND HAND WASHING

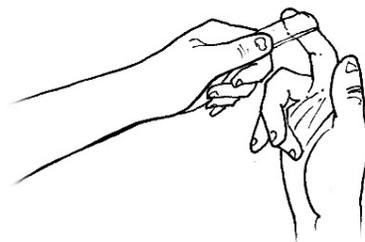
A.8.1 GENERAL HYGIENE NOTES

When dealing with ill or injured persons it is important to keep the risk of infection between yourself and the sick or injured person to a minimum:

- If possible, wash your hands with soap and water (40-60 seconds) before and definitely after you take care of an ill or injured person. Alternatively, you can also use ash to wash your hands. Alcohol-based hand sanitizers can also be used, if the hands are not visibly soiled (20-30 seconds).
- Avoid direct contact with blood or body fluids.
- Use gloves if there is blood or other body fluids like urine or vomit. You can also use a clean plastic bag to cover the hands.



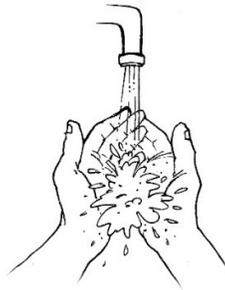
- If no gloves or plastic bags are available you can:
 - Instruct the sick or injured person as to what he can do himself.
 - Try to avoid contact with blood or body fluids as much as possible when you give first aid.
 - You may decide not to give help if you cannot ensure avoiding contact with blood or body fluids.
- It is good to have gloves in your first aid kit.



- Use a sticking plaster, bandage or clean cloth to protect any cuts, grazes, or wounds you may have yourself. Infections may spread through breaks in your skin.
- Wear shoes to protect your feet from infection.
- Use lots of clean water to rinse out any blood or other body fluid that splashes into your eyes or mouth, straight away.

- Dispose of used materials appropriately and clean up any blood spills because it can cause infection to others.
- Be very careful with sharp objects. They should be disposed of with care (e.g. in a box) so that they form no danger to others.
- Dispose of any soiled bandages carefully. Put them in a plastic bag or bin and then burn or bury them.
- Be careful not to use dirty or contaminated materials to treat ill or injured persons as these can pass on diseases from one person to another.
- You can sterilize material by placing it for 10 minutes in boiling water or running it through a flame a few times.
- Use clean drinking water or boiled and cooled water if a person needs to drink.

A.8.2 TECHNIQUE OF HAND WASHING



1. Wet your hands under running water.



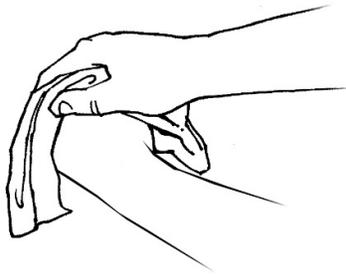
2. Use soap to cover all hand surfaces. If you have liquid soap, this is best. Alternatively you can also use ash that is no longer hot to wash your hands.



3. Rub your hands firmly together (40-60 seconds) and wash your hands thoroughly. Make sure the soap touches all the parts of your hands. Do not forget the tips of your fingers, your thumbs and the skin between your fingers.



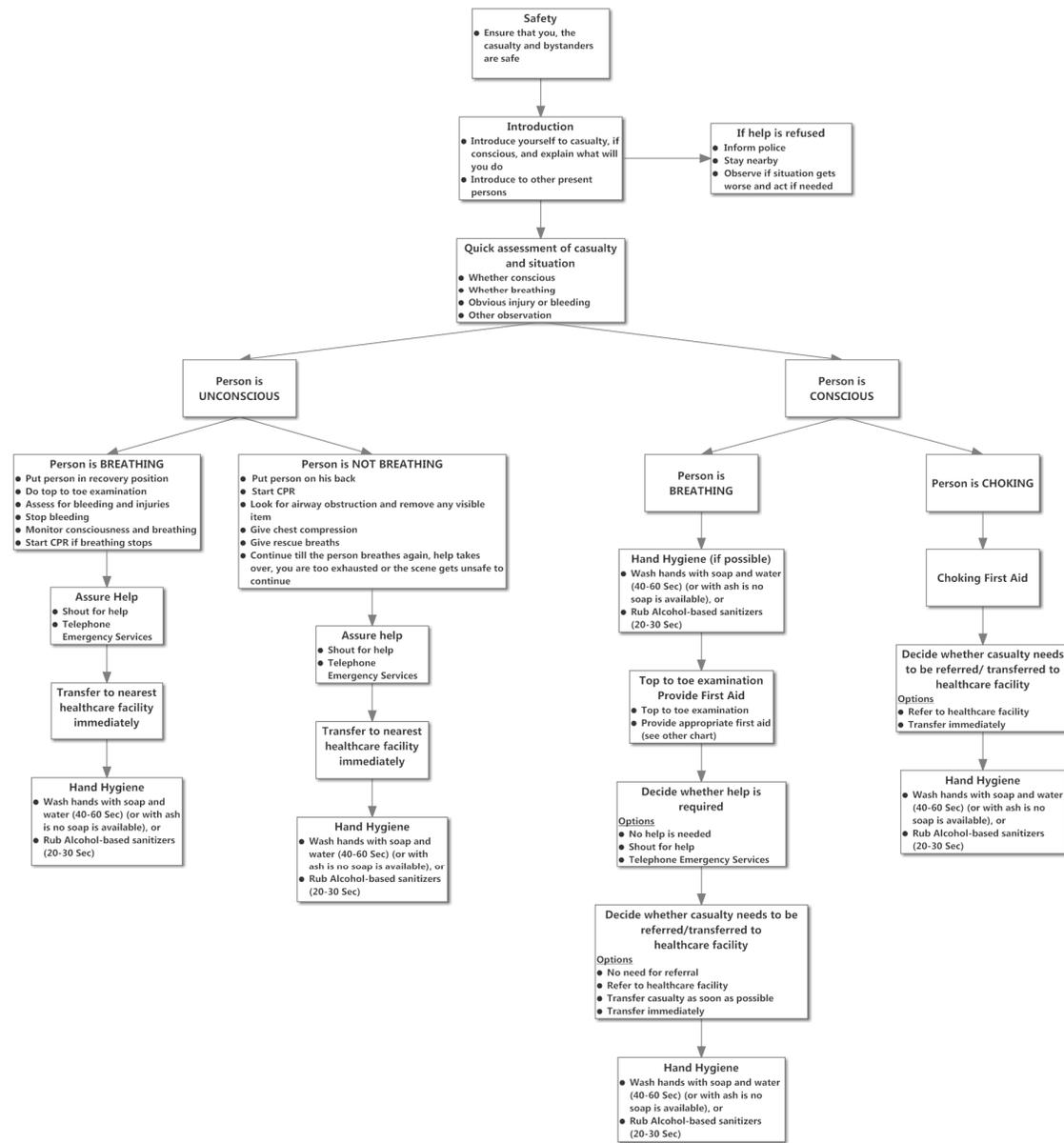
4. Rinse your hands well. Use plenty of water.



5. Dry your hands.

WHO pictures

A.9 FIRST AID OVERVIEW FLOW CHART



B. RESPIRATORY SYSTEM AND BREATHING

In this chapter you will learn about:

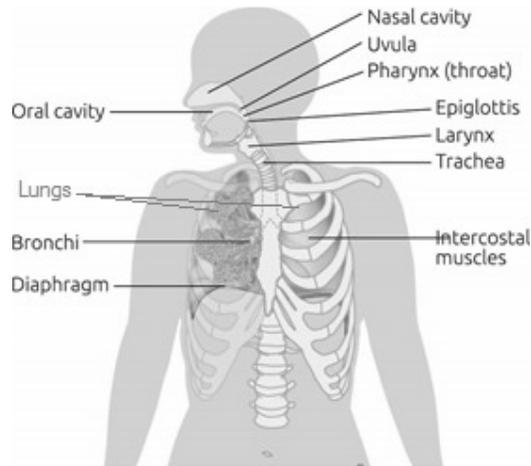
- Respiration.
- No breathing or difficult breathing.
- Drowning.
- Strangulation and hanging.
- Choking.
- Swelling within the throat.
- Suffocation by smoke or gases.
- Asthma.

B.1 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.

B.1.1 THE RESPIRATORY SYSTEM

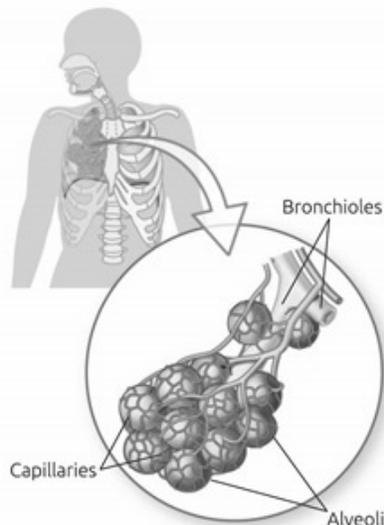


B.1.1.1 THE AIR PASSAGES

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).

B.1.1.2 THE LUNGS

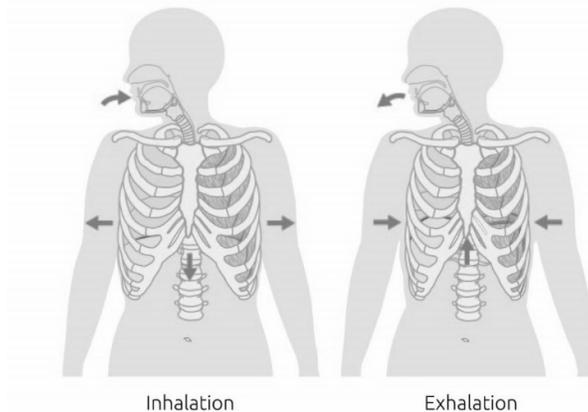
The lungs (two in number) are situated on the right and left sides of the chest cavity. Each lung is made up of a number of small sacs, called alveoli. The lungs are covered by a membrane called 'pleura' which lines the inner wall of the chest cavity.



B.1.2 THE RESPIRATORY MUSCLES

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

B.1.3 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.

B.2 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.

B.2.1 CAUSES OF NO BREATHING

B.2.1.1 CONDITIONS AFFECTING THE AIR PASSAGE

Following reasons can cause no breathing:

B.2.1.1.1 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.).

B.2.1.1.2 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).

B.2.1.2 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).

B.2.1.3 CONDITIONS AFFECTING RESPIRATORY CENTRE

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

B.2.1.4 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).

B.2.1.5 LACK OF OXYGEN AT HIGH ALTITUDES

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

B.2.2 WHAT DO I SEE AND ENQUIRE?



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:

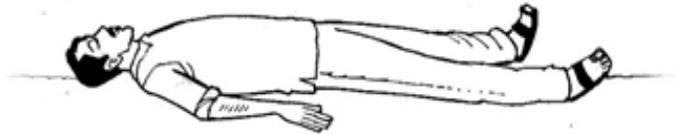
- difficulty in breathing and signs of restlessness;
- the rate of breathing increases;
- the breaths get shorter;
- the veins of the neck become swollen;
- the face, lips, nails, fingers and toes turn blue; and
- the pulse gets faster and feebler.

B.2.3 WHAT DO I DO WHEN THE CASUALTY IS NOT BREATHING OR NOT BREATHING NORMALLY?

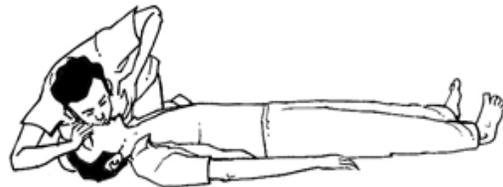
B.2.3.1 SAFETY FIRST AND CALL FOR HELP

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.

B.2.3.2 SECURE AN OPEN AIRWAY AND START CPR



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



6. 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.



7. Cover the casualty.

8. If the breathing starts again:
 - a. Keep the victim covered to keep him warm.
 - b. Arrange urgent transport to a hospital.
 - c. Do not leave the victim alone and continue to observe him.
 - d. If the breathing stops, restart CPR.

B.2.3.3 HYGIENE

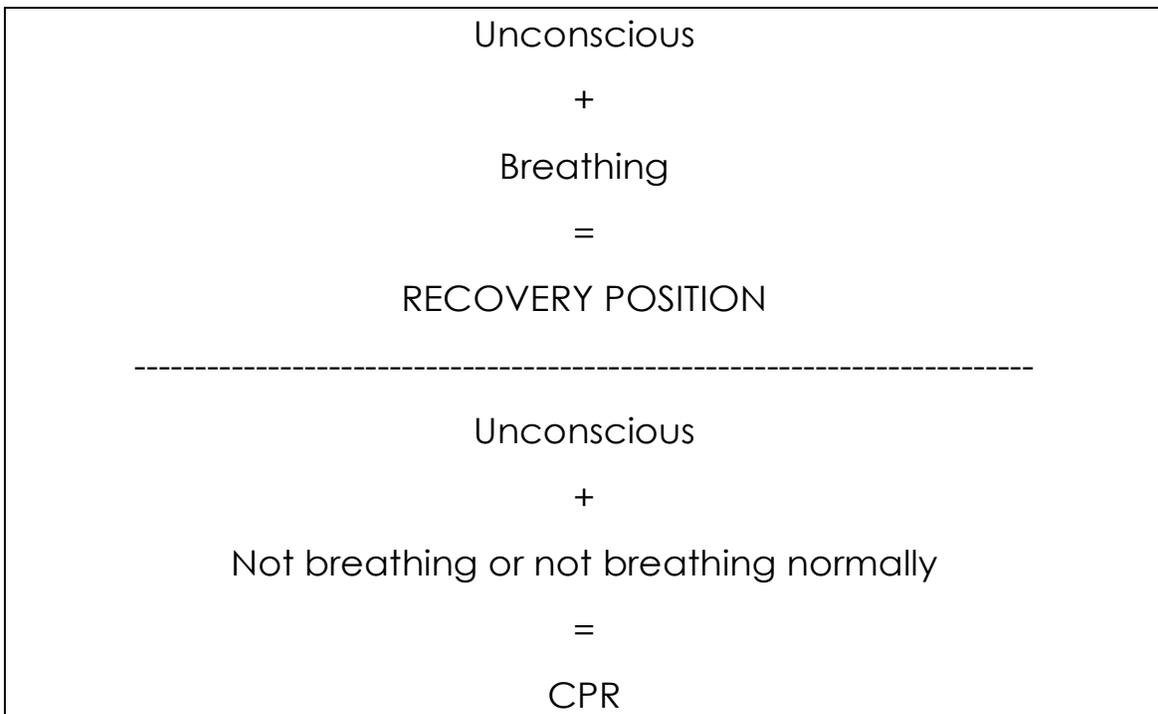
Always wash your hands after taking care of a person. Use soap and water to wash your hands. If no soap is available, you can use ash to wash your hands. Alcohol-based sanitizers can also be used, if available.

B.2.4 WHEN TO REFER THE CASUALTY TO A HEALTHCARE FACILITY?



Always urgently transport any person who stopped breathing or has suffered a suffocation incident to the nearest healthcare facility as quickly as possible continuing CPR.

SUMMARY:



B.3 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.

B.3.1 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 feeble; 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.

B.3.2 WHAT DO I DO?

B.3.2.1 SAFETY FIRST AND CALL FOR HELP

1. Make sure there is no danger to you or 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.

B.3.3 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.

B.3.3.1.1 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.

B.3.3.1.2 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.

B.3.3.2 *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.

B.3.4 **WHEN TO REFER A DROWNING VICTIM TO A HEALTHCARE FACILITY?**



Always urgently transport people who have been in a drowning situation to a healthcare facility.

B.4 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.

B.4.1 WHAT DO I DO?

B.4.1.1 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.

B.4.1.2 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.

B.4.1.3 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:

- a. Cover the victim to keep him warm.
- 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.

B.4.1.4 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.



Do not wait for the police to arrive, but give first aid immediately.
Do not interfere or destroy any material or evidence.

B.4.2 WHEN TO REFER A VICTIM OF STRANGULATION OR HANGING TO A HEALTHCARE FACILITY?



Always urgently transport victims of a strangulation or hanging to a healthcare facility.

B.5 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.

B.5.1 WHAT DO I SEE AND ENQUIRE?



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

- the person has difficulty in breathing,
- he 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.

B.5.2 WHAT DO I DO IN CASE A PERSON IS CHOKING?



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

B.5.2.1 APPROACH AND HELP THE CHOKING PERSON

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

B.5.2.1.1 WHAT DO I DO IF THE PERSON CAN ANSWER THE QUESTION, CAN COUGH OR BREATHE?

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

B.5.2.1.2 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.

B.5.2.1.3 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.

B.5.2.1.4 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:

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

B.5.2.2 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.

B.5.3 WHAT DO I DO IF THE CHOKING PERSON IS A BABY UNDER THE AGE OF ONE YEAR?



1. The baby urgently needs help. Shout or call for help if you are alone but do not leave the child 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.
2. Kneel down so that you can use your thighs to prevent the baby from falling.
3. Lay the baby down along your forearm.
If you are right-handed, use your left forearm; if you are left-handed, use your right forearm.
4. Support the baby's head and neck with one hand without covering the mouth so the baby lies face down, with the baby's head below his trunk, over your forearm, supported by your thigh.
5. With your free hand, give five firm blows with the base of your palm to the area between the baby's shoulder blades.
6. Quickly turn the baby, while supporting the head, onto his back to face you, resting on your arm.
7. Check if the object has come out and the baby can breathe freely.

B.5.3.1 WHAT DO I DO IF THE OBJECT DOES NOT COME OUT?



1. Place two fingers (the two after your thumb) in the middle of the baby's chest and deliver five thrusts (pushing inwards and upwards).
- ⚠ This method of chest thrust is only to be used on babies under the age of one year.
2. Stop after five thrusts.
 3. If the object does not come out and the baby is still choking, give another five blows on the back followed by five thrusts.

4. Repeat this until the object is released or the choking baby loses consciousness.

B.5.3.1.1 WHAT DO I DO IF THE BABY LOSES CONSCIOUSNESS?

1. Lay the baby down on the floor or on a hard and safe surface.
2. Start CPR on the baby.

Do not interrupt the resuscitation until:

- the baby starts to wake up, moves, opens his eyes and breathes normally; or
- help (trained in CPR) arrives and takes over.

B.5.3.2 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.

B.5.4 WHEN TO REFER A CHOKING PERSON A HEALTHCARE FACILITY?



Always urgently transport the person to the nearest healthcare facility if he lost consciousness.



Always urgently transport a choking baby or child for a check-up and follow-up to the nearest healthcare facility, even if the obstruction came out and the baby or child is breathing normally again.



Always advise the person to visit healthcare facility as soon as possible if abdominal thrusts has been applied.

B.6 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.

B.6.1 WHAT DO I DO IN CASE OF A VICTIM WITH A SUSPECTED SWELLING WITHIN THE THROAT?

B.6.1.1 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.

B.6.1.2 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.

B.6.2 WHEN TO REFER PERSON WITH A SWELLING THROAT A HEALTHCARE FACILITY?



Always urgently transport a casualty with a swelling in the throat to the nearest healthcare facility,

B.7 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 gases 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 (CO₂), 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.

B.7.1 WHAT DO I DO IN CASE OF A VICTIM SUFFERING SUFFOCATION BY SMOKE?

B.7.1.1 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.



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

B.7.1.2 MOVE THE VICTIM OUT OF THE SMOKE

5. Move the victim as quickly as possible away from the area.
6. Loosen the victim's clothes at neck and waist.

7. If the breathing stopped, call for help and start CPR.
8. Always arrange transport for the victim to a healthcare facility for further follow up.

B.7.1.3 HYGIENE

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

B.7.2 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

1. 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.
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.

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

3. Ensure the circulation of fresh air by opening doors and windows.



4. 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.
5. Crawl on the floor and stay as low as possible.
6. Move the victim to an area of fresh air away from the affected area.
7. Loosen the victim's clothes at neck and waist.
8. If the breathing has stopped, call for help and start CPR.
9. Always arrange transport for the victim to a healthcare facility for further follow up.

B.7.2.2 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.

B.7.3 WHAT DO I DO IN CASE OF A VICTIM SUFFERING SUFFOCATION BY CARBON DIOXIDE (CO₂) OR GASES HEAVIER THAN AIR?

B.7.3.1 SAFETY FIRST

1. 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.
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.



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

3. Ensure the circulation of fresh air before entering the area if possible.



4. 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.
5. Enter in upright position and stay as high as possible.

B.7.3.2 MOVE THE VICTIM TO AN AREA OF FRESH AIR

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

B.7.3.3 HYGIENE

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

B.7.4 WHEN TO REFER PERSON EXPOSED TO SMOKE OR GASSES TO A HEALTHCARE FACILITY?



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

B.8 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.

B.8.1 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.

B.8.2 WHAT DO I DO?

B.8.2.1 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.

B.8.2.2 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.

B.8.3 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.

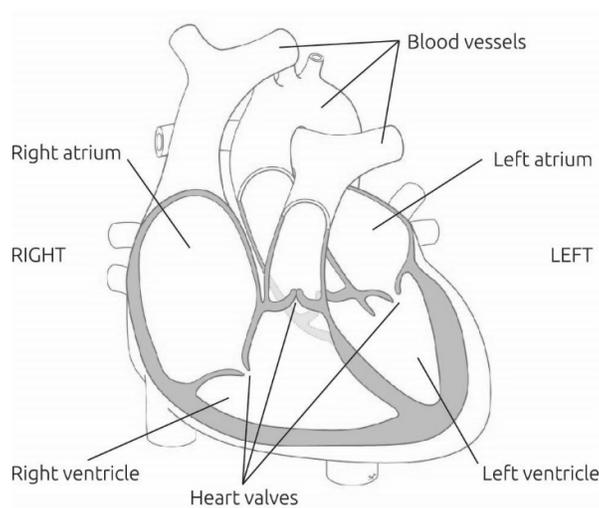
C. HEART, BLOOD CIRCULATION, SHOCK

In this chapter you will learn about:

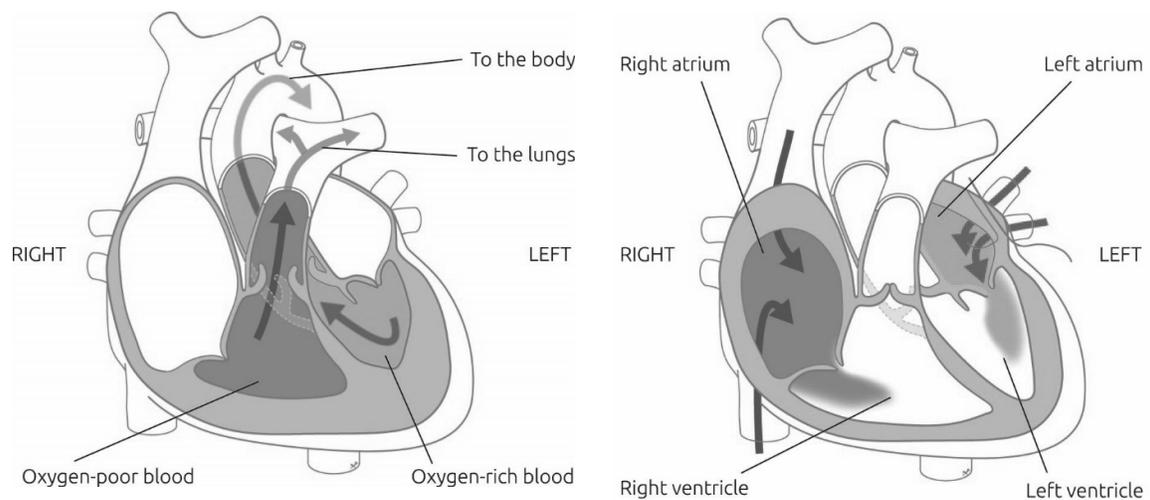
- The heart and the blood circulation.
- The blood.
- Chest discomfort.
- Bleeding.
- Wounds.
- Shock.

C.1 THE HEART AND THE BLOOD CIRCULATION

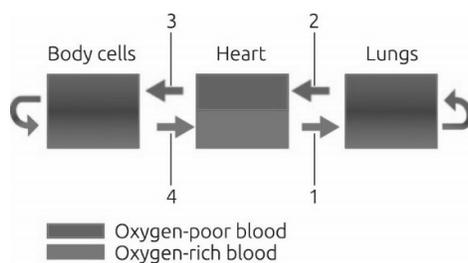
C.1.1 HEART AND BLOOD CIRCULATION



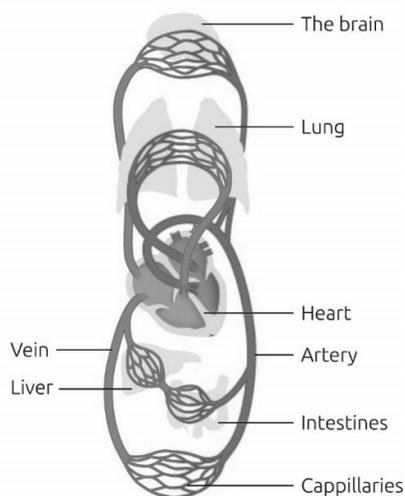
The heart is a muscular organ situated at the centre of the chest cavity. It acts as a pump. It is divided into four chambers. The right upper chamber called the *right atrium* receives impure blood from all parts of the body through blood vessels called veins.



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.

C.1.3 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

C.1.4 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 viscid 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.

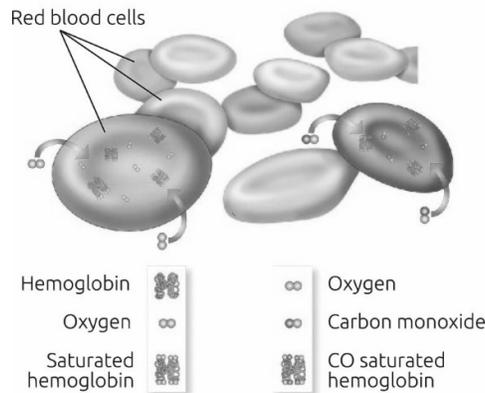


Figure c02 ipv C0 ...Blood consists of varieties of cells:

- 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.

C.1.5 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.

C.2 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.

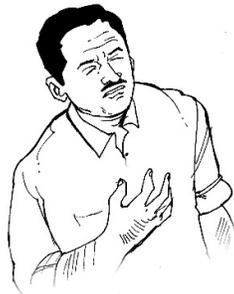
When a person complains of chest pain, always suspect an impending heart attack. However, not every chest discomfort or pain is a heart attack. Several other less problematic health problems present with similar symptoms.

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.

C.2.1 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.

C.2.2 WHAT DO I DO?

C.2.2.1 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.

C.2.2.2 PROVIDE FIRST AID



3. 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.
4. Ask him to rest and not move. He should rest wherever he is at that moment.
5. Loosen tight clothing for more comfort.
6. Reassure the person and tell him what is happening.
7. 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.



8. 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.
9. Arrange urgent transport to a nearby healthcare facility or hospital.
10. Keep observing the person in case he collapses.

C.2.2.2.1 WHAT DO I DO WHEN THE PERSON BECOMES UNCONSCIOUS, BUT IS STILL BREATHING?

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

C.2.2.2.2 WHAT DO I DO WHEN THE PERSON STOPS BREATHING?

Perform CPR.

Do not interrupt the resuscitation until:

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

C.2.2.3 HYGIENE

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

C.2.3 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.

C.3 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.

C.3.1 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 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).

C.4 FIRST AID FOR BLEEDING (IN GENERAL)

C.4.1 WHAT DO I SEE AND ENQUIRE?

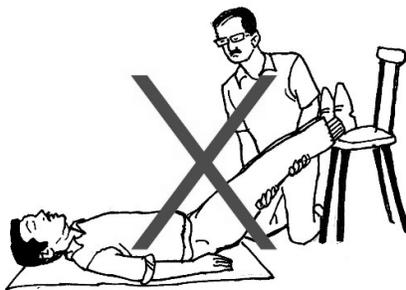
A person who has an injury which is bleeding severely is in a life-threatening situation and needs immediate help. Therefore, stopping the bleeding is a core first aid activity. In addition, bleeding in the face or neck may impede the air flow to the lungs.

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 might cause harm.

C.4.2 WHAT DO I DO?

C.4.2.1 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.

C.4.2.2 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.

C.4.2.3 STOP THE BLEEDING



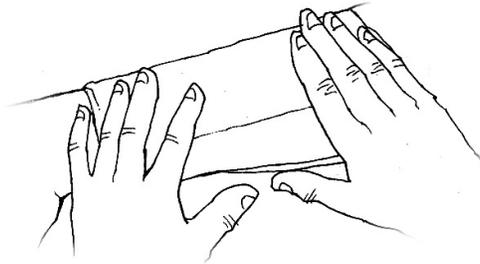
5. Ask the injured to sit or lie down or put him in comfortable position.
6. Comfort the person and explain what is happening to him. Tell the person to relax and rest. He should not try to exert.



7. 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.



8. If you have a piece of clean (cotton) cloth, then cover the wound with it. If you have no bandages, improvise with other materials.



9. 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.

10. Do not apply a tourniquet or fix a bandage above the wound, except in special situations (as specified below)!

Only apply a tourniquet:

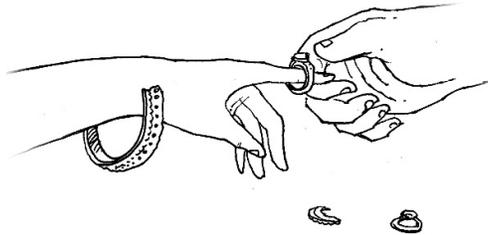
- if the bleeding of an external limb cannot be stopped by putting direct pressure on the wound, or
- if there are many casualties you have to give help to, and
- the first aider has been well trained on how to apply a tourniquet.

If a tourniquet is applied on a bleeding limb:

- a. apply it above the wound,
- b. note down the time when the tourniquet is applied,
- c. maximally have a tourniquet applied for 2 hours,
- d. transfer the casualty as quickly as possible to a healthcare facility for further treatment.



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



12. 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.



13. Keep the injured person warm by taking off wet clothing, covering him with a blanket or other covering, taking care not to overheat him.
14. Keep checking for the bleeding and also check that the person is conscious and breathing properly.

15. Stay with the person until medical help is available.
16. Do not give the injured person anything to eat or drink.
17. Arrange transport to the nearest healthcare facility.

C.4.2.3.1 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.

C.4.2.3.2 WHAT DO I DO IF THE VICTIM STOPS BREATHING?

Start CPR.

Do not interrupt the resuscitation until:

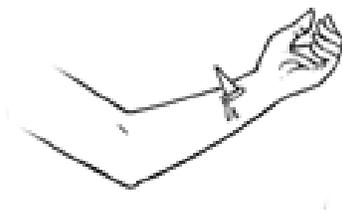
- the victim starts to wake up, moves, opens eyes and breathes normally;
- help (trained in CPR) arrives and takes over;
- you become too exhausted to continue, or
- the scene becomes unsafe for you to continue.

C.4.2.4 HYGIENE

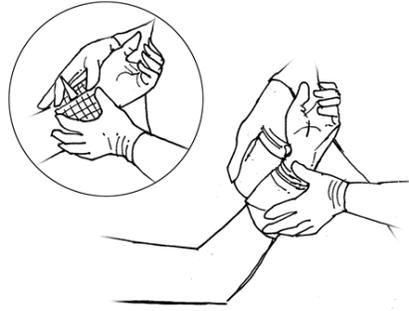
Always wash your hands after taking care of a person. Use soap and water to wash your hands. If no soap is available, you can use ash to wash your hands. Alcohol-based sanitizers can also be used, if available.

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

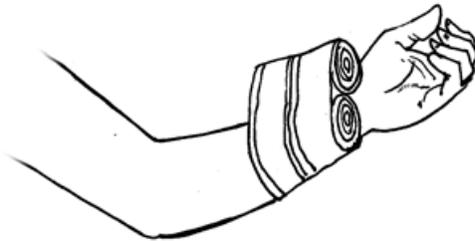
1. Do not remove the object.



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:

- a. apply it above the wound,
- b. note down the time when the tourniquet is applied,
- c. maximally have a tourniquet applied for 2 hours,
- d. 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.

C.4.4 WHAT DO I DO WHEN I SUSPECT AN INTERNAL BLEEDING?



1. Ask the injured person to sit or lie down or make him comfortable.
2. Check the airway, breathing and circulation.
3. 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.



4. Keep the injured person warm by taking off wet clothing, covering him with a blanket or other covering, taking care not to overheat him.
5. Keep checking that the person is conscious and breathing properly.
6. If the person stops breathing, start CPR.
7. Do not apply hot water bottles or ice bags to the chest or the abdomen.
8. The person needs to be transported urgently to the nearest healthcare facility.

C.4.5 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.

D. 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.

D.1 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.

- 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.

- Lacerations



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.

- 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.

D.1.1 COMPLICATIONS OF WOUNDS

Wounds can cause two great dangers:

- Bleeding, and
- Infection

D.1.1.1 BLEEDING

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

D.1.1.2 INFECTION

*Germ*s 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.

D.2 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.

D.2.1 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.

D.2.2 WHAT DO I DO?

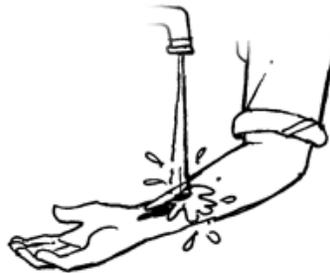
D.2.2.1 HYGIENE

1. 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.

D.2.2.2 STOP THE BLEEDING AND BANDAGE THE WOUND



2. 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.



3. 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.



4. 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.



5. 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.



6. 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.
7. 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.

D.2.2.3 *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.

D.3 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:

1. Ask the injured not to blow his nose.
2. Do not pack the ear or nose. You may eventually place a light dressing on the ear or nose.
3. If the person is breathing, put him in recovery position. Be aware of the risk of neck (spinal) injury.
4. Urgent transport to the nearest hospital is required.
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.



Always urgently transport the casualty with a suspected head injury to the nearest healthcare facility,

D.3.1 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 feelsick.
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.

D.3.2 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.

D.4 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.

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,

D.5 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:

1. Control the bleeding by providing direct pressure to the wound.
2. Put a clean cotton bandage on the wound.
3. Adjust the position of the victim so the wound does not gap



4. 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.
5. Do not give anything to drink or eat.
6. If the casualty becomes unconscious but is breathing, put him in the recovery position.
7. If the casualty stops breathing, start CPR.
8. Arrange urgent transport to the nearest hospital.
9. 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,

D.6 BLEEDING FROM VARICOSE VEINS

Swollen knobby 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:

1. Ask the person to lie down on the floor.



2. 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.
3. Put a bandage on the wound.
4. Refer the person to a healthcare facility. Transport the person to the hospital if the bleeding can't be stopped.
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.



Transport the person to the nearest healthcare facility if the bleeding can't be stopped.

D.7 AMPUTATION

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:



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



2. Place the amputated part in a clean plastic bag.
3. 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.



4. Mark the package clearly with the casualty's name and the time the amputation occurred.
5. Arrange urgent transport of the casualty and the amputated part to the nearest hospital.

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.



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.

D.8 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.

In case of a crush injury:

1. Try to keep the head of the victim as low as possible.
2. Monitor the respiration and consciousness of the victim.
3. If the victim stops breathing, start CPR.
4. Arrange urgent transport to the nearest healthcare facility or hospital.
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.



Always urgently transport a casualty suffering (potential) crush injuries to the nearest healthcare facility,

D.9 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.

D.9.1 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*).

D.9.2 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 restless and aggressive.
- The casualty might complain of chest pain.

D.9.3 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.

D.9.4 WHEN TO REFER TO A HEALTHCARE FACILITY?



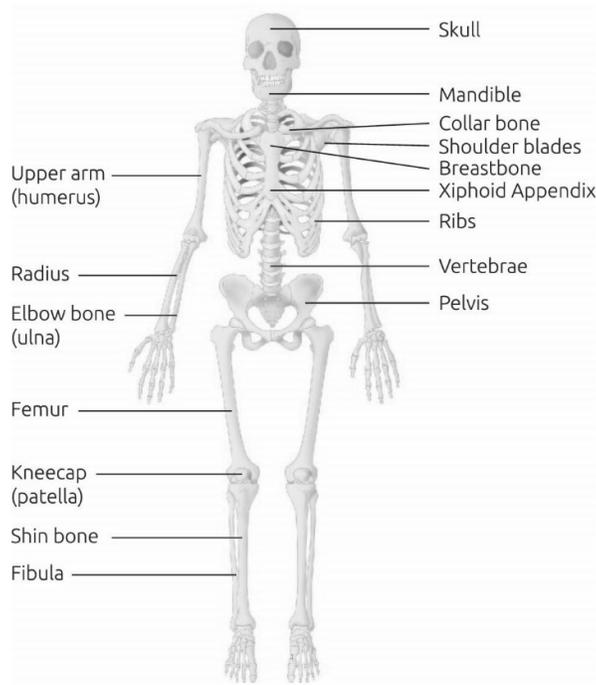
Always urgently transport a casualty showing shock symptoms to the nearest healthcare facility.

E. BONES, JOINTS AND MUSCLES

In this chapter you will learn about:

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

E.1 THE SKELETON



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

The bones in different parts:

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

E.1.1 THE SKULL

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

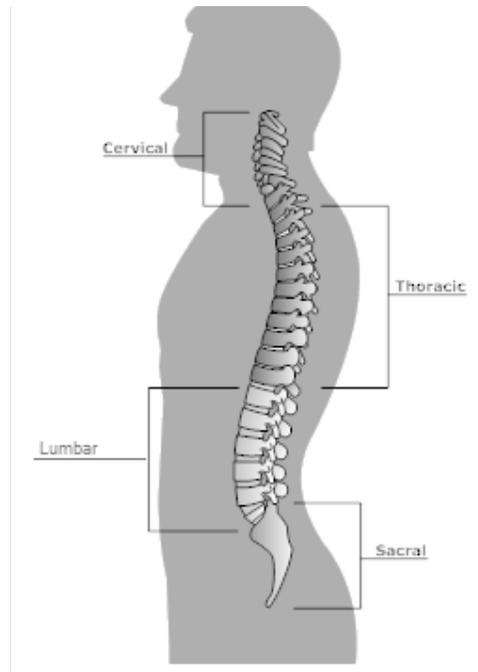
- one in the front, corresponding to the forehead, called the frontal bone;
- two, one on either side, called the parietal bones;
- two, one on either side below the parietals, at the level of ears, called the temporal bones;
- one behind, corresponding to the back of the head, called the occipital bone;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

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

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

E.1.2 THE BACKBONE OR SPINE (VERTEBRAL COLUMN)

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

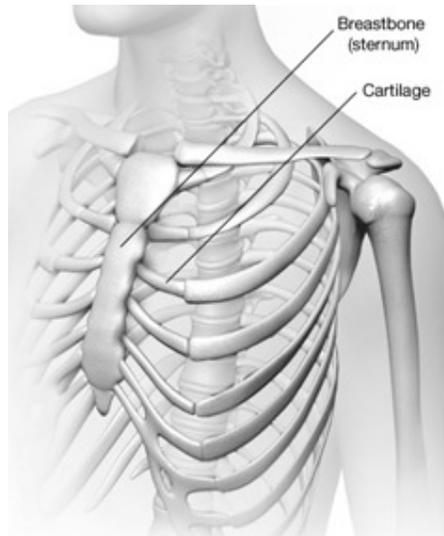


The vertebral column can be divided in different regions:

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

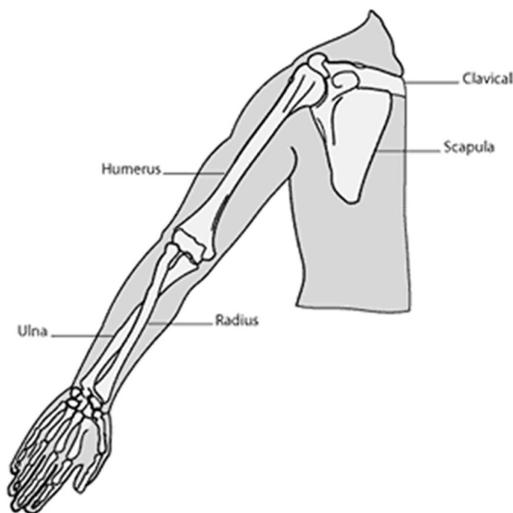
Between each pair of vertebrae is a *disk* of cartilage that acts as a shock absorber and allows movement. Muscles and ligaments attached to the vertebrae stabilize the spine and control the movement of the back. Inside the central canal the *spinal cord* passes which carries impulses from and to the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

E.1.3 THE RIBS AND BREAST BONE (STERNUM)



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

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



E.1.4.1 THE SHOULDER

Each shoulder consists of following bones:

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

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

The bones of the upper limbs (arms) are:

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

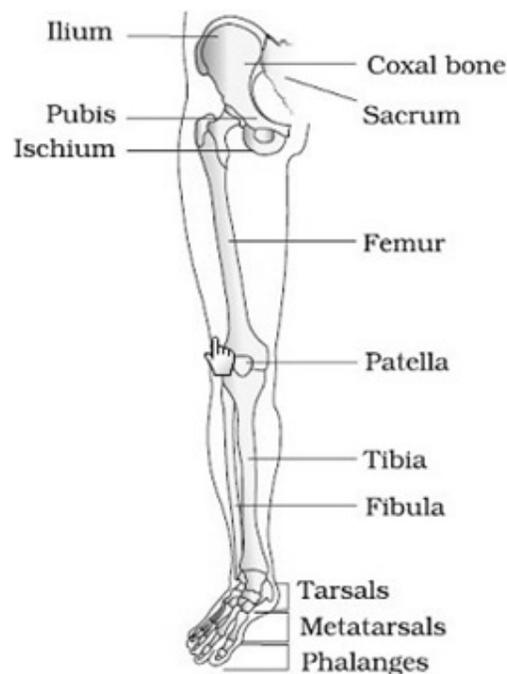
The joint between the upper arm and forearm is called the elbow.

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

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

E.1.5.1 THE PELVIS

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



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

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

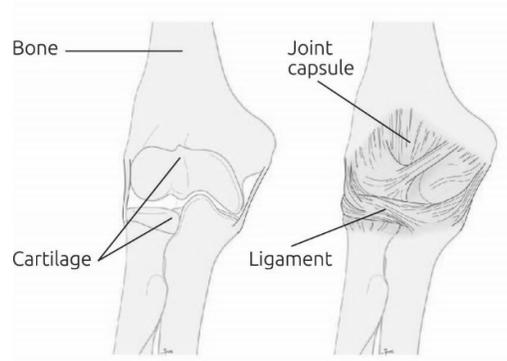
The thigh bone, called *femur*, is the longest and strongest bone in the body. Its upper end forms a part of the hip joint while its lower end forms a part of the knee joint.

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

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

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

E.2 JOINTS



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

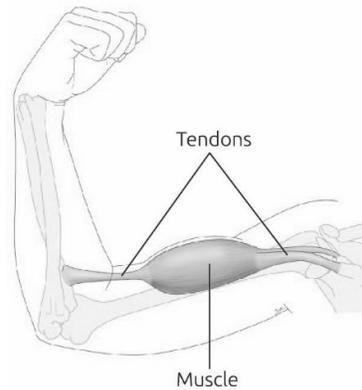
There may be no movement (immovable joints) as in skull or there may be free movements (movable joints) as in knee, elbow, shoulder and hip joints.

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

There are three types of movable joints:

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

E.3 MUSCLES



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

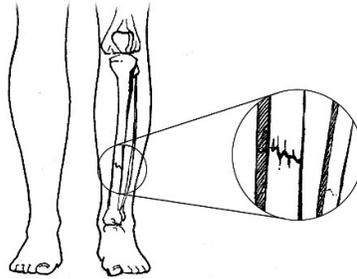
An individual muscle consists of bundles of long muscle fibres. The whole muscle is covered with a strong connective tissue sheath and attached to a bone by inextensible tendons.

There are two types of muscles:

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

E.4 FRACTURES (INJURIES TO BONES)

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



E.4.1 CAUSES OF FRACTURES

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

E.4.1.1 DIRECT FORCE

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

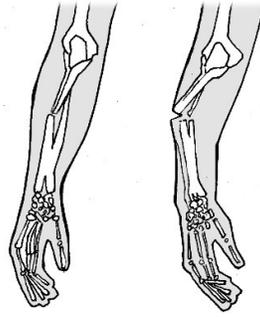
E.4.1.2 INDIRECT FORCE

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

E.4.1.3 MUSCULAR FORCE

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

E.4.2 TYPES OF FRACTURES



E.4.2.1 OPEN AND CLOSED FRACTURES

E.4.2.1.1 CLOSED FRACTURES

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

E.4.2.1.2 OPEN FRACTURES (COMPOUND FRACTURES)

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

E.4.2.2 SIMPLE AND COMPLEX FRACTURES

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

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

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

E.4.3 WHAT DO I SEE AND ENQUIRE?

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

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



Never press hard on a suspected fracture spot!

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

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

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

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

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

E.4.4 WHAT DO I DO?

E.4.4.1 SAFETY FIRST AND CALL FOR HELP

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

E.4.4.2 HYGIENE

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

E.4.4.3 PROVIDE FIRST AID

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

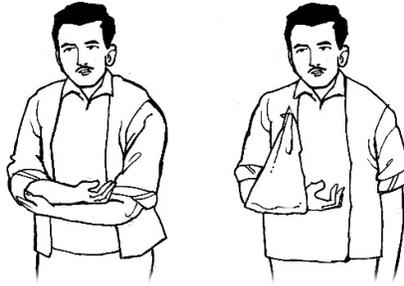
Providing CPR when the victim does not breathe, or treating a severe bleeding is more urgent and should be handled on priority.

6. There may be more than one fracture in the same patient or even in the same limb.
7. Try not to move the broken or dislocated limb unnecessarily.

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

If you need to move the victim, be careful when moving or turning him. It is better to ask assistance by bystanders.

8. Reassure the casualty.
9. Advise the person to keep calm.



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

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

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

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

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

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

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

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

Perform CPR.

Do not interrupt the resuscitation until:

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

E.4.4.4 HYGIENE

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

E.4.5 WHEN TO REFER TO A HEALTHCARE FACILITY?



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

A treatment by bonesetters is not recommended.

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

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

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

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

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

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

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

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

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

E.5.2 WHAT DO I SEE AND ENQUIRE?

You should suspect a potential serious injury if the person:

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

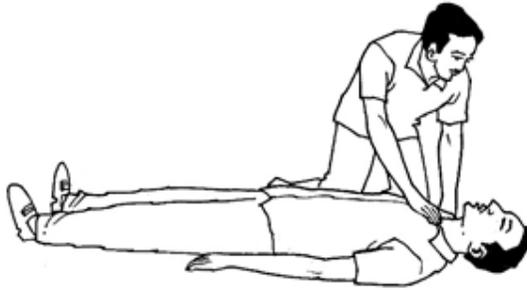
Blood and brain fluid (CSF) may flow from the ear and/or nose in case of fracture of base of skull.

E.5.3 WHAT DO I DO?

E.5.3.1 SAFETY FIRST AND CALL FOR HELP

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

E.5.3.2 PROVIDE FIRST AID



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

Todo so:

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

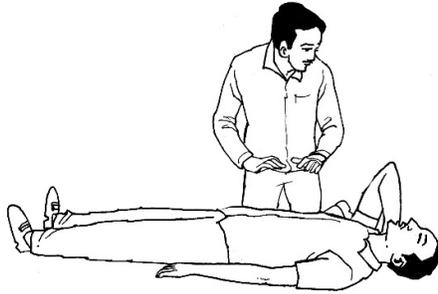
- 'What is your name?'
- 'Where do you live?'
- 'How old are you?'

Check if the injured person responds to simple commands:

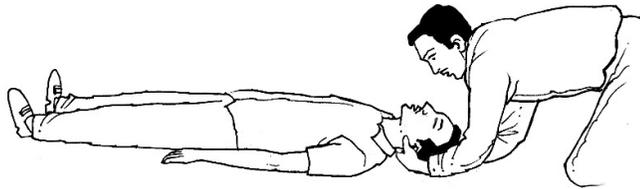
- "Squeeze my hand?"
- "Move your arm/leg/foot/hand"

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

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



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



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



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

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

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

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

Perform CPR.

Do not interrupt the resuscitation until:

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

E.5.3.3 HYGIENE

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

E.5.4 WHEN TO REFER TO A HEALTHCARE FACILITY?



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

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

E.6.1 FRACTURE OF THE CHEEKBONE OR NOSE

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

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

E.6.1.2 WHAT DO I SEE AND ENQUIRE?

You might observe following signs and symptoms:

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

E.6.1.3 WHAT DO I DO?

E.6.1.3.1 SAFETY FIRST

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

E.6.1.3.2 HYGIENE

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

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

E.6.1.3.3 PROVIDE FIRST AID



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



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

E.6.1.3.4 HYGIENE

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

E.6.1.4 WHEN TO REFER TO A HEALTHCARE FACILITY?



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

E.6.2 FRACTURES OF THE LOWER JAW

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

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

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

In some cases the jaw might also be dislocated.

E.6.2.2 WHAT DO I SEE AND ENQUIRE?

You might observe following signs and symptoms:

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

E.6.2.3 WHAT DO I DO?

E.6.2.3.1 SAFETY FIRST

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

E.6.2.3.2 HYGIENE

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

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

E.6.2.3.3 PROVIDE FIRST AID

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



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

14. Arrange transport to the nearest healthcare facility.

E.6.2.3.4 HYGIENE

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

E.6.2.4 WHEN TO REFER TO A HEALTHCARE FACILITY?



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

E.7 INJURIES TO THE SHOULDER, RIBS OR BREASTBONE

E.7.1 INJURIES OR FRACTURES OF THE SHOULDER

E.7.1.1 CAUSES OF INJURIES OR FRACTURE OF THE SHOULDER

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

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

E.7.1.1.1 WHAT DO I SEE AND ENQUIRE?

You might observe following signs and symptoms:

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

E.7.1.2 WHAT DO I DO?

E.7.1.2.1 SAFETY FIRST

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

E.7.1.2.2 HYGIENE

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

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

E.7.1.2.3 PROVIDE FIRST AID



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

E.7.1.2.4 HYGIENE

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

E.7.1.3 WHEN TO REFER TO A HEALTHCARE FACILITY?



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

E.7.2 INJURIES AND FRACTURES OF THE COLLAR BONE

E.7.2.1 CAUSES OF FRACTURES OF THE COLLAR BONE

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

E.7.2.2 WHAT DO I SEE AND ENQUIRE?

You might observe following signs and symptoms:

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

E.7.2.3 WHAT DO I DO?

E.7.2.3.1 SAFETY FIRST

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

E.7.2.3.2 HYGIENE

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

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

E.7.2.3.3 PROVIDE FIRST AID



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

E.7.2.3.4 HYGIENE

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

E.7.2.4 WHEN TO REFER TO A HEALTHCARE FACILITY?



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

E.7.3 RIB INJURIES AND FRACTURES

E.7.3.1 CAUSES OF INJURIES OR FRACTURES OF THE RIBS

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

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

E.7.3.2 WHAT DO I SEE AND ENQUIRE?

Following signs and symptoms may be observed:

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

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

E.7.3.3 WHAT DO I DO?

E.7.3.3.1 SAFETY FIRST

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

E.7.3.3.2 HYGIENE

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

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

E.7.3.3.3 PROVIDE FIRST AID

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

E.7.3.3.4 HYGIENE

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

E.7.3.4 WHEN TO REFER TO A HEALTHCARE FACILITY?



Always transport a casualty with potential rib injury or 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.

E.7.4 FRACTURES OF THE BREAST BONE (STERNUM)

E.7.4.1 CAUSES OF BREAST BONE FRACTURES

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

E.7.4.2 WHAT DO I SEE AND ENQUIRE?

You might observe following signs and symptoms:

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

E.7.4.3 WHAT DO I DO?

E.7.4.3.1 SAFETY FIRST

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

E.7.4.3.2 HYGIENE

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

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

E.7.4.3.3 PROVIDE FIRST AID

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

E.7.4.3.4 HYGIENE

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

E.7.4.4 WHEN TO REFER TO A HEALTHCARE FACILITY?



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

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

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

E.8.1.1 CAUSES OF INJURIES AND FRACTURES OF THE ARM

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

E.8.1.2 WHAT DO I SEE AND ENQUIRE?

You might observe following signs and symptoms:

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

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

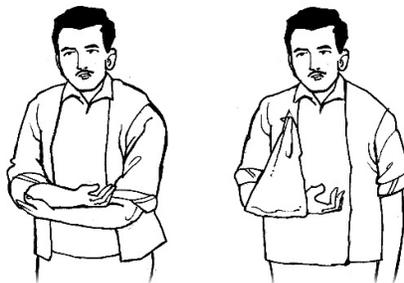
E.8.1.3.1 SAFETY FIRST

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

E.8.1.3.2 HYGIENE

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

E.8.1.3.3 PROVIDE FIRST AID



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

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

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

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



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

- A splint is a rigid piece of wood, plastic or metal that is applied to the fractured limb to support it and to prevent further movement of the broken bone(s).
 - Reasonably wide splints are better than narrow ones.
 - In emergency cases splints can be improvised: a folded newspaper, a piece of wood or a book can be used.
 - The splint should be long enough to immobilize the elbow and the wrist of fractured forearm.
 - The splint should be padded with cotton or cloths to make it fit softly and snugly on the injured forearm.
 - The splint is best applied over the clothing.
8. If the broken arm looks deformed or dislocated, do not try to reset it. This might make the injury worse and will cause pain.
 9. Do not raise an injured arm to ensure that there is no further damage or increase in pain.
 10. Refer the injured to the nearest healthcare facility.

E.8.1.3.4 HYGIENE

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

E.8.1.4 WHEN TO REFER TO A HEALTHCARE FACILITY?



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

E.8.1.5 CAUSES OF INJURIES AND FRACTURES OF THE ELBOW

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

E.8.1.6 WHAT DO I SEE AND ENQUIRE?

You might observe following signs and symptoms:

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

E.8.1.6.1 SAFETY FIRST

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

E.8.1.6.2 HYGIENE

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

E.8.1.6.3 PROVIDE FIRST AID



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

- b. Place paddings under and between the elbow and the body to immobilise the elbow.
 - c. Strap the arm and forearm on the side of the body using three folded (narrow) triangular bandages. Knots are tied on the opposite side of the body.
6. Transport the casualty to the nearest healthcare facility.

E.8.1.6.4 HYGIENE

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

E.8.1.7 WHEN TO REFER TO A HEALTHCARE FACILITY?



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

E.8.2 INJURIES AND FRACTURES OF HAND OR FINGERS

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

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

Hand crush injuries often result in multiple hand fractures.

E.8.2.2 WHAT DO I SEE AND ENQUIRE?

You might observe following signs and symptoms:

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

E.8.2.3 WHAT DO I DO?

E.8.2.3.1 SAFETY FIRST

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

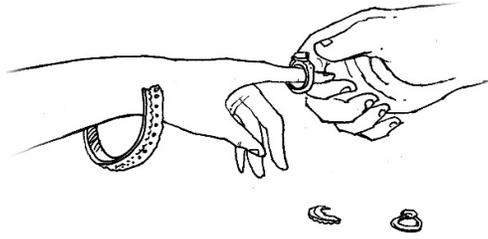
E.8.2.3.2 HYGIENE

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

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

E.8.2.3.3 PROVIDE FIRST AID

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



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

E.8.2.3.4 HYGIENE

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

E.8.2.4 WHEN TO REFER TO A HEALTHCARE FACILITY?



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

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

E.9.1 INJURIES AND FRACTURES OF THE PELVIS

E.9.1.1 CAUSES OF PELVIS INJURIES AND FRACTURES

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

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

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

E.9.1.2 WHAT DO I SEE AND ENQUIRE?

You might observe following signs and symptoms:

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

E.9.1.3 WHAT DO I DO?

E.9.1.3.1 SAFETY FIRST

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

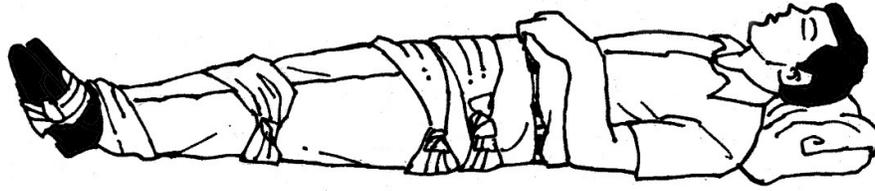
E.9.1.3.2 HYGIENE

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

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

E.9.1.3.3 PROVIDE FIRST AID

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



- If the travel distance is long or the road is rough:
 - a. Place the center of a broad bandage on the hip joint at the injured side. Pass one end around the pelvis and tie it on the other side.
 - b. Tie another broad bandage so that it overlaps with the first by half its breadth and tie similarly. Place some padding between the thighs. This bandage should be firm, but not too tight.
- 7. Avoid pressing the broken bone parts.
- 8. Check if the bandages are not too tight.
- 9. Observe the casualty for signs of shock.
- 10. Keep the person warm by putting a blanket over him, but do not overheat him.
- 11. Transport the casualty to the nearest healthcare facility.

E.9.1.3.4 HYGIENE

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

E.9.1.4 WHEN TO REFER TO A HEALTHCARE FACILITY?



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

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

E.9.2.1 CAUSES OF INJURIES AND 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.

E.9.2.2 WHAT DO I SEE AND ENQUIRE?

You might observe following signs and symptoms:

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

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

E.9.2.3.1 SAFETY FIRST

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

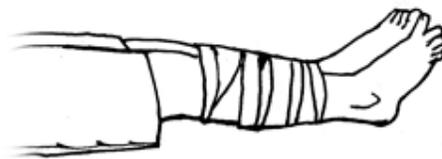
E.9.2.3.2 HYGIENE

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

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

E.9.2.3.3 PROVIDE FIRST AID

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

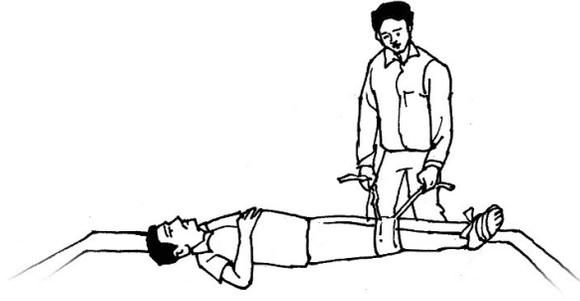


6. To transport the injured person, keep the leg still by bandaging or splinting one leg to the other non-broken/non-dislocated one.

To do so:

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

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

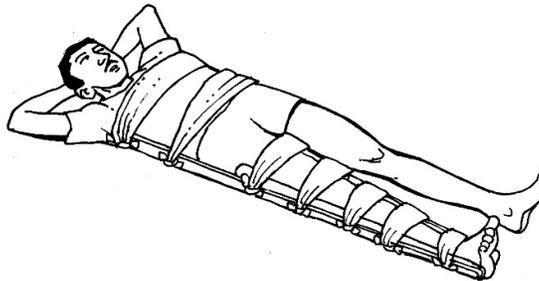


- f. Always tie the knots on the uninjured leg side.
- g. The bandaging should be fairly firm so that there is no movement of the fracture ends, but it should not be too tight in which case the circulation of blood might be stopped.

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

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

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



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

8. Ask the person to keep still.

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

E.9.2.3.4 HYGIENE

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

E.9.2.4 WHEN TO REFER TO A HEALTHCARE FACILITY?



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

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

E.9.3 FRACTURE OF THE KNEE CAP (PATELLA)

E.9.3.1 CAUSES OF FRACTURES OF THE KNEE CAP

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

E.9.3.2 WHAT DO I SEE AND ENQUIRE?

You might observe following signs and symptoms:

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

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

E.9.3.3.1 SAFETY FIRST

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

E.9.3.3.2 HYGIENE

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

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

E.9.3.3.3 PROVIDE FIRST AID

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

E.9.3.3.4 HYGIENE

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

E.9.3.4 WHEN TO REFER TO A HEALTHCARE FACILITY?



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

E.9.4 INJURIES AND FRACTURES OF FOOT OR TOES

E.9.4.1 CAUSES OF INJURIES AND 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).

E.9.4.2 WHAT DO I SEE AND ENQUIRE?

You might observe following signs and symptoms:

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

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

E.9.4.3.1 SAFETY FIRST

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

E.9.4.3.2 HYGIENE

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

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

E.9.4.3.3 PROVIDE FIRST AID

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

E.9.4.3.4 HYGIENE

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

E.9.4.4 WHEN TO REFER TO A HEALTHCARE FACILITY?



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

E.10 DISLOCATIONS (INJURIES TO JOINTS)

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

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

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

E.10.1 CAUSES OF DISLOCATIONS

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

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

E.10.2 WHAT DO I SEE AND ENQUIRE?

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

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

E.10.3 WHAT DO I DO?

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

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

E.10.4 WHEN TO REFER TO A HEALTHCARE FACILITY?



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

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

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

E.11.1 CAUSES OF STRAINS AND SPRAINS

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

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

E.11.2 WHAT DO I SEE AND ENQUIRE?

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

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

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

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

E.11.3 WHAT DO I DO?

E.11.3.1 SAFETY FIRST

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

E.11.3.2 HYGIENE

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

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

E.11.3.3 PROVIDE FIRST AID

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



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.

E.11.3.4 HYGIENE

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

E.11.4 WHEN TO REFER TO A HEALTHCARE FACILITY?



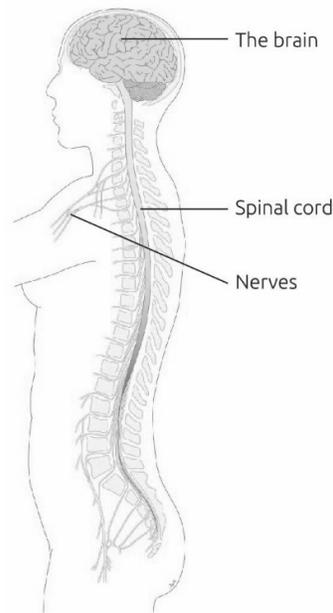
If the pain is severe or the pain does not get better or worsens, the person has difficulty in moving or you think there might be a fracture, always transport the person to a nearby healthcare facility.

F. NERVOUS SYSTEM AND UNCONSCIOUSNESS

In this chapter you will learn about:

- The nervous system.
- Unconsciousness.
- Head injuries.
- Stroke.
- Fits – convulsions – seizures.
- Epilepsy.

F.1 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.

F.1.1 THE CENTRAL NERVOUS SYSTEM

The central nervous system (CNS) comprises of the brain and the spinal cord.

F.1.1.1 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.

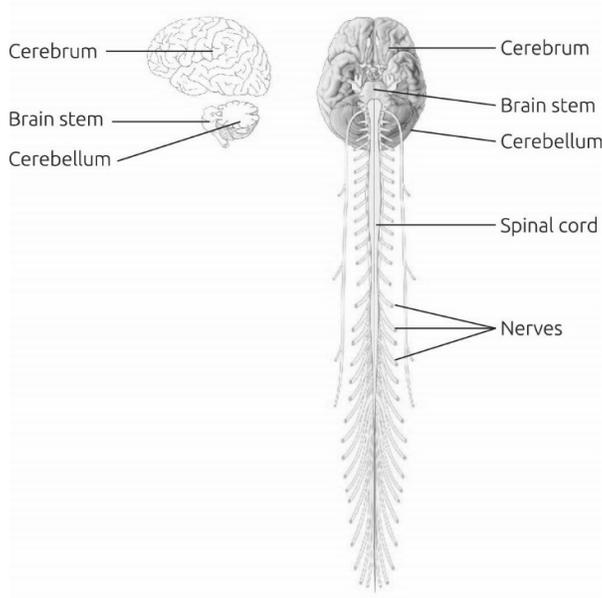
The brain is encased in the skull and suspended in a clear fluid, called the *cerebrospinal fluid (CSF)*, which acts as a partial shock absorber. Nonetheless, since the brain is free to move within the skull the brain is sensitive to violent movements or pressure.

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.

F.1.1.2 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.

F.1.2 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*.

F.1.2.1 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.

F.1.2.2 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.

F.2 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).

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.

i The first aider can measure and record a patient's responsiveness and level of consciousness using the AVPU scale (see chapter on basic first aid techniques).

F.2.1 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.

F.2.2 WHAT DO I DO?

F.2.2.1 SAFETY FIRST AND CALL FOR HELP

1. Make sure there is no danger to you, the person or bystanders.

F.2.2.2 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.



Todo 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.

i The first aider can measure and record a patient's responsiveness and level of consciousness using the AVPU scale (see chapter on basic first aid techniques).

F.2.2.2.1 WHAT DO I DO WHEN THE CASUALTY RESPONDS?

1. Try not to change the position of the person if there has been a head, neck, back, leg or arm injury.
2. Try to find out what happened to the person.
3. Tell the person to stay calm and not to move (if at all possible).



4. Look and feel for breathing
5. Keep checking the casualty to make sure he is not getting worse.
6. Verify regularly the level of consciousness and breathing.
7. Find medical help for the person if needed.

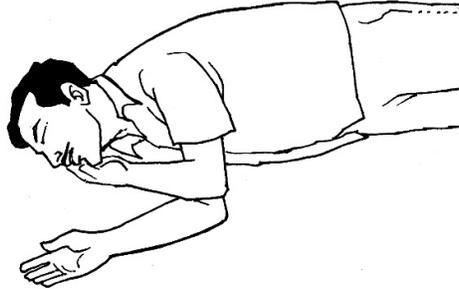
F.2.2.2.2 WHAT DO I DO WHEN THE CASUALTY DOES NOT RESPOND?

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:
 - a. 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.
 - 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.

F.2.2.2.3 WHAT DO I DO WHEN THE PERSON STOPS BREATHING?



Perform CPR.

Do not interrupt the resuscitation until:

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

F.2.2.2.4 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.

F.2.3 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.

F.3 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.

F.3.1 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.

F.3.2 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.

F.3.3 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.

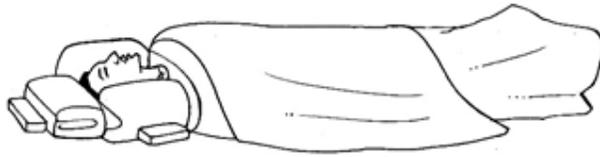
You might observe following signs and symptoms:

- 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.

F.3.4 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 chapter on Injuries and fractures to the head, neck and spine).

F.3.5 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.

F.4.2 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 is 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.

F.4.2.1 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

F.4.3 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.

F.4.4 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.

F.5 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).

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.

F.5.1 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.

F.5.2 WHAT DO I DO?

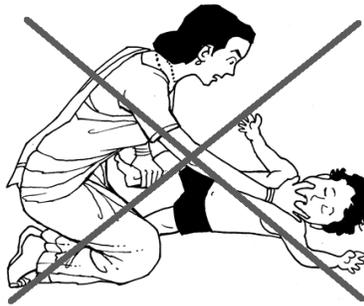
F.5.2.1 SAFETY FIRST

1. Make sure there is no danger to you, the person or bystanders.

F.5.2.2 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.

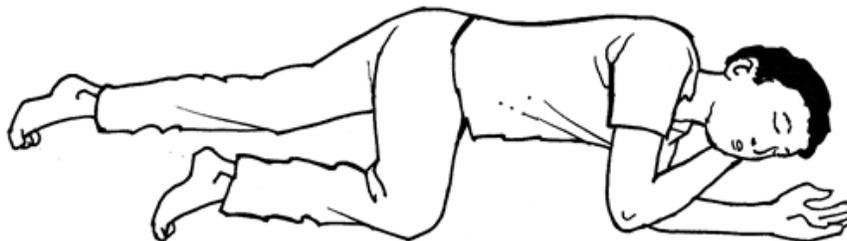


7. Do not put your fingers in the person's mouth.

i A person cannot swallow his saliva during a convulsion. A person might bite his own tongue, 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.
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.

F.5.2.3 HYGIENE

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

F.5.3 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.

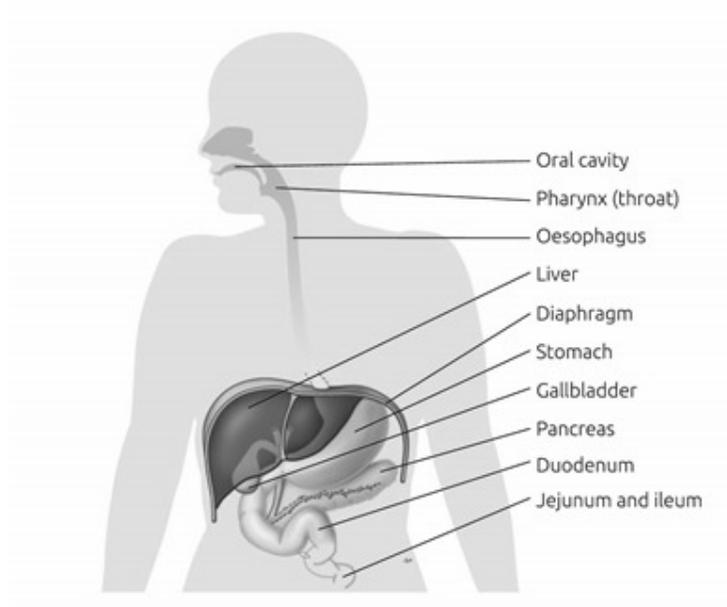
G. GASTROINTESTINAL TRACT, DIARRHOEA, FOOD POISONING AND DIABETES

In this chapter you will learn about:

- The gastrointestinal system.
- Diarrhoea.
- Food poisoning.
- Diabetes.

G.1 GASTROINTESTINAL TRACT

Water and food are essential for the survival of the human body. The unique structure of the gastrointestinal tract (GI) allows it to perform its specialized functions to turn food into the energy for survival and packaging the residue for waste disposal.



- Mouth

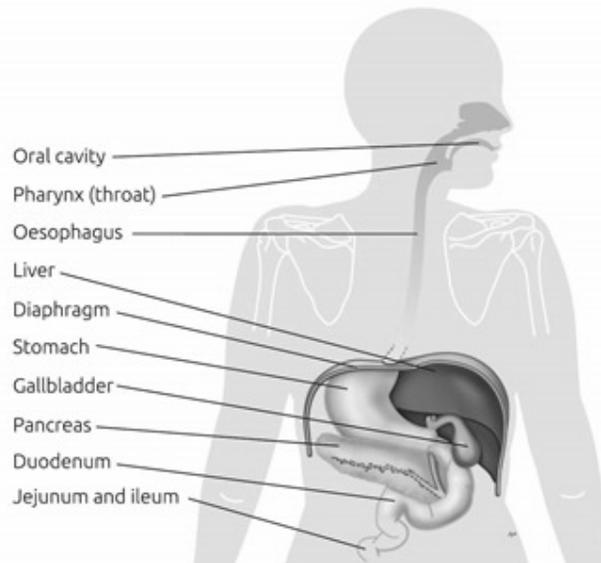
The mouth or *oral cavity* is the beginning of the digestive tract. In fact, digestion starts here when taking the first bite of food. Chewing breaks the food into pieces that are more easily digested, while saliva mixes with food to begin the process of breaking it down into a form the body can absorb and use.

- Oesophagus

Located in *throat cavity* near your *trachea* (windpipe), the gullet, also called *oesophagus*, receives food from the mouth when swallowing. By means of a series of muscular contractions, the oesophagus delivers food to the stomach.

- Stomach

The stomach is a hollow organ that holds food while it is being mixed with enzymes that continue the process of breaking down food into a usable form. Cells in the lining of the stomach secrete strong acid and powerful enzymes that are responsible for the breakdown process. When the contents of the stomach are sufficiently processed, they are released into the small intestine.



- Small intestine

Made up of three segments — the *duodenum*, *jejunum*, and *ileum* — the small intestine is an approximately 7 meter (app. 22.5 foot) long muscular tube that breaks down food using enzymes released by the pancreas and bile from the liver. Peristalsis also is at work in this organ, moving food through and mixing it with digestive secretions from the pancreas and liver. The duodenum is largely responsible for the continuous breaking-down process, with the jejunum and ileum mainly responsible for absorption of nutrients into the bloodstream.

Contents of the small intestine start out semi-solid, digested on the way and end in a more liquid form after passing through the organ. Water, bile, enzymes, and mucous contribute to the change in consistency. Once the nutrients have been absorbed and the leftover-food residue liquid has passed through the small intestine, it then moves on to the large intestine, or *colon*.

- Pancreas

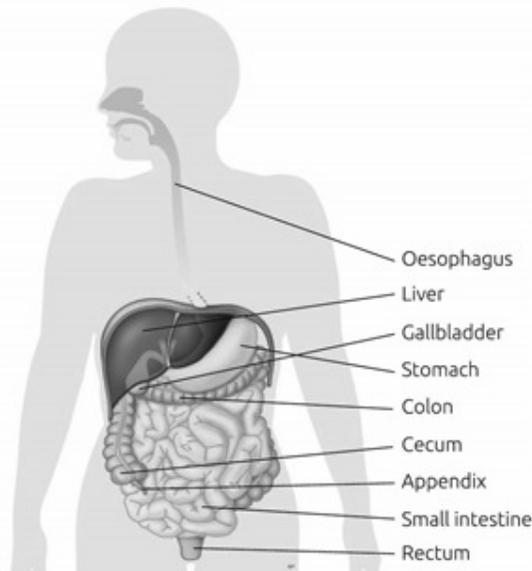
The *pancreas* secretes digestive enzymes into the duodenum, the first segment of the small intestine. These enzymes break down protein, fats, and carbohydrates. The pancreas also makes insulin, secreting it directly into the bloodstream. Insulin is the chief hormone for metabolizing sugar.

- Liver

The liver has multiple functions, but its main function within the digestive system is to process the nutrients absorbed from the small intestine. Bile from the gall bladder (liver) secreted into the small intestine also plays an important role in digesting fat. In addition, the liver is the body's "chemical factory." It takes the raw materials absorbed by the intestine and makes all the various chemicals the body needs to function. The liver also detoxifies potentially harmful substances. It breaks down and secretes many substances.

- Gallbladder

The gallbladder stores and concentrates bile, and then releases it into the duodenum to help absorb and digest fats.



- Large intestine (colon)

The *colon* is an approximately 1.5 meter (app. 60 inches) long muscular tube that connects the small intestine to the *rectum*. The large intestine is made up of the *cecum*, the *ascending (right) colon*, the *transverse (across) colon*, the *descending (left) colon*, and the *sigmoid colon*, which connects to the rectum. The *appendix* is a small tube attached to the cecum. The large intestine is a highly specialized organ that is responsible for processing waste so that emptying the bowels is easy and convenient.

Stool, or waste left over from the digestive process, is passed through the colon by means of peristalsis, first in a liquid state and ultimately in a semi-solid/solid form. As stool passes through the colon, water is removed. Stool is stored in the sigmoid (S-shaped) colon until a "mass movement" empties it into the rectum once or twice a day. It normally takes about 36 hours for stool to get through the colon. The stool itself is mostly food debris and bacteria. These bacteria perform several useful functions, such as synthesizing various vitamins, processing waste products and food particles, and protecting against harmful bacteria. When the descending colon becomes full of stool, also called *faeces*, it empties its contents into the rectum to begin the process of elimination.

- Rectum

The *rectum* is 18 to 20 cm (app. 8-inch) chamber that connects the colon to the *anus*. It is the rectum's job to receive stool from the colon, to let the person know that there is stool to be evacuated, and to hold the stool until evacuation happens. When anything (gas or stool) comes into the rectum, sensors send a message to the brain. The brain then decides if the rectal contents can be released or not. If they can, the sphincters relax and the rectum contracts, disposing of its contents. If the contents cannot be disposed of, the sphincter contracts and the rectum accommodates so that the sensation temporarily goes away.

- Anus

The *anus* is the last part of the digestive tract. It is a 3 to 5 cm (app 2-inch) long canal consisting of the pelvic floor muscles and the two anal sphincters (internal and external). The lining of the upper anus is specialized to detect rectal contents. It lets the person know whether the contents are liquid, gas, or solid. The anus is surrounded by sphincter muscles that are important in allowing control of stool movement. The pelvic floor muscles create

an angle between the rectum and the anus that stops stool from coming out when it is not supposed to. The internal sphincter is always tight, except when stool enters the rectum. It keeps us continent when we are asleep or otherwise unaware of the presence of stool. When we get an urge to go to the bathroom, we rely on our external sphincter to hold the stool until reaching a toilet, where it then relaxes to release the contents.

A well balanced diet contains carbohydrates, proteins, fat, minerals (ea. iron, calcium, sodium, potassium, magnesium, fluorine, iodine, zinc, copper etc.) and vitamins.

G.2 DIARRHOEA

Diarrhoea is the passage of three or more loose or liquid stools per day, or more frequently than is normal for the individual. It is usually a symptom of gastrointestinal infection, which can be caused by a variety of bacterial, viral and parasitic organisms.

A person can catch this infection by:

- drinking contaminated water;
- preparing food with contaminated water;
- eating unsafe food, such as fish that was caught in polluted water;
- food that has not been kept cold or has gone bad;
- touching faeces; or
- not washing his hands.

Diarrhoea causes dehydration as too much water and nutrition leaves the body. If the sick person does not receive help, he can die. Babies and children are most at risk of dehydration.

If both fever and diarrhoea occur together, laypersons often focus on fever only and not enough attention is paid to replacing lost fluids due to diarrhoea.

A sick person with diarrhoea does not normally need antibiotics, unless prescribed by a doctor.

G.2.1 WHAT DO I SEE AND ENQUIRE?

You may observe following signs and symptoms:

- The sick person has frequent loose or liquid stools.
- The sick person has an urgent need to defecate and might have trouble to keep it under control. Even after defecation person may complain of feeling of incomplete evacuation.
- Often the sick person complains about pain in the abdomen (cramps).
- The abdomen might appear bloated or tense.
- The sick person complains of feeling unwell.
- Fever might be present.
- There might be nausea and/or vomiting.
- The sick person might be passing blood and/or mucus in stool.

G.2.2 WHAT DO I DO?

G.2.2.1 HYGIENE

1. 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.
2. 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 stool or vomit.

G.2.3 PREVENT DEHYDRATION



3. Prevent dehydration by giving plenty of fluids to the sick person. Ask the sick person to drink the equivalent of what he lost every time he passes loose stools:

On an average, a person should drink 5-10 ml/kg bodyweight per loose stool.



- a. Children under two years old should drink between a quarter and half of a large cup (50-100 ml) each time they pass loose stools.



- b. Children between 2-10 years should drink between a half and a full large cup (100-200 ml) each time they pass loose stools.



- c. Children above ten years and adults should at least drink one large cup (200 ml) each time they pass loose stools.



- d. Feed the sick child more frequently.

Tell the mother to continue to give breast feeding with a higher frequency.

Tell the mother to continue to give bottle feeding (for bottle-fed children only) with a higher frequency. Use the same milk as usual.

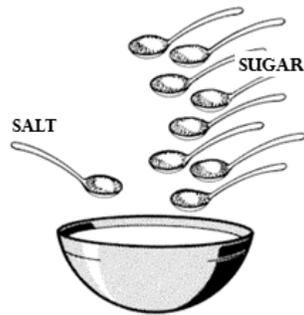


4. Advise the sick person to avoid fruit juices.



5. Let the sick person drink (if available) ORS (package bought at chemist or available at Govt. healthcare facilities free of cost).

Prepare and use as instructed on package.



6. If no ORS is available, you can prepare a homemade sugar and salt solution:
 - a. Take one litre of safe clean water (boiled and cooled cleanwater).
 - b. Add eight teaspoons of sugar.
 - c. Add one teaspoon of salt.
 - d. Mix well.
7. If the sick person also vomits, wait five to ten minutes before giving another drink. Then ask the person to drink slowly or give it by spoon.



8. You may give the sick person curd (if available).
9. The sick person can eat light food.
10. If a person has to travel, providedrinks so thathe cantake in fluids on the way.
11. Advise for regularly check on the sick person and to seek medical help if his condition worsens. This includes passing blood and mucus in stool, having fever, developing dehydration, or if diarrhoea does not get better within 2 days.

G.2.3.1 HYGIENE

Wash your hands after taking care of the sick person or if you came into contact with stools or vomit or you used the toilet. 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.

G.2.4 WHEN TO REFER TO A HEALTHCARE FACILITY?

 The person should seek medical help if having any of the following symptoms:

- has blood in the stool,
- has fever,

- suffers from severe sleepiness or is difficult to wake up or is confused,
- urinates less and the colour of the urine darkens,
- has sunken eyes,
- cries without tears,
- has a dry mouth,
- does not drink,
- has repeated vomiting,
- has fits,
- has fast breathing, or
- the diarrhoea does not get better within two days.

When transporting the person to a healthcare facility, provide drinks so that he can take in fluids on the way.

G.3 FOOD POISONING

Usually people loosely refer to all cases of gastroenteritis (vomiting, diarrhoea) caused by contaminated food as having food poisoning. Infectious organisms including viruses, bacteria and parasites are the most common causes of food poisoning. Contamination can occur at any point of production, processing, handling, storage, or cooking. The person may become sick in a few hours to several days after eating the contaminated food. These cases can be managed as other cases of diarrhoea.

Sometimes, food is directly contaminated by toxins, for example toxins released by Staphylococci or Clostridium bacteria. In such cases, the person usually becomes unwell very soon after consuming the food and the main symptom is vomiting. Some consider cases caused by food contaminated by a toxin as having true food poisoning. These cases need to be referred to the hospital urgently for proper management.

G.3.1 WHAT DO I SEE AND ENQUIRE?

You may observe following signs and symptoms:

- The sick person has nausea or vomits.
- The sick person complains about cramping and abdominal pain.
- The sick person has diarrhoea.
- The sick person might complain of a headache.
- There might be fever.
- The sick person might have impaired consciousness.

Several people sharing the contaminated food fall ill at the same time, as in a marriage.

G.3.2 WHAT DO I DO?

G.3.2.1 HYGIENE

1. 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.

G.3.2.2 PROVIDE FIRST AID



2. Advise the sick person to lie down and rest.



3. Prevent dehydration if the sick person suffers from vomiting and/or diarrhoea (see chapter on diarrhoea - What do I do?).
4. Observe the sick person; when his condition worsens, refer him to the nearest healthcare facility.

G.3.2.2.1 WHAT DO I DO WHEN THE PERSON BECOMES UNCONSCIOUS, BUT IS STILL BREATHING?

- a. Put the person in the recovery position.
- b. Continue to observe the patient's condition and breathing.

G.3.2.2.2 WHAT DO I DO WHEN THE PERSON STOPS BREATHING?

Perform CPR.

Do not interrupt the resuscitation until:

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

G.3.2.3 HYGIENE

Always wash your hands after taking care of a person or after coming into contact with vomit, stools or other fluids. 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.

G.3.3 WHEN TO REFER TO A HEALTHCARE FACILITY?



Always urgently transport a person having food poisoning due to food contaminated with toxins or chemicals (Symptoms develop early) to the nearest healthcare facility.



When the person is considered having food poisoning due to food contaminated with organisms (toxins not released; the symptoms develop later) he should seek medical care if the condition worsens or he has any of the following symptoms:

- has blood or mucus in the diarrhoea,
- has fever,
- feeling sleepiness or is difficult to wake up or is confused,
- passing less urine and the colour of the urine darkens,

- has sunken eyes,
- cries without tears,
- has a dry mouth,
- does not drink,
- has repeated vomiting,
- has fits,
- has fast breathing,
- the diarrhoea does not get better within two days, or
- suffers impaired consciousness or blurred vision.

When transporting the person to a healthcare facility, provide drinks so that he can take in fluids on the way.

G.4 DIABETES

Diabetes is a condition that causes a person's blood sugar level to become high.

Many people have blood sugar levels above the normal range, but not high enough to be diagnosed as having diabetes. This condition is sometimes referred to as '*pre-diabetes*'. If the blood sugar level is above the normal range, the risk of developing 'full-blown' diabetes is increased.

There are two main types of diabetes: type 1 diabetes and type 2 diabetes.

G.4.1 TYPE 1 DIABETES

In type 1 diabetes, the body's immune system attacks and destroys the cells that produce insulin. As no insulin is produced, the glucose level increases, which can seriously damage the body's organs. People diagnosed with type 1 diabetes need insulin injections for the rest of their life.

Type 1 diabetes is often known as *insulin-dependent diabetes*. It's also sometimes known as *juvenile diabetes* or *early-onset diabetes* when it develops in young persons, often during the teenage years.

Type 1 diabetes is less common than type 2 diabetes.

G.4.2 TYPE 2 DIABETES

Type 2 diabetes occurs when the body doesn't produce enough insulin, or the body's cells don't respond to insulin. This is known as *insulin resistance*.

Type 2 diabetes is far more common than type 1 diabetes.

People diagnosed with type 2 diabetes may be able to control the symptoms simply by eating a healthy diet, exercising regularly, and monitoring their blood glucose levels frequently.

However, as type 2 diabetes is a progressive condition, people diagnosed with type 2 diabetes may eventually need medication, usually in the form of tablets and/or injections.

Type 2 diabetes is often associated with obesity. It is sometimes referred to as *maturity-onset diabetes* because it's more common in older people.

G.4.3 GESTATIONAL DIABETES (DIABETES DURING PREGNANCY)

During pregnancy, some women have such high levels of blood glucose that their body is unable to produce enough insulin to convert it into energy. This is known as *gestational diabetes*.

Pregnancy can also make existing type 1 diabetes worse. Gestational diabetes can increase the risk of health problems developing in an unborn baby, so it's important to keep the blood glucose levels under control.

In most cases, gestational diabetes develops during the second trimester of pregnancy (weeks 14 to 26) and usually disappears after the baby is born. However, women who have gestational diabetes are at an increased risk of developing type 2 diabetes later in life.

G.4.4 DIAGNOSIS

It is very important for diabetes to be diagnosed as early as possible because it will get progressively worse if left untreated. Symptoms such as feeling thirsty, hungry and passing urine more often than usual, losing weight and muscle bulk, having wounds that heal slowly, experiencing blurred vision or feeling tired all the time might indicate a person suffers from diabetes and this person should contact a healthcare facility.

G.5 HYPERGLYCAEMIA

A too high level of blood sugar, called *hyperglycaemia* occurs when the body can't remove glucose from the blood and turn it into energy. It usually only happens in people with diabetes because people with this condition have problems with insulin – the hormone that helps remove glucose from the blood and converts it to energy.

If you have diabetes, there are some situations that can trigger an increase in blood glucose including infections, stress, missing a dose of insulin, eating too much or being ill.

G.5.1 SYMPTOMS OF HYPERGLYCAEMIC COMA OR DIABETIC COMA

Immediate medical attention is required if a person with diabetes, experiences the following symptoms:

- nausea or vomiting;
- stomach pain;
- a fruity smell on the breath, which may smell like pear drops or nail varnish;
- drowsiness or confusion;
- rapid breathing (hyperventilation);
- signs of dehydration (signs of which include a headache, dry skin, and a weak, rapid heartbeat);
- loss of consciousness.

These symptoms may be a sign of *diabetic ketoacidosis*, a serious and potentially life-threatening complication of hyperglycaemia.

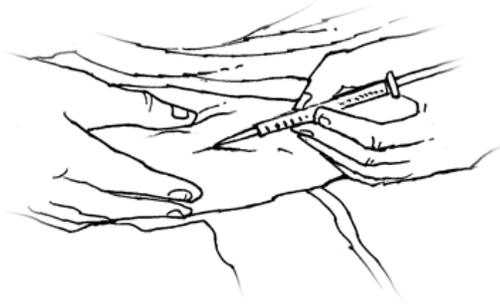
G.5.2 WHAT DO I DO?

G.5.2.1 SAFETY FIRST

1. Make sure there is no danger to you, the person or bystanders.

G.5.2.2 PROVIDE FIRST AID

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.
3. Make the person lie down in a comfortable position.



4. Ask if the person is taking medicines for diabetes. If so, allow the person to take the prescribed medication.
5. Arrange urgent transport to a nearby healthcare facility.
6. Keep observing the person in case he collapses.

G.5.2.2.1 WHAT DO I DO WHEN THE PERSON BECOMES UNCONSCIOUS, BUT IS STILL BREATHING?

- a. Put the person in the recovery position.
- b. Continue to observe the patient's condition and breathing.

G.5.2.2.2 WHAT DO I DO WHEN THE PERSON STOPS BREATHING?

Perform CPR.

Do not interrupt the resuscitation until:

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

G.5.2.3 HYGIENE

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

G.5.3 WHEN TO REFER TO A HEALTHCARE FACILITY?

Always arrange urgent transport to the nearest healthcare facility as a diabetic coma is a serious and potentially life-threatening condition.

G.6 HYPOGLYCAEMIA

Hypoglycaemia, or also known as a "hypo", is an abnormally low level of sugar (glucose) in the blood. When the glucose level is too low, the body doesn't have enough energy to carry out its activities.

Hypoglycaemia is most commonly associated with diabetes and mainly occurs if someone with diabetes taking too much insulin (overdoses insulin) or other medicines, missing a meal or exercises too hard.

People who do not have diabetes can also experience hypoglycaemia, although this is much rarer. It can be triggered by malnutrition, binge drinking or certain other conditions.

G.6.1 SYMPTOMS OF HYPOGLYCAEMIA

Most people will have some warning that their blood glucose levels are too low, which gives them time to correct them. Typical early warning signs are feeling hungry, trembling or shakiness, dizziness, and sweating.

In more severe cases, there can also be confusion and difficulty in concentration. In severe cases, the person experiencing hypoglycaemia may lose consciousness.

It is also possible for hypoglycaemia to occur during sleep, which can cause excess sweating, disturbed sleep, and feeling tired and confused upon waking.

G.6.2 WHAT DO I DO?

G.6.2.1 SAFETY FIRST

1. Make sure there is no danger to you, the person or bystanders.

G.6.2.2 PROVIDE FIRST AID

2. Make the person lie down in a comfortable position.
3. Ask if the person is taking insulin and/or other medicines for diabetes and if he might have taken too much insulin and/or other medicines, missed a meal or have done a heavy physical exercise.



4. If the person is conscious and is able to follow commands and can swallow, give the sick person some food or drink that contains sugar, such as sweets, jam, or dextrose tablets or fruit juice.

Often the diabetic patient has fast acting sugars such as biscuits available with them. Allow him to take it.

After having something sugary, suggest the person to have a longer-acting "starchy" carbohydrate food, such as a few biscuits or a sandwich.

5. Never try to put food or drink into the mouth of someone who is drowsy or unconscious, as he could choke
6. Keep observing the person in case he collapses.
7. If you cannot differentiate between hyperglycaemia and hypoglycaemia (which is difficult even for a trained person), treat the patient as having hypoglycaemia. Low blood sugar can kill a person quickly.

G.6.2.2.1 WHAT DO I DO WHEN THE PERSON BECOMES UNCONSCIOUS, BUT IS STILL BREATHING?

- a. Put the person in the recovery position.
- b. Continue to observe the patient's condition and breathing.

G.6.2.2.2 WHAT DO I DO WHEN THE PERSON STOPS BREATHING?

Perform CPR.

Do not interrupt the resuscitation until:

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

G.6.2.3 HYGIENE

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

G.6.3 WHEN TO REFER TO A HEALTHCARE FACILITY?



Always arrange urgent transport to the nearest healthcare facility as a diabetic coma is a serious and potentially life-threatening condition.



If the diabetic person experienced hypoglycaemia but improved with oral sugar, he should contact the healthcare facility to review his condition and eventually to correct his insulin doses and other medications.

H. SKIN, BURNS, HEAT EXHAUSTION, FEVER AND HYPOTHERMIA

In this chapter you will learn about:

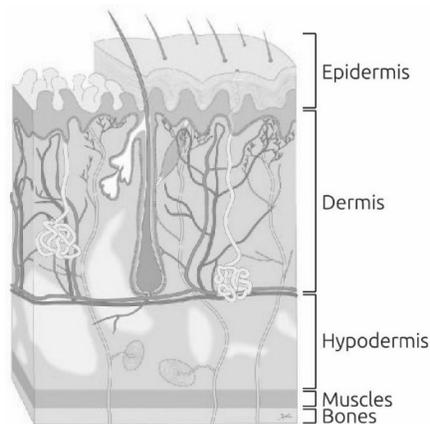
- The skin.
- Burn wounds.
- Dry burns and scalds (burns from fire, heat and steam).
- Electrical burns.
- Chemical burns.
- Sun burns, heat exhaustion and heatstroke.
- Frost bites (cold burns).
- Prevention of burns.
- Fever.
- Hypothermia.

H.1 THE SKIN

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*.

H.1.1 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.

H.1.2 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.

H.1.3 THE FATTY LAYER: HYPODERMIS

This layer is also known as the *subcutis*.

It hosts sweat glands, and fat and collagen cells, and is responsible for conserving your body's heat and protecting your vital inner organs.

H.2 SKIN FUNCTIONS

The main functions of the skin are protection, sensation, temperature regulation, immunity, allowing movement and growth, excretion and synthesis of vitamins.

H.2.1 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.

H.2.2 SENSATION

The pain and touch receptors in the dermis allow us to feel touch, pressure, heat, cold and pain.

H.2.3 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.

H.2.3.1.1 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.

H.2.3.1.2 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.

H.2.4 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.

H.2.5 ALLOWS GROWTH AND MOVEMENT

The elasticity of the skin allows growth, movement and adaptation of the contours of the body during movement.

H.2.6 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).

H.2.7 SYNTHESIS OF VITAMINS

The skin plays an important role in the synthesis of vitamin D.

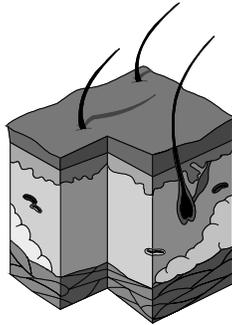
H.3 BURN WOUNDS

Burns are injuries to the skin and underlying tissue that result from the sun, heat sources, fire, hot items, boiling liquids, chemicals, irradiation, etc. However, cold can also create burn wounds!

H.3.1 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.

H.3.1.1 FIRST DEGREE BURNS

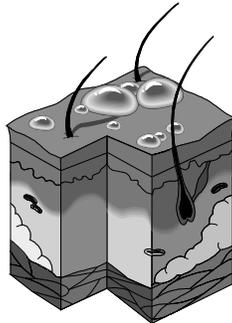


Superficial first degree burns show following signs and symptoms:

- red or darker than usual skin;
- slightly swollen skin;
- painful, but mostly bearable.

These burns usually extend only into the epidermis.

H.3.1.2 SECOND DEGREE BURNS

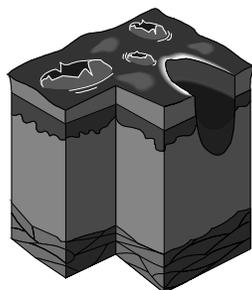


Intermediate second degree burns show following signs and symptoms:

- blistering,
- swelling,
- very painful.

These burns usually involve the epidermis and the dermis.

H.3.1.3 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.

H.3.2 TYPE OF BURNS BY ORIGIN

Burns can be differentiated by their origin:

H.3.2.1 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).

H.3.2.2 SCALDS

Scalds are burns by steam or hot liquids (e.g. tea, coffee, hot fat).

H.3.2.3 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.

H.3.2.4 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.

H.3.2.5 RADIATION BURNS

Exposure to radioactive sources, e.g. X-rays or radiotherapy-rays, can result in radiation burns.

H.3.2.6 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).

H.3.2.7 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.

H.3.3 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

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.

H.3.4 DRY BURNS AND SCALDS (BURNS FROM FLAMES, HOT SURFACES, STEAM, ...)

H.3.4.1 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

H.3.4.2 WHAT DO I DO?

H.3.4.2.1 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.

H.3.4.2.2 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:

3. Make sure you have already called for help prior entering the location.



4. 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.
5. 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.
6. Do not open other doors or windows when there is fire in the room. The rush of air will increase the fire.

H.3.4.2.3 PROVIDE FIRST AID

7. If the person's cloths are on fire:



a. stop him from running around;



b. douse the fire with water;



c. 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



d. make the person roll on the ground to smother the flames.



8. 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.

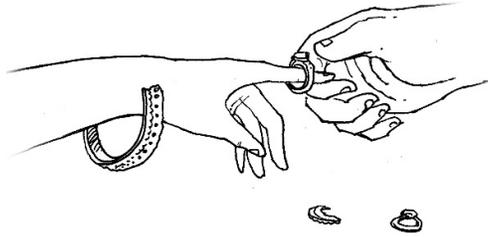
Do not use very cold water for cooling the burns. Burn victims can easily become hypothermic.



9. Protect the burn victim by wrapping him in clean blankets.
10. 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.
11. Put on gloves if available. You can also use a clean plastic bag. Try not to touch the person's wounds.



12. Cover burn wounds with a clean cotton cloth.
13. Do not open blisters – leave them intact.



14. 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.

15. If possible, remove the person's belt, shoes or boots as the limb might swell.

16. Keep the casualty warm, but do not overheat him.



17. If possible, keep burned hands, legs or feet in an elevated position.

18. Do not leave the casualty alone, and keep observing him.

19. 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.

20. In case of severe burns, transport the casualty as quickly as possible to the nearby healthcare facility or hospital.

H.3.4.2.3.1 WHAT DO I DO IF THE PERSON IS UNCONSCIOUS, BUT IS STILL BREATHING?

- a. Put the person in the recovery position, if possible.
- b. Continue to observe the victim and check his breathing

H.3.4.2.3.2 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.

H.3.4.2.4 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.

H.3.4.3 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 person's 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.

H.3.5 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.

H.3.5.1 HYGIENE

1. 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.

H.3.5.2 PROVIDE FIRST AID

After cooling down the burn wound (see above on how to approach the casualty):



2. Dress the wound with a clean cotton cloth.



3. 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.



4. Make sure the burned casualty has sufficient fluids to drink.
5. Refer the victim to a healthcare facility for further management.

H.3.5.3 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.

H.3.6 SPECIFIC BURN LOCATIONS

H.3.6.1 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.

H.3.6.2 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:

1. 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.



2. 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.

3. If the person wears contact lenses, ask the person to take them out and keep them in a safe place.
4. Arrange transport to the nearest healthcare facility or hospital.

5. Do not put medication into the eye.
6. Eye injuries have to be managed always with great care. Always refer these victims to the nearest healthcare facility or hospital.

H.3.7 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.

H.3.7.1 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.

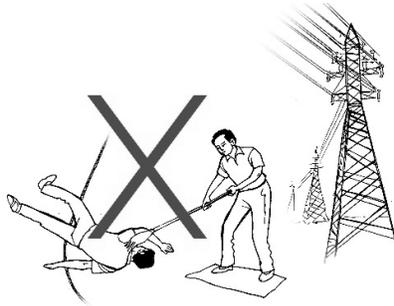
H.3.7.2 WHAT DO I DO?

H.3.7.2.1 SAFETY FIRST AND CALL FOR HELP

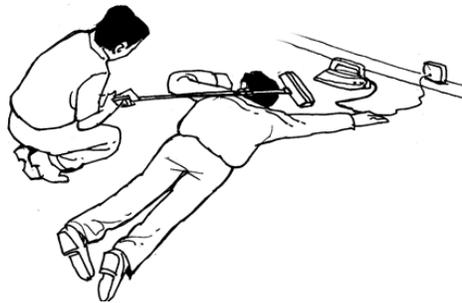
1. Never touch a casualty that still is connected to an electrical source!



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.



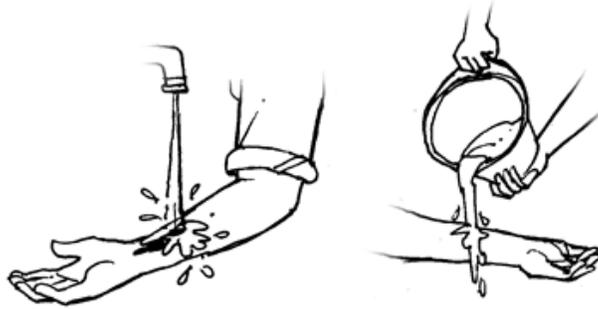
- b. In case of electrocution by home electricity (220V) and if you cannot switch off the electric source, you may try move the source away from both you and the injured person using a dry, non-conducting object made of cardboard, plastic or wood.



- 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.

H.3.7.2.2 PROVIDE FIRST AID

4. Try not to move the casualty, except if he is in immediate danger.



5. 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.

- a. Pour water on the burn for 10-15 minutes or until the burn stops hurting.
- b. Do not use very cold water for cooling the burns. Burn victims can easily become hypothermic.

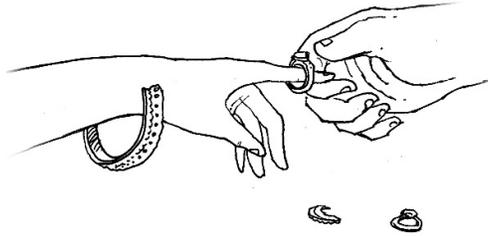


6. Protect the burn victim by wrapping him in a clean sheet of cloth or blankets.
7. If possible, wash your hands before taking care of the patient. Use soap and water to wash your hands. If no soap is available, you can use ash to wash your hands. Alcohol-based sanitizers can also be used, if available.
8. Put on gloves if available. You can also use a clean plastic bag. Try not to touch the person's wounds.



9. Cover burn wounds with a clean cotton cloth.

10. Do not open blisters – leave them intact.



11. 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.

12. If possible, remove the person's belt, shoes or boots as the limb might swell.

13. Keep the casualty warm, but do not overheat him.



14. If possible, keep burned hands, legs or feet in an elevated position.

15. Do not leave the casualty alone, and keep observing him.

16. Transport the casualty as quickly as possible to the nearby healthcare facility or hospital.

H.3.7.2.2.1 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

H.3.7.2.2.2 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.

H.3.7.2.3 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.

H.3.7.3 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 person's 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.

H.3.8 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.

H.3.8.1 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 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 (see chapter on Poisoning).

H.3.8.2 WHAT DO I DO IF THE VICTIM'S SKIN IS BURNED BY A CHEMICAL?

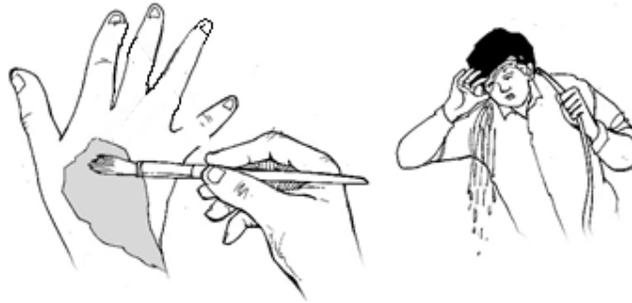
H.3.8.2.1 SAFETY FIRST AND CALL FOR HELP



1. 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.
2. Shout or call for help if you are alone but do not leave the person alone. 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.

H.3.8.2.2 PROVIDE FIRST AID

3. Wear gloves to protect yourself. If no gloves are available, use a plastic bag to cover your hands.



4. 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.



5. Remove clothing or jewellery that has been contaminated by the chemical.



6. Wrap the burned area loosely with a clean cloth.
7. Rewash the burned area for several more minutes if the person experiences increased burning after the initial washing.
8. Arrange transport to the nearest healthcare facility.

H.3.8.2.2.1 WHAT DO I DO WHEN THE CHEMICAL HAS BEEN SWALLOWED OR BREATHED IN?

Approach the casualty as described in the chapter 'Poisoning'.

H.3.8.2.2.2 WHAT DO I DO WHEN HARMFUL LIQUIDS WERE SPILLED IN THE EYE?

Approach the casualty as described in the chapter 'Burns to the eye'.

H.3.8.2.2.3 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.

H.3.8.2.2.4 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.

H.3.8.2.3 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.

H.3.8.3 WHEN TO REFER TO A HEALTHCARE FACILITY?



Always transport the victim of chemical burns urgently to the nearest healthcare facility or hospital.

H.3.9 SUNBURNS, SNOW/WELDERS EYES, HEAT EXHAUSTION AND HEAT STROKE

H.3.9.1 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.

H.3.9.1.1 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.

H.3.9.1.2 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).

H.3.9.2 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.

H.3.9.2.1 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)

H.3.9.2.2 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.

H.3.9.2.3 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.

H.4 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.

H.4.1 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.

H.4.2 WHAT DO I DO?

H.4.2.1 PROVIDE FIRST AID



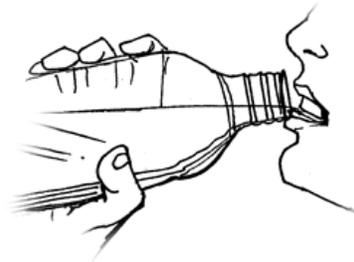
1. Help the casualty move to a cool place.



2. Help the casualty to lie down with the legs slightly raised.
3. Cool the casualty by sponging him or having him to take a cool shower.



4. Ask the casualty to rest.



5. 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).
6. Keep observing the casualty's breathing and consciousness.
7. Refer the casualty to a healthcare facility.

H.4.2.1.1 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

H.4.2.1.2 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.

H.4.2.2 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.

H.4.3 WHEN TO REFER TO A HEALTHCARE FACILITY?

 Always refer the casualty to a healthcare facility for further medical follow up.

H.5 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.

H.5.1 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).

H.5.2 WHAT DO I DO?

H.5.2.1 PROVIDE FIRST AID

1. Help the casualty move to a cool place.
2. Check the casualty's breathing and consciousness.
3. Help the casualty to lie down with the legs slightly raised.



4. Cool the casualty by sponging him or showering him with cool water.



5. Make the casualty to rest.



6. 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).
7. Keep observing the casualty's breathing and consciousness.
8. Transport the casualty to the nearest healthcare facility or hospital.

H.5.2.1.1 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

H.5.2.1.2 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.

H.5.2.2 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.

H.5.3 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.

H.6 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.

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.

H.6.1 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.

H.6.2 WHAT DO I DO?

H.6.2.1 SAFETY FIRST

1. Make sure you are protected sufficiently against the cold, prior helping the other person

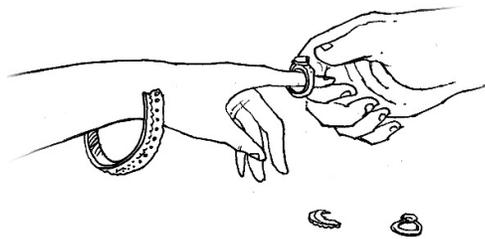
H.6.2.2 PROVIDE FIRST AID



2. If possible, move the victim to a warmer place.
3. 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.



4. Replace wet clothing with soft, dry clothing to stop further heat loss.



5. Gently remove gloves, rings, and other constrictions, such as boots.

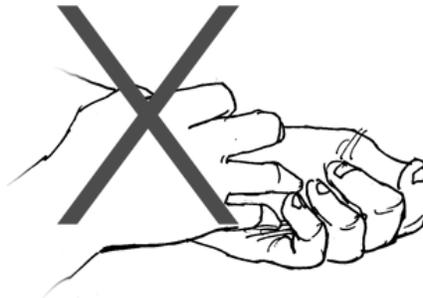


6. The affected areas need to be re-warmed.

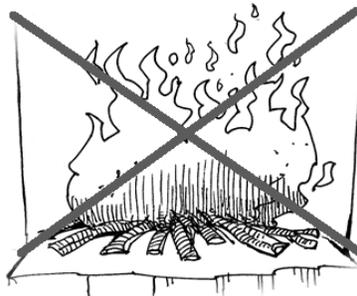
Do not try to do this until you are out of the cold. If the warming process is started and the frozen parts are re-exposed to the cold, it can cause further irreversible damage.



You can warm the affected part with your hands, in your lap, or in the person's armpits.



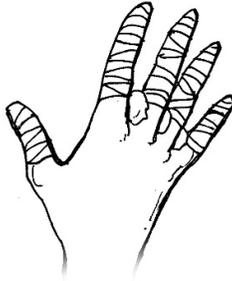
7. Do not rub the affected area as this can damage the skin and other tissues and do more harm than benefit.



8. Do not apply direct heat (such as from a fire or heater) as this can cause further injury.
9. 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.



10. Do not allow the person to smoke as this can affect blood circulation.



11. 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.
12. 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.
13. Refer the person with frostbites to a healthcare facility.

Transport the person to the nearest healthcare facility or hospital in case of advanced frostbites.

H.6.2.3 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.

H.6.3 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.

H.7 PREVENTION OF BURNS

Burn injuries can be caused by cooking accidents, house fires, electrical faults, candles, incense, or children accessing fire or heat sources.

Burn wounds cause a lot of pain, scars, deformities and even death. Burn injuries can easily be prevented by simply following simple precautions:

Teach and protect the children:

- Teach children about household objects that can burn them, could cause fire and explain the danger of fire to them.
- Do not leave children alone near heat sources, hot water, or open fires.
- Install fences around open fires to discourage children from standing too close.
- Hot drinks and liquids should be kept out of reach of young children.
- Cover the electric points properly.

Cooking & heating:

- Ensure that gas cylinders do not leak.
- Switch off the gas supply after the work is over.
- Designate a specific cooking area, for example by making a raised stove with a mud barrier when you cook outside.
- The safest cooking height is when the cooking area is raised to a height that allows cooking whilst standing.
- Keep children out of cooking areas.
- Never leave food unattended on a stove.
- Turn the pot and pan handles towards the back of the stove when cooking, so that children can't accidentally knock them over.
- Do not leave spoons or utensils in pots when cooking.
- Only handle pots and pans with the insulated handles, or use cloth or other protective material before touching the handle.
- Avoid wearing clothing that could easily catch fire whilst cooking. Avoid wearing loose clothing when cooking or handling a fire. Do not hang clothes near an open fire.
- Do not keep flammable objects like towels, potholders near to the fire.
- Do not overheat oil when cooking.
- Never use water to extinguish burning oil
- Be careful when handling kerosene stoves and lamps as they can easily be knocked over and ignite.
- Have something handy to extinguish a fire (wet towel or cloth, water, sand bucket, fire extinguisher).

Electricity:

- Remove electrical cords from floors and keep them out of reach.
- Do not overload the electricity sockets.
- Use correct wiring.
- Do not use electrical appliances near water.
- Use plug protectors to make sure children can't stick something in the electrical outlets and get electrocuted.

Candles and lights:

- Do not leave burning candles unattended.
- Ensure they are in a sturdy metal, glass or ceramic holder. Place them where they cannot be knocked down,
- Do not burn candles near flammable materials (like curtains).
- Never sleep with a kerosene lamp near the bed.

Smoking:

- Never smoke in bed.
- Do not leave cigarettes burning unattended.
- Do not empty smouldering ashes into a trash can. Keep ashtrays away from clothes.

Bathing:

- To prepare water at the right bathing or washing temperature, use cold water first and mix this with hot water (do not pour the hot water first and cool it down afterwards with cold water).
- Make sure bathwater is not too hot. Test the temperature of the water before putting children in the bath tub. Your water geysers should be set at 49-54 °C (120-130 °F).

Chemical and inflammable products

- Never store flammable products in the proximity of a heat source.
- Store chemical, flammable or corrosive products safely out of the reach of children.
- Store chemical products at the eye level of an adult person; higher placed items are more difficult to reach and might spill over you when reaching for them.
- Be careful when handling chemical products – they can create burn wounds when spilled on the skin, face or eyes.
- Use the right containers to store chemicals in and label them.
- Do not reuse old bottles of drinks for storage of chemicals.

Heat:

- Do not stay too long in direct sunlight.
- Drink water and liquids frequently, especially in hot weather.

Cold:

- Protect head, face, hands and feet when in cold weather or cold wind.
- Do not consume alcohol when going out into the cold.

Exits:

- Make an escape plan.
- Do not block (fire) exits.

H.8 FEVER

A fever is a temporary increase in the body temperature. Fever can be a sign of serious illness. Any person with fever needs medical attention to determine the cause. Fever caused by malaria, typhoid, pneumonia (lung infection) etc., can be very dangerous if they are left untreated and can lead to death.

The normal body temperature is around 37 °C (98.6 °F). Fever is generally agreed to be present if the temperature is above 37.7 °C (100 °F).

Following set points are used to identify fever:

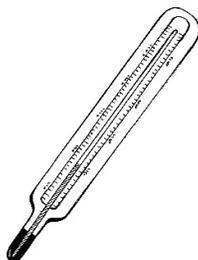
- If the temperature in the anus (*anal/rectal*) is at or over 38.0 °C (100.4 °F).
- If the temperature in the mouth (*oral*) is at or over 37.7 °C (100 °F).
- If the temperature under the arm (*axillary*) or in the ear (*otic*) is at or over 37.2 °C (99.0 °F).

H.8.1 HOW TO MEASURE THE BODY TEMPERATURE?

The body's temperature can be measured by a thermometer you place in the armpit, mouth, rectum, ear or on the forehead.

H.8.1.1 TYPES OF THERMOMETERS

H.8.1.1.1 MERCURY TEMPERATURE THERMOMETERS



In a mercury thermometer, a glass tube is filled with mercury and a standard temperature scale is marked on the tube. A mercury thermometer can be easily identified by the presence of a silver bulb. Do not use mercury thermometers to measure the body temperature via the mouth or rectum.

If the bulb is red, blue, purple, green or any other colour, it is not a mercury thermometer, but contains another non-poisonous fluid. It works on the same principle as a mercury thermometer. These type of glass thermometers also can be used to measure the body temperature via the mouth or rectum.

Shake down the fluid in the glass thermometer before starting a new temperature measurement. Do this by holding the thermometer firmly and flicking the wrist until the fluid reads at or below the lowest number.

With changes in temperature, the fluid expands and contracts in a consistent fashion and the temperature can be read from the scale.

H.8.1.1.2 ELECTRONIC BODY TEMPERATURE THERMOMETERS



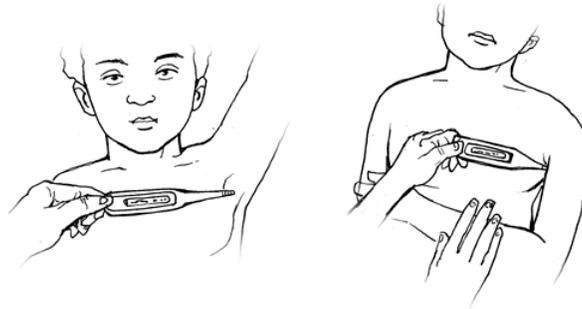
Electronic thermometers exist in different formats and types. These mostly work on battery power, some use sunlight as power source. They have a display where you can read the measurement (in Celsius or Fahrenheit corresponding to the device settings). Most electronic thermometers will beep when the measurement is complete and the body temperature can be read of the display.

Special electronic thermometers exist to measure the temperature via the ear or via scanning the forehead.

H.8.1.2 MEASURING THE BODY TEMPERATURE

H.8.1.2.1 MEASURING THE BODY TEMPERATURE IN THE ARMPIT

1. Clean the thermometer using water and soap or rubbing alcohol.
2. Place the thermometer in the armpit.



3. Wait for five minutes or until the electronic thermometer beeps.
4. Read the temperature.
5. Clean the thermometer using water and soap or rubbing alcohol.
6. 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.

H.8.1.2.2 MEASURING THE BODY TEMPERATURE IN THE MOUTH

1. Clean the thermometer using water and soap or rubbing alcohol.
2. Place the thermometer in the mouth, under the tongue.



3. Ask the person to close the mouth and fix the thermometer via the lips, but not to bite on the thermometer. The person can breathe through the nose.
4. Wait for three minutes or until the electronic thermometer beeps.
5. Read the temperature.
6. Clean the thermometer using water and soap or rubbing alcohol.
7. 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.

H.8.1.2.3 MEASURING THE BODY TEMPERATURE IN THE RECTUM

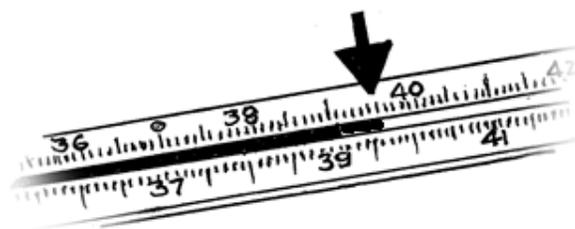
1. This method is used for small children.
2. Clean the thermometer using water and soap or rubbing alcohol.
3. Put petroleum jelly (Vaseline) on the bulb of the thermometer.
4. Place the child face down on a flat surface or knees.
5. Spread the buttocks and insert the bulb end about 1 to 2 cm (1/2 to 1 inch) into the anal canal. Be careful not to insert it too far. Struggling can push the thermometer in further.



6. Wait for three minutes or until the electronic thermometer beeps.
7. Read the temperature.
8. Clean the thermometer using water and soap or rubbing alcohol.
9. 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.

H.8.1.3 READ THE RESULT

Read the temperature of the glass fluid or electronic thermometer immediately after taking the temperature.



The temperature is read to the closest line of the fluid in glass fluid thermometers, or from the electronic display in electronic thermometers.

A person has fever if his temperature is higher than 37.7° ($>100^{\circ}\text{F}$) in the mouth.

If you have no thermometer you can feel with the back of the hand on the abdomen

If the skin feels hot, the person has probably fever.

H.8.2 WHAT DO I SEE AND ENQUIRE WHEN A PERSON HAS FEVER?

Following signs and symptoms may be observed:

- The person has a raised temperature.
- The person complains of feeling cold, but his skin feels hot.
- He may shiver and have chattering teeth.
- Later the person may show a hot, flushed skin and is sweating.
- The person may complain of headache, malaise (feeling sick) and muscle pain.



- Children under five year of age may show convulsions (aka fits) and shake fast and uncontrollably when their body temperature rises quickly. Seizures can occur even if the child has a mild fever. Alternatively, they can occur when a child's temperature drops fast from a high level.

During simple febrile seizures:

- the child's body will become stiff and their arms and legs will begin to twitch,
- they'll lose consciousness and they may wet or soil themselves,
- they may also vomit and foam at the mouth and their eyes may roll back,

- the seizure usually lasts for less than five minutes,
- following the seizure, the child may be sleepy for up to an hour afterwards.

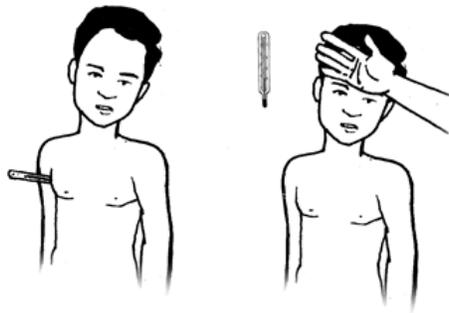
Look also for signs of dehydration, especially when the sick person has diarrhoea or vomiting, the sickness lasts over a longer period, or it is a sick child or elderly person.

H.8.3 WHAT DO I DO?

H.8.3.1 HYGIENE

1. 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.

H.8.3.2 SUPPORT THE SICK PERSON



2. Find out how high the temperature of the person is (see "How to measure the body temperature?").
3. Ask the person to rest.
4. Keep the person in a cool environment.



5. Give the person lots of water to drink to prevent dehydration. Check if the urine darkens or there is less urine.

Breast-fed babies should be breast-fed more frequently than usual.

Bottle-fed babies should be bottle-fed normally and should be given extra rehydration drinks as a supplement.

6. Contact the local healthcare worker as soon as possible so the cause of the fever can be investigated.
7. Evaluate how the person is dressed.

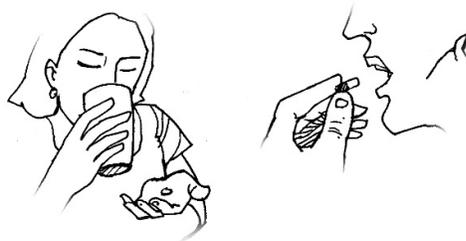
Too much clothing can increase the fever; too little can cause shivering which will deplete the energy of the sick person.



8. Use water at room temperature to sponge the sick person unless he does not like it and starts shivering. Do not use cold water.

If the person with fever is suffering he may benefit from paracetamol. Give the person the appropriate dose of anti-fever medication. These medications might bring temporary relief, but do not treat the cause of the illness.

9. If the sick person has convulsions (aka fits) (the person suddenly shakes fast and uncontrollably): treat for fits (see chapter 'Fits – convulsions – seizures').
10. Keep checking on the sick person. There may be need to get up in night to check the temperature.



11. If medication has been prescribed to treat the person, advise the person to finish the whole course of medicine. If he does not finish the whole course, the disease might come back.

Advise the person to make sure the correct dose and amount of medicine is taken at the prescribed time intervals. Advise the parents when giving medication to a child to make sure that the child is not crying. When a child is crying, the medication will not be swallowed.

If the sick person vomits less than 30 minutes after taking the medicine, the medicine can be given again.

12. Advise not to use, buy or give medication that has:
 - passed the expiry date, or
 - has been exposed to direct sunlight, or
 - has been wet.
13. Bring the person to a nearby healthcare facility if the fever remains or the patient's condition worsens.

H.8.3.3 **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.

H.8.4 **WHEN TO REFER TO A HEALTHCARE FACILITY?**

Fever can be a sign of a serious illness. Any person with fever needs medical attention to determine the cause. It is always advised to undergo a blood test for malaria in malaria prone regions.

Medical attention is especially important for babies, children, pregnant women and the elderly.



Arrange transport for the person to a nearby healthcare facility if:

- The person cannot take his medication.
- The person has convulsions (fits).
- The person is very sleepy, difficult to wake up or is confused.
- The person complains of headache.
- The person keeps vomiting.
- The person cannot drink.
- The person urinates less and the colour of the urine darkens.
- The person has sunken eyes.
- The sick child continues to cry without tears.
- The person's mouth is dry.
- The person cannot sit up or stand up.
- If sick baby is less than three months old, or the baby is too weak.
- The person has fast breathing:
 - Children up to 12 months: more than 50 breaths/minute.
 - Children more than 12 months: more than 40 breaths/ minute.
- The person has difficulty in breathing, for example chest heaving, nostrils flaring or chest indrawing.
- The person lets out a whistling noise when breathing.
- The person starts bleeding spontaneously.

When transporting the person to a healthcare facility or hospital, provide him with something to drink.

H.9 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.

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.

H.9.1 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;
- clumsiness or lack of coordination;
- drowsiness or very low energy;
- confusion or memory loss;
- loss of consciousness; or
- bright red, cold skin (in infants).

H.9.2 WHAT DO I DO?

H.9.2.1 SAFETY FIRST

1. Make sure you are protected sufficiently against the cold, prior helping the other person

H.9.2.2 PROVIDE FIRST AID

2. Gently move the person out of the cold.

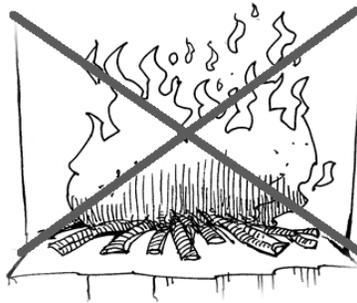
If going indoors isn't possible, protect the person from the wind, especially around the neck and head and insulate the individual from the cold ground.



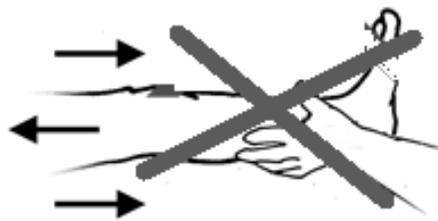
3. Gently remove wet clothing. Replace wet things with warm, dry coats or blankets.
4. If further warming is needed, do so gradually. For example, apply warm, dry compresses to the center of the body — neck, chest and groin.



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.



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.
9. Urgently transport the person to the nearest healthcare facility or hospital.

H.9.2.2.1 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

H.9.2.2.2 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.

H.9.2.3 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.

H.9.3 WHEN TO REFER TO A HEALTHCARE FACILITY?



Always urgently transport the hypothermic person to the nearest healthcare facility.

I. POISONING

In this chapter you will learn about:

- Poisoning.

I.1 POISONING

Some substances when taken in can be dangerous to the health of human beings and can even cause death. Such substances are called 'poisons' or 'toxins'.

Poisoning can occur when these poisons are taken by accident or with a view to causing harm or committing suicide.

Poisons can get into the body by swallowing, inhaling (gases), by injection or via absorption through the skin.

I.1.1 POISONING BY SWALLOWING

Poisoning from swallowing is often caused by household products, overdose of medication or toxic plants.

The effects of poisoning depend on what poison has been swallowed.

- Acids, alkalis, disinfectants etc. swallowed burn the lips, tongue, throat, oesophagus and stomach and cause great pain.
- Other swallowed poisons cause vomiting, pain abdomen and later on diarrhoea (e.g. poisonous fungi, berries, metallic poisons).
- Some swallowed poisons affect the nervous system. To this group belong:
 - alcoholic drinks (methylated spirit, wine, whisky etc.) when taken in large quantities;
 - sleeping pills, tranquilizers, and painkillers when taken in overdoses.

Victims of poisoning must be considered as seriously ill. The symptoms are either delirium or fits or coma.

Please note that 'Food poisoning' is an illness caused by eating contaminated food. Please see the 'Food poisoning' chapter for more information on this topic.

I.1.2 POISONING BY GASES

Fumes or gases from charcoal stoves, household gas, motor exhausts and smoke from explosions etc., cause choking (asphyxia) which may result in unconsciousness in addition to difficulty in breathing. Please refer to the chapter on 'Suffocation by smoke or gasses' for more information.

I.1.3 POISONING BY INJECTION

Poisons get into the body through injection, bites of poisonous snakes and rabid dogs, or stings by scorpions and poisonous insects. Danger to life is again by choking and coma. Please refer to the chapter on animal bites for more information.

I.1.4 POISONING BY SKIN ABSORPTION

Hazardous chemicals that are spilt on the skin can cause irritation or burns. Certain substances can be also absorbed through the skin and cause damage inside the body. Please refer to the chapter on 'Chemical burns' for more information.

I.1.5 WHAT DO YOU SEE AND ENQUIRE?

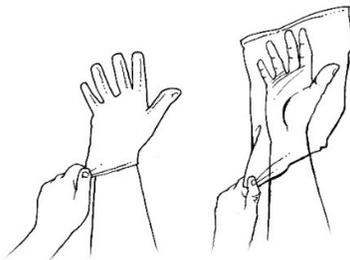
Following signs and symptoms may be observed in a case of poisoning:

- nausea and vomiting;
- pain in lips, mouth or throat;
- frothing from mouth
- abdominal pain or cramps;
- redness, skin rash;
- itching;
- swelling;
- blurred vision;
- irregular, slow or fast heartbeat (pulse);
- hyperactivity or slowness;
- muscle twitching;
- seizures;
- impaired consciousness or unconsciousness;
- difficulty in breathing;
- slow breathing; or
- cyanosis (blue-grey skin (lips)).

I.1.6 WHAT DO I DO?

I.1.6.1 SAFETY FIRST AND CALL FOR HELP

1. Secure your own safety, and then the safety of the affected 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 call the anti-poison centre (toll free: 1800 116 117) and to seek help or to arrange for urgent transport to the nearest healthcare facility. Tell him to come back to you to confirm if help has been secured.
3. If possible, 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.



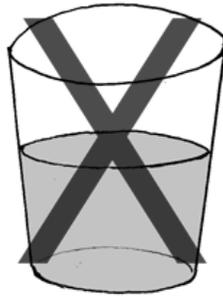
4. Use gloves to protect yourself. If gloves are not available, you can use a clean plastic bag.

I.1.6.2 PROVIDE FIRST AID

5. If possible, try to find out what poison has been swallowed, injected, inhaled or has come into contact with his skin. But be careful: do not put yourself in a dangerous situation to find the origin of the poisoning!



6. If it is safe, keep the container of the poison to show to the doctor.
7. Avoid contact with the poison.
8. If not done yet, call the poison centre for advice: 1800 116 117 (toll free).



9. Do not give the person anything to drink or eat.
Do not give milk or water to a poisoned person.
10. Do not induce vomiting.
11. Transport the person urgently to the nearest healthcare facility or hospital.

I.1.6.3 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 be sufficient to remove poison.

I.1.7 WHEN TO REFER TO A HEALTHCARE FACILITY?



Always urgently transport the person to a healthcare facility or hospital for further treatment.

Being poisoned can be a dangerous situation and requires medical attention.

Always call the anti-poison centre (toll free: 1800 116 117) or a nearby hospital, healthcare facility or medical caregiver for advice on how to act in case of a specific poisoning.

J. BITES AND STINGS

In this chapter you will learn about:

- Animal bites.
- Snake bites.
- Insect stings and bites.

J.1 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.

J.1.1 WHAT DO I SEE AND ENQUIRE?

You might see the following on a person that has been bitten:

- Bite marks.
- Puncture wounds (if skin is broken).
- Scraped skin.
- Moderate or severe bleeding.
- Local swelling.
- Redness.
- Pain.

J.1.2 WHAT DO I DO?

J.1.2.1 SAFETY FIRST AND HYGIENE



1. Make sure the area is safe and the animal cannot bite you or the injured person again.
2. 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.
3. Put on gloves if available. If not, you can also use a clean plastic bag.
Try not to come in contact with the injured person's blood or wound.

J.1.2.2 PROVIDE FIRST AID



4. Flush the wound immediately with lots of clean water and then wash the wound with soap and water or a detergent for 10-15 minutes, if available to remove the rabies virus from the wound. Wash with povidone-iodine (*Alopim, Betadine, Clopo, Wokadine, a.o.*) if available. Washing is also necessary when a person is licked, scratched or has abrasion.



5. If the person is severely bleeding, stop the bleeding by applying pressure to the wound.
6. Do not cut the wound larger.
7. Do not put herbs or unclean materials like chillies, oil, petrol in or on the wound.



8. Cover the wound with a dry clean cloth or bandage.
9. Refer the person to a healthcare facility immediately for further treatment.

J.1.2.3 *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.

J.1.3 *WHEN TO REFER TO A HEALTHCARE FACILITY?*



A person bitten by a dog (or any other animal) should always visit the nearest healthcare facility.

Any person who was licked, scratched or suffered abrasions from an animal should visit the healthcare facility.

J.2 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.

J.2.1 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.

J.2.2 WHAT DO I DO?

J.2.2.1 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.

J.2.2.2 PROVIDE FIRST AID

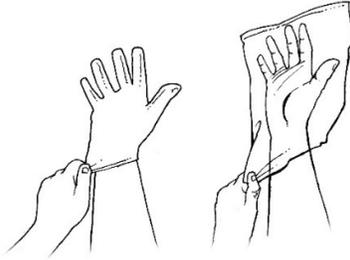


3. Comfort person

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.

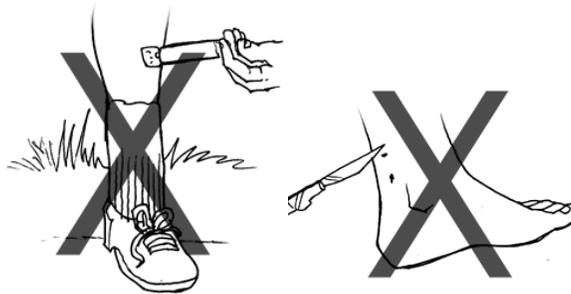
If safe to do so, check what type of snake has bitten the person. If possible, note down the features of the snake. Do not lose time chasing the snake: the person needs urgent help now. It is difficult to assess whether a snake is poisonous or not. Therefore, always assume that the snake is poisonous.

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.

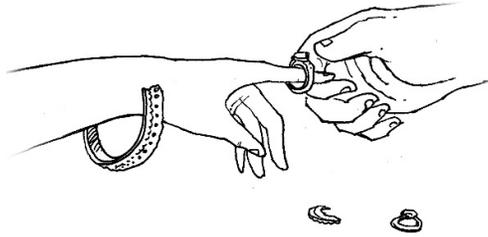


7. Do not suck or cut the venom out of the skin.

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.

J.2.2.2.1 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

J.2.2.2.2 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.

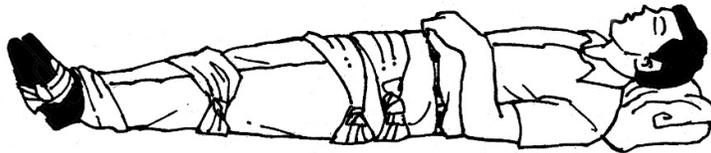
J.2.2.2.3 WHAT DO I DO WHEN VENOM GOT INTO THE EYES?



1. Clean eye with water
2. Rinse the eyes for 10-15 minutes with clean water.
3. Pour the water from the nose outwards.

J.2.2.2.4 WHAT DO I DO IF THE PERSON IS BITTEN IN THE LEG?

1. Immobilize the leg by bandaging it to the other leg.



2. Splint leg with snake bite wound

To do so:

- a. Gently bring the good leg to the bitten leg.
- b. Use a stick to splint the limb and bandage it into place with cloths or clothing.

J.2.2.2.5 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.

J.2.2.2.6 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.

J.2.2.3 *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.

J.2.3 **WHEN TO REFER TO A HEALTHCARE FACILITY?**



Always urgently transport a snake bite victim to the nearest healthcare facility.

J.3 INSECT STINGS AND BITES

Most insect bites and stings cause small reactions that are confined to the area of the bite or sting (local reaction). They can usually be treated at home.

Insect stings inside the throat are dangerous due to potential swelling and can be life-threatening.

Mites, ticks and leeches are found in marshes and jungles. They attach themselves firmly to the skin. Mites and ticks might carry typhus and may transmit it to the person. Ticks may also transmit the lyme disease.

Leeches are mostly harmless, but suck blood from the victim.

The effects of stings from scorpions or bites of spiders vary according to the type of the insect. Note that not all insects are poisonous.

J.3.1 WHAT DO I SEE AND ENQUIRE?

If a person has been stung or bitten by an insect, you might observe:

- pain,
- swelling,
- redness or rash,
- itching,
- some animals stay sucked onto the skin.

Some people experience an allergic reaction to the sting. This reaction can be localised or systemic. A systemic allergic reaction requires immediate medical attention as it is potentially life-threatening.

A person with a systemic allergic reaction may show the following symptoms:

- rash;
- itching;
- wheezing, hoarseness of voice or difficulty in breathing;
- dizziness or feeling faint;
- difficulty in swallowing;
- a swollen face or lips;
- nausea, vomiting or diarrhoea;
- confusion, anxiety or agitation.

The effects of bites or stings from scorpions or spiders vary according to the type of the animal. Note that not all insects are poisonous.

J.3.2 WHAT DO I DO?

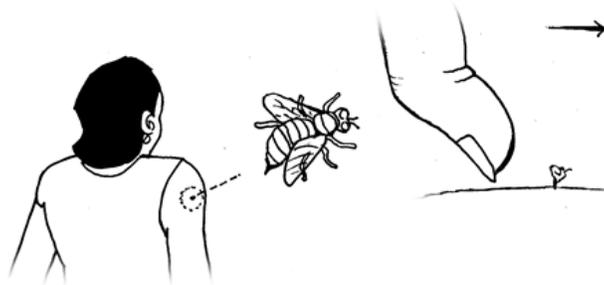
J.3.2.1 SAFETY FIRST

1. Make sure the area is safe before you assist the person.
2. If you are in an area where the wasp or hornet is still around, walk calmly away to a safer area with the victim. If attacked by a swarm, run away as fast as possible and seek shelter (indoors, in a car...).

J.3.2.2 PROVIDE FIRST AID

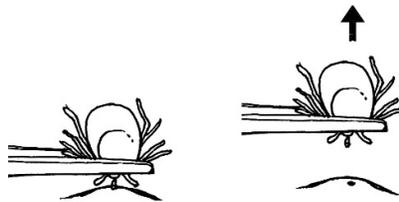
3. Ask the person to keep calm.

J.3.2.2.1 IN CASE OF A BEE OR WASP STING



Removing the sting of bees (wasps and hornets don't usually leave their sting behind) as quickly as possible can help to keep the bite smaller. Use a finger nail, the edge of a bankcard, or whatever thin sturdy material you have at hand to remove the sting. This can be easily done by pushing upwards from underneath the sting site in a sliding position.

J.3.2.2.2 IN CASE OF A TICK BITE

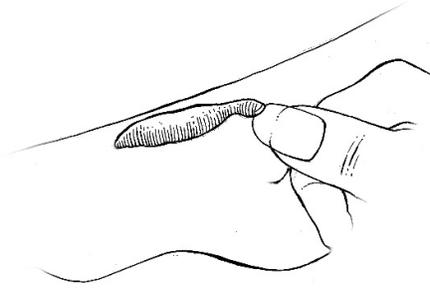


Remove ticks using fine tweezers (not with fingers) and grab the tick as close to the skin as possible. Pull it firmly up until the tick's mouthparts have been removed.

Do not twist or jerk the tick to remove it.

Do not use petroleum jelly, alcohol, a lit match or cigarette, or any other method to try to remove a tick.

J.3.2.2.3 IN CASE OF A LEECH BITE



If you find one leech on the person's body, check the entire body as there may be more. Slide a fingernail, the edge of a bankcard or whatever thin sturdy material you have at hand, under the sucker mouth (the smaller head of the leech) of the leech and flick it off right away. Do not squeeze the leech.

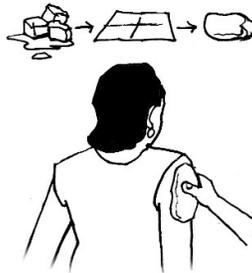
The person may also consider the leech to fill up and fall off by themselves.

Do not put salt on the leech or burn it, as this will make the leech to vomit back into the wound before it falls of. Leech bites tend to bleed for a long time, apply a small bandage and change it regularly.



4. Wash the sting or bite site and wipe away any venom.
5. Do not suck or cut the venom out of the skin.

Do not rub herbs on the bite.



6. Use ice, if you have it, to cool the bite or sting.

Wrap the ice in a cloth or a towel so that it does not touch the skin directly.

If you do not have ice, use cold water.

Do not cool for more than 20 minutes at a time.

7. You may raise the legs of a person suffering an anaphylactic shock.

J.3.2.3 HYGIENE

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

J.3.2.4 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

J.3.2.5 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.

J.3.3 WHEN TO REFER TO A HEALTHCARE FACILITY?



If the person's condition worsens or the pain does not get better or gets worse, always refer the person to a healthcare facility.

K. SENSES, FOREIGN BODIES IN EYE, EAR, NOSE OR SKIN AND SWALLOWED FOREIGN OBJECTS

In this chapter you will learn about:

- Senses.
- Foreign objects in the eye, ear, nose or skin.
- Swallowed foreign objects.

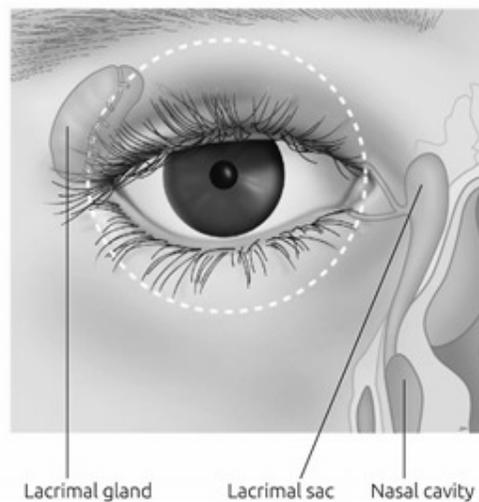
K.1 THE SENSES

The human body exchanges information with its environment via five senses:

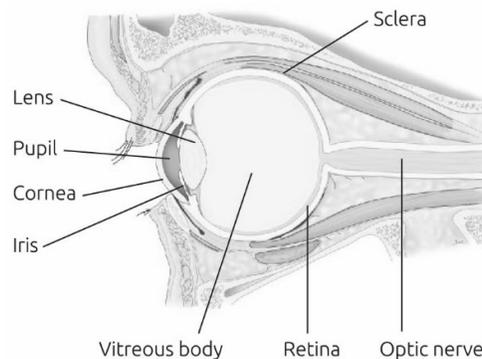
- Sight (the eyes).
- Hearing (the ears).
- Smelling (the nose).
- Tasting (the tongue and nose).
- Touching (the skin).

In addition to these five senses, the human body senses heat and cold (*thermoception*), balance and acceleration (*vestibular sense*), the relative position on its body parts (*kinaesthetic sense* or *proprioception*), feels pain (*nociception*) and can perceive time (*chronoception*).

K.1.1 EYE



The eyeballs are covered with folds of skin (the eyelids) from which the eyelashes project. The outermost parts of eyes are covered by a smooth membrane (*conjunctiva*) and are kept moist by tears produced by the tear-glands.



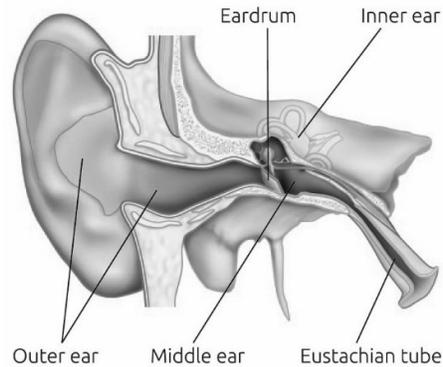
The transparent portion of the eye is called *cornea* through which the light from the object passes and forms the image at the back of the eye. Behind the cornea is seen a coloured

circular diaphragm (*iris*) with a round opening (hole), the pupil. The latter varies in size with the amount of light passing through it.

Behind the pupil is the lens of the eye which focuses rays of light on to the light sensitive part of the eye (*retina*).

Both eyes move simultaneously.

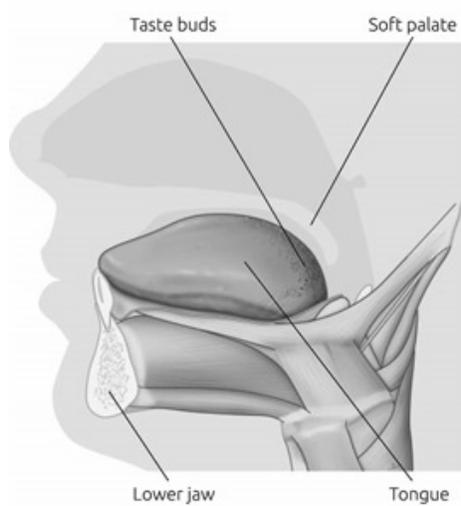
K.1.2 EAR



The ear consists of three parts:

1. The outer ear is that part which can be seen projecting from the side of the skull, together with the canal which leads to the eardrum.
2. The middle ear, situated inside the skull, receives and transmits sound waves concerned in hearing to the inner ear. It also communicates with the back of the nose and throat through the Eustachian tube, which opens during swallowing.
3. The inner ear is embedded inside the skull and is concerned with the sense of balance in addition to the sense of hearing. The outer ear is separated from the middle ear by the eardrum.

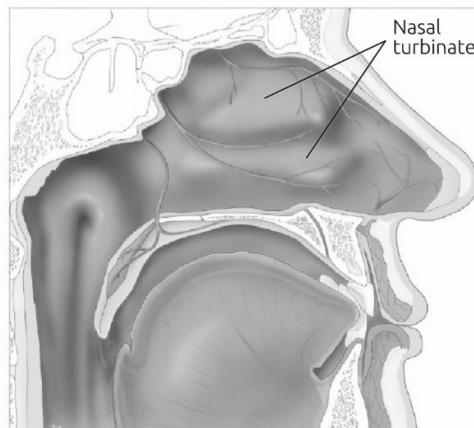
K.1.3 TONGUE



The tongue is the muscular organ which lies on the floor of the mouth; it assists in tasting, mastication and swallowing of food.

In an unconscious casualty, the tongue tends to obstruct by falling back in the throat and prevents breathing.

K.1.4 NOSE



The nose is organ of smell and also functions as part of the body's respiratory system. Air enters into the body through the nose. As it passes over the specialized cells of the *olfactory system*, the brain recognizes and identifies smells. Hairs in the nose clean the air of foreign particles. As air moves through the nasal passages, it is warmed and humidified before it goes into the lungs.

People may not taste anything without some help from the nose: the ability to smell and taste go together because odours from foods allow to taste more fully.

K.1.5 SKIN

The pain and touch receptors in the skin allow us to feel touch, pressure, heat, cold and pain. See also the chapter on 'The skin' for more detail.

K.2 FOREIGN OBJECTS IN THE EYE, EAR, NOSE OR SKIN

K.2.1 FOREIGN BODY IN THE EYE

Wings of insects, dust, coal, metal particles from lathes and loose eye-lashes are common objects which get lodged under the eyelids. They cause pain and later redness if they are not removed at-once.

Sometimes iron particles and wood splinters get lodged in the cornea causing severe trouble.

All penetrating foreign bodies are a danger to the eye itself.

K.2.1.1 WHAT DO I SEE AND ENQUIRE?

Following signs or symptoms may be observed:

- The person complains of pain or discomfort in the eye.
- Redness and watery eyes.
- The person complains of a blurred vision.
- Eyelids are screwed up in spasm.

K.2.2 WHAT DO I DO?

1. Ask the casualty not to rub into the eye.
2. Ask the casualty to sit. Pull the lower lid down to inspect.

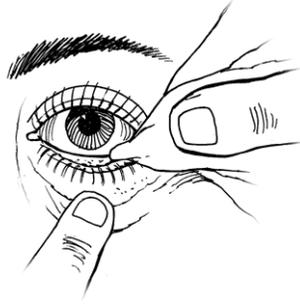


3. Rinse the eye immediately with plenty of water for 10-15 minutes, preferably from the nose outwards. Use clean water or water that has been boiled and cooled.

Be careful:

- Water at room temperature 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.



4. If washing of eyes did not work, you may try to remove foreign object with a narrow moist swab or a twisted corner of a clean handkerchief.

If foreign body is not visible it may be under the upper eye lid. Ask the casualty to grasp his upper lashes and pull the upper eyelid over the lower lid. The lower lashes may brush the particle clear.

If this did not work, you may ask the casualty to blink under clean water. You can also use an eye cup to blink the eye in it.

5. If something is sticking to or embedded in the eye, the eyeball or pupil, do not try to remove it.
6. Cover the eye and transport the casualty to the nearest healthcare facility for further care.
7. Do not put medication into the eye.
8. Wash your hands after taking care of the patient. Use soap and water to wash your hands. Alcohol-based sanitizers can also be used, if available.

K.2.2.1.1 WHAT DO I DO WHEN THERE ARE BURNS TO THE EYE?

Provide first aid as described in the section on burns to the eye.

K.2.2.1.2 WHAT DO I DO WHEN THERE ARE HARMFUL LIQUIDS SPILLED INTO THE EYE?

Provide first aid as described in the section on chemical burns to the eye.

K.2.3 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.

K.3 FOREIGN BODY IN THE EAR

Sometimes foreign objects become lodged in the ear. The object might even damage the drum.

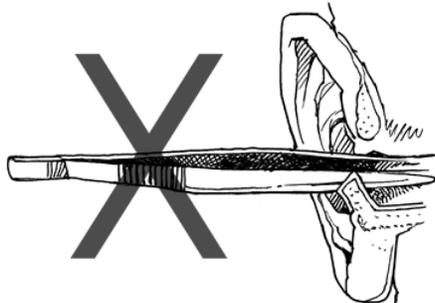
Children often push objects into their ears. Cotton wool may get stuck in the ear while cleaning it. Insects may crawl or fly into the ear.

K.3.1 WHAT DO I SEE AND ENQUIRE?

Following signs or symptoms may be observed:

- The person complains of pain or itching in the ear.
- The person complains of worsened hearing.
- There may be damage to the drum if:
 - the person hears a constant noise;
 - the person complains of ear pain;
 - blood comes out of the ear, or
 - the person feels dizzy.

K.3.2 WHAT DO I DO?



Never try to get lodged objects out of the ear and always refer the person to a healthcare facility for further treatment.

In case of an insect, you may fill the ear with tepid clean water so the insect can float out. If it does not come out refer the person to a healthcare facility for further treatment.

K.3.3 WHEN TO REFER TO A HEALTHCARE FACILITY?

 A casualty with an object lodged into the ear has always to be referred to a healthcare facility.

Also refer the casualty to a healthcare facility in case of an insect that flew or crawled into the ear and did not come out.

K.4 FOREIGN BODY IN THE NOSE

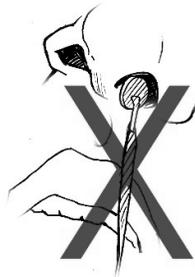
Children sometimes push objects into their nose. These objects may get stuck and may damage the nose tissue.

K.4.1 WHAT DO I SEE AND ENQUIRE?

Following signs and symptoms may be observed:

- The breathing through the nose is impossible or difficult.
- The nose may be swollen or have a deformed shape.
- The eyes may tear.
- The nose may bleed.
- The person may complain of pain.

K.4.2 WHAT DO I DO?



1. Do not put something into nose
2. Do not fiddle with the foreign body. Make casualty breathe through the mouth.
3. Transport the casualty to a healthcare facility for further treatment.

K.4.3 WHEN TO REFER TO A HEALTHCARE FACILITY?



A casualty with a foreign object in the nose is always to be transported or referred to the healthcare facility.

K.5 FOREIGN BODY IN THE SKIN

Glass, thorns, pieces of iron, wood or stone, needles, etc. may get stuck under the skin.

Unless it is very easy to deal with (e.g. a wood splinter), do not fiddle with objects stuck under the skin.

Treat the wound as described in section 'Bleeding', dress the wound and refer the casualty to a healthcare facility for further treatment.

K.6 SWALLOWED FOREIGN OBJECTS

Small objects as coins and buttons may be swallowed by children. Most objects will follow the digestive track without issues. But they can also lead to choking.

In some cases the swallowed object may cause internal damage. This is specifically the case for swallowed batteries (containing corrosive and poisonous material), cigarette stubs, cosmetics, medication, poisonous plants, poisonous berries or fruits, or sharp objects (e.g. fish bones, partial dentures...). In these cases medical assistance is always required.

K.6.1 WHAT DO I SEE AND ENQUIRE?

Except if the person is choking, you may not observe any signs or symptoms at first and it is the person himself who reports you that he swallowed something.

Sometimes the swallowed object may cause choking; this can result in a life threatening situation and has to be taken care of immediately (see section on 'Choking' for more detail).

In some cases the casualty may complain of pain in the throat, food pipe (*oesophagus*) or stomach. Also vomiting is possible. At a later stage blood may appear in the faeces.

K.6.2 WHAT DO I DO?

In case the person is choking, treat as described in the section on 'Choking'.

In case a small harmless object has been swallowed, the object will follow the normal track and be expelled via the faeces. In case of even small doubt, contact a healthcare facility.

In case of dangerous objects (batteries, cigarette stubs, cosmetics, medication, poisonous plants, poisonous berries or fruits ...), sharp objects or when the person complains of pain, stomach ache, always refer the casualty to the nearest healthcare facility.

K.6.3 WHEN TO REFER TO A HEALTHCARE FACILITY?



In case a person swallowed dangerous objects (as batteries, cigarette stubs, cosmetics, medication, poisonous plants, poisonous berries or fruits ...), sharp objects; or when the person complains of pain, stomach ache or blood loss in the faeces, he should be transported to the nearest healthcare facility.

L. URINARY SYSTEM, REPRODUCTIVE SYSTEM AND EMERGENCY CHILDBIRTH

In this chapter you will learn about:

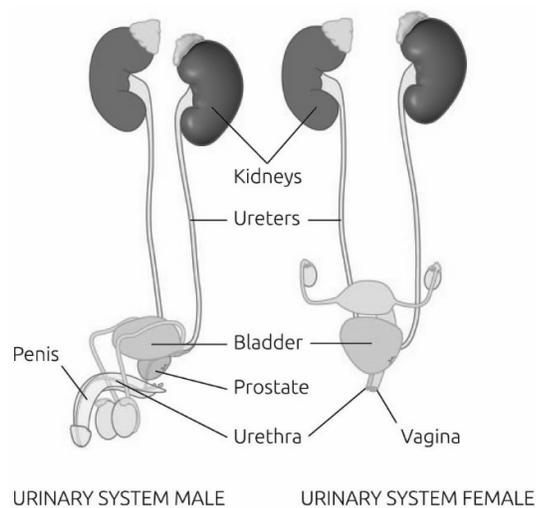
- Urinary system.
- Reproductive system.
- Prevention of sexually transmitted diseases.
- Emergency childbirth.

L.1 URINARY SYSTEM

The body takes nutrients from food and converts them to energy. After the body has taken the food components that it needs, waste products are left behind in the bowel and in the blood.

The kidney and urinary systems help the body to eliminate liquid waste called urea, and to keep chemicals, such as potassium and sodium, and water in balance. Urea is produced when foods containing protein, such as meat, poultry, and certain vegetables, are broken down in the body. Urea is carried in the bloodstream to the kidneys, where it is removed along with water and other wastes in the form of urine.

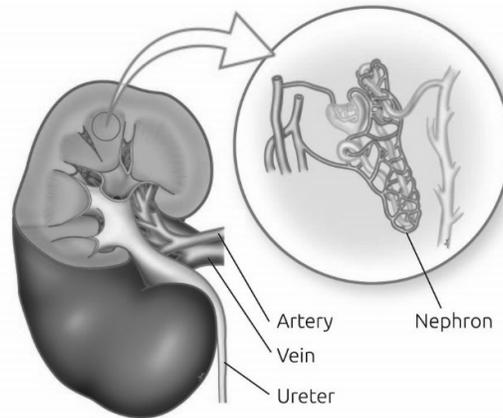
Other important functions of the kidneys include blood pressure regulation and the production of erythropoietin, which controls red blood cell production in the bone marrow. Kidneys also regulate the acid-base balance and conserve fluids.



A pair of purplish-brown organs, the kidneys, are located below the ribs toward the middle of the back. The functions of the kidneys are to:

- Remove waste products and drugs from the body.
- Balance the body's fluids.
- Release hormones to regulate blood pressure.
- Control production of red blood cells.

The kidneys remove urea from the blood through tiny filtering units called *nephrons*. Each nephron consists of a ball formed of small blood capillaries, called a glomerulus, and a small tube called a renal tubule. Urea, together with water and other waste substances, forms the urine as it passes through the nephrons and down the renal tubules of the kidney



Two narrow tubes (one on each side), called *ureters*, carry urine from the kidneys to the bladder. Muscles in the ureter walls continually tighten and relax forcing urine downward, away from the kidneys. If urine backs up, or is allowed to stand still, an infection can develop. About every 10 to 15 seconds, small amounts of urine are emptied into the bladder from the ureters.

The bladder, a triangle-shaped, hollow organ, is located in the lower abdomen. It is held in place by ligaments that are attached to other organs and the pelvic bones. The bladder's walls relax and expand to store urine, and contract and flatten to empty urine through the *urethra*. The typical healthy adult bladder can store up about 500-600 ml (ca. two cups) of urine for two to five hours.

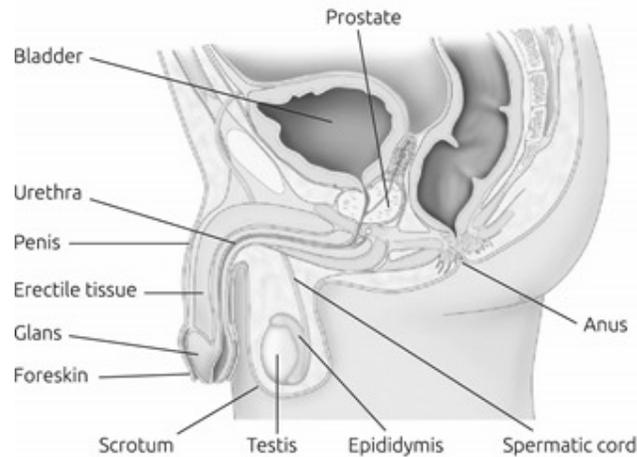
Two sphincter muscles (circular muscles) help keep urine from leaking by closing tightly like a rubber band around the opening of the bladder. Nerves in the bladder alert a person when it is time to urinate, or empty the bladder.

The urethra allows urine to pass outside the body. The brain signals the bladder muscles to tighten, which squeezes urine out of the bladder. At the same time, the brain signals the sphincter muscles to relax to let urine exit the bladder through the urethra. When all the signals occur in the correct order, normal urination occurs.

Urine in a healthy person is of a pale straw or transparent yellow colour.

L.2 REPRODUCTIVE SYSTEM

L.2.1 MALE REPRODUCTIVE SYSTEM



The external reproductive organ of the male is the *penis*. The penis is made up of two parts, the shaft and the glans. The *glans* is the tip of the penis, while the shaft is the main part of the penis and contains the tube (*urethra*) that drains the bladder. All boys are born with a foreskin, or a covering over the tip of the penis. Some boys are *circumcised*, which means that this covering of skin is removed. Other boys are not circumcised and may have skin that covers the tip of the penis.

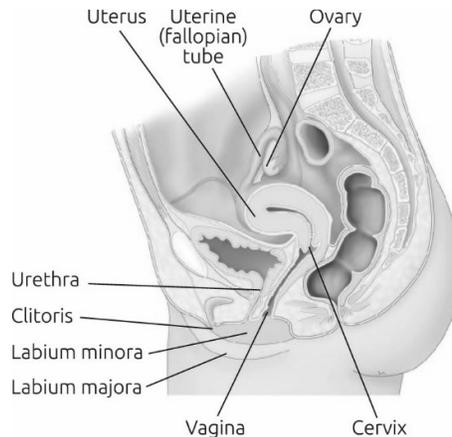
The *scrotum* is a bag of skin which holds and helps to protect the *testicles*. The *testicles* (or testes) are the male sex glands and are part of the male reproductive system. They are located in the scrotum. To make *sperm* the temperature of the testicles needs to be cooler than the inside of the body. This is why they are located in the scrotum outside body. The testes are also involved in producing a hormone called testosterone. Testosterone is an important hormone during male development and maturation for developing muscles, deepening the voice, and growing body hair.

A long tube, the *epididymis*, is located near each testicle. The epididymis is a collection of microscopic tubes in which the sperms are stored. The *vas deferens* is the tube which moves the sperms from the testicles out of the scrotal sac to the urethra and connects these together. *Seminal vesicles*, the sac-like glands, lie behind the bladder and release a fluid that forms part of *semen*.

The *prostate* gland is about the size of a walnut, and surrounds the neck of the bladder and urethra. The prostate gland secretes a slightly alkaline fluid that forms part of the seminal fluid, a fluid that carries sperms. During male climax (orgasm), the muscular glands of the prostate help to propel the prostate fluid, in addition to sperms that were made in the testicles, into the *urethra*.

The urethra is the tube that allows urine to flow outside the body. It is also the channel for semen to pass during ejaculation.

L.2.2 FEMALE REPRODUCTIVE SYSTEM



Although a woman's external genitals are commonly referred to as the "vagina," the vagina is actually one of several organs that comprise this section of a woman's body.

The vagina is a muscular tube about three to four inches long that ends the birth canal. This is where a man's penis enters the woman during sexual intercourse. The vaginal opening is visible from the outside but it is protected by the *labia*

The *labia majora* are two folds of skin that extend from the front of the vaginal opening to the back of it. The outer surfaces of the folds have darker-colored skin and thick hairs, while the inner folds are smoother. The *labia majora* join to form the cleft shape of the female genitals.

The *clitoris* is a crucial element for sexual arousal in most women. This small sexual organ at the junction of the labia minora appears outside the folds of skin like a small pink button. During sexual stimulation, the clitoris functions much like a man's penis in that it becomes erect due to the signals from the brain. The clitoris is a very sensitive area when stimulated.

Between the labia majora are the labia minora, two folds of skin that also extend down from the clitoris and around the vaginal opening. These vary in size from woman to woman. They are joined together by a small fold of skin known as the *fourchette*.

The outer female genitals also include the *urethra*. Located between the vaginal opening and the frontal connection of the labia minora, the urethral opening is where a woman expels urine from her body.

The womb or *uterus* is located between the bladder and the rectum, in the pelvic area. The uterus is connected to the fallopian tubes, the *cervix*, and (via the *cervix*) the vagina.

In menstruating females, the *ovaries* release eggs that travel via the fallopian tubes to the uterus. If fertilized, the egg will bind to the wall of the uterus and the foetus will develop. The uterus nourishes and protects the foetus until birth.

The cervix of the uterus, also known as the cervix or *uterine cervix*, attaches the vagina to the uterus. It is approximately four centimetres long. The uterine cervix produces a mucus that aids in carrying sperm from the vagina to the uterus, where it can fertilize an egg if the woman is ovulating. When the woman isn't ovulating, the cervical mucus thickens and serves as a barrier to keep sperm out of the uterus.

During childbirth, the cervix thins out and eventually dilates (expands) to 10 centimetres to allow the baby to pass through the birth canal. Once the baby is born and the placenta is expelled, the cervix begins to thicken and close.

The *ovary* is the ductless female reproductive gland in which the female reproductive cells are produced. Females have a pair of ovaries, held by a ligament beside the uterus on each side of the lower abdomen.

During *ovulation*, a *follicle* (a small egg in the ovary) expels an egg under the stimulation of *gonadotropic hormones*. The rest of the follicle, or the *corpus luteum*, secretes the sex hormones *oestrogen* and *progesterone*, which regulate menstruation and control the development of the sex organs. The sex hormones and the gonadotropic hormones interact with each other to control the menstrual cycle.

When an egg matures, it is released and passes into *the fallopian tube* toward the uterus. If the ovum is fertilized by the male reproductive cell, or sperm, conception happens and pregnancy begins.

L.3 PREGNANCY

The signs of pregnancy vary from woman to woman. Usually the most obvious sign is the absence of menstruation (*amenorrhea*). However, some women may continue to have some bleeding even while pregnant. The following are the most common initial signs of pregnancy. However, each woman may experience the signs of pregnancy differently. These may include:

- fatigue,
- sore and swollen breasts,
- nausea or vomiting (also called morning sickness),
- frequent urination,
- certain food cravings or aversions,
- bloating of the abdomen, and
- darkening of the skin around the breast nipples (also called the areola).

These early signs may not always indicate pregnancy, but may signal another process occurring within the body

A pregnancy is divided into three phases, called trimesters. Each trimester has its own significant milestones. The first trimester is the most fragile period, during which all major organs and systems are formed. Most birth defects and miscarriages occur during the first trimester. During the second and third trimesters, the foetus is fully formed and grows and matures rapidly.

After nine months of incredible growth and changes both in the mother and the foetus, labour (contractions) may finally start, signalling the pending birth of the baby. Some women may fear the prospect of delivering their child. Part of this fear may be attributed to the unknown, especially in first pregnancy.

Labour is a series of continuous, progressive contractions of the uterus which help the cervix to open (dilate) and to thin (efface), allowing the foetus to move through the birth canal. Signs of labour vary from woman to woman, as each woman experiences labour differently.

Some common signs of labour may include:

- A small amount of mucus, slightly mixed with blood, may be expelled from the vagina indicating a woman is in labour.
- Contractions (uterine muscle spasms) occurring at intervals of less than ten minutes are usually an indication that labour has begun. Contractions may become more frequent and severe as labour progresses.
- Labour sometimes begins with *amniotic fluid* gushing or leaking from the vagina. Women who experience a rupture of the amniotic sac should go to the healthcare facility immediately. The majority of women go into labour within hours after the amniotic sac breaks. If labour still does not begin, it needs to be induced.

L.3.1 STAGES OF LABOUR AND GIVING BIRTH

There are three stages of labour:

1. The first stage, when the contractions make the cervix gradually open up (dilate). This is usually the longest stage.
2. The second stage of labour is when the cervix is fully open and birth is given. This is the part of labour where the baby moves through the vagina by the woman in labour pushing with the contractions.
3. The third stage of labour is after the birth, when the womb contracts and causes the placenta to come out through the vagina.

L.3.1.1 THE FIRST STAGE OF LABOUR – DILATION

The cervix needs to open about ten cm for a baby to pass through. This is what's called being "*fully dilated*". Contractions at the start of labour help to soften the cervix so that it gradually opens.

The woman in labour should attempt to get comfortable and relaxed, and if possible try to sleep. A warm bath or shower may help to relax.

During the day, the woman in labour can keep upright and be gently active. This helps the baby move down into the pelvis and helps the cervix to dilate.

Once labour is established, the cervix reaches an opening of more than three centimetres; the time to full dilation is usually between 6 and 12 hours. It is often quicker in subsequent pregnancies. The woman in labour will be asked not to try to push until the cervix is fully open and the baby's head can be seen. To help to overcome the urge to push, breathing out slowly and gently or, if the urge is too strong breathing in small puffs may help. Some women find this easier lying on their side, or on their knees and elbows, to reduce the pressure of the baby's head on the cervix.

L.3.1.2 THE SECOND STAGE OF LABOUR

This is the "pushing" stage. It begins when the cervix is fully dilated and lasts until the birth of the baby. When the cervix is fully dilated the woman in labour will be asked to push when she feels the need to do so during contractions.

This stage of labour is hard work. This stage may take 1-2 hour.

WHAT HAPPENS AT THE ACTUAL BIRTH?

During the second stage, the baby's head moves down the vagina until it can be seen. When the head is almost ready to come out, the woman in labour will be asked to stop pushing and to do a couple of quick short breaths, blowing out through the mouth. This is done so that the baby's head can be born slowly and gently, giving the skin and muscles of the *perineum* (the area between the vagina and anus) time to stretch without tearing. The skin of the perineum usually stretches well, but it may tear. Afterwards, the cut or tear may be stitched up to help the healing process.

Once baby's head is born, most of the hard work is over. With one more gentle push, the body is born quite quickly and easily. The baby may be born covered with a white, greasy substance known as *vernix*, which has acted as protection in the uterus.

L.3.1.3 THE THIRD STAGE OF LABOUR – THE PLACENTA

After the baby is born, more contractions will push out the placenta.

The baby should be presented to the mother to be breastfed as soon after birth as possible. This helps with breastfeeding later on and it also helps the womb to contract. Babies start sucking immediately. However, this sometimes occurs just for a short period of time – they may just like to feel the nipple in their mouth.

L.4 **AFTERCARE OF THE MOTHER**

The mother will be taken care of to recover from the labour as soon as possible. As the mother recovers after giving birth, following symptoms are not uncommon:

- Bloody vaginal discharge that changes to brown, then whitish over the next few weeks after delivery.
- Pain in perineal region.
- Painful contractions that may continue after delivery (as the uterus returns to its original size).
- Breast engorgement (as milk production begins).
- Fatigue, sorebreast and backache are common in the first few weeks.
- Piles (*haemorrhoids*) are common, but usually disappear after a few days.

It is not uncommon for women to experience a "baby blues" period during the first days or weeks after delivery (most commonly seen occurring suddenly on the third or fourth day after delivery). These "baby blues" are characterized by the following symptoms, although each woman may experience symptoms differently:

- feelings of disappointment,
- crying with no known reason,
- irritability,
- impatience,
- anxiety, and
- restlessness

It is common for these "baby blues" feelings to go away soon after onset and, in most cases, without treatment.

These symptoms may also be present in case of a *postpartum depression*. Postpartum depression is a more severe form of "baby blues". Women with postpartum depression may have trouble coping with their daily tasks.

The following are the most common symptoms of postpartum depression; however, each woman experiences these symptoms differently:

- sadness,
- anxiety,
- hopelessness,
- fatigue or exhaustion,
- poor concentration,
- confusion,
- a fear of harming the new-born or herself,
- mood swings characterized by exaggerated highs and/or lows,

- diminished libido (sex drive),
- feelings of guilt,
- low self-esteem,
- uncontrolled crying and with no known reason,
- over concern/over attentiveness for the new-born or a lack of interest for the new-born,
- appetite changes,
- sleep disturbances,
- resentment,
- memory loss, and
- feelings of isolation.

While the exact cause for postpartum depression is unknown, it is likely that a number of different factors, such as the following, are involved:

- the changing of roles (as a spouse and new parent),
- hormonal changes during and after delivery,
- stress,
- personal or family history of mental illness, particularly postpartum depression, and
- marital strife.

If you think someone may have postpartum depression, or if partner or family members are concerned about what the person does, it is important to refer the mother to her healthcare provider or healthcare facility as soon as possible. Do not let her wait until her next postpartum check-up.

L.5 MEDICAL CONDITIONS AND PREGNANCY

Certain medical conditions may complicate a pregnancy. However, with proper medical care, most women can enjoy a healthy pregnancy, despite their medical challenges. It is important that the pregnant woman contacts her healthcare provider early.

L.5.1 DIABETES

Diabetes in pregnancy can have serious consequences for the mother and the growing foetus. The severity of problems often depends on the severity of the mother's diabetic disease, especially if she has vascular (blood vessel) complications and poor blood glucose control.

Gestational diabetes mellitus (GDM) is the condition in which the glucose level is elevated and other diabetic symptoms appear during pregnancy in a woman who has not previously been diagnosed with diabetes. In most cases of GDM, all diabetic symptoms disappear following delivery. However, women with gestational diabetes have an increased risk of developing diabetes later in life, especially if they were overweight before pregnancy. Unlike other types of diabetes, gestational diabetes is not caused by a lack of insulin, but by other hormones that block the insulin that is produced, a condition referred to as insulin resistance.

L.5.2 HIGH BLOOD PRESSURE

High blood pressure can occur in pregnancy in two forms. It may be a pre-existing condition, called *chronic hypertension*, or it can develop during pregnancy -- a condition known as *gestational hypertension*. It is also called *toxemia* or *preeclampsia/eclampsia* and occurs most often in young women with the first pregnancy. It is more common in twin pregnancies, and in women who had blood pressure problems in a previous pregnancy.

High blood pressure can lead to placental complications and slowed foetal growth. If untreated, severe hypertension may cause dangerous seizures and even death in the mother and foetus.

Women who have high blood pressure before pregnancy often need to continue taking their antihypertensive medication. Such patients need to be managed by joint physician and gynaecologist care before conception and during pregnancy. Only the treating physician and the gynaecologist can give the correct advice on this.

L.5.3 INFECTIONS

Infections during pregnancy can pose a threat to the foetus. Even a simple urinary tract infection or vaginal infection which is common during pregnancy, should be treated immediately. An infection that goes untreated can lead to preterm labour and rupture of the membranes surrounding the foetus.

L.5.3.1 FOOD POISONING (E.G. LISTERIOSIS)

A pregnant woman should avoid eating undercooked or raw foods because of the risk of food poisoning. Food poisoning can dehydrate a mother and deprive the foetus of nourishment.

L.5.3.2 CHLAMYDIA

Chlamydia is a common *sexually transmitted disease (STD)* that can infect both men and women. It can cause serious, permanent damage to a woman's reproductive system, making it difficult or impossible for her to get pregnant later on. Chlamydia infection is associated with tubal disease and tubal pregnancy (pregnancy that occurs outside the womb) which can be fatal.

Chlamydia--infections may be associated with premature labour and rupture of the membranes. New-borns can develop a chlamydia eye infection during childbirth, which may lead to blindness.

The only way to avoid STDs is to not to have vaginal, anal, or oral sex. If sexually active, the following things lower the chances of getting chlamydia:

- Being in a long-term mutually monogamous relationship with a partner who has been tested and has negative STD test results;
- Using condoms the right way every time having sex.

L.5.3.3 HEPATITIS

Hepatitis is an inflammation of the liver resulting in liver cell damage and destruction. Several types of the hepatitis virus have been identified.

The most common type that occurs in pregnancy is hepatitis B (HBV). This type of hepatitis spreads mainly through contaminated blood and blood products, sexual contact, and contaminated needles and syringes. Although HBV resolves in many people, some will develop chronic HBV infection.

Hepatitis B virus can lead to chronic hepatitis, cirrhosis, liver cancer, liver failure, and death. Infected pregnant women can transmit the virus to the foetus during pregnancy and at delivery. The later in pregnancy a mother contracts the virus, the greater the chance for infection in her baby. A very safe and effective vaccine is available against HBV infection. Using safe blood and safe needles and syringes will also prevent viral hepatitis B.

The only way to avoid sexual transmission is to not to have vaginal, anal, or oral sex. If sexually active, the following things lower the chances of getting HBV:

- Being in a long-term mutually monogamous relationship with a partner who has been tested and found negative for HBV;
- Using latex condoms the right way every time having sex.

L.5.3.4 HIV AND AIDS

A woman with *human immunodeficiency virus (HIV)* has about one in four chance of infecting her foetus. *AIDS (acquired immune deficiency syndrome)* is caused by the human immunodeficiency virus (HIV), which kills or impairs cells of the immune system and progressively destroys the body's ability to fight infections and certain cancers.

HIV is spread most commonly by sexual contact with an infected partner. HIV may also be spread through contact with infected blood, especially by sharing needles, syringes, or drug use equipment with someone who is infected with the virus.

Some people may develop a flu-like illness within a month or two after exposure to the HIV virus, although many people do not develop any symptoms at all when they first become infected. Persistent or severe symptoms may not surface for 10 years or more, after HIV first enters the body in adults, or within two years in children born with an HIV infection. The term AIDS applies to the most advanced stages of an HIV infection.

Using safe blood and safe needles and syringes will also prevent HIV/AIDS. The only way to avoid sexual transmission of STDs including HIV/AIDS is to not to have vaginal, anal, or oral sex. If sexually active, the following things lower the chances of getting HIV:

- Being in a long-term mutually monogamous relationship with a partner who has been tested and found negative for HIV and other Sexually transmitted infections (STIs);
- Using latex condoms the right way every time having sex
- If a woman with HIV becomes pregnant she should be referred to concerned specialist and should be encouraged to get her viral loads and CD4 counts checked and should continue with medications.

L.5.3.5 GENITAL HERPES

Herpes is a sexually transmitted disease caused by the *herpes simplex virus (HSV)*. *Genital herpes* can be spread to the baby during delivery, if a woman has an active infection at that time.

Herpes infections can cause blisters and ulcers on the mouth or face (*oral herpes*), or in the genital area (*genital herpes*). HSV is a life-long infection. Symptoms of HSV may include painful blisters or open sores in the genital area, which may be preceded by a tingling or burning sensation in the legs, buttocks, or genital region. The herpes sores usually disappear within a few weeks, but the virus remains in the body and the lesions may recur from time to time.

It is important that women avoid contracting herpes during pregnancy, because a first episode during pregnancy creates a greater risk of transmission to the new-born. Genital herpes can cause potentially fatal infections in babies if the mother has active genital herpes (shedding the virus) at the time of delivery. Fortunately, infection of an infant is rare among women with genital herpes infection. Protection from genital herpes includes abstaining from sex when symptoms are present, and /or using latex condoms the right way every time having sex.

L.5.3.6 CMV (CYTOMEGALOVIRUS)

Cytomegalovirus (CMV) is one of the herpesviruses. CMV is spread by close contact with a person who has the virus in his or her saliva, urine, or other body fluids.

CMV can be transmitted from a pregnant woman to her foetus during pregnancy. The virus in the mother's blood crosses over the placenta and infects the fetus' blood. Most babies with *congenital* (meaning present at birth) CMV infection never have health problems. But in some babies, congenital CMV infection causes health problems that may be apparent at birth or may develop later during infancy or childhood.

A few simple steps can help to avoid exposure to saliva and urine that might contain CMV:

- Washing the hands often with soap and water for 40-60 seconds, especially after
 - changing diapers,
 - feeding a young child,
 - wiping a young child's nose or drool, or
 - handling children's toys.
- Do not share food, drinks, or eating utensils used by young children.
- Avoid contact with saliva when kissing a child.
- Clean toys, countertops, and other surfaces that come into contact with children's urine or saliva.

L.5.3.7 TOXOPLASMOSIS

Toxoplasmosis is an infection caused by a single-celled parasite named *Toxoplasma gondii*. Although many people may have toxoplasma infection, very few have symptoms because the immune system usually keeps the parasite from causing illness. Babies who became infected before birth can be born with serious mental or physical problems. Toxoplasmosis often causes flu-like symptoms, swollen lymph glands, or muscle aches and pains that last for a few days to several weeks.

The following measures can help prevent toxoplasmosis infection:

- Wear gloves when you garden or do anything outdoors that involves handling soil. Cats who may pass the parasite in their faeces, often use gardens. Avoid any contact with cat faeces. Wash your hands well with soap and warm water after outdoor activities, especially before you eat or prepare any food.
- Have someone who is healthy and not pregnant handle raw meat for you. If this is not possible, wear clean gloves when you touch raw meat and wash any cutting boards, sinks, knives, and other utensils that might have touched the raw meat. Wash your hands well with soap and warm water afterward.
- Cook all meat thoroughly, that is, until it is no longer pink in the center or until the juices run clear. Do not sample meat before it is fully cooked.

L.6 PREVENTION OF SEXUALLY TRANSMITTED DISEASES (STD)

L.6.1 SEXUAL TRANSMITTED INFECTIONS

Sexually transmitted infections (STIs) are passed from one person to another through unprotected sex.

Some frequent STIs and STDs, in alphabetical order:

L.6.1.1 CHANCROID

Chancroid is a small bump in the genital area which is infected with a bacteria known as *Haemophilus ducreyi*. The bump is painful, soft and usually bursts and forms an ulcer within a day of its appearance. Along with this bump (or ulcer), small rubbery bumps (but different from the former) may also be felt in the crease between the belly and thigh.

People infected with this bacteria spread it to others through sexual contact.

L.6.1.2 CHLAMYDIA

Chlamydia is common and is easily passed on during sex. Most people don't experience any symptoms, so they are unaware they're infected.

In women, chlamydia can cause pain or a burning sensation when urinating, a vaginal discharge, pain in the lower abdomen during or after sex, and bleeding during or after sex or between periods. It can also cause heavy periods.

In men, chlamydia can cause pain or a burning sensation when urinating, a white, cloudy or watery discharge from the tip of the penis, and pain or tenderness in the testicles.

It's also possible to have a chlamydia infection in the rectum (bottom), throat or eyes.

You can get chlamydia through unprotected vaginal, oral or anal sex or by contact with partner's genitals, or sharing sex toys when they are not washed or covered with a new condom between each person who uses them. Sexual fluid from the penis or vagina can pass chlamydia from one person to another even if the penis does not enter the vagina, anus or mouth. This means you can get chlamydia from genital contact with someone who has the infection even if there is no penetration, orgasm or ejaculation. It isn't clear if chlamydia could be passed on by transferring infected semen or vaginal fluid on the fingers, or by rubbing female genitals together. Chlamydia cannot be passed on through casual contact, including kissing and hugging, or from sharing baths, towels, swimming pools, toilet seats or cutlery.

L.6.1.3 DONOVANOSIS

Donovanosis is a sexually transmissible genital ulcer disease. The bacterium that causes it is *Klebsiella granulomatis*. It infects the skin around the genitals, groin or anal area and causes ulcers and destruction of the skin. After infection, one or more initially painless ulcers (sores) or lumps develop on the genitals, or around the anus or mouth.

Without treatment the ulcers will increase in size and can form a raised red fleshy lump that progressively destroys normal skin. Other bacteria can infect these sores, causing them to become painful and distressing with an unpleasant smell.

Donovanosis is spread by sexual contact. Symptoms generally appear from 1-4 weeks after infection but occasionally may take as long as a year to develop. A very small proportion of people may be infected through direct, nonsexual contact (skin-to-skin contact).

L.6.1.4 GENITAL WARTS – HUMAN PAPILLOMA VIRUS (HPV)

Genital warts are small fleshy growths, bumps or skin changes that appear on or around the genital or anal area. They're caused by the human papilloma virus (HPV). The warts are usually painless, but they may give some itching or redness. Occasionally, they can cause bleeding.

Genital warts can be spread during vaginal or anal sex, and by sharing sex toys. A person does not need to have penetrative sex to pass the infection on because HPV is spread by skin-to-skin contact.

L.6.1.5 GENITAL HERPES

Genital herpes is a common infection caused by the *herpes simplex virus* (HSV), which is the same virus that causes cold sores.

Some people develop symptoms of HSV a few days after coming into contact with the virus. Small, painful blisters or sores usually develop, which may cause itching or tingling, or make it painful to urinate. After a person is infected, the virus remains dormant (inactive) most of the time. However, certain triggers can reactivate the virus, causing the blisters to develop again, although they're usually smaller and less painful.

Genital herpes is usually transmitted by having sex (vaginal, anal or oral) with an infected person. Even if someone with genital herpes doesn't have any symptoms, it's possible for them to pass the infection to a sexual partner.

L.6.1.6 GONORRHOEA

Gonorrhoea is a STI easily passed on during sex caused by bacteria called *Neisseria gonorrhoeae* or *gonococcus*. About 50% of women and 10% of men don't experience any symptoms and are unaware that they are infected.

In women, gonorrhoea can cause pain or a burning sensation when urinating, a vaginal discharge (often watery, yellow or green), pain in the lower abdomen during or after sex, and bleeding during or after sex or between periods, sometimes causing heavy periods.

In men, gonorrhoea can cause pain or a burning sensation when urinating, a white, yellow or green discharge from the tip of the penis, and pain or tenderness in the testicles.

It's also possible to have a gonorrhoea infection in the rectum, throat or eyes.

Gonorrhoea is easily passed between people through unprotected vaginal, oral or anal sex or by sharing sex toys that haven't been washed or covered with a new condom each time they are used. Gonorrhoea is not spread by kissing, hugging, sharing baths or towels, swimming pools, toilet seats, or sharing cups, plates and cutlery, because the bacteria can't survive outside the human body for long.

L.6.1.7 HEPATITIS B

Hepatitis B is a type of virus that can infect the liver.

Symptoms can include feeling sick, lack of appetite, flu-like symptoms, such as tiredness, general aches and pains, and headaches, and yellowing of the skin and eyes (jaundice). However, many people don't realise they have been infected with the virus because the symptoms may not develop immediately, or even at all. A mother can also pass on the hepatitis B infection to her new-born baby.

Hepatitis B can be spread through blood and body fluids such as semen and vaginal fluids, so it can be caught during unprotected sex, including anal and oral sex and by sharing needles and syringes.

L.6.1.8 HIV

The HIV virus attacks and weakens the immune system, making it less able to fight infections and disease. There's no cure for HIV, but there are treatments that allow most people to live a long and otherwise healthy life.

AIDS is the final stage of an HIV infection, when your body can no longer fight life-threatening infections.

Most people with HIV look and feel healthy and have no symptoms. When you first develop HIV, you may experience a flu-like illness with a fever, sore throat or rash. This is called a *seroconversion illness*.

HIV is most commonly passed on through unprotected sex. It can also be transmitted by coming into contact with infected blood – for example, and sharing needles and syringes.

L.6.1.9 PUBIC LICE

Pubic lice ("crabs" (because they look similar to crabs.)) are easily passed to others through close genital contact. They're usually found in pubic hair, but can live in underarm hair, body hair, beards and occasionally eyebrows or eyelashes.

It may take several weeks for you to notice any symptoms. Most people experience itching, and you may notice the lice or eggs on the hairs. Pubic lice are sometimes called crab lice because they look similar to crabs.

Pubic lice spread through close body contact with someone who has them. The lice crawl from hair to hair, but cannot fly or jump. They need human blood to survive, so generally leave the body to move from one person to another. They are most commonly passed on during sexual contact. Condoms will not prevent them being passed to another person. It is also possible for pubic lice to be spread through sharing clothes, towels and bedding.

L.6.1.10 SCABIES

Scabies is caused by tiny mites that burrow into the skin. It can be passed on through close body or sexual contact, or from infected clothing, bedding or towels.

If a person develops scabies, he may experience an intense itching that's worse at night. The itching can be in the genital area, but it also often occurs between the fingers, on wrists and ankles, under the arms, or on the body and breasts.

The infected person may have a rash or tiny spots. In some people, scabies can be confused with eczema. It's usually very difficult to see the mites.

Scabies mites can be passed on through close body or sexual contact, or from infected clothing, bedding or towels.

L.6.1.11 SYPHILIS

Syphilis is a bacterial infection (*Treponema pallidum*) that in the early stages causes a painless, but highly infectious, sore on the genitals or around the mouth. The sore can last up to six weeks before disappearing.

Secondary symptoms such as a rash, flu-like illness or patchy hair loss may then develop. These may disappear within a few weeks, after which you'll have a symptom-free phase.

The late or tertiary stage of syphilis usually occurs after many years, and can cause serious conditions such as heart problems, paralysis and blindness.

The syphilis bacteria can enter your body if you have close contact with an infected sore, normally during vaginal, anal or oral sex, or by sharing sex toys with someone who is infected. It may also be possible to catch syphilis by sharing needles for drug use with somebody who is infected. Pregnant women can pass the infection to their unborn baby. Syphilis also cannot be spread by using the same toilet, clothing, cutlery or bathroom as an infected person, as the bacteria cannot survive for long outside the human body.

L.6.1.12 TRICHOMONIASIS

Trichomoniasis is an STI caused by a tiny parasite called *Trichomonas vaginalis* (TV). It can be easily passed on through sex and most people don't know that they're infected.

In women, trichomoniasis can cause a frothy yellow or watery vaginal discharge that has an unpleasant smell, soreness or itching around the vagina, and pain when passing urine.

In men, trichomoniasis rarely causes symptoms. You may experience pain or burning after passing urine, a whitish discharge, or an inflamed foreskin.

The parasite is usually spread by having unprotected sex (without using a condom), although it can also be spread by sharing sex toys. You do not have to have many sexual partners to catch trichomoniasis. Anyone who is sexually active can catch it and pass it on. Trichomoniasis cannot be passed on through oral or anal sex, kissing, hugging, sharing cups, plates or cutlery, toilet seats or towels.

L.6.2 WHEN TO REFER TO A HEALTHCARE FACILITY?

Any person who is at risk and doubts he might be infected, if had unprotected sex with a potentially infected person or has been exposed to multiple sex partners should always be referred to the nearest sexual health clinic or healthcare facility for a check-up as soon as possible.

Sex workers should always be advised to have frequent regular check-ups.

L.6.3 REDUCING THE RISK OF STDs/STIs

Effective strategies for reducing STD risk include:

L.6.3.1 ABSTINENCE SEX

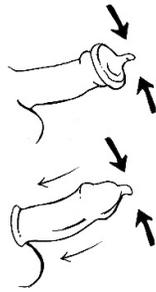
The most reliable way to avoid infection is to not to have sex, especially anal and oral sex.

L.6.3.2 MUTUAL MONOGAMY

Mutual monogamy means to agree to be sexually active with only one person, who has agreed to be sexually active only with the same person.

Being in a long-term mutually monogamous relationship with an uninfected partner is one of the most reliable ways to avoid STDs.

L.6.3.3 **CONDOMS**



Correct and consistent use of the male latex condom is highly effective in reducing STD transmission. Use a condom every time you have sex.

L.6.3.4 **REDUCED NUMBER OF SEX PARTNERS**

Reducing the number of sex partners decreases the risk of STDs. It is important to get tested for STDs regularly.

L.6.3.5 **VACCINATIONS**

Vaccines are safe, effective, and recommended ways to prevent hepatitis B and HPV. HPV vaccines for males and females can protect against some of the most common types of HPV. The person can discuss this option with his healthcare provider.

L.7 EMERGENCY CHILDBIRTH

Pregnant women should always visit a health centre or another healthcare facility for pregnancy follow-up from the moment the woman notices she is pregnant.

Expectant mothers usually reach the health centre on time, but there may be some situations where this is not possible, for instance in the last stages of pregnancy when an expectant mother can go into labour at any time.

As a first aider you might be required to assist with the delivery of the baby during emergency childbirth.

L.7.1 WHAT DO I SEE AND ENQUIRE?

The following signs indicate that labour has started and the baby is about to be born:

- painful contractions occurring at increasingly shorter intervals,
- the waters break,
- blood mixed sticky discharge,
- abdominal discomfort,
- urge to push, or
- localised back pain.

L.7.2 WHAT DO I DO?

**ALL PREGNANT WOMEN MUST BE ENCOURAGED TO OPT FOR
AN INSTITUTIONAL DELIVERY.**

L.7.2.1 WHEN TO GO IMMEDIATELY TO A HEALTHCARE FACILITY DURING PREGNANCY?

If at any time the mother feels the loss of foetal movement, feels sick or has concerns about her or the baby's health, she should visit the healthcare facility and consult a doctor.

If any of the following symptoms show, the mother should go to the healthcare facility without any delay:

- fever and weakness or unable to get out of bed,
- pain in the belly and/or bad smelling discharge from the vagina,
- sudden bleeding or increasing loss of blood,
- fits,
- difficulty in breathing, fast breathing or chest pain,
- irregular heartbeat, palpitations,
- terrible headache and blurry vision,
- nausea and vomiting,
- faintness or dizziness,
- swelling of the feet,

- labour that starts before 34 weeks of gestation,
- labour that lasts longer than 12 hours.

If there is a healthcare facility in the area, it is best to arrange immediate transportation to take the woman there. If not, send for a trained birth attendant or health worker to help.

L.7.2.2 WHAT DO I DO IF THE WOMAN IS IN LABOUR OR IF THE WATERS HAVE BROKEN?

If there is a healthcare facility in the area, it is best to arrange immediate transportation to take the woman there. If not, send for a trained birth attendant or health worker to help.

L.7.2.3 WHAT DO I DO WHEN I HAVE TO ASSIST IN AN EMERGENCY BIRTH?

1. Encourage the expectant mother's companions and relatives to be involved.
2. Praise and encourage the mother.
3. Protect and respect her privacy and the local or religious customs.
4. Wash your hands before assisting. 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.
5. Provide a reassuring touch to reduce anxiety



6. Encourage the woman to move around and find the most comfortable position.
7. Let her urinate often. A full bladder delays the process of labour and increases the chances of tearing and bleeding.
8. Permit sips of water to moisten the lips during labour.
9. Encourage her to breathe out calmly and to relax with each breath.
10. Seek immediate help if you notice the following complications:
 - The baby is coming out with the hips or feet first, instead of his head.
 - There are no contractions six hours after the waters break.
 - The contractions continue for more than 12 hours.
 - The woman is bleeding and/or she has fever.

L.7.2.4 WHAT DO I DO DURING THE PUSHING STAGE?



1. Support the woman in a comfortable position.

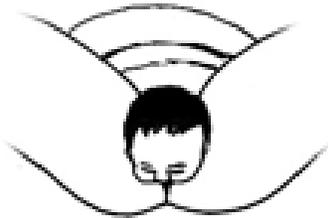
An upright position is the best, but a lying position is the least challenging to assist with delivery.

You can put a pillow under the right hip.

2. Wash your hands with water and soap. If no soap is available, you can use ash to wash your hands. Alcohol-based sanitizers can also be used, if available.
3. Put on (disposable) gloves or use a clean plastic bag to avoid contact with the bodily fluids.
4. Naturally, at this stage, the mother feels the urge to push.

If the pushing is not working, tell her to change position and to empty her bladder.

Tell the mother not to push when the baby's head is out.



5. Watch the baby come out while supporting the baby's head and shoulders.

Do not pull the baby out.

Do not push on the woman's belly during labour or after the delivery.

L.7.2.5 WHAT DO I DO WHEN THE BABY IS BORN?

1. Immediately after birth, place the baby on the mother's bare chest or abdomen so that they can have skin-to-skin contact.



2. To sterilise the cutting equipment, boil it for ten minutes or run it through a flame a few times and let it cool down.
3. Cut the baby's cord:



- a. Create two knots/ties:
 1. The first knot/tie is two cm (about three fingers) away from the baby's abdomen.
 2. The second knot/tie is four cm (about five fingers) away from the first knot/tie.
- b. Cut between the two knots/ties with a clean razor blade, scissors or a knife.
- c. Create another knot/tie on the side of the baby's abdomen if the cord continues to bleed after it has been cut.
- d. Keep the cord dry and clean.
4. Wipe the baby's skin clean and dry and ensure that the baby is kept warm and close to the mother.
5. The baby can be dressed or wrapped.



6. The placenta or afterbirth will come out naturally on its own. When it is out, put it somewhere safe until it can be disposed of properly.

Do not pull on the umbilical cord to remove the placenta and afterbirth. If the cord rips, it may cause infection or severe bleeding.

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.



8. Encourage the mother to breastfeed the newborn. Although there is no breast milk at that moment, the baby's sucking will stimulate the production of milk.

Immediate breast-feeding also helps the placenta to come out and prevents bleeding of the mother after delivery.

9. Encourage the mother to move around as soon as she feels able and ready to do so.
10. Do not leave the mother unattended during the first 24 hours after giving birth.
11. The mother should go to a healthcare facility for further check-up and management.

L.7.2.6 WHAT DO I DO WHEN THE BABY IS NOT BREATHING OR NOT BREATHING NORMALLY?

1. Tell the mother that the baby is having problems breathing and that you will help.
2. Move the baby on to a clean, dry and warm surface.
3. Keep the baby wrapped and warm.
4. Start CPR for the baby.
5. Stop resuscitating after 20 minutes if the baby is not breathing or gasping for air and explain to the mother what has happened and offer her support.

L.7.2.7 WHAT DO I DO WHEN THE MOTHER IS BLEEDING HEAVILY AFTER GIVING BIRTH?

1. Call for help and arrange urgent transport to the nearest healthcare facility or hospital.
2. Massage the mother's belly firmly below the navel. This might slow down the bleeding.
3. Ask the mother to urinate if possible. This might slow down the bleeding.

L.7.2.8 WHAT DO I DO AFTER ASSISTING THE EMERGENCY BIRTH?



After birth, mother and baby should always be transported to a healthcare facility for further checkup and follow up.

M. PSYCHOLOGICAL FIRST AID

In this chapter you will learn about:

- What is psychological first aid?
- Traumatic crisis.
- How do I provide (psychological) first aid?

M.1 DEFINITION OF PSYCHOLOGICAL FIRST AID

It is a process of facilitating resilience within an individual to enable to bounce back from the impact of crisis and help him to deal with the event/crisis by respecting the independence, dignity and coping mechanism.

In the past first aid was mainly focussed on giving physical first aid to an injured or suddenly sick person by someone who happens to be present when the accident happened or the illness occurred.

Traumatic events and sickness may stress people. They might feel overwhelmed, worried, confused or feel uncertainty. Some people might show little or no signs, others might present with a more severe reaction.

The SPHERE (2011) and IASC (2007) define psychological first aid (PFA) as a humane, supportive response to a fellow human being who is suffering and who may need support. It includes:

- providing practical care and support, which does not intrude;
- assessing needs and concerns;
- helping people to address basic needs (for example, food and water, information);
- listening to people, but not pressuring them to talk;
- comforting people and helping them to feel calm;
- helping people connect to information, services and social supports, and
- protecting people from further harm.

Physical and psychological first aid go hand in hand and should be delivered simultaneously.

M.2 TRAUMATIC CRISIS



A traumatic crisis is caused by a sudden, unexpected and intense incident.

The event, as in following examples

- traffic accident, a fire, ...;
- natural disasters (earthquakes, floods, ...);
- serious illness;
- death of a close one;
- violence, robbery, attack, rape ...;
- financial difficulties;
- relational difficulties;
- suicide (attempt);
- etc,

produces a significant emotional shock that temporarily overwhelms the individual.

The traumatic crisis will almost always follow a certain pattern. One may say that the traumatic crisis can be divided into four phases:

1. (Psychological) Shock phase.
2. Reaction phase.
3. Processing phase.
4. Reorientation phase.

M.2.1 (PSYCHOLOGICAL) SHOCK PHASE

The shock phase follows immediately after the event which triggered the crisis. During the shock phase, the person is not yet able to comprehend the event that caused the crisis and may even deny it. While some people in shock become completely paralysed, others behave in a mechanical and cold way. Some people in shock may become strongly agitated; they may scream or cry furiously. People may also alternate between paralysis and restlessness states. The reactions of people in shock, such as apparent lack of feelings, may confuse the people close to them and even cause embarrassment or resentment.

The shock phase may include:

- denial,

- emotional shutdown,
- feeling surreal and like an outsider, and
- shouting, crying and panic.

Reactions during the (psychological) shock phase may seem scary and strange.

M.2.2 REACTION PHASE

The immediate danger is over. The person will slowly face the tragic incident and try to understand what has happened. At the beginning of the reaction phase, people might experience strange and unexpected sensations; for example, they may feel that the person they have lost is still around or they may hear their voice somewhere.

The feelings of people in the reaction phase are often very similar to each other and they are often expressed in the same form: "I think I'm going crazy", "I can't take it any more", "will I ever make it through?", "life feels like a rollercoaster", or "will this pain last forever?", for example.

The reaction phase may include:

- fear and anxiety,
- self-accusations and the need to find someone to blame,
- sleeplessness and loss of appetite, and
- nausea or other physical symptoms.

During the reaction phase of a crisis, people often feel the need to be heard. They may feel the need to discuss the matter over and over again. This may feel very heavy and consuming to the people close to the individual.

M.2.3 PROCESSING PHASE

In the processing phase, the person begins to understand what has happened. The matter is no longer denied; instead, the person understands that the incident and all its changes and losses are really true. The person is ready to face all the different aspects of the incident and the new personal situation. He is aware of the changes caused by the crisis and often begins to analyse his own identity and personal convictions and beliefs. He begins to think beyond the event, but will not yet have strength to plan for the future. Nevertheless, the person is preparing to face the future. He also regains the capability to better concentrate on everyday's life.

The processing phase may include:

- problems with memory and concentration,
- irritability, and
- withdrawal from social relationships.

M.2.4 REORIENTATION PHASE

The crisis is over. The person is able to live with what has happened, and it is no longer constantly on his mind. Every once in a while, the pain will resurface but there is also joy in life; the person will be able to look to the future and regain confidence in life.

Nevertheless, the course of a crisis is not always straightforward; for example, things reminding of the incident can bring back heavy thoughts, anxiety and other symptoms.

M.3 HOW DO I PROVIDE (PSYCHOLOGICAL) FIRST AID?



Life-saving first aid is a top priority. It is important to start with limiting the physical injuries. You must first and foremost give life-saving first aid where necessary, in order to make sure that the injured persons get to the hospital alive. Doing the best you can to limit the injuries as much as possible also has a very soothing effect on the injured ones, and on all others present: 'There is someone who helps'.

M.3.1 BEHAVE CALMLY

Behaving calmly has a very soothing effect on the casualties and the psychically affected persons. Calmness can be just as contagious as uneasiness.

Behaving calmly is:

- Speaking quietly in a normal pitch.
- Focus the right amount of time on the person you are there to help, instead of running from one thing to the other.
- Showing clearly that you have time to take care of the affected person.
- Avoiding mentioning that it seems to take too long for the ambulance or other helping teams to arrive.

M.3.2 LISTEN TO THE AFFECTED PERSON

The affected person must be given the opportunity to tell what he has experienced. This is called "Venting".

You must accept what he tells you, and you must not comment on it; only ask questions which make him enlarge upon the subject.

Perhaps his account sounds quite unbelievable, but to him that is what he has experienced or thinks he has experienced. By telling about the experiences he gets a chance to recognize for himself that quite incredible things, which he thinks he has experienced and which make him frightened, are not true. This way he can get free of these fantasies.

Venting experiences also has the result that he gets them sorted out and gets them placed in the proper succession in his memory. It makes it easier to endure having experiences emerging as a tangled series of frightening pictures which he cannot control at all.

You should:

- Try to find a quiet place to talk, and minimize outside distractions.
- Respect privacy and keep the person's story confidential, if this is appropriate.

- Behave appropriately by considering the person's culture, age and gender.
- Respect the person's right to make his own decisions.
- Stay near the person but keep an appropriate distance depending on their age, gender and culture.
- Let them know you are listening; for example, nod your head or say " hmmm...."
- Be patient and stay calm.
- Be honest and trustworthy.
- Provide only factual correct information, if you have it. Be honest about what you know and don't know. Say "I don't know, but I will try to find out about that for you." if you can't answer the question.
- Give information in a way the person can understand and keep it.
- Acknowledge how he is feeling.
- If he tells you about any losses or important events, such as loss of the home or death of a loved one, reply with "I'm so sorry. I can imagine this is very sad for you."
- Acknowledge the person's strengths and how he has helped himself.
- Allow for silence.
- Make it clear to people that even if they refuse help now, they can still access help in the future.

M.3.3 GENERAL CONSIDERATION WHEN GIVING HELP

Consider following basic topics when providing help or when you ask bystanders to give help:

- Get his personal belongings gathered.
- Find out where he is going.
- Find out how he got there.
- Make sure that there is someone who can take care of the affected one when he arrives at the destination.

M.3.4 PHYSICAL CONTACT

It helps incredibly and creates an immediate sense of security, if you take the hand of the affected person or put an arm around his shoulder while you listen to him. If he cries - which in itself is very good for him - you can allow him to put his head on your shoulder.

Physical contact is so important because the affected person unconsciously will try to protect himself from the violent psychic trauma by reacting like a child. For this reason contact with a "grown-up" helper may help him to feel more secure.

M.3.5 ALLOW PEOPLE TO HAVE “HAVE A GOOD CRY”

Crying is a strong outburst of feeling and a means of getting rid of extremely oppressive feelings. It is therefore very important to cry when the urge to do so arises.

But crying is also very visible and audible expression of being affected by strong feelings and for some reason this is considered "embarrassing" in many culture. It is necessary that we set aside our culture constraints; when you are giving psychological first aid the affected person should be allowed to give way to his feelings. Tell him you understand this.

M.3.6 PROTECT AGAINST INQUISITIVE ONLOOKERS

The affected person will be embarrassed showing his feelings, and he will, altogether, feel sorry to let other people see him in this particular situation.

A person may react on the onlookers in different ways. He may try to hide himself in an "ostrich like" manner by holding his hands in front of his face, but he may just as well react very aggressively and abuse them.

Your help must consist in getting the affected one away from the onlookers, or make them leave the area.

M.3.7 DO NOT LET THE AFFECTED PERSON BE ALONE

Even if the affected person does not like to have people around him, it is not a good idea to leave him alone with his psychic crisis. His feelings will seem much more oppressive when he is alone with them.

You have to make sure that someone else can stay with him, if you cannot continue to provide help. It is important that the person who stays with him knows what has happened, and what the situation is. It will also be of great advantage, if the helper who takes over, knows the basics of psychological first aid and provides the best humane support.

M.3.8 PROVIDING PSYCHOLOGICAL FIRST AID TO ALL

This means giving immediate emotional support to those who are physically injured, as well as to those who are not physically injured but might be psychologically impacted.

Also, look after the confused, the lost, and those who are separated from families. Care for those who are left behind. Help them to be re-united with their relatives.

Recovering from a psychological injury can take longer than recovering from a wound. The person may need your continuing support in the weeks ahead

When there are mass casualties follow the instructions of the medical team in charge.

M.3.9 DON'T FORGET TO TAKE CARE OF YOURSELF

Helping responsibly also means taking care of your own health and wellbeing.

As a helper, you may be affected by what you experience in a crisis situation, or you or your family may be directly affected by the event. It is important to pay extra attention to your own wellbeing and be sure that you are physically and emotionally able to help others. Take care of yourself so that you can care best for others.

If working in a team, be aware of the wellbeing of your fellow helpers as well.

N. SPECIFIC EMERGENCY SITUATIONS AND DISASTER MANAGEMENT

In this chapter you will learn about:

- Emergencies at school.
- Emergencies at work.
- Road and traffic accidents.
- Emergencies in rural areas.
- Disasters and multiple casualty accidents.
- Triage.

N.1 EMERGENCIES AT SCHOOL

Children are highly vulnerable to injuries and accidents. Usually these are only minor bruises and grazes, but sometimes the child may incur a severe accident resulting in fracture, bleeding, suffocation, fainting, burns, drowning or electric shock (etc.).

Also, a school staff member may suffer a heart attack or a respiratory disorder with which first aiders have to cope.

Under these circumstances the first aider should be able to rise to the occasion, instead of getting nervous. There are several simple procedures anyone can learn and, if correctly and immediately applied, can make the difference between life and death.

Children are liable to the same type of emergencies and injuries as adults in similar circumstances. Details on how to handle emergency cases are described in the various chapters of this training programme. The procedure of attending an emergency always remains the same and includes the following:

1. Assess the situation.
2. Safety first.
3. Alert and seek help.
4. Provide first-aid.
5. Transport or refer to a healthcare facility, if needed.
6. Hygiene.

Training and exercising helps the first aider to act swiftly, calmly and in the correct way. There is no substitute for proper training!

The school management should ensure that:

- a well-equipped first aid room or station with the necessary materials is available,
- a trained first aider(s) is(are) available in the school or is on call, and
- in each class at least one child (preferably more) is trained in first aid.

Having trained first aiders available is a great asset to the school at the time of emergency.

It is again underlined that there is no substitute for proper training. The Red Cross and St John Ambulance organize first aid trainings for teachers, staff and students. Make sure each school has a SOP (Standard Operating Procedures) for any disaster including violence by fellow students and others.

N.2 EMERGENCIES AT WORK

A common injury in workshop and factories is a worker being stuck in or pinned down under the machinery. This can result in twisted limbs, lacerations, severe bleeding and fractures, and may lead to shock.

In some cases it is not possible to extricate or release the victim easily. In all cases, the machinery should be stopped immediately, the power of the machine cut off and a person who is familiar with handling the machine or a senior foreman should be called to the scene.

Most modern machines have automatic releasing devices. Eventually, machine parts may have to be dismantled to get access and release the casualty.

The first aider must assess the situation, ensure the safety for himself and casualty, control any bleeding, provide the necessary first aid, prevent shock and reassure the casualty. He continuously needs to observe the casualty's condition. It is best to cover any injured or burned parts when possible. Provide CPR when needed, and arrange for immediate medical aid on site or transport to a healthcare facility or hospital.

Details on how to handle this and other emergency cases are described in the various chapters of this training programme. The procedure of attending an emergency always remains the same and includes the following:

1. Assess the situation.
2. Safety first.
3. Alert and seek help.
4. Provide first-aid.
5. Transport or refer to a healthcare facility, if needed.
6. Hygiene.

Training and exercising helps the first aider to act swiftly, calmly and in the correct way. There is no substitute for proper training!

The workshop or factory management should ensure that:

- a well-equipped first aid room or station with the necessary materials is available;
- a trained first aider(s) is (are) available in the workshop or factory, or is on call;
- preferably some workers (or all) are trained in first aid; and
- all the workers should be sensitized about possible hazards and help available.

Having trained first aiders available at the workplace is a great asset to the workshop or factory at the time of emergency.

In case of accidents in deep mines such as coal mines rescue work is also very important besides first aid and is to be arranged urgently. Only trained specialised rescuers with special safety devices can provide this. All mines have to arrange the continuous availability of these teams and the required rescue materials.

It is again underlined that there is no substitute for proper training. The Red Cross and St John Ambulance organize first aid trainings for workers, miners and laypeople.

N.3 ROAD AND TRAFFIC ACCIDENTS

On many occasions the victims of road side accidents remain lying on the spot without medical aid or any help of the public until the arrival of police, which in many cases may take time.

The members of the public do not basically have an indifferent attitude in such situation, but they have a fear that instead of receiving credit for helping the injured or by transporting him to a medical facility or hospital, there might be harassment by the police who might look to them with suspicion. They may also feel that they will have to bear the expenditure of the transportation.

This thinking is not correct. A person who is lying helpless can be relieved from sufferings if someone provides the appropriate first aid and transport him to the nearest medical facility. Even a little knowledge of first aid of trained laypeople can save lives.

To overcome this difficulty and to create public awareness of the moral duty to help, the government, the court and the police have been issuing instructions via the press, posters and radio- and TV-spots that members of public are to be given a positive response in their noble task helping and transporting the injured at the earliest to the healthcare facility or hospital for further medical aid. Instructions have also been given to police staff to ensure that such persons who bring an injured to the hospital for medical aid are not be detained. It should suffice for the emergency centres in hospitals to ask only following questions to the person who brings the injured to the hospital:

1. Where have you brought this casualty from?
2. Do you know anything about the cause of the injury of the casualty?
3. May I have your particulars?

It is likely that the person would answer the first question, but may not be able to answer the second one. He might hesitate to answer to the third question, in which case it should not be insisted upon. The escorts should, under no circumstances be detained in the hospital for interrogation. On the other hand he should be treated with courtesy.

However, rendering aid to the injured is the moral and civil duty of each and every one of us.

Details on how to handle these emergency cases are described in the various chapters of this training programme. The procedure of attending an emergency always remains the same and includes the following:

1. Assess the situation.
2. Safety first.
3. Alert and seek help.
4. Provide first-aid.
5. Transport or refer to a healthcare facility, if needed.
6. Hygiene.

Training and exercising helps the first aider to act swiftly, calmly and in the correct way. There is no substitute for proper training!

Having trained first aiders available is always a great asset to the public at the time of emergency.

In air crash or railway accidents, comprehensive skilled medical facilities are made available by the concerned authorities. The instructions issued by these teams are to be followed.

It is again underlined that there is no substitute for proper training. The Red Cross and St John Ambulance organize first aid trainings for commercial drivers, driving schools and laypeople.

Emergency telephone numbers (for example, police, fire, ambulance etc.) should be repeatedly displayed at important places and in media.

N.4 EMERGENCIES IN RURAL AREA

Medical facilities are often inadequately available, especially in the remote villages. It is also difficult to transport the injured or sick persons due to difficult roads or the non-availability of proper transport services. A *charpai* could be used in the village in place of stretcher.

In rural areas following specific types of injuries are frequent:

- Fall from a tree or fall of a branch onto a victim (people have the habit to sit or sleep under the shade of trees in the summer).
- Fall from walls or roofs. The roofs of houses in villages have usually no parapet walls and children may fall from the roof.
- Collapsing of mud walls or roofs of houses onto people.
- Caving in of mud while digging and getting buried under the mud.
- Fall from horseback, or getting kick of a horse or donkey or other animals.
- Fall from a *jhulah* (suspension bridge) when the rope snaps.
- Drowning in the village pond, well or in canal water.
- Railway track accident (when walking on or crossing a railway line or when sitting or hanging on a wagon).
- Being crushed under a bus, car, tractor or other vehicles.
- Boat disasters.
- Bites of snakes, scorpions, leeches, dogs (rabies!), monkeys, tigers, jackal or camels.
- Heat stroke, heat exhaustion and hyperthermia.
- Frostbite in hilly areas.
- Food poisoning.
- Poisoning by DDT or other insecticides, pesticides and fertilizers.
- Cut from sharp agricultural equipment. ("thresher injuries")
- Electrocution from electric wires, especially over-head high tension wires.
- Burns of various degrees
- Acute febrile illness (e.g. malaria)
- Acute diarrhoeal diseases leading to dehydration (e.g. cholera).
- *Lathi* blow, stone throwing, stab wound, *kirpan* (or other sharp weapon) wound or gunshot wound as a result of fighting between rival groups.
- Carbon Monoxide (CO) poisoning by sleeping in a room where *sigri* is kept burning especially at night, when room is kept closed and there is no ventilation
- Tetanus infection from wound etc.

Many of these problems can be handled by a trained first aider in the initial stage.

Training and exercising helps the first aider to act swiftly, calmly and in the correct way. There is no substitute for proper training!

Having trained first aiders available is a great asset to the community at the time of emergency. It is again underlined that there is no substitute for proper training. The Red Cross and St John Ambulance organize first aid trainings for communities and laypeople.

N.5 DISASTERS AND MULTIPLE CASUALTY ACCIDENTS

India is such a vast country that some part is affected by flood, drought, cold, heat-wave, fire, earthquake, vehicle or train accidents ... at any given time. These incidents can cause huge losses from collapsed buildings, damaged crops to large number of human casualties. Sometimes disasters strike suddenly.

Rendering of first aid to the victims affected by a disaster is a very important relief activity and is a part of the first aid training programmes. Mass casualty management stresses the importance of the role of first responders and first aiders in disaster relief and counts on their preparedness to respond to emergency situations.

In recent years, there has been renewed realizations that the people who become victim of injury or sudden illness need not only immediate attention but also proper medical care. Thus, it is imperative that first aid training and practice should keep pace with modern medical advancements.

Unfortunately, many human lives are lost or disturbed by disasters and accidents. These stressful life events should be supported by appropriate and timely psychological aid. It is very important that someone is helping in making necessary arrangements, giving practical advice, listening to the grievances, assuaging the feelings and providing physical comfort by being with them. It is also important to educate victims about stress reactions and where to refer to for further help. These tasks do not require a psychologist, but trained first aiders can assist supporting these victims.

For smooth working at a disaster or mass casualty accident site the first aiders need to:

- Have the appropriate knowledge and training in first aid and disaster management.
- Have the capability to think practically and be able to improvise, if required.
- Obtain the full particulars nature of the accident or disaster and the affected site.
- Coordinate with the appropriate governmental authorities.
- Coordinate with other local agencies, other institutions or organizations.
- List the resources (transport capacity, available medical personnel, available first responders and first aiders, stand by medical equipment, available medication supplies, available equipment and disaster relief materials, etc.) he has at his disposal and have an estimate how fast he can mobilize these resources.
- Obtain permission to act from the superior officer on site.
- Survey the site, the situation and the security risks.
- Survey the casualties.
- Allot the priorities for treatment and transport of the casualties.
- Provide the necessary assistance.
- Treat and transport the casualties to the assigned medical facilities.
- Submit a daily report to the concerned authorities and to his organization.
- Submit on completion of the mission a detailed final report to the concerned local authorities as well as his St. John Ambulance Headquarters or to his Red Cross Society along with his observations and suggestions.

Training and exercising helps the first aider to act swiftly, calmly and in the correct way. There is no substitute for proper training!

Having trained first aiders available is a great asset at the time of disasters.

It is again underlined that there is no substitute for proper training. The Red Cross and St John Ambulance organize first aid and disaster management trainings.

N.6 EMERGENCY TRIAGE

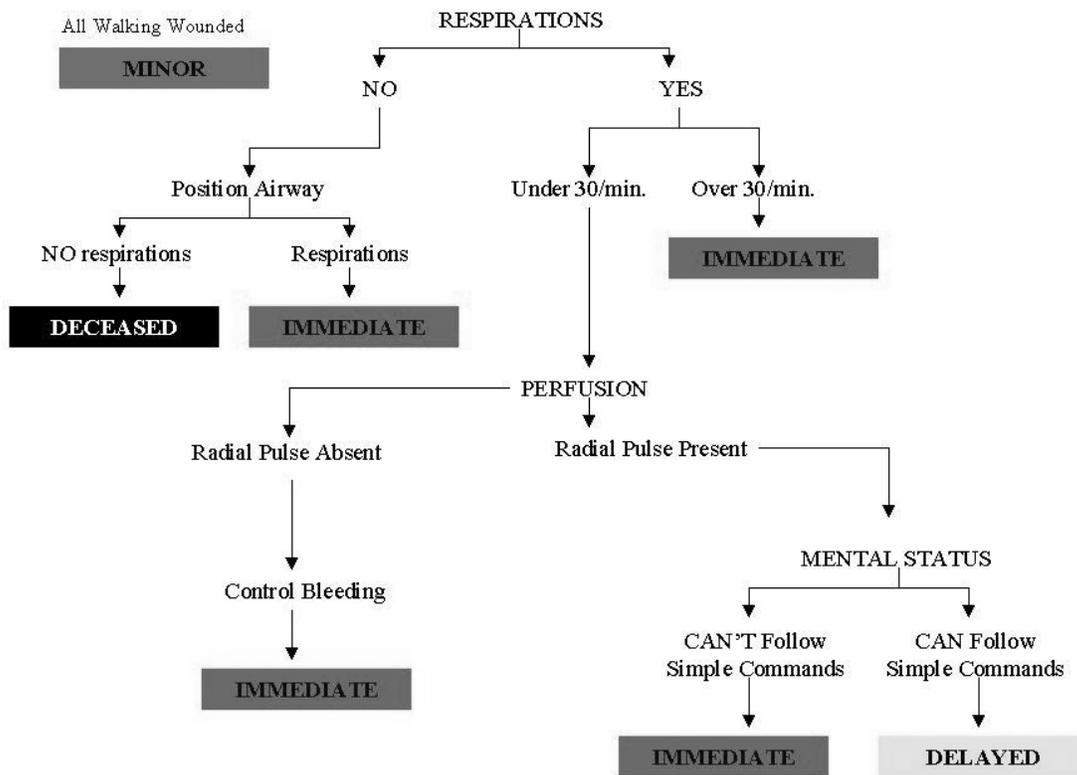
Triage is derived from the French trier, meaning 'to sort or sieve'. In medicine, this is the process of sorting patients in order of priority for treatment and evacuation. Triage may take many different forms, and operates at a number of different levels. However, it aims to give the right patient the right care at the right time in the right place.

In certain circumstances, this may also mean 'doing the most for the most'. Originally developed for use in military conflicts, triage is equally applicable to civilian disasters and in day-to-day emergency settings. Accurate triage allows correct identification of those patients who need the most urgent intervention, as well as quickly and safely identifying those who can wait longer for treatment. The latter are the majority at a typical major incident. Triage may also be used to identify patients who are so severely injured that they will not survive, or whose treatment will tie up resources that would be best used for other patients.

Triage is dynamic – as the patient's condition progresses, so his/her need for intervention alters, and the triage category will change.

The casualties are classified in different categories:

Category →	RED (U1 or I)	YELLOW (U2 or II)	GREEN (U3 or III)	BLACK
Urgency	Extremely urgent.	Fast treatment needed. Constant follow up of breathing and circulation required.	Non urgent treatment.	Deceased.
Injuries	Life-threatening injuries.	Severe. Not immediately life-threatening.	Localised injuries. Non-life-threatening.	Fatal injuries.
Condition	Cardiac arrest. Hypoxia. Shock. Life-threatening bleeding.	Relatively stable condition. Bleeding under control. Breathing.	Walking wounded.	No respiration. No pulse. CPR unsuccessful.
Survival rate	Low if no urgent medical treatment. Better if medical treatment available.	Good when timely medical treatment is provided.	High.	None.
Transport	Immediate transport when stabilized with medical team escort in medically equipped ambulance	Urgent transport (after RED) when stabilized under paramedic observation in equipped ambulance	Non-urgent transport (after RED, YELLOW) by ambulance or any available transport (taxi, car).	Post mortem transport to morgue



Please note:

- There is a fifth category: the non-wounded (sometimes tagged 'BLUE'). They are victims of the incident but seem not to be injured.
- Inside each category, i.e. the categories RED and YELLOW, all casualties of the same are again 'categorized by urgency'. For example, casualties with difficult breathing in category YELLOW will be attended first before patients in the same category with a better condition.
- Triage is a snapshot of the moment the victim has been evaluated. Victims of one category can move in between categories. For example, a patient in category GREEN was walking around, but due to an internal bleeding his condition deteriorates and he becomes a category YELLOW, even RED, depending on his 'new' condition.
- In a mass casualty incident assigning the triage category is done very quickly. The category 'BLACK' (deceased) may be assigned to all casualties that are not breathing without even a CPR attempt (as incident is so massive and there are too many casualties that have to be attended with very limited resources). When more help arrives, and if the situation allows, these victims might be re-evaluated.
- In most mass casualty disasters, a zone for the RED (U1), YELLOW (U2) and GREEN (U3), the deceased (BLACK) and non-wounded (BLUE) will be assigned.
- Always make sure somebody is also observing the casualties in the GREEN zone and the non-wounded (BLUE) as some signs and symptoms of an injury may only show over time.

- Always follow the directives of the medical team on place or of the leader in charge. He assigns people to perform the triage, to assist in the different triage zones, or who will be responsible for managing the transport capacity, etc.

O. FIRST AID TECHNIQUES: DRESSINGS, BANDAGES AND TRANSPORT TECHNIQUES

In this chapter you will learn about:

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

O.1 DRESSINGS

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

- 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.

O.1.1 TYPES OF DRESSINGS

O.1.1.1 ADHESIVE DRESSINGS (BAND AID)



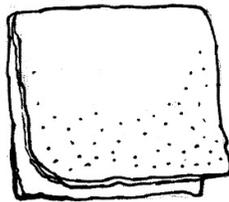
These sterile dressings consist of a pad of absorbent gauze of cellulose held in place by a layer of adhesive material. Sterile adhesive dressings are supplied in paper or plastic covers.

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

O.1.1.2 NON ADHESIVE DRESSING

O.1.1.2.1 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.



O.1.1.2.2 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.

O.1.1.3 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.

O.1.2 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.

O.2 BANDAGES

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. 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 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.

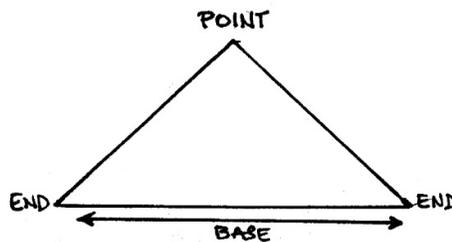
Bandages should be applied firm enough to keep dressing and splints in position, but not as tight as to cause injury to the part or to impede the circulation of the blood. A bluish tinge of the finger or nails may be a danger sign indicating that the bandage is too tight. Loss of sensation is another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

O.2.1 TYPES OF BANDAGES

There are several types of bandages.

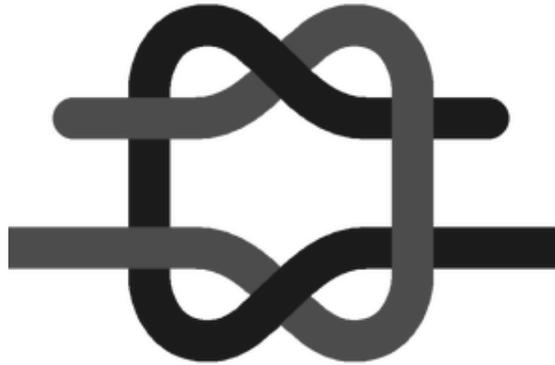
- Triangular bandages (also referred to as “*master bandage*”) can be used as large dressings, or as slings, to secure dressings or to immobilize limbs.
- Roller and crepe bandages secure dressings and support injured limbs.
- Tubular bandages hold dressings on fingers or toes or support injured joints.

O.2.1.1 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.

O.2.1.2 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.

O.2.1.2.1 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.
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 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.
9. If the casualty is not wearing a coat, place a soft pad under the neck portion of the sling to prevent rubbing of the skin in that place.

O.2.1.2.2 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 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.

O.2.1.2.3 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.



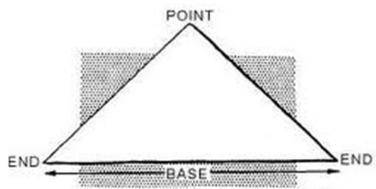
To apply a triangular sling:

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.

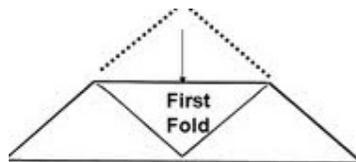
2. Place an open bandage over the arm/chest, with one end over the hand and the point beyond the elbow.
3. Tuck the base of the bandage comfortably under the forearm and hand.
4. Fold the lower end also around the elbow and take it up and across the back of the shoulder (uninjured side) and tie it into 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.

O.2.1.3 BANDAGES

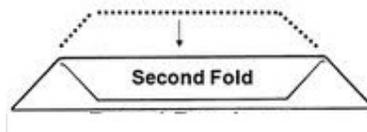
A triangular bandage can be used as:



- a whole cloth (spread out fully) or called "open bandage"



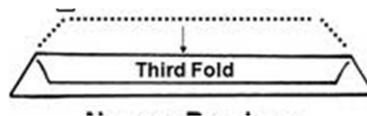
- one fold"



- 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.

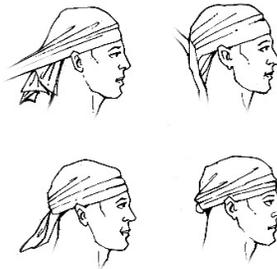


- a narrow bandage (three or more folds):

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.

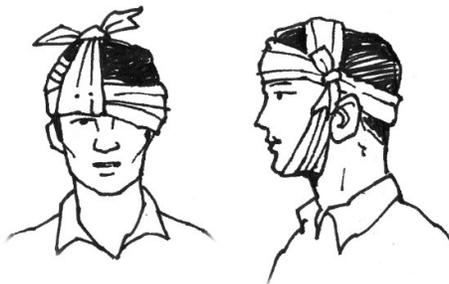
O.2.1.3.1 SCALP BANDAGE



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.
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.

O.2.1.3.2 FOREHEAD, EYE, CHEEK/JAW FRACTURE BANDAGE OR BANDAGE FOR ANY PART WHICH IS ROUND IN SHAPE



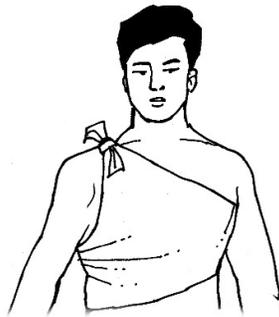
Use two triangular bandages folded as a broad or narrow bandage.

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

O.2.1.3.3 FRONT OR BACK OF THE CHEST BANDAGE

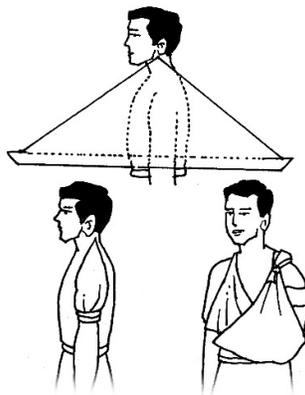
Use an open triangular bandage.



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.

O.2.1.3.4 SHOULDER BANDAGE

Use a broad bandage.

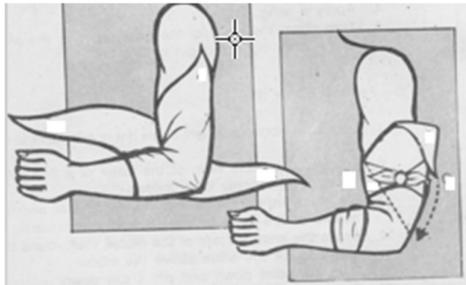


1. Stand facing the injured side.

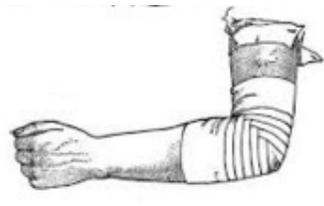
2. Place the center of the open bandage on the shoulder with the point over the side of the neck reaching the ear.
3. Carry the ends crossed, after hemming the base inward around the middle of the arm and tie the knot on the outer side so that the lower border of the bandage is in fixed position.
4.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

O.2.1.3.5 ELBOW BANDAGE

Use an open triangular bandage.



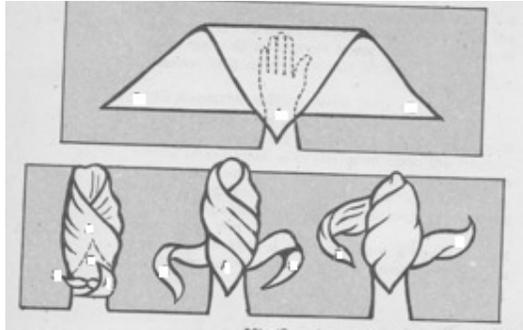
1. Bend the elbow to a right angle if it is feasible to do so.
2. Folding a suitable hem of the base of a triangular bandage and apply it as follows:
 - a. Lay the point on the back of the upper arm and the middle of the base on the back of the forearm.
 - b. Cross the ends in front of the elbow, then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

O.2.1.3.6 HAND BANDAGE

Use an open triangular bandage.



1. 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.
2. Now bring the point over to the wrist.
3. Make a narrow inward hem as usual, pass the ends around the wrist, cross over and tie it up over the point.
4. Turn the point over the knot and pin it.

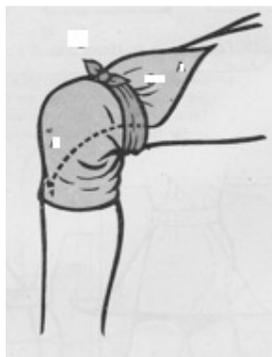
O.2.1.3.7 HIP AND GROIN BANDAGE

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.

O.2.1.3.8 KNEE BANDAGE

Use an open triangular bandage.



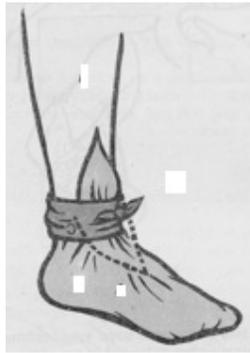
1. Bend the knee to a right angle.
2. With a narrow inward hem, place the open bandage in front of the knee with the point upon the thigh.
3. Cross the ends, take them upwards on the back of the thigh, bring them to the front of the thigh and tie up.
4. Bring the point down over the knot and the knee 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.

O.2.1.3.9 FOOT BANDAGE

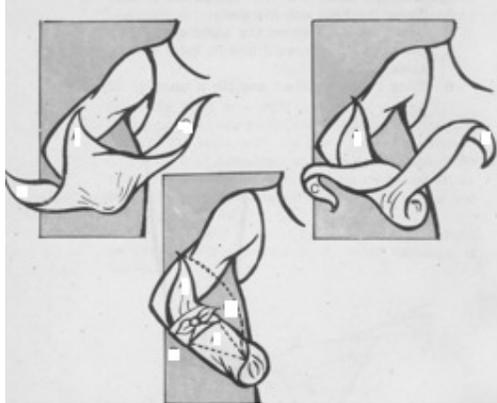
Use an open triangular bandage.



1. Place the foot in the centre of an open bandage with the point beyond the toes.
2. Draw the point over the foot on to the leg.
3. Cover the heel with the ends.
4. Cross the ends around the ankle at the back.
5. Bring the ends forward and tie them in front of the ankle.
6. Bring the point down and pin it up.

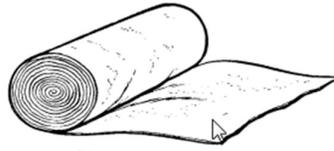
O.2.1.3.10 STUMP BANDAGE

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

O.2.2 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	Width in inch
Finger	2	1
Hand	5	2
Arm	5 or 6	2 or 2.5
Leg	7.5 or 9	3 or 3.5
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:

1. Face the patient.
2. Always keep the "tail" of the bandage towards the patient and the "head or drum" towards you.
3. When bandaging left limb, hold the head of the bandage in the right hand and vice versa.

4. Apply the outer surface of the bandage over the pad and wind it around the injury twice so that it is firm.
5. Bandage from below upwards over the limb. Also make it a rule to apply bandage from the inner side to the outer side.
6. Check that the bandage is neither too loose nor too tight.
7. Roll bandage so that each layer covers two thirds of the earlier layer.
8. 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:

O.2.2.1 SINGLE OR SIMPLE SPIRAL

PICTURE CHANGE

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.

O.2.2.2 REVERSE SPIRAL



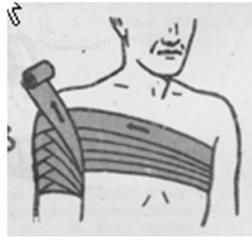
This is a modified spiral in which the roll is reversed downwards on itself at each round. This technique should be used where the thickness of the part varies such as a leg, forearm, etc.

O.2.2.3 FIGURE OF EIGHT



In this, the bandage is applied obliquely alternative up and down, so that the loops appear like the figure of eight. It is used for joints like the elbow, knee etc.

O.2.2.4 SPICA



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

O.2.3 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.

O.3 FAST EVACUATION TECHNIQUES (SINGLE RESCUER)

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!

O.3.1 SHOULDER PULL



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.

O.3.2 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.

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.

O.4 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:

- 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.

O.4.1 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

O.4.1.1 CRADLE TECHNIQUE



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

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

O.4.1.2 HUMAN CRUTCH TECHNIQUE



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

O.4.1.3 PICK-A-BACK TECHNIQUE



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

O.4.1.4 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 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.

O.4.2 **MULTIPLE HELPER TRANSPORT.**

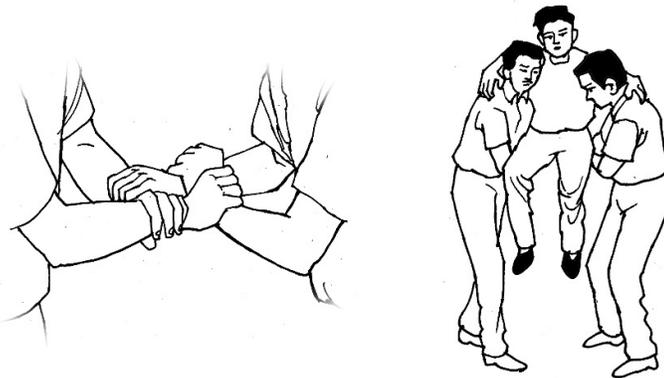
When multiple helpers are available, following transport techniques can be used.

O.4.2.1 **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.

O.4.2.2 **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.
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.

O.4.2.3 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 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.

O.4.2.4 THE FORE AND AFT METHOD TECHNIQUE



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

1. One bearer stands between the casualty's legs, facing the feet with hands down and grasps the casualty under his knees.
2. 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.
3. The casualty is then lifted.
4. The bearers walk in step.
5. 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).

O.4.2.5 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.



O.4.2.6 BLANKET LIFT TECHNIQUE



1. Place the casualty on to a blanket:
 - a. Place the blanket or rug on the ground in line with the casualty, and rolled lengthwise for half its width.
 - b. 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.
2. 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.
3. 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.
4. 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.

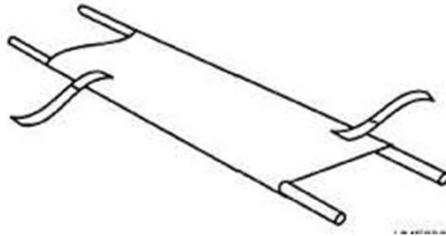
O.4.2.7 THREE PERSON CARRY AND STRETCHER LIFT



1. 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.
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 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).

O.5 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.

O.5.1 LOADING A STRETCHER

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

- blanket lift, and
- emergency lift.

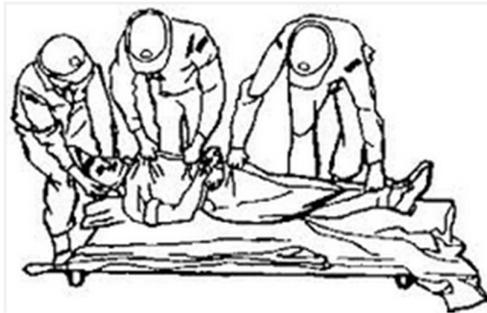
O.5.1.1 BLANKET LIFT

1. In the blanket lift, a blanket is placed under the casualty (as described earlier).
2. 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.

3. If necessary, broad bandages are placed around the body, one at the level of the thigh, another at the level of the shoulders.
4. Lift the casualty and place the stretcher exactly under the casualty.
5. In case of potential injuries to head, neck, spine or legs, two bearers should support the neck and ankle.
6. Lower the casualty on the stretcher.
7. Secure the casualty on the stretcher.

O.5.1.2 EMERGENCY LIFT



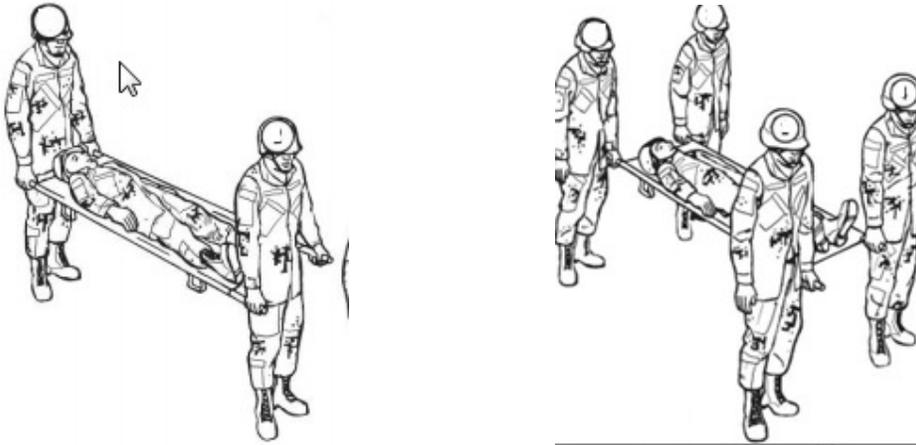
1. If no blanket is available, the following method is used: Open the casualty's coat or bush-coat and roll the free ends firmly close up to the side of the casualty's body.
2. Lift the casualty and put him on the stretcher as described above.

O.5.2 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.

O.5.3 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.

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.

O.5.4 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.

O.6 MOVING AND TRANSPORTING A CASUALTY SUSPECTED OF A 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 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.

O.6.1.1 TRANSPORTING UNCONSCIOUS VICTIMS

After giving emergency first aid, the victim is to be placed on a large hardboard or inverted "charpai". 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.

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 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
- 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

- 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.

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CDC. Several electronically accessible information for public and professionals. www.CDC.gov/.

Healthline. Electronically accessible patient information on diseases. www.healthline.com/.

John Hopkins Medicine. Electronically accessible patient information on urology and pregnancy. <http://hopkinsmedicine.org/>.

NHS UK. Electronically accessible information on several diseases, treatments and patient information. www.NHS.uk/.

Mieli – The Finish Association for Mental Health. Electronically accessible publication on psychological trauma. <http://www.mielenterveysseura.fi/>

UN. Electronically accessible information on several guidelines: www.UN.org and www.UNICEF.org/.

WHO. Electronically accessible information on several guidelines: www.WHO.int/.

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