



Falck First Aid

17th edition



FALCK



The 3 main points of First Aid

1. Ensure Safety

a) Overview

- Stop. **Calm yourself**
- What is the **extent** of the accident?
- Are you or anyone else at **risk**?

b) Secure

- Yourself
- The surroundings (relatives/bystanders)
- The casualty(s)

2. Perform First Aid

- React using the **[M] A B C rule**

3. Call for Help 1-1-2

State:

- **What has happened?**
- **Where** it has occurred?
- **When** did it happen?
- **Where** should the help be sent (exact address)?
- **How many people are injured?**

While waiting for the Ambulance

- Check for other injuries
- Maintain overview
- Control safety
- Perform Psychological First Aid

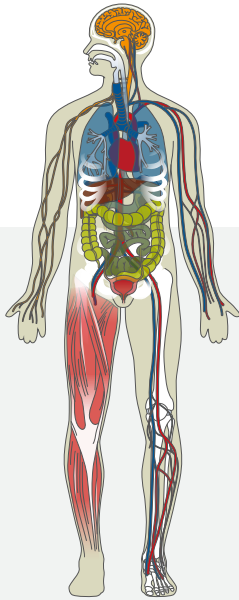


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Preface

Help save lives

This FIRST AID textbook has been completed based on the principles of treatment used by Falck's Ambulance Service thus having converted years of experience with problem solving, emergency management and ambulance treatment into a practical first aid course.

We are confident that your participation in this course will enable you to perform qualified first aid at scenes of accidents and sudden illness, be it at home, at work, or in the public arena.

The first aid course and the content of this book should be regarded as a unit. Therefore, this book must only be regarded as a supplement to the training you have received on the first aid course. This book is meant to be used as a reference book. Note the fold-out page after page 51.

A quick response to, for instance, cardiac arrest is vital for survival chances.

You can see the complete first aid treatment in the "Chain of Survival" below, where each step is essential. After having attended a first aid course, you can complete the first two links in the chain, ensuring the best possible chances of survival without any side effects.

This first aid training is based upon the recommended guidelines by the European Resuscitation Council (ERC).

Falck and the instructor wish you a profitable course.



Source: Danish Resuscitation Council

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The 3 MAIN POINTS of First Aid

In situations where people are struck with a sudden illness or an accident, the implicated people will somehow all be affected by the situation. This applies to the casualty, bystanders, relatives, first-aiders as well as any rescue teams.

As a First Aider, or bystander, the situation may appear to be confusing and chaotic. In situations like these it can be difficult to determine how to commence the proper assistance.

The time factor is important with regards to saving lives. Therefore, your help must be organized and prioritized in the right order and in a fast and efficient manner, until professional assistance arrives on the scene.

- Ensure Safety
- Perform First Aid
- Call for help

Always use the 3 main points of First Aid:

Ensure Safety (see page 2-5)

Perform First Aid (see page 6-51)

Call for help (see page 52-55)





Ensure Safety

This features 2 important points:

1. Overview
2. To secure

1. Overview

When performing first aid, you need to create an overview of the situation. Keep calm and commence first aid while taking possible risks into consideration. A clear overview reduces the risk of overlooking other casualties or elements of danger.

An accident with one or multiple injured casualties

The type of injury

(mentioned in the section about types of injuries).

- Chemical injuries.
- Mechanical injuries.
- Thermal injuries.
- Psychological injuries.

The extent of the injury

- How many are injured? (approximately).
- Is there any danger at the scene of the accident? (for yourself, bystanders, others and/or the casualty).
- Is it necessary to call for help? (Ambulance, Fire and Rescue for people trapped etc.).

4



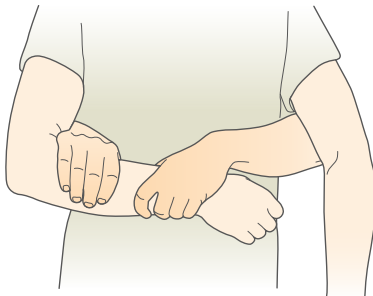
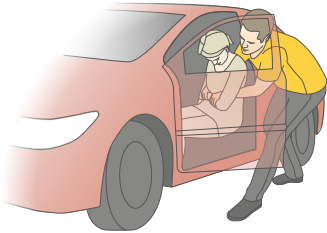
To secure



Emergency removal from the ground:



Emergency removal from car:



2. To Secure

To prevent an accident from escalating further, you must secure the scene of the accident, thus avoiding the possibility of you or anyone else getting injured. Do this before commencing first aid. Keep calm when securing the scene of the accident, and prioritize in the following order:

1. Secure yourself

It is vital that you ensure your own safety, in order to continue with first aid.

2. Secure bystanders/relatives

You need to secure bystanders/relatives to avoid the accident from escalating.

3. Secure the casualty(s)

Always perform first aid on location. If the location poses any danger, the only solution may be an emergency removal (see figure on page 4), even though this may worsen the condition of the casualty.

If the casualty is unconscious, remove them from the car immediately.

If there is nothing to secure: Perform First Aid.

Examples of securing the scene of an accident before commencing first aid:

Road traffic collisions

Stop running cars and engines. Keep a powder extinguisher ready (a minimum of 2 Kgs). Set up a warning triangle and if possible, start the hazard lights. If necessary, place a car to shield from oncoming traffic.

Drowning accidents

Call for help immediately if it is not possible to rescue the casualty by yourself, or if your own life is at risk (cold water etc.)

Electrical accidents

Always switch off power or remove the power source.

Choking

Loosen/remove tight clothing from the neck area. If possible, remove the foreign object if visible.

**Basic rule: The casualty's life is always more important than their mobility
But REMEMBER that the safety of the first aider comes before the injured casualty**



When providing first aid, it is important, that you assess the casualty's level of consciousness. Consciousness is divided into 4 levels:

Awake: The person is awake and responds to speech and touch. You can communicate with the person, and they can provide you with information about what has happened and how they are feeling.

Groggy: The person is not fully awake but responds when spoken to. They may open their eyes and perhaps answer questions, but their reactions may be slow or confused.

Sleeping: The person does not respond to speech, but shows reactions to painful stimuli, such as squeezing the shoulder or rubbing a knuckle against sternum. The reactions can be movement, grimaces or sounds.

Unconscious: The person does not respond to speech or touch. In this case, you must immediately ensure clear airways, check the breathing and be prepared to provide chest compressions and rescue breaths, if necessary.

Identifying the level of consciousness helps determine the appropriate first aid response and prioritization of actions to take.

How to examine a casualty's level of consciousness:

- Call out to the casualty in a loud voice.
- Shake the casualty moderately,

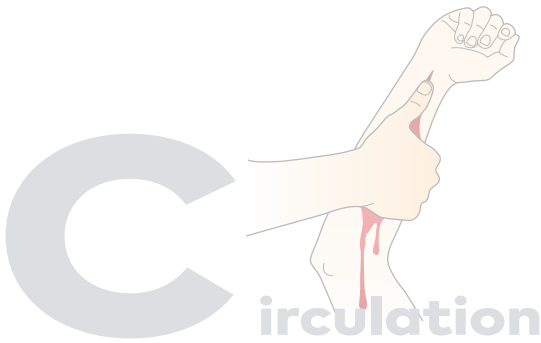
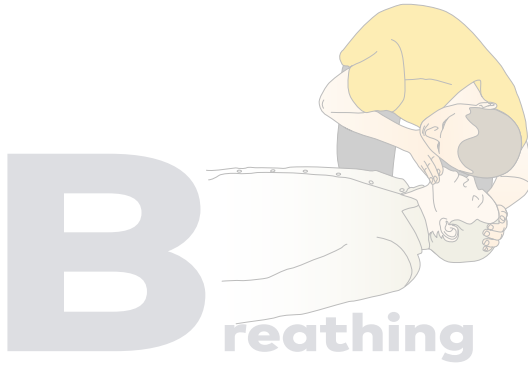
**Is the casualty not responding to your calls or gentle shaking?
Then the casualty is unconscious, and you have to**

Call for help 1-1-2

Afterwards, identify injuries based on the mechanism of the injury by:

- Examining the surroundings of the casualty to understand how the injury occurred.
- Asking the casualty what happened, if there is any pain, and where it is located.

By systematically using this method you are able to assist and assess the vital systems of the casualty.



[M] A B C Rule

The vital systems (the central nervous system, respiratory system and circulatory system) are key element in first aid. If one of these systems are impaired, or stops, you must react quickly, ensuring that the vital transportation of oxygen is not jeopardized.

Organize your examination and help according to the condition of the casualty.

The A-B-C rule is an easy and safe way to assess the condition of the casualty, allowing you to respond to possible life-threatening changes. The method is used internationally by health authorities and ambulance service.

[M] A B C stands for:

- [M] – Major bleeding (see page 23)
- A – Airway (see page 13)
- B – Breathing (see page 13)
- C – Circulation (see page 23)

A B C is used in this section about "Performing First Aid" which you can read about on the following pages, where first aid is split into steps.

By systematically using this method you are able to assist the vital systems of the casualty.

[M] – Major bleeding must be stopped immediately to contain total bloodloss. A is then most important, then B, and finally C.

A B C Rule is prioritized. A problem with A, has a higher priority than B and B has a higher priority than C.

All problems, however, with A, B or C are critical for the casualty.

[M] – Major bleeding

Must be stopped immediately to contain total bloodloss (see page 23)

A – Airway

As part of step 2 when performing basic resuscitation, you must evaluate the airway of the casualty. The airway may be partially or completely obstructed by a foreign object, blood or swelling, which may affect the casualty's ability to speak.

If blood or other types of secretion are present, you may hear gurgling sounds. If the casualty is unconscious, you may hear a snoring sound, or the breathing has stopped/obstructed, as the muscles of the pharynx are relaxed, and the tongue has fallen back into the throat blocking the airway (see figures 1 and 2 on page 34)

If the casualty is unconscious: Remove or relieve the obstruction as quickly as possible thus clearing the airway:

- Remove visible foreign objects.
- Remove secretion (blood, mucous, vomit etc.) by rolling the casualty over onto the side with an open mouth, allowing the fluids to drain. If necessary, clear the mouth by using your finger.
- Bend the casualty's head backward until natural resistance (tilt head backwards).

If the casualty is awake and able to talk, it means the airway is clear and you may proceed to assessment of [B]

B – Breathing

When the airway is cleared [A], you must examine the breathing:

- **See** – if the chest is rising (see page 35).
- **Listen** – by the person's mouth/nose to hear if they are breathing normally (see page 35).
- **Feel** – the person exhaling against your cheek (see page 35).

Spend a maximum of 10 seconds doing this.

Normal breathing for an adult occurs between 12 and 20 times per minute. If the casualty is unconscious and if the breathing rate is less than this or consists of only small or large gasps or other sounds, it is not considered normal breathing, and you must commence resuscitation (CPR).

Important: During the first minutes after a cardiac arrest, the victim may gasp or breathe only a little.

When in doubt whether the unconscious casualty is breathing normally, you must act as if there is no breathing and perform CPR.

[M] A B C Rule – continued –

C – Circulation

This is the last and lowest prioritized of the 3 points. Visible and intense bleeding, however, must always be stopped immediately. Assess the circulation:

- [Does bleeding occur? Where does the bleeding originate from?
- [Indications of internal bleeding?
- [Indications of circulatory problems?

If there is no visible bleeding: assess the circulation by touching the casualty's skin and by holding their hand. Does the casualty feel:

- [Hot – does the casualty have a fever?
- [Cold – is the casualty cold and needs to be warmed?
- [Clammy and pale – is the casualty in danger of shock/circulatory failure? (see pages 26-29).

Is the casualty cyanotic – in danger of oxygen deficiency? (see pages 13-21).

Compare your observations with the condition of the casualty and provide the necessary first aid. Also, assess whether or not help should be summoned, or if the person is able to seek medical attention on their own.

A B C is used in this section regarding "Cardiac Arrest", and you can read more under the tab, where the first aid has been divided into different stages.

For a detailed description of the A B C – rule see page 9-10.

fig. a

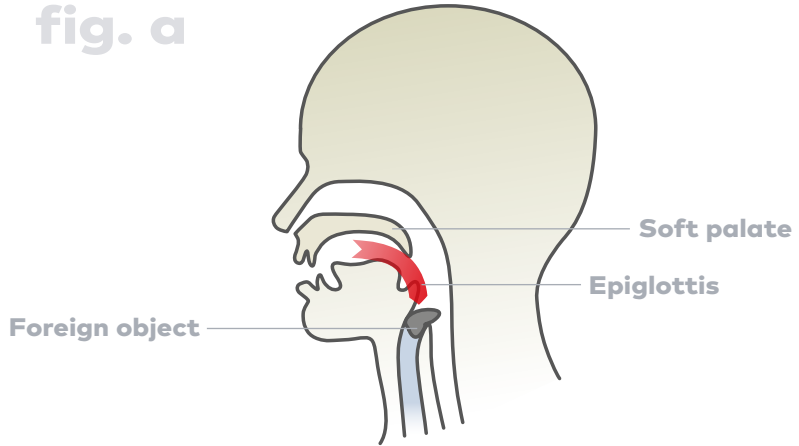
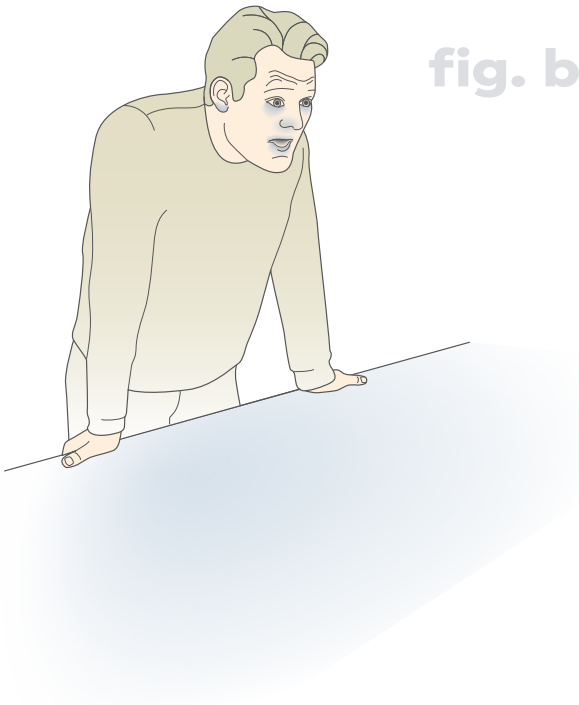


fig. b



Cyanosis [A and B]

Cyanosis (bluish skin coloration) can be caused by oxygen deficiency in the organism, and first aid may be necessary. Injuries as well as illnesses, can lead to oxygen deficiency and this may indicate a life threatening condition. Cyanosis is a symptom one must attend to immediately.

Normal breathing can be heard and seen as regular and short pauses between each breath. If breathing is irregular or consists of gasps or other sounds, this is not normal and CPR must be started.

IMPORTANT: In the first minutes of Cardiac Arrest the casualty can breathe with long or short gasps or have long pauses between breaths. This is NOT a normal breathing pattern.

An adult has a breathing rate between 12-20 times per min. Breathing should look and sound normal. Ask the casualty if they have difficulty breathing, or they suffer from some illness which can affect their breathing.

When a person lacks oxygen, cyanosis is often seen around:

- [Lips
- [Wings of nose
- [Earlobes
- [Under the nails.

If the oxygen deficiency continues, it will spread to the entire face, hands and feet.

External influences that may obstruct the supply of oxygen

- [Lack of oxygen in the surrounding air in accidents, in wells, silos, basements and confined spaces
- [Suffocation (for instance suicide or violence) by pressure to the throat
- [Chest injuries
- [Pressure against the chest (collapse)
- [Drowning accidents.

For instructions on First Aid for the above mentioned, see Types of injuries (pages 58-92).

Internal injuries that may obstruct the supply of oxygen

- [The tongue falling to the back of the throat (can be observed when a person is unconscious)
- [Foreign objects (see fig. a) [A]
- [Swelling
- [Chest injuries [B]
- [Various diseases (see the section: Illnesses in the vital system). [B]

Heimlich-maneuver

fig. a1



fig. a2

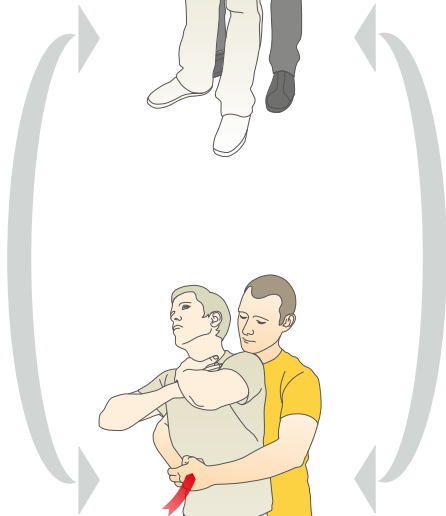
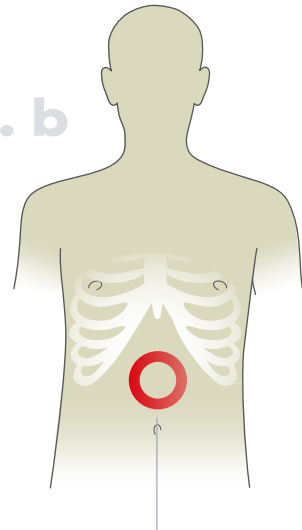


fig. c



fig. b



Compression area for the Heimlich maneuver

First Aid for Airway Obstruction [A]

The airway can be obstructed in two ways; partial obstruction or complete obstruction.

Ask: Are you choking?

In a partial obstruction the person is able to answer, breathe and cough. This condition is not life threatening. You can urge the person to cough and slap him on the back in between the shoulders.

Symptoms of complete obstruction:

The person cannot talk or cough. They shows signs of suffocating (grasping the throat in a state of panic). Cyanosis of the lips, ears, and tip of nose. Unconsciousness without the ability to provide rescue breaths.

How to remove foreign objects in a complete obstruction

Adults and children above 1 year

Start by giving 5 back blows between the shoulders with an open hand (try to place the person's upper body in a downward position).
If this does not help, perform 5 abdominal thrusts (the Heimlich maneuver).

If neither the 5 back blows or 5 attempts at Heimlich work then call 112 as soon as possible.

Then repeat 5 back blows and 5 attempts at Heimlich to ensure the greatest chance of ejecting the foreign object.

If the person becomes unconscious

- Ensure help is called: 1-1-2.
- Place the casualty on their back.
- Commence CPR.

CPR ensures circulation and may be able to loosen the foreign object.

- After the initial 30 compressions: Check the person's mouth to see if the foreign object has been removed.
- If not: Continue CPR until professional help takes over, the person wakes up, opens their eyes or moves and breathes normally.
- Spend a maximum of 10 seconds checking and providing rescue breaths (then continue chest compressions).

Important:
Remove the foreign object if visible.

The Heimlich maneuver (abdominal thrusts)

Grab the casualty from behind, around the waist, and grab your clenched fist pressing your hand in between the navel and the lower edge of the rib cage. Thrust your hands into the casualty's stomach in a rapid upward movement. Alternate between 5 back blows and 5 abdominal thrusts (see figures a1+b+c).

REMEMBER: always position your hands with great care. A person receiving the Heimlich maneuver must ALWAYS be attended to by a Doctor or Casualty Dept. staff.

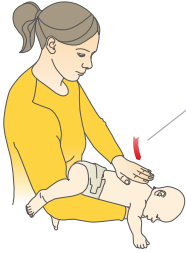
If the person is big, and the first aider finds it difficult to perform the first aid, the method shown in fig. a2 can be used.

Heimlich maneuver

Children above 1 year

Children ages 0-1

fig. a



5 back blows

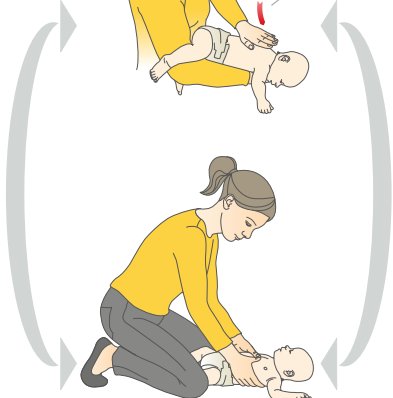


fig. b



5 compression attempts

fig. d



5 back blows

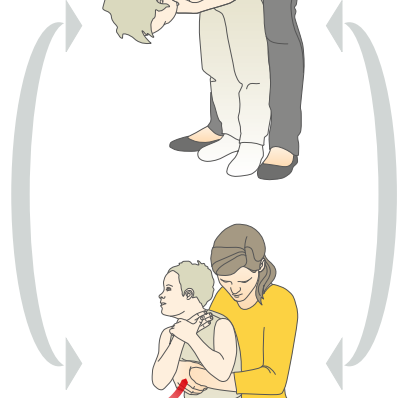


fig. e

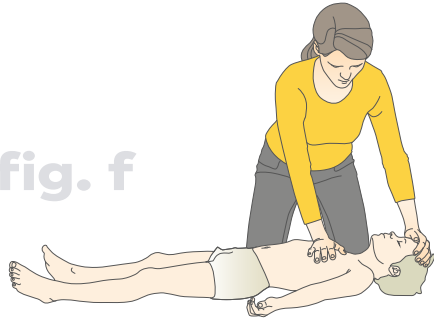


5 abdominal thrusts

fig. c



fig. f



First Aid for Airway Obstruction [A] – continued –

How to remove foreign objects Younger children ages 0-1

- Place the child on your forearm and on its stomach (see fig. a).
- Place your hand on the child's shoulder using your thumb to support its head.
- Apply 5 back blows with the flat of the hand in between the shoulders.

If the foreign object has not been removed:

- Turn the child over on its back.
- Provide 5 compressions to the compression area (as with CPR – see fig. b).

If neither the 5 back blows or 5 compression attempts work, then call 1-1-2 as soon as possible.

Then repeat the 5 back blows and 5 compressions to the compression area to ensure the greatest chance of ejecting the foreign object.

If the child becomes unconscious:

- Ensure help is called: 1-1-2.
- Place the child on their back (see fig. b) or on your forearm (see fig. c)
- Commence CPR.

**Important:
Remove the foreign object if you can see it.**

How to remove foreign objects Children above 1 year

Start by giving 5 back blows with the flat of your hand in between the shoulders (try to place the child's upper body in a downward position). (see fig. d)

If the foreign object has not been removed:

- If this does not help, perform 5 abdominal thrusts. (Heimlich maneuver) (see fig. e)
- If neither the 5 back blows or 5 attempts at Heimlich work then call 112 as soon as possible
- Then repeat 5 back blows and 5 attempts at Heimlich to ensure the greatest chance of ejecting the foreign object.

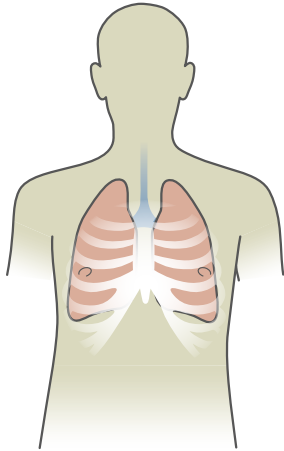
If the child becomes unconscious:

- Ensure help is called: 1-1-2.
- Place the child on their back (see fig. f).
- Commence CPR.

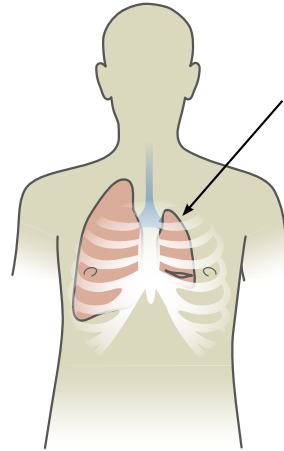
CPR ensures circulation and may be able to loosen the foreign object.

- After the initial 30 compressions: Check the child's mouth to see if the foreign object has been removed.
- If the foreign object does not eject: Continue CPR until professional help takes over, the child wakes up, opens their eyes or moves and breathes normally, or until you are too exhausted to continue.
- Spend a maximum of 10 seconds checking and providing rescue breaths (then continue chest compressions).

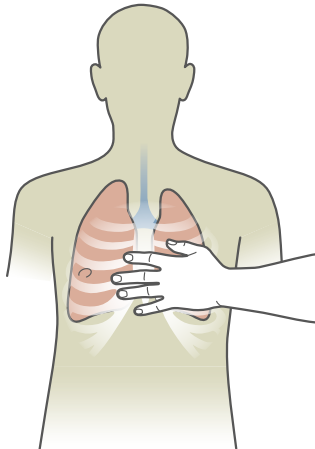
Normal lung



Collapsed lung



First Aid for chest injuries



Cyanosis [B] – Chest injuries

Road traffic collisions and falls are the most common causes of chest injuries. They also include blunt force trauma, caused by violence or even the handlebars of a bicycle striking the chest. These injuries are not always visible but can cause underlying injury due to broken ribs or other bones which in turn damage blood vessels or tear lung tissue. These injuries can often be life threatening.

Injury can also be caused by penetrating objects piercing the skin or entering the chest cavity. This can be a projectile from a firearm or the blade of a knife.

An internal injury can be much more significant than an external one.

In the event of an accident, chest injuries are seen as the most serious and should demand high priority.

This is to ensure free airways and sufficient breathing.

The casualties A B C must be evaluated.

If the casualty is conscious, then first aid is basically the same no matter the injury (see below).

If the casualty is unconscious:

Call for help 1-1-2 and start basic resuscitation no matter the injury

Chest injuries are split into two groups: closed or open.

Closed injuries

Closed injuries can be seen during accidents where a large release of energy has occurred e.g. road traffic collisions (chest against steering wheel), violence etc.

Fractures to one or more ribs can cause lung injury. A broken rib can penetrate the lung causing it to collapse, breathing difficulty will follow. (see fig.).

A punctured lung is a serious condition which requires immediate medical attention.

Symptoms:

Breathing difficulty

Chest pains, intensified by deep breaths

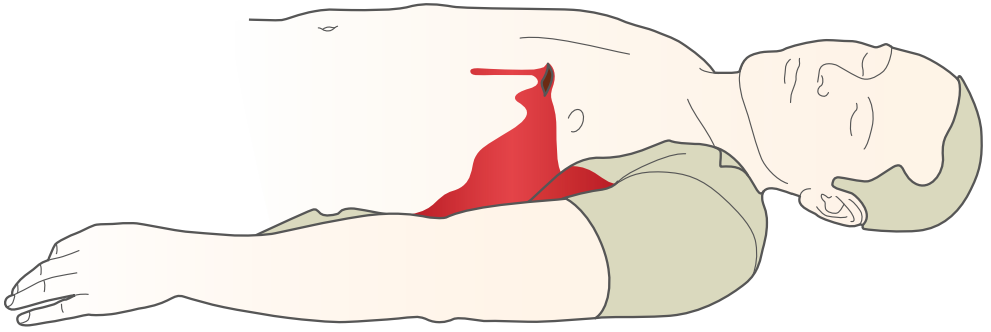
Cyanosis of lips, ears and tip of nose

Shock symptoms

Possibly pinkish foam from the mouth.

First Aid for closed chest injuries:

- Calm the casualty.
- Loosen tight clothing.
- Position casualty to ease breathing.
- With altered conscious level place casualty in recovery position carefully, to avoid affecting the injured side.
- Call 1-1-2.
- If situation worsens, A B C or basic resuscitation.



Open chest injuries

Open chest injuries can occur where sharp objects have penetrated the chest. The vacuum in the pleural cavity is compromised causing the lung to collapse. Knife inflicted wounds will not always be registered by the casualty if these occur during a fight. It is not until the casualty starts showing signs of shock, or by visible bleeding through garments, or even breathing problems.

Symptoms:

Breathing difficulties

Shock symptoms

Bleeding from chest wound

(wounds can be difficult to find)

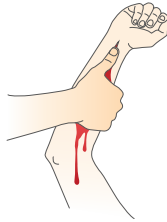
Cyanosis of lips, ears and tip of nose

Possible air rushing/bubbling sounds from wound.

First Aid for open chest injuries:

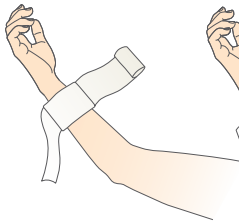
- Calm the casualty.
- Lie the casualty down.
- Call 1-1-2.
- DO NOT cover wound, keep clean, and allow air to pass freely through it (very important).
- Place clean gauze over the wound.
- Place the casualty so that breathing is not compromised.
- With altered conscious level, place in the recovery position carefully, to avoid affecting the injured side.
- If bleeding persists, apply direct pressure against wound (see fig. page 18).
- If situation worsens, A B C or basic resuscitation.

Foreign objects must not be removed.

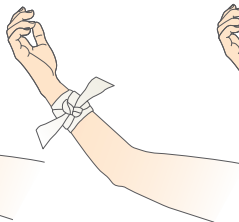


Compression bandage

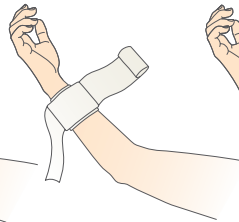
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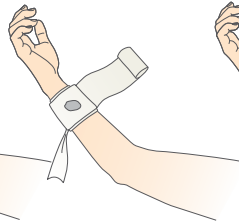
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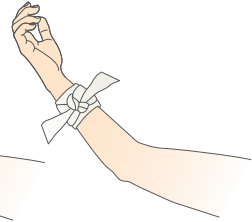
3



4



5



Over the first dressing

Bleeding [C]

[M] – Major bleeding must be treated immediately

Major bleeding is a pulsating bleed, blood that pools on the ground or clothing that is saturated with blood. If one of these criteria are fulfilled then there is massive bleeding.

Massive bleeding must be stopped immediately to contain total bloodloss.

Visible bleeding

Visible bleeding may indicate that a person requires immediate attention and basic resuscitation.

Your examination:

1. Where does the bleeding originate from?
2. Is the bleeding spurting (arterial bleeding) or oozing (venous bleeding)?

Veins and arteries

Veins: Carries blood from the body towards the heart.

Arteries: Carries blood away from the heart to the rest of the body.

A person may lose a lot of blood from both arteries and veins, however it is easier to stop or reduce bleeding from a vein as the pressure here is lower, than in the arteries.

First Aid for major bleeding:

1. Exert pressure using your fingers or hand directly onto the wound.
2. Prevent shock/circulatory failure (see page 26-29).
3. Call for help: 1-1-2.

For minor external or internal bleeding, such as muscle injuries and joint injuries, direct pressure (compression) and cooling is recommended.

You may also:

- Apply a compression dressing – while still exerting pressure with your fingers or hand (see improvised dressing on page 24).
- “Reinforce” the compression dressing with a pressure bandage (apply another dressing tightening the knot over a suitable object like a watch, stone, etc.).

Improved bandage

fig. a

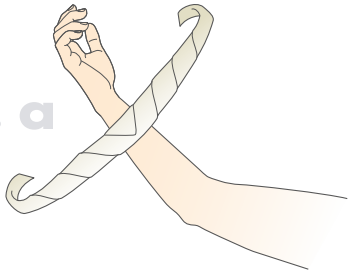


fig. b

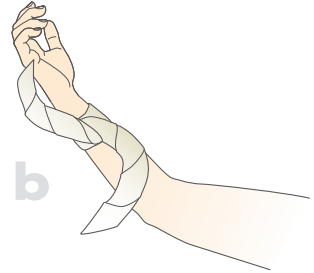
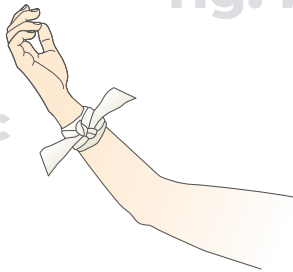
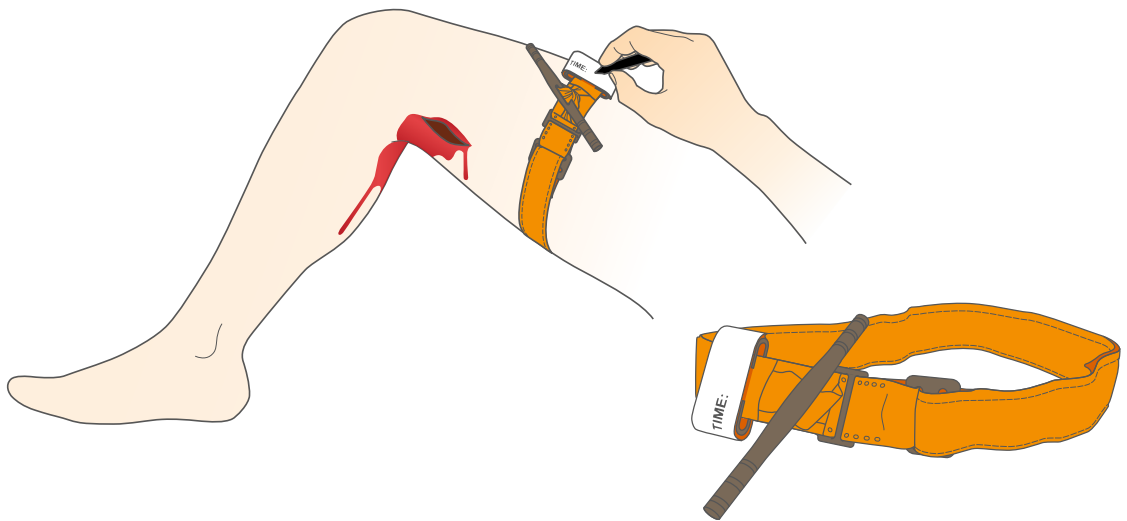


fig. c



Tourniquet



Bleeding – continued –

The final solution if the bleeding cannot be stopped:

- Apply a tourniquet approx. 5-7 cm above the injury - directly on the skin on healthy tissue and not over the joints (see page 24).
- You must note the time the tourniquet was applied.
- Falck recommend this in "Bleeding Kits" or First Responder bags.

Be aware that use of a tourniquet will provide severe pain.

Internal bleeding is a critical condition requiring immediate attention.

Bleeding in the abdominal cavity

In an accident the casualty may experience a violent impact, which may cause damage to the highly blood-filled organs, which are more sensitive to pressure than other organs – e.g. the air-filled intestines in the abdominal cavity, spleen, liver and kidneys. (see section about the human body)

This may cause severe internal bleeding, **which is only noticeable from the symptoms listed below.**

Symptoms of internal bleeding:

- Paleness
- Pain
- Cold and clammy skin
- Rapid and shallow breathing
- Rapid and weak pulse.

How to measure the heart rate?

You can find the pulse in several places on the body where a large blood vessel lies close to the surface of the skin. The easiest place to feel the pulse is at the wrist or on the neck. Preferably use your middle finger and index finger to feel for the pulse.

When suspecting bleeding in the abdominal cavity:

- Reassure and comfort the casualty.
- Loosen tight clothing.
- Call for help: 1-1-2.
- Place the casualty in a supportive reclined position (see fig. b on page 28).
- Prevent shock/circulatory failure; if the casualty shows any symptoms of this (see page 28 fig. a).

In a deterioration of the level of consciousness: perform First Aid [A B C].

Causes of Circulatory Failure

Burns



Blood loss



Burns on large Body area

The blood vessels are damaged causing fluids to evaporate. As the body loses lots of fluid this will affect the circulation.

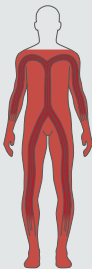
Injuries with massive blood loss

The blood volume will eventually become insufficient, causing circulatory failure.

Prevention of shock/circulatory failure due to trauma/bleeding



Anaphylaxis shock



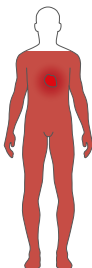
Anaphylactic shock

This is a serious condition. Histamine release due to anaphylaxis, causing vessel dilation, leading to a fall in blood pressure.

Prevention of shock/circulatory failure due to anaphylaxis shock



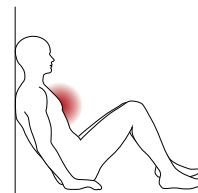
Cardiac Problems



Heart disease

E.g. a heart attack (a blood clot in the heart) may reduce its pumping efficiency, which in turn causes circulatory failure.

Prevention of shock/circulatory failure due to cardiac problems



Paleness [C]

When a person is pale you should act immediately.

Circulatory failure

If the circulation is affected by illness or injury, it may cause reduced or failing blood flow to the body. Should the vital transportation of oxygen be compromised – this condition causes shock/ circulatory failure.

Symptoms:

- Decreasing level of consciousness/unconsciousness
- Rapid and shallow breathing
- Paleness
- Cold and clammy skin
- Rapid and weak pulse
- Anxiety/hostile behavior

Circulatory failure must be prevented to ensure sufficient blood flow and a steady blood pressure.

What may induce circulatory failure?

Burns on large areas of the body

The blood vessels are damaged, leaving fluids to evaporate, as the body loses fluids this will affect the circulation.

Injuries with massive blood loss

The blood volume will eventually become insufficient, causing the blood flow to fail.

Anaphylaxis

The blood vessels throughout the body have dilated, due to a violent reaction at cellular level. A number of elements are released i.e. Histamine, causing this reaction. Because the blood vessels dilate blood pressure will fall drastically. You should, as soon as a serious allergic reaction is suspected help the person find their medicine. If the person is so incapacitated that they cannot find it- autoinjector with adrenalin (Epipen®), or show where it is then you should look for it. Then give the medicine as soon as possible. If their symptoms have not improved after 5 minutes, then another dose should be given. Ambulance crews also carry adrenalin to reverse life threatening allergic reactions.

Heart illness

A heart attack may reduce its pumping efficiency, which in turn causes circulatory failure.

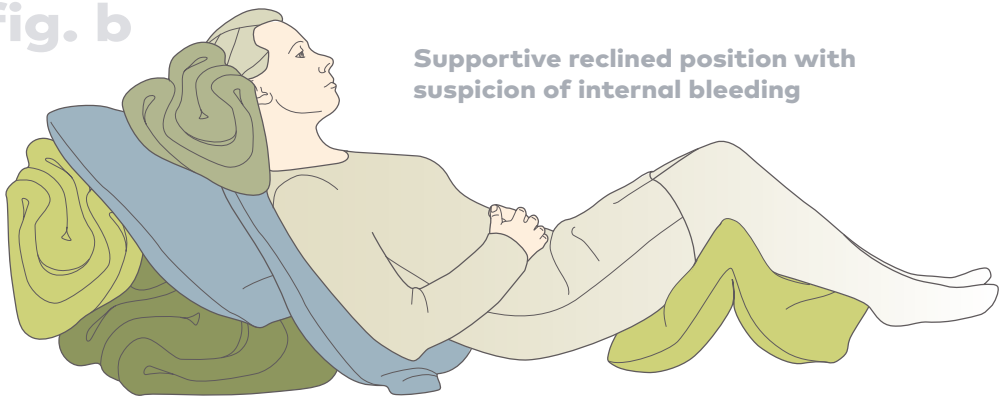
Read more about First Aid for symptoms of heart attack on pages 101 and 102.

fig. a



fig. b

Supportive reclined position with suspicion of internal bleeding



Prevent symptoms of Shock/Circulatory Failure

First Aid for symptoms of shock/circulatory failure:

- Reassure and comfort.
- Lay the casualty down.
When suspecting anaphylaxis, the legs are raised (60 degrees)
- Call for help: 1-1-2.
- Relieve pain, support fractures and injuries.
- Protect the casualty from cold and heat loss.
- Wrap the casualty in blankets (see fig. a).
- Provide Psychological First Aid and shield the casualty from curious bystanders.



Perform First Aid – continued –

Examine the casualty, based upon the points on page 30:

- ┌ Does the casualty appear to be awake?
- ┌ Does the casualty have difficulty breathing?
- ┌ Does the casualty answer incoherently?
- ┌ Does the casualty remember the entire incident or just parts of it?
- ┌ Where is the pain located?

While talking with the casualty, you must examine them for injuries (see the order of examination below). This is done in search of palpable changes in shape, internal bleeding, pain when being touched, cold and clammy skin, thus enabling you to perform the correct type of first aid. Be gentle, as your touch may inflict pain.

Examine the casualty in the following order:

1. Neck, throat and head.
2. Chest, abdomen and pelvis.
3. Arms and legs.

Always use this examination sequence when dealing with injuries, fall accidents, collisions, violence etc.

First Aid for minor bleeding:

- ┌ Lay the casualty down.
- ┌ Elevate the area of bleeding.
- ┌ Place a dressing or bandage against the wound for a few minutes and then dress the wound.
- ┌ Prevent shock/circulatory failure (see page 26-29).



Basic Resuscitation

Step 1

Examining the level of consciousness (The Central Nervous System)

When you are providing first aid, it is important- that you first assess the casualty's level of consciousness. There are two levels of consciousness distinguished:

- Awake
- Unconscious

How to examine the level of consciousness:

- Call out to the casualty in a loud voice. Shake the casualty carefully.

Is the casualty not responding to your calls or shake? Then the casualty is unconscious, and you must:

- Call for help 1-1-2 and proceed to Step 2: check for breathing (see next page)

If the casualty responds, the person is conscious.

Then identify the injuries based on the mechanism of injury by:

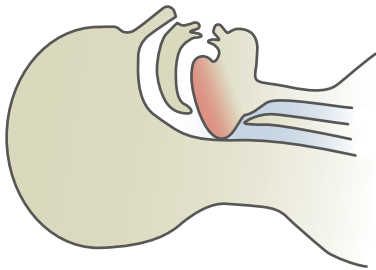
- Observing the surroundings around the casualty to understand what caused the injury.
- Ask the casualty what happened, if and where the person is in pain, and if there are any specific areas that hurt.

Be aware that brief seizures that stop can be signs of cardiac arrest!

NOTE! For children under the age of 18: See page 51.

If possible, ask others to call for help. Otherwise stay with the casualty, while you call for help. Activate speaker on phone to speak hands-free with 1-1-2 while you perform basic resuscitation.

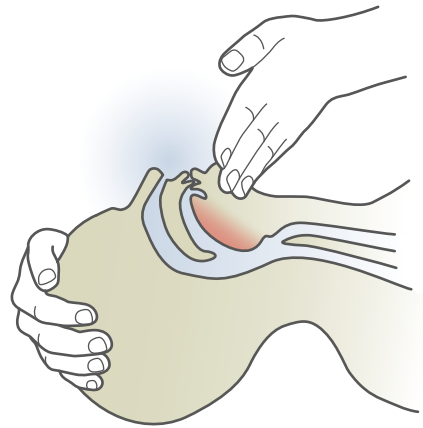
fig. 1



Closed airway



fig. 2



Open airway

fig. 3



Step 2

Check for Breathing [A and B]

Check the casualty's breathing for a maximum of 10 seconds while clearing the airway. See the instructions below.

Clearing the airway [A] (see fig. 2)

- Place your fingers under the chin and hold forehead.
- Be careful not to press on the throat.
- Tilt head backwards until natural resistance.
- Chin and jaw are lifted and tilted.
- On suspicion of a foreign object in the airway: see page 14.

Check for breathing [B] (see fig. 3)

- See** – if the chest is rising.
- Listen** – close to the mouth/nose in order to hear if the casualty is breathing normally.
- Feel** – the casualty's breathing against your cheek.

Normal breathing can be heard and seen by normal breathing movements, with equal and short pauses between each breath. If breathing is not normal, or consists of only small, short gasps or other sounds then this is abnormal.

You should commence CPR (cardio pulmonary resuscitation).

Important notice: During the first few minutes after cardiac arrest, the casualty may make minor and major gasps, or have compromised breathing. This is NOT considered normal breathing.

When in doubt whether the unconscious casualty is breathing normally, the medical professional at 1-1-2 will be able to help and guide you.

If the unconscious casualty is breathing: place the casualty in the recovery position. Always remember to check breathing regularly after having placed the casualty in recovery position.

If the casualty is not breathing: proceed to CPR (Step 3 – see page 39).

fig. a

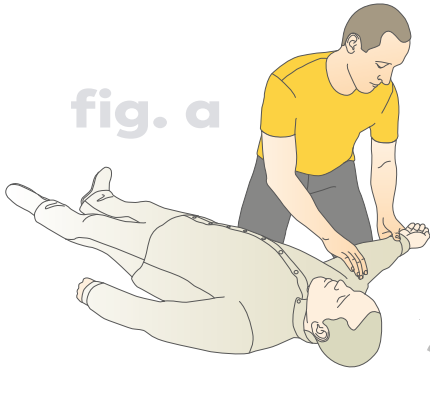


fig. b

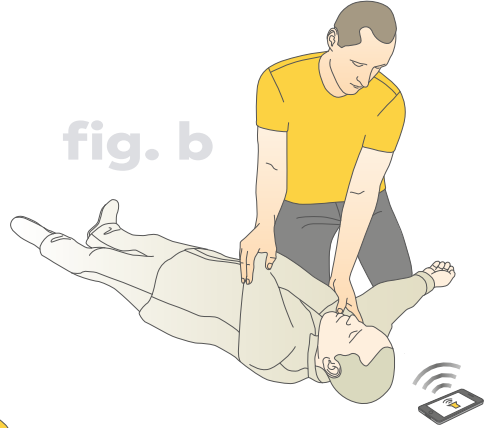
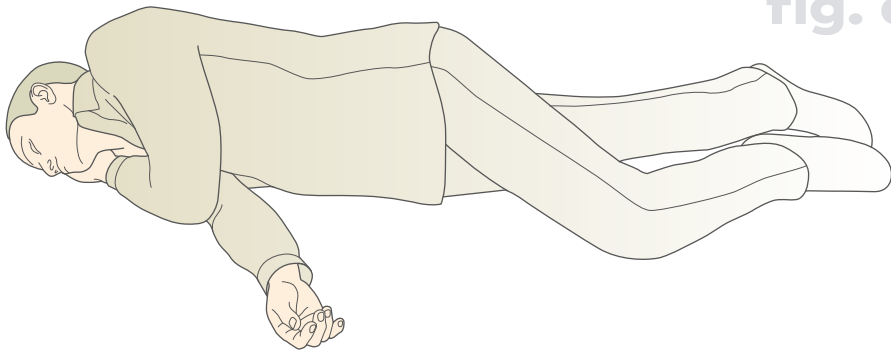


fig. c



fig. d



Step 2 – Continued –

Recovery position

An unconscious casualty, still breathing normally, must always be placed in the **recovery position**, thus ensuring and protecting a free airway.

Figures a-d illustrates how to place a person in the **recovery position**, as recommended by ERC (European Resuscitation Council).

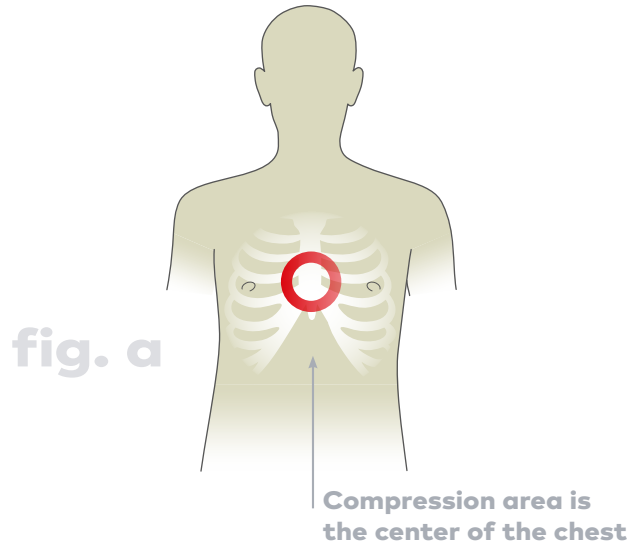
How to place a casualty in the recovery position - recommended by ERC:

- Kneel down beside the casualty. Make sure that the person's legs are straightened (**fig. a**).
- Position the arm closest to you, away from the body with the palm of the hand upward (**fig. a**).
- Pull the other arm across the chest positioning the back of the hand against the casualty's cheek (**fig. b**).
- Grab the leg furthest away, just above the knee with your other hand. Pull the leg upward and keep the foot on the ground (**fig. c**).
- Keep the hand against the cheek, pull on the leg furthest away and roll the casualty towards you.
- Adjust the leg leaving both hip and knee bent.
- Tip the head backward to ensure that the airway remains free.
- If necessary, adjust the hand under the jaw in order to keep the head tipped to ensure a free airway (**fig. d**).

Reposition the casualty on the opposite side after 30 minutes thus relieving the pressure on the lower arm.

Always remember to check the casualty's breathing regularly after having placed them in the recovery position.

**Place all unconscious casualties breathing normally in the recovery position.
Ensure help has been called: 1-1-2**



**If there are two First Aiders:
take turns giving CPR every two minutes**

Step 3 – Commence CPR

CPR (cardio pulmonary resuscitation) consists of two parts:

- Perform 30 chest compressions as soon as possible. Press rapidly and hard in the center of the chest – approximately 5 – max 6 centimeters in depth.
- Press rapidly and hard – only interrupted by rescue breaths (min. 100 and max. 120 compressions per min.) When you release the chest to administer a breath, and return to compressions no more than 10 sec. must have elapsed. Administer 30 compressions and 2 breaths (30:2) Remember to lift hands after each compression so you barely are touching the chest, but still have contact with the chest. This will ensure an effective refill of the heart.
- Two breaths, one approx. every second until you see the chest rise.

CPR

The Circulatory system:

The heart is a muscle that functions as a pump with four chambers. Through the aid of the heart valves blood is transported to the lungs, where the oxygen uptake occurs, then transported from here to the rest of the body where the oxygen is released. The pumping function of the heart is automatically controlled by electrical impulses (see page 127).

How does CPR work?

By compressing the chest, you are mechanically performing the heart's pumping function, pressing the heart against the spine (see fig. b + c).

How to perform CPR:

- Place the casualty on a hard surface, e.g. floor if possible.
- Find the compression area in the center of the chest (lower half of the breastbone).
- Place your hands in the center of the chest. Place one hand on top of the other keeping the flat of the hand parallel with the sternum.
- Press fast and hard – only interrupted by rescue breaths, max. of 10 sec. (a minimum of 100 and a maximum of 120 compressions per minute).
- Alternate between 30 compressions and 2 rescue breaths (30:2). Lift your hands after each compression, barely touching the chest, while still keeping in contact with the chest to ensure an effective refill of blood to the heart. Count out loud so others can hear your progress.
- If there are two first-aiders: take turns providing CPR every two minutes.
- Find an AED (Automated External Defibrillator) as soon as possible – see step 4.

fig. a



fig. b



Step 3 – continued – Commence CPR

How to provide efficient rescue breaths (artificial respiration):

- Position the head providing an open airway (A and B).
- Squeeze the nose of the casualty (fig. a).
- Place your open mouth over the unconscious victims mouth (fig. a).
- Blow until you see the chest starting to rise (figure a).
- Alternatively, you can use the mouth-to-nose method (fig. b).
- Only attempt the two rescue breaths once.
- Continue CPR within 10 seconds.
- Every rescue breath segment must not exceed 10 seconds.
- Continue giving CPR: *30 compressions immediately after the rescue breaths.*

If the rescue breaths fail, you must: (on your next attempt at rescue breaths)

- Check inside the casualty's mouth and remove any foreign objects.
- Make sure that you are holding the casualty's head so that the airway is open (A and B).

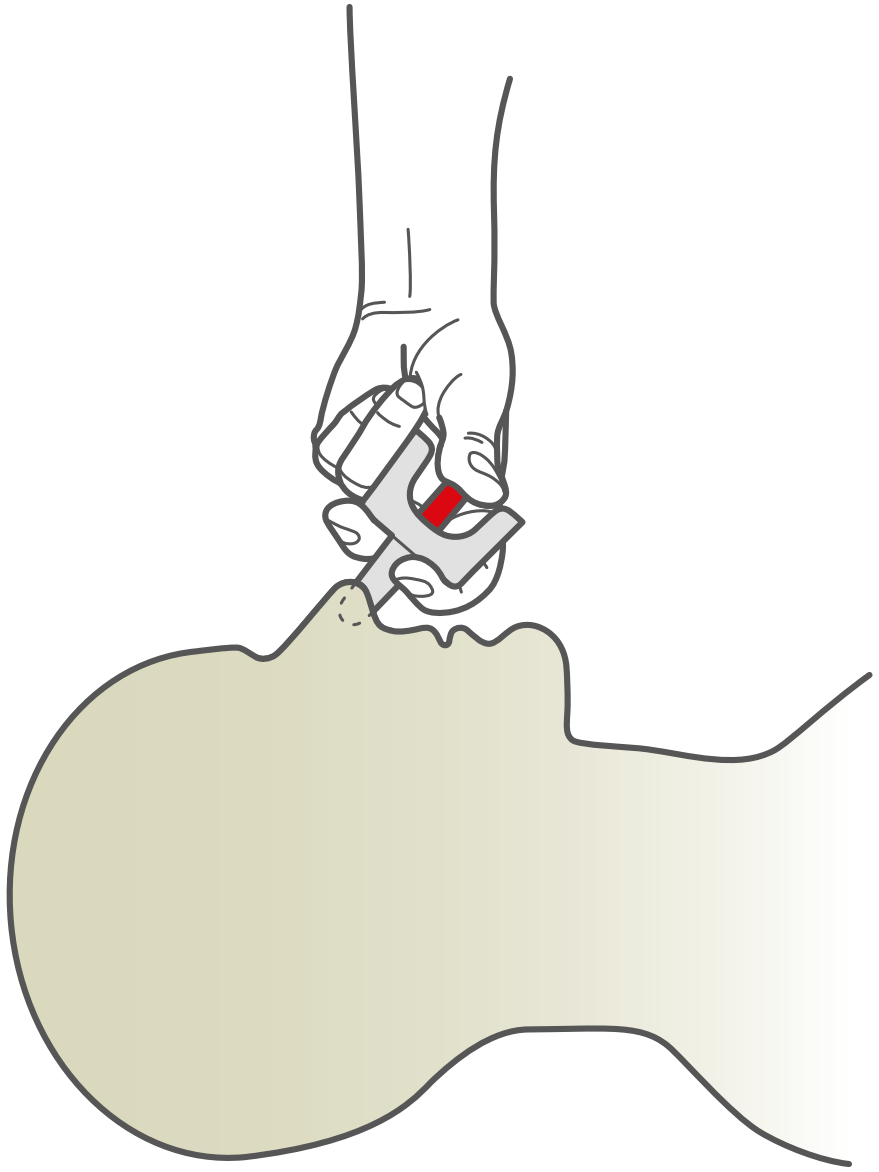
Important: This check must not exceed 10 seconds before continuing CPR.

Please note:

Continue CPR until professional help takes over, the casualty wakes, opens their eyes, moves and breathes normally, or you are too exhausted to continue.

If you are unable to provide rescue breaths i.e. because of facial injury, you must provide chest compressions as a minimum.

**Find an AED as soon as possible. Let others do this.
Medically trained staff at 1-1-2 can help to find the nearest resource.**



Signs of overdose

First Aid for opioid overdose and the use of Naloxone (antidote)

Narcan/Antidote are both nasal sprays that contain the same active substance: Naloxon. Both can be used to treat opioid overdoses.

Opiates and opioids – what are the difference

Opiates: Natural alkaloids derived directly from the opium poppy plant, e.g. morphine and codeine.

Opioids: All substances that effect the opioid receptors – both natural, semi-synthetic, and synthetic, e.g. heroin, fentanyl and ozycodone.

In short:

All opiates are opioids – but not alle opioids are opiates.

Naloxone – antidote for opioid overdose

Naloxone is a medication that **reverses the effect of opioids** during an overdose and can restore normal breathing.

It is available, among other forms, as a nasal spray under names such as **Narcan, Nyxoid og Antidote.**

Although the products may vary in dosage, they work in the same way and can be administered by non-professionals.

First Aid for an apparently unconscious casualty with suspected overdose.

Call out to the casualty in a loud voice.

Shake the casualty moderately.

Is the casualty not responding? → Then the casualty is unconscious.

Call **1-1-2**, put the phone on speaker, and proceed with A-B-C.

A – Clear the airways

Tilt the head backwards until natural resistance and lift the chin.

Remove visible foreign objects, if you can see them.

B – Check for breathing

(max. 10 sec.)

Look: Is the chest rising?

Listen: Do you hear normal breathing?

Feel: Feel for breath against your cheek.

If breathing is **abnormal or has stopped**, this is considered cardiac arrest, and commence CPR (30:2)

Use of Naloxone (Antidote)

Important:

Do **not** test the nasal spray before use

May **only** be administered in the nose

One spray = **one** dose

How to administer Naloxone

Hold the spray with your thumbs under the plunger.

Plaze the nozzle into the nostril.

Press firmly and decisively on the plunger so the full dose is delivered.

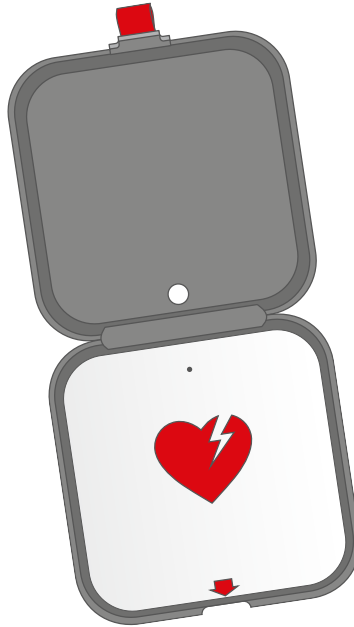
After Naloxone

Continue **CPR**

If the casualty wakes up, withdrawal symptoms may occur (agitation, pain, nausea)

Let the casualty remain lying down, speak calmly and wait for professional help.

AED



Plaque in the Coronary Arteries



Absent breath sounds = Cardiac Arrest

Each year in Denmark about 5.000 people are struck with cardiac arrest outside of hospital. About half of these are still part of the work force. The fact that more people have provided first aid also means that survival rates have increased to 13-16%. Many more could survive (over 50%) with a quick response within the first 3 minutes with the help of cardiopulmonary resuscitation (CPR) and defibrillation.

(Source: Danish Cardiac Arrest Register).

This is why it is important that as many as possible learn first aid, CPR and the use of an AED.

Sudden stop of cardiac function is defined as cardiac arrest. When the heart stops, so does the circulation.

The normal breathing rate for an adult is between 12-20 times a minute. When a person is unconscious, hypoxic and circulation is threatened then breathing will be reduced and maybe cease.

Symptoms of Cardiac Arrest are as follows:

- [Unconscious
- [No normal breathing (slow, maybe small gasps, or none at all).

The most common cause of cardiac arrest is plague in the coronary arteries, followed by oxygen starvation to the heart muscle as a result (see illustration). Other causes of

cardiac arrest can be poisoning, suffocation, electric shocks, hypothermia and many more.

It is vital during cardiac arrest to restore the circulation as soon as possible, as hypoxia (lack of oxygen to the brain) will cause irreversible damage after about 5 min.

When cardiac arrest occurs it is often related to a heart arrhythmia known as Ventricular Fibrillation. (The ventricles being the lower chambers of the heart). This means these chambers contract so fast and uncoordinated, that the heart loses the ability to circulate blood out into the circulatory system; the casualty will go into shock/circulatory failure.

There is a number of different arrhythmia that may cause circulatory failure and can turn into cardiac arrest. An AED can analyse and possibly shock to create a normal heart rhythm and the return of spontaneous circulation.

The idea behind defibrillation is to restore a normal heart rhythm with an electric shock; this is achieved by repolarising the cardiac cells and hoping that a normal rhythm is achieved.

The AED shock must be delivered as soon as possible. See next page.

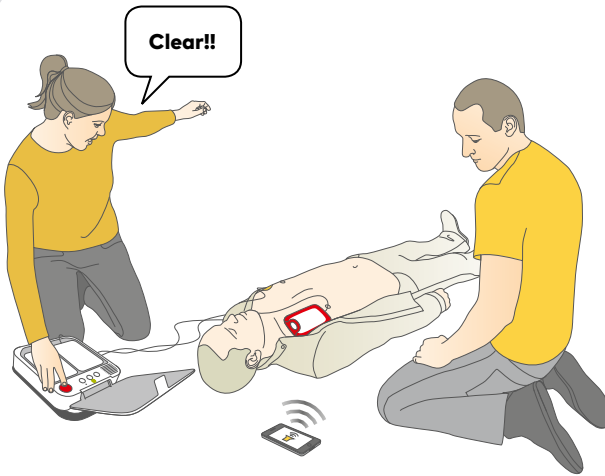
See more FAQ on page 144.

**If you are in any doubt that an unconscious casualty has normal breathing or not, assume that the casualty has cardiac arrest.
In short: If you are in DOUBT, then there is NO DOUBT!**

fig. a



fig. b



Step 4 – Using an AED

An AED is designed to deliver an electric shock. The shock is delivered through electrodes which are stuck onto the casualty's chest, analyzing the heart rhythm, looking for the following arrhythmia.

- Ventricular fibrillation.
- Ventricular tachycardia.

During this electrical chaos there is no circulation. The AED can convert the rhythm, bringing the heart back into normal function thus re-ensuring circulation. The AED will decide whether or not to shock, taking the decision making away from the user.

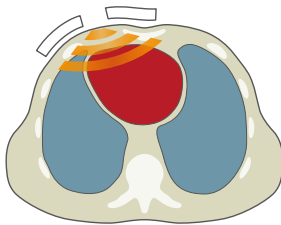
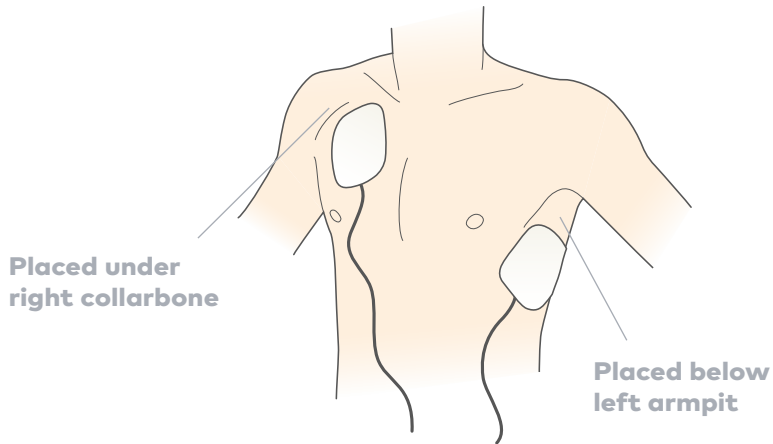
How to use an AED (see figures a and b)

- Open AED.
- If it doesn't start automatically – press the green start button.
- Follow instructions.
- Remove clothing from casualty's chest.
- If the casualty has a very hairy chest, it may be necessary to remove some hair so the electrode pads will adhere properly to the person's skin.
- Find electrodes (should be plugged in) and remove from packaging.
- Place electrodes on casualty as shown by diagram on electrodes/packaging.
- If there are several first aiders on scene, then CPR should be started during electrode placement.
- Allow AED to assess the heart rhythm.
- It is vital that no-one touches the casualty during analysis – shout "CLEAR".
- If AED advises shock you must ensure that no one is touching the casualty – shout – "SHOCKING".
- Press the flashing button or wait for the AED to deliver shock.
- Follow instructions and begin CPR 30:2.
- Note if you have to press the shock button or the AED does this automatically – follow safety procedure on page 49.

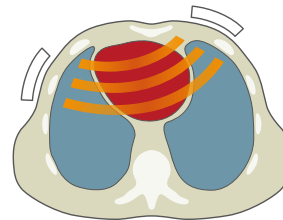
If the casualty starts to breathe normally, stop CPR and place casualty into the recovery position, continue observations leaving electrodes in place.

If the casualty starts to breathe normally, stop CPR and place casualty into the recovery position. Continue observations leaving electrodes in place.

Correct placement of electrodes



Incorrect electrode placement



Correct electrode placement

It is important to place electrodes so that the energy passes directly through the heart, In smaller individuals it is important to maintain a distance of at least three fingers between the electrodes.

Safety

When as a First Aider you use an AED, it is vital you respect some basic safety guidelines, to ensure you or others avoid injury. Electricity will always find the easiest route, and if the casualty is touched, there is not enough current to reach the person's heart at the moment of the shock. This means that approximately 4% of the current expected to reach the heart is significantly reduced, which could prove to be insufficient. However, you risk getting a shock if you are touching the victim when a shock is delivered.

Below is described what to be aware of to avoid injury. Training in this will be part of your AED training.

Electrode placement and shock environment

- An AED must only be connected to casualty's who are unconscious and without normal breathing, which means cardiac arrest.
- Expose the casualty's chest.
- Remove excessive body hair where the electrodes should be placed.
- Remove jewelry/piercings, medical patches, or other items on the chest that may come in contact with the electrodes.
- The electrodes must not be placed on top of pacemakers and ICDs.
- Wipe casualty's chest if wet (sweat, water etc.)
- Move the casualty to a dry area if wet (e.g. The edge of a pool).
- It should NOT be wet where you are sitting, when preparing to use an AED.
- Press firmly on electrodes.

- Ensure correct electrode placement on the casualty's chest.
- Ensure no one touches the casualty during analysis and shock delivery.
- Control surroundings and move oxygen or any flammable items (min of 1 meter away) before delivering shock

Service procedure or if AED has been in use

Depending on the make and type of AED you have, you must ensure regular checks. You will then always be one step ahead if there are issues with the AED or the battery is flat. Remember it is always the customer's responsibility to maintain the AED and electrodes.

On the AED's which Falck deliver, there is a window indicating any fault. All AED's recommended by Falck perform a daily self-test.

If you have a service contract with Falck, you may call telephone no. 7025 6611 and report the fault. Falck will then ensure that you receive a replacement, new battery or electrodes.

In most health regions where an AED has been used, the ambulance crew will take it to the nearest emergency call center for data retrieval. Falck recommend that you provide the AED with a label stating the address where it belongs, so it can be returned.

If there is a Service Contract, then Falck will ensure, battery change and refreshment of electrodes after your call.

See more FAQ on page 144.
Read more on falck.dk

fig. a

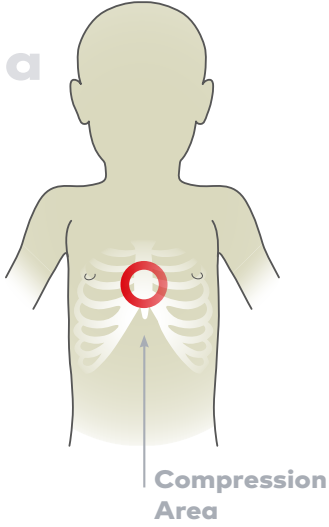


fig. b

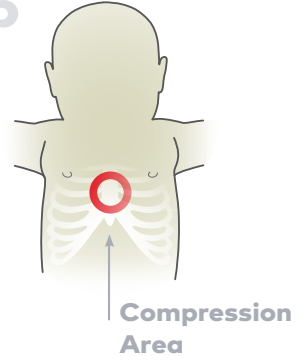


fig. c

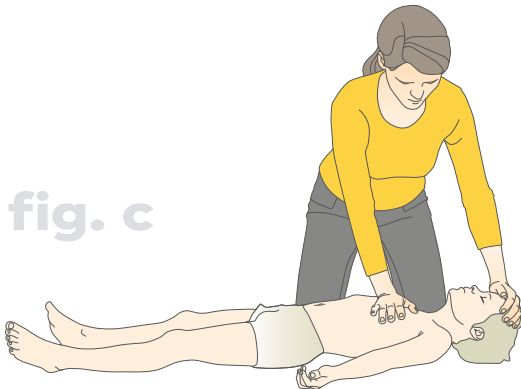


fig. d



Basic resuscitation for children from 0-18 years old

The procedures for the resuscitation of children are similar to that of adults. There are however slight differences in the Hand-holds.

Examining the consciousness level in children

- ┌ Call out to the child in a loud voice and shake carefully
- ┌ If the child is unresponsive, it is unconscious.
- ┌ Call for help 1-1-2
- ┌ Open airway, check breathing.

Opening the airway in smaller children (ages 0-1)

- ┌ Keep the head in a neutral position, not tilted back use a towel to lift the shoulders.
- ┌ Lift chin with fingers.
- ┌ Press the lower jaw against the upper jaw (being careful not to depress the soft tissue underneath as this can inhibit breathing).

Opening the airway in older children (ages 1-18)

- ┌ Gently tilt the head backwards, but not as far back as with adults.
- ┌ See, listen and feel for breathing as with adults.

The child breathes normally

- ┌ Place the child in the recovery position to extent possible and ensure help has been called 1-1-2.

The child is not breathing normally

If you have a mobile phone with you

- ┌ Ensure help has been called 1-1-2
- ┌ Provide 5 rescue breaths
- ┌ Perform CPR (30:2)

If you do not have a mobile phone with you

- ┌ Provide 5 rescue breaths and commence CPR (30:2) for one minute before ensuring help has been called 1-1-2
- ┌ Continue CPR

CPR for children

Press hard and fast (frequency 100 - 120 compressions per min.). When providing CPR to a child press down to at least one third of the depth of the child's chest. Place on hard surface.

For all children

- ┌ Lower half of breastbone (see markings on fig. a and b).

Rescue breaths for children

Rescue breaths for children should be adjusted to the size of the child. With younger children you are able to blow through the nose and mouth simultaneously. With older children and adults, you must use either the mouth or the nose method as the distance between nose and mouth is greater.

If, for some reason cannot remember the single elements you have learnt here, then just use what you can remember. The most important thing is to do something when you are faced with a lifeless child.

Children rarely suffer cardiac arrest. More often they will experience difficulties breathing. Rescue breaths will often have a positive effect.

CPR for children ages 0-18:

If you have a mobile phone with you:

Call for help: 1-1-2

- ┌ Provide 5 rescue breaths.
- ┌ Perform CPR (30:2)

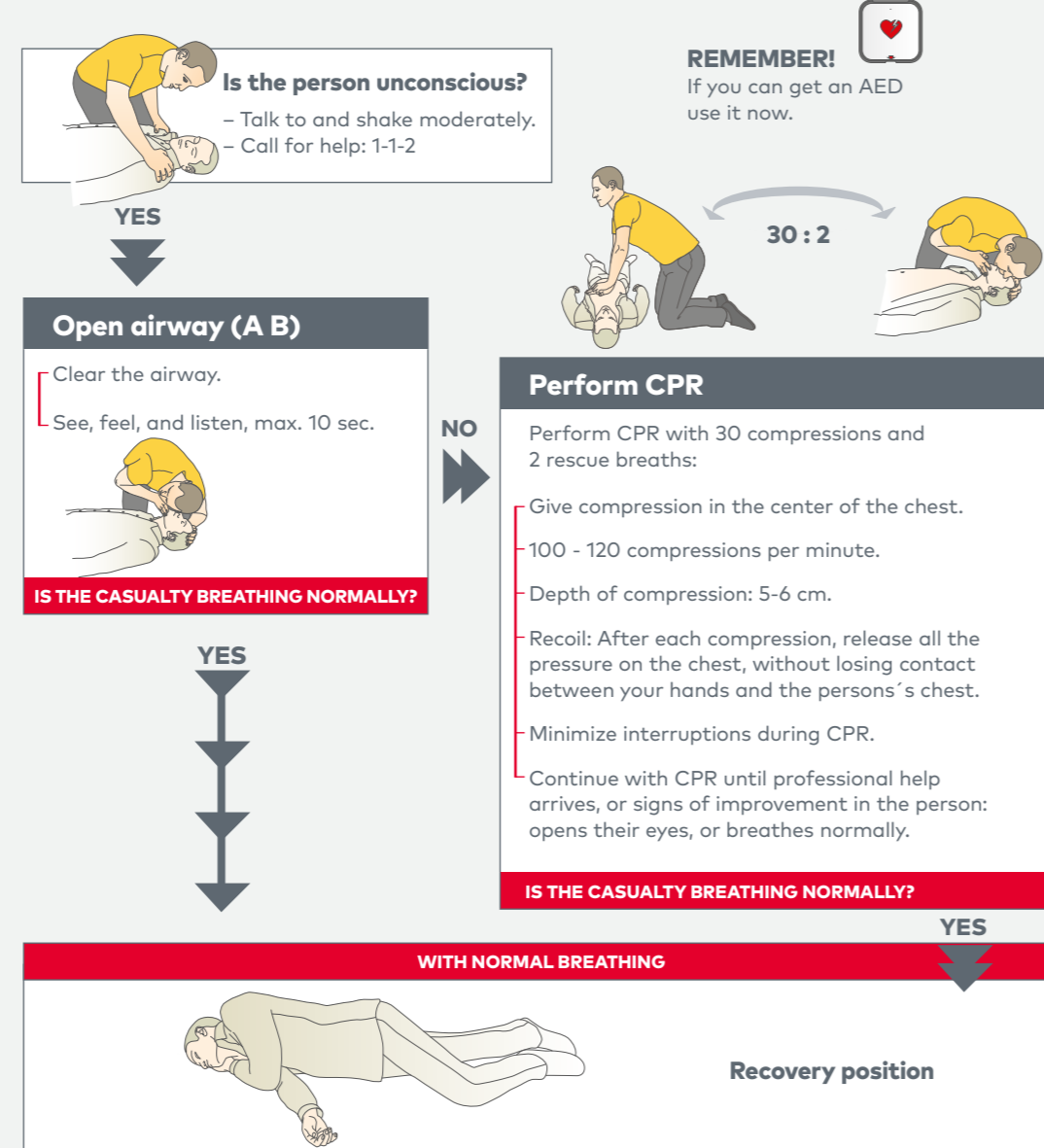
If you do not have a mobile phone with you:

- ┌ Provide 5 rescue breaths and commence CPR (30:2) for 1 minute before **calling for help: 1-1-2**
- ┌ Continue CPR (30:2)
- ┌ Continue CPR until professional help arrives, the child wakes up, opens its eyes and breathes normally, or you become too exhausted to continue

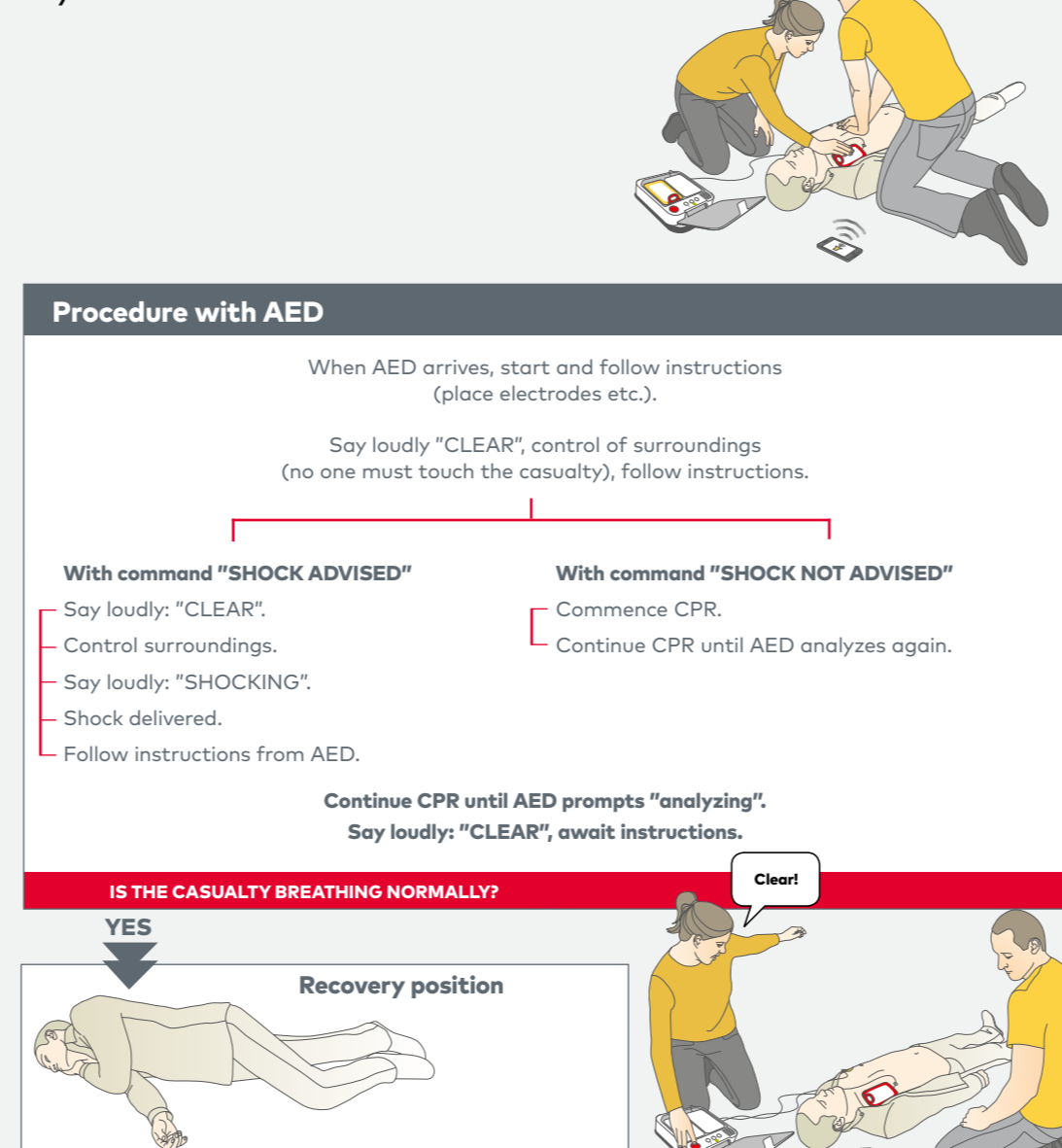
CHECKLIST FOR CPR

	ADULTS	CHILDREN AGES 0-18
Compression area	Compression area is the center of the chest (lower half of the breastbone)	Compression area is the lower half of the breastbone. See markings in figures a and b on page 46
Press with	Both hands Using the heel of the hand	Evaluate: Use the two-thumb technique or the hand
Depth of compression	5 - 6 cm	Adjust the depth according to the child's chest size, compress one third of this
Frequency of compressions (per minute)	100 - 120	100 - 120
Ratio of compressions and rescue breaths	30:2 Both alone and with helper	Start with 5 rescue breaths, proceed with 30:2 when alone or with the aid of a helper
Special remarks		If you do not have a mobile phone with you: Continue CPR for 1 minute before calling for help. Always start with 5 rescue breaths
Are you in doubt whether or not the breathing is normal? Continue as if there is no breathing and perform CPR.		
Continue CPR until professional help arrives, the casualty wakes up, opens their eyes, moves or breathes normally, or you become too exhausted to continue.		
If you are not able to provide rescue breaths due to facial injuries, you must at least perform chest compressions.		
If you have difficulty remembering the procedure for children, then use adult algorithm.		

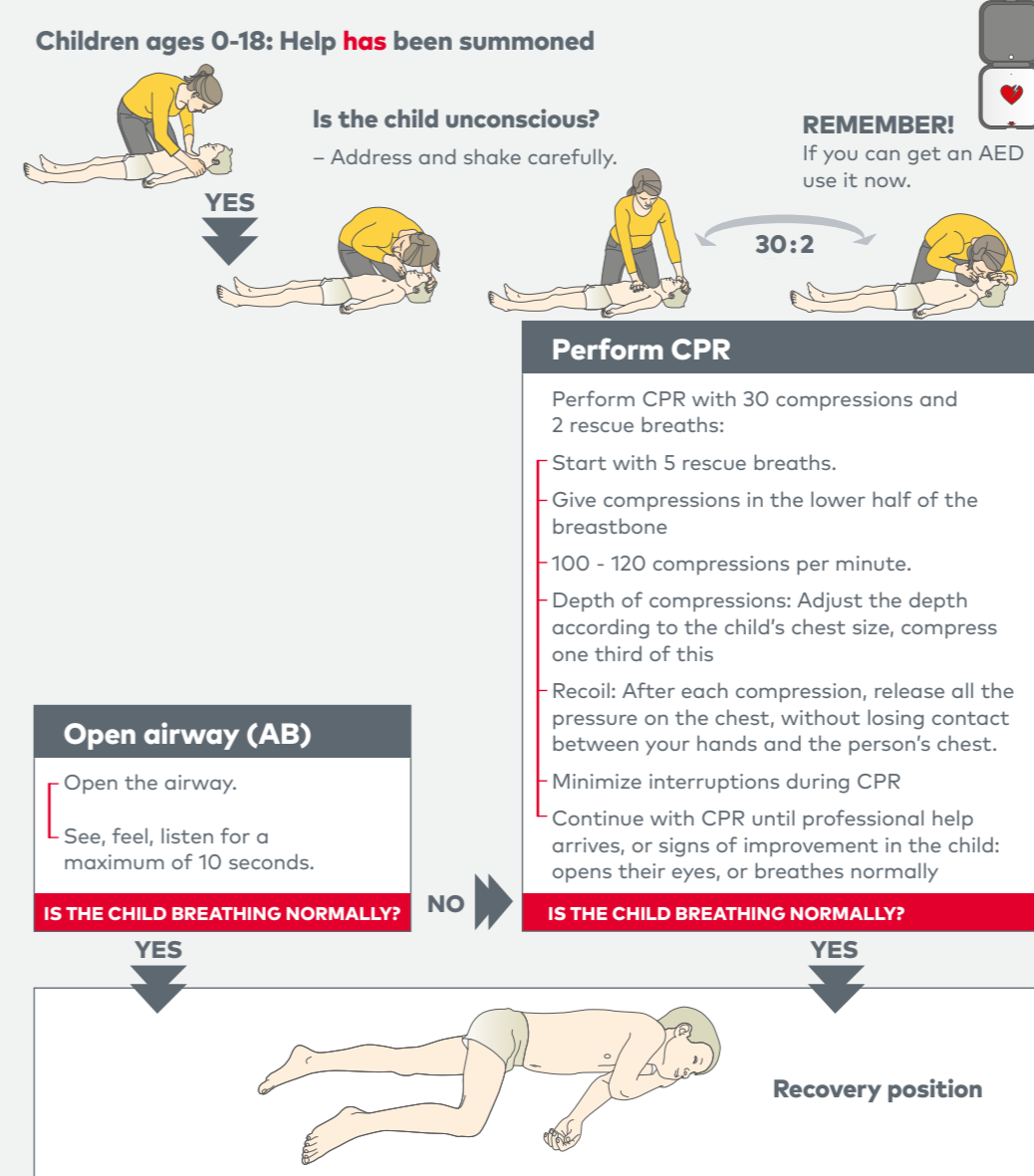
Basic resuscitation for Adults



If you have an AED

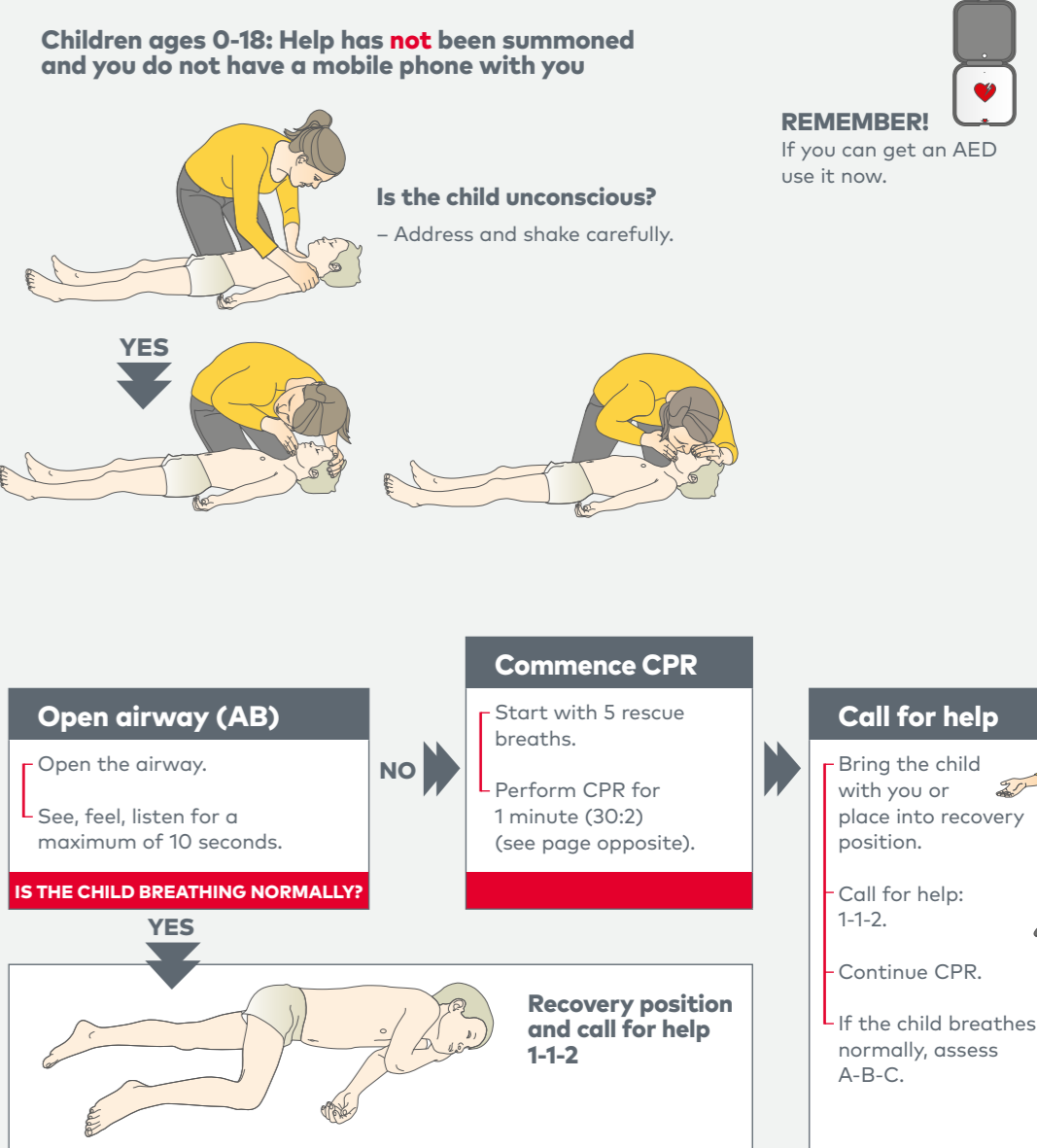


Basic resuscitation



PERFORM FIRST AID

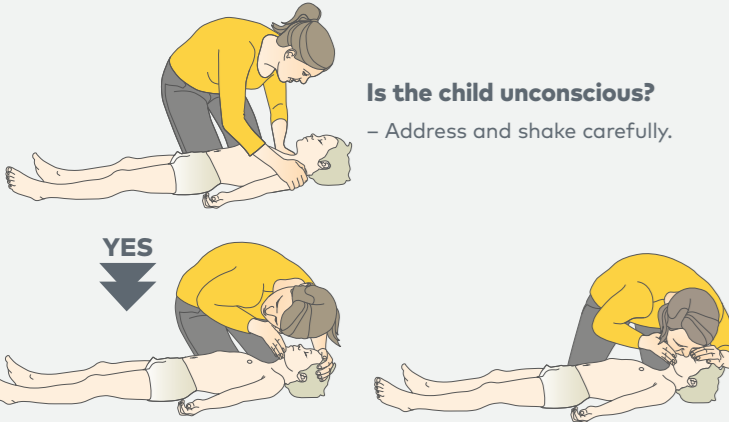
Basic resuscitation



PERFORM FIRST AID

Basic resuscitation

Children ages 0-18: Help has **not** been summoned and you do not have a mobile phone with you



REMEMBER!
If you can get an AED use it now.

Basic resuscitation

Children ages 0-18: Help **has** been summoned



REMEMBER!
If you can get an AED use it now.

If you have an AED



Procedure with AED

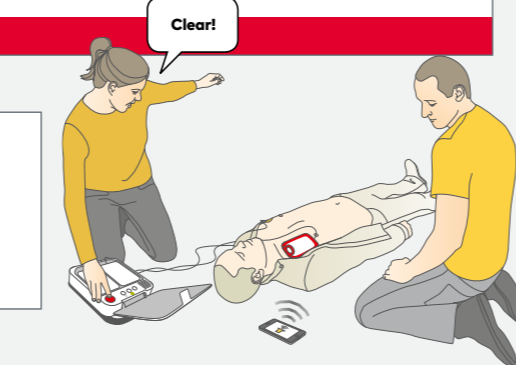
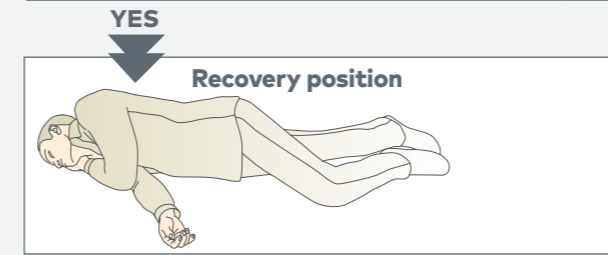
When AED arrives, start and follow instructions (place electrodes etc.).

Say loudly "CLEAR", control of surroundings (no one must touch the casualty), follow instructions.

- With command "SHOCK ADVISED"**
 - Say loudly: "CLEAR".
 - Control surroundings.
 - Say loudly: "SHOCKING".
 - Shock delivered.
 - Follow instructions from AED.
- With command "SHOCK NOT ADVISED"**
 - Commence CPR.
 - Continue CPR until AED analyzes again.

Continue CPR until AED prompts "analyzing". Say loudly: "CLEAR", await instructions.

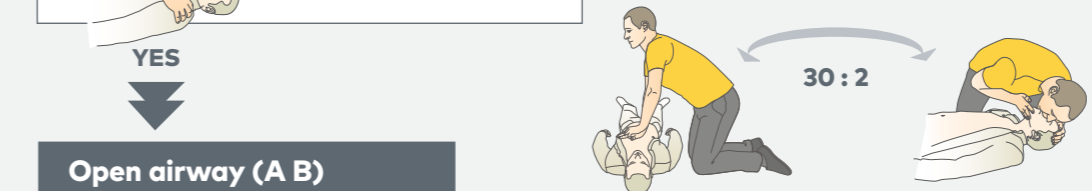
IS THE CASUALTY BREATHING NORMALLY?



Basic resuscitation for Adults

Is the person unconscious?
- Talk to and shake moderately.
- Call for help 1-1-2

REMEMBER!
If you can get an AED use it now.



Open airway (A B)

Clear the airway.
See, feel, and listen, max. 10 sec.

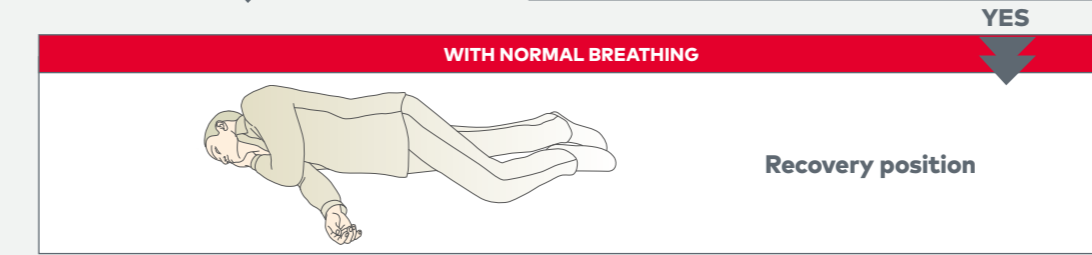
IS THE CASUALTY BREATHING NORMALLY?

Perform CPR

Perform CPR with 30 compressions and 2 rescue breaths:

- Give compression in the center of the chest.
- 100 - 120 compressions per minute.
- Depth of compression: 5-6 cm.
- Recoil: After each compression, release all the pressure on the chest, without losing contact between your hands and the persons' chest.
- Minimize interruptions during CPR.
- Continue with CPR until professional help arrives, or signs of improvement in the person: opens their eyes, or breathes normally.

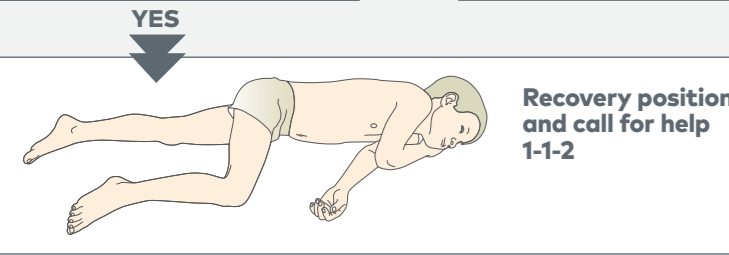
IS THE CASUALTY BREATHING NORMALLY?



Open airway (AB)

Open the airway.
See, feel, listen for a maximum of 10 seconds.

IS THE CHILD BREATHING NORMALLY?



Commence CPR

Start with 5 rescue breaths.
Perform CPR for 1 minute (30:2) (see page opposite).

Call for help

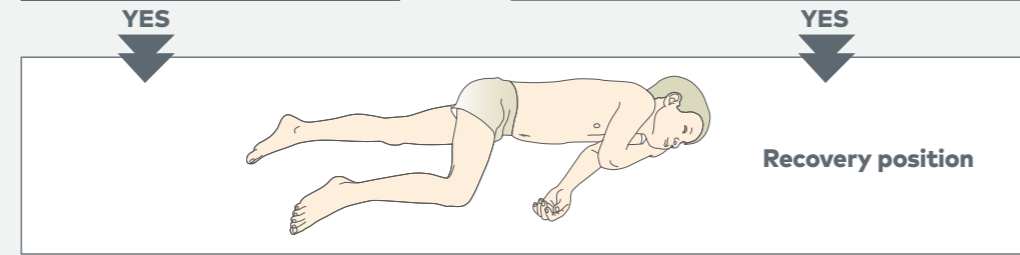
Bring the child with you or place into recovery position.

- Call for help: 1-1-2.
- Continue CPR.
- If the child breathes normally, assess A-B-C.

Open airway (AB)

Open the airway.
See, feel, listen for a maximum of 10 seconds.

IS THE CHILD BREATHING NORMALLY?



Perform CPR

Perform CPR with 30 compressions and 2 rescue breaths:

- Start with 5 rescue breaths.
- Give compressions in the lower half of the breastbone
- 100 - 120 compressions per minute.
- Depth of compressions: Adjust the depth according to the child's chest size, compress one third of this
- Recoil: After each compression, release all the pressure on the chest, without losing contact between your hands and the person's chest.
- Minimize interruptions during CPR
- Continue with CPR until professional help arrives, or signs of improvement in the child: opens their eyes, or breathes normally

IS THE CHILD BREATHING NORMALLY?

CHECKLIST FOR CPR

	ADULTS	CHILDREN AGES 0-18
Compression area	Compression area is the center of the chest (lower half of the breastbone)	Compression area is the lower half of the breastbone. See markings in figures a and b on page 46
Press with	Both hands Using the heel of the hand	Evaluate: Use the two-thump technique or the hand
Depth of compression	5 - 6 cm	Adjust the depth according to the child's chest size, compress one third of this
Frequency of compressions (per minute)	100 - 120	100 - 120
Ratio of compressions and rescue breaths	30:2 Both alone and with helper	Start with 5 rescue breaths, proceed with 30:2 when alone or with the aid of a helper
Special remarks		If you do not have a mobile phone with you: Continue CPR for 1 minute before calling for help. Always start with 5 rescue breaths

Are you in doubt whether or not the breathing is normal?
Continue as if there is no breathing and perform CPR.

Continue CPR until professional help arrives, the casualty wakes up, opens their eyes, moves or breathes normally, or you become too exhausted to continue.

If you are not able to provide rescue breaths due to facial injuries, you must at least perform chest compressions.

If you have difficulty remembering the procedure for children, then use adult algorithm.

1-1-2



First Aider



Important team for greater survival!

Dial 1-1-2 (one, one, two)

When calling 1-1-2: stay on the phone until contact has been established.

After having dialed, you may experience a short pause. This delay can be as long as 15 seconds.

During these 15 seconds, wrong calls will be disconnected. Therefore, it is important that you stay on the line.

When contact is established, you must state:

Name and address:

State the phone number, you are calling from, your name and address. You may be asked for your social security number.

What has happened?

Inform about the situation/incident.

Special circumstances, such as chemicals or toxic spills.

Is anyone trapped? Is special aid required?

Once you have provided this information, the conversation will be forwarded to a medical professional, who will assess the need for an ambulance in collaboration with you.

Where the incident has occurred?

State whether it is a company, private address, placename etc.

When did it happen?

Possible time.

Where should the help be sent (exact address)?

Address, road number, town, possibly municipality and placename.

Agree on a meeting point, or place someone by the roadside to aid in finding the scene.

How many casualties?

Number of casualties.

Medical professional

Help will be sent while you talk to the medical professional. The conversation continues as long as needed and the medical professional can guide you in first aid, prioritization etc. until the ambulance arrives. See the team described.

Medical team in First Aid situations

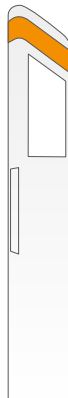
When an accident occurs and you call 1-1-2, you become part of a First Aid team.

You will then become part of a team working together with the medical professional at 1-1-2, helping the casualty. In the case of cardiac arrest (unconscious and no normal breath sounds) you must quickly perform CPR (30:2). You are the vital link in the chain, who can ensure survival by starting basic resuscitation when Cardiac arrest is present. Activate the loudspeaker on your phone, so you can communicate with the medical professional whilst delivering CPR.

If possible before the ambulance arrives, the medical professional will try to provide an AED to you.

The key to more survivors is when the team work is optimised.

Emergency phones



Marker posts

Beach numbers



Mobile phones

If you call from a mobile phone, it is important that you can say precisely where you are and exactly what has happened.

AML (Advanced Mobile Location) is an integrated part of the phone's operating system. AML can be used to automatically send location data to the emergency call center when a person dials 1-1-2, provided that AML is enabled. The technology has been implemented, and the emergency call center is equipped to receive location data via AML. However, certain data protection regulations must be followed, and agreements must be made with private providers of AML technology. Since AML is embedded in the phone's operating system, it does not need to be activated for individual users but for all users of the given operating system.

Use the roads markings to assist you:

Other road users or markings on marker posts and road signs can give you vital information. Your vehicle's GPS will also give you your exact location – always a good idea to check these things before you are placed in an emergency situation, then you can easily navigate through menus to find your exact location. There are certain makes of car that send an emergency signal when involved in a substantial impact. Check with your car dealer.

Telephones on Motorways and Dual carriageways

For emergency preparedness and safety reasons, the Danish Road Directorate has decided that the orange emergency telephones will continue to be maintained at and in tunnels.

The emergency telephones have a direct connection to the Traffic Information Center (TIC), which notifies the nearest 1-1-2 emergency center.

It applies at and in Limfjord Tunnel, Silkeborg motorway Tunnel, Guldborgsund Tunnel, Fredrikssundsvej Tunnel and Bernstorffsvej Tunnel, and is an requirement under the Tunnel Directive. Emergency phones will always be located opposite one another. There is no need to cross the highway.

Telephones at the workplace

At some workplaces you must press a number (typically 0 or 1) to get an outside line.

REMEMBER: If there are local instructions in place, always follow these.

Medical advice

If you are in doubt about whether or not to call an ambulance or require some medical advice, then each Health Region has a number which can be called – find this through Citizen's Advice Service. These numbers are manned by medical staff ready to assist you. They can also send an Ambulance.

Beach numbers

Most beaches, lakes and harbour baths in Denmark have been assigned a unique beach number, which you must provide when calling 1-1-2. These numbers consist of one letter and three digits. These numbers are shown on signs with black text on a white background and a green border. This system allows the emergency center to quickly determine your exact location, so that help can reach you faster when you need assistance.

**You can always receive help, for first aid or prioritizing help,
through Medical Professionals at 1-1-2**



While you're waiting for the Ambulance or assessing your requirements

- **Maintain overview** (has the accident escalated further? See page 3).
- **Ensure safety** (is the accident scene safe? See page 5).
- **Examine for other injuries** (systematic examination of the casualty(s), see section below).
- **Support injuries, cleanse, and dress minor wounds.**
- **Care for the casualty(s)**
Comfort and reassure, keep the casualty(s) calm and shielded. Wrap the casualty(s) in blankets.
- **Observe whether or not the condition of the casualty(s) changes. Use the A-B-C method.**
- **Provide psychological first aid** (see page 91).

You must go through the points mentioned above when assessing the need for help. If an Ambulance is on its way, you can go through the points in the meantime.

You may also use the examination below to assess a person who has been involved in an accident to gain knowledge of the person's injuries.

Systematic examination of the accident victim

When examining the casualty(s) for other injuries, it is to create knowledge of the casualty's condition. This will enable you to assess the need for help, the type of first aid necessary, if the casualty's status changes, as well as the need for support of injuries.

You do this by:

- Asking.
- Listening.
- Seeing.
- Feeling.
- Noticing any odours from the casualty or the surroundings.

You may start by asking:

- What is your name?
- Do you remember what happened?
- Where do you live?
- Do you have pain anywhere?
- Other relevant questions.

More about First Aid and Anatomy

On the following pages you have the opportunity to read more about first aid and the individual types of incidents, also anatomy or first aid to smaller injuries etc.



Types of Incidents	page 59-92
Illness in the Vital Systems	page 93-103
Minor Injuries – How to act	page 104-112
Vaccinations, Hygiene and Infections	page 113
Dealing with Major and Minor accidents	page 114-115
The Human body – Anatomy	page 116-141



Even without realizing it, both children and adults can ingest toxic or corrosive substances, and this is the cause of some of the acute hospitalizations.

Every day we are surrounded by chemical substances. In our homes we find cleaning detergents, laundry detergents and over-the-counter drugs. Our garden may have poisonous flowers and bushes (e.g. berries from the pepper tree, wisteria, wisteria yew and thuja).

You can always seek guidance from the Poison Hotline.

Chemical injuries can be divided into:

- [Poisonings and internal caustic burns
- [External caustic burns.

Ensure safety

Please remember to secure yourself with protective equipment such as gloves or goggles, if these are available.

When giving rescue breaths during CPR, use a face shield.

For people where you suspect carbon monoxide poisoning, you should only perform emergency removal, if it is safe for you.

Take a deep breath before entering the room! Often, the only thing you can do is call 1-1-2, and possibly ventilate the area.



Poisonings and internal caustic burns

Symptoms:

Difficulty breathing

Headache

Fatigue/groggy

Severe burning and pain in the oral cavity, oesophagus, stomach

Nausea

Uneasiness

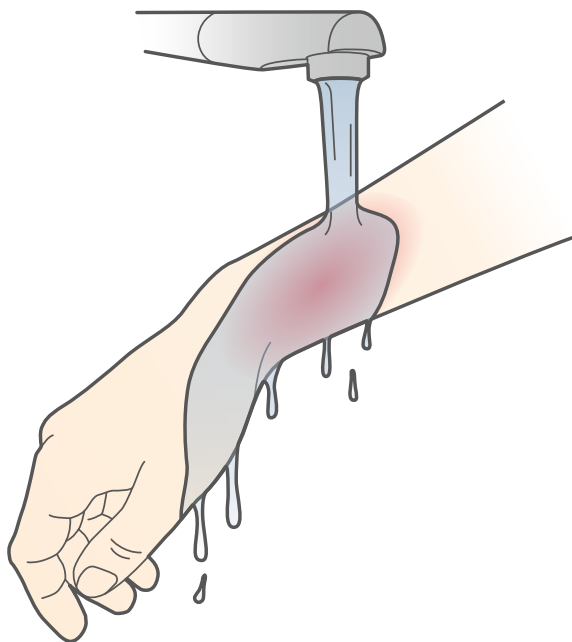
Seizures

Slipping into a state of unconsciousness.

First Aid:

- Keep the casualty calm
- Give the casualty a glass of water
- If it is a caustic or irritating substance, it is especially important to immediately give liquid to dilute and rinse. However, do not give more than one glass of 2 dl to adults and for children max. 1 dl.
- Avoid inducing vomiting
- If necessary, call the Poison Hotline for further information on 8212 1212
- If possible, bring the packaging from the poisonous substance, remains of poisonous plants, medication, or take a picture of it to the Doctor/Casualty Dept.
- If the condition deteriorates: Perform First Aid [A B C]

Poisoned individuals who are awake always require Doctor/Casualty Dept. attention!



External Caustic Burns

Some chemical substances (acid and alkaline) may cause caustic burns. Externally, they will affect and possibly damage the skin and the underlying tissues. Internally, they may damage mouth, oesophagus and stomach.

External caustic burns

Symptoms:

Severe pain

Damaged skin area

Pale gel-like skin or brownish skin, depending on it being acid or alkaline

Progressing to shock/ circulatory failure.

First Aid for external caustic burns:

- Rinse the substance off using ample amounts of lukewarm water.
- Remove clothing if it is soaked in the chemical.
- Continue rinsing until pain subsides – a minimum of 30 minutes.
- If necessary, call the Poison Hotline for further information on 8212 1212
- If possible, bring the chemical packaging to the Doctor/Casualty Dept.
- If the condition deteriorates: perform First Aid [A B C].

External caustic burns always require Doctor or Casualty Dept. attention

Flushing the eye



Remember: Flush from the nose outward

Caustic burns in the eye

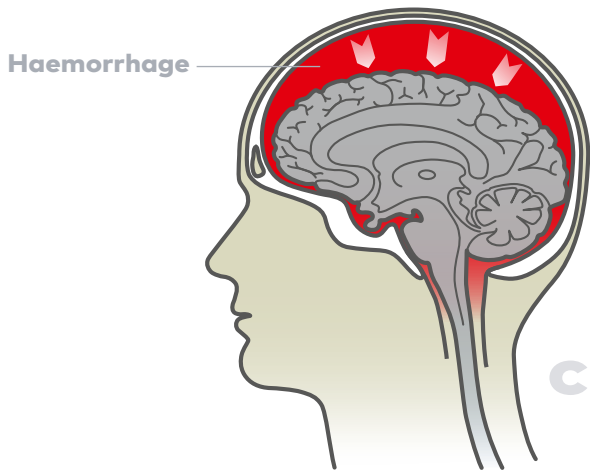
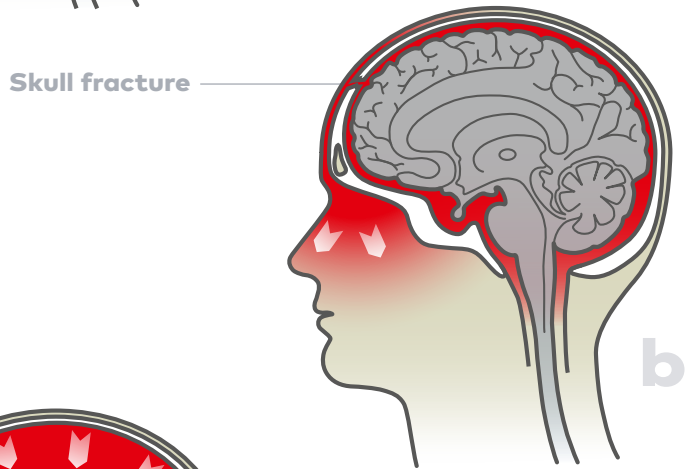
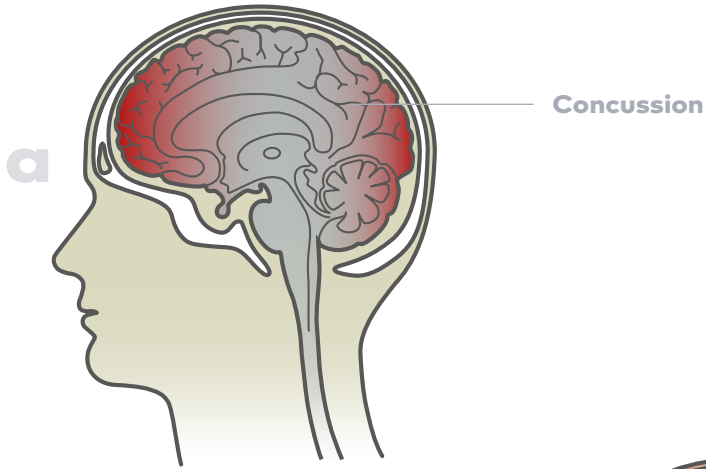
Symptoms:

Pain and stinging in the eye.

First Aid for caustic burns of the eye

- Rinse with water from the nose outward – rinse under the eyelid.
- Keep eyelid open during rinsing. Allow the casualty to remove contact lenses.
- If possible, bring the chemical packaging to the Doctor/Casualty Dept.
- If the condition deteriorates: perform First Aid [A B C].

Caustic burns to the eye require Doctor or Casualty Dept. attention!



Mechanical Injuries

The majority of accidents in everyday life are mechanical e.g. accidents at home, at work, during leisure activities or road traffic collisions. Drowning and electric shocks are also considered mechanical injuries. Mechanical injuries can affect every system in the body.

Head injuries

A blow to the head may cause concussion, fractured skull, and intracranial bleeding. These types of injuries often occur in accidents of great velocity, such as road traffic collisions or falling from high places.

Concussion

A concussion is an impact to the brain (a blow or shaking of the skull), which may lead to minor cranial bleeding/fluid transfer in the brain tissue. (see fig. a).

Skull fractures

A skull fracture is caused by a larger impact, which may cause a fracture to one or several of the cranial bones. The fracture can be either open or closed. When suffering from a skull fracture, there may be bleeding from both ears (see fig. b).

Intracranial bleeding

This is an extremely dangerous condition. Large blood vessels situated just below the skull can be damaged which may result in bleeding. This bleeding can develop over several hours, that in time, results in an increase in intracranial pressure which can alter the level of consciousness, circulation and breathing. (see fig. c).

NB: A person suffering from concussion, skull fracture or intracranial bleeding can be difficult to assess. Therefore, the injuries should be assessed by a Doctor or Casualty Dept. staff.

Concussion, skull fractures and intracranial bleeding

Symptoms for these types of injuries:

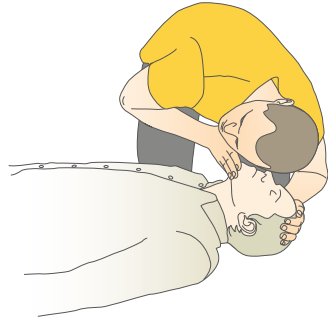
- Headache
- Nausea
- Vomiting
- Altered level of consciousness.

First Aid for head injuries:

- Stop any visible bleeding.
- Comfort the casualty.
- Place the casualty with their head elevated, if the casualty is conscious.
- Avoid being alone for the first 24 hours as there is a risk that you have or may develop a concussion.

Call 1-1-2- if the condition deteriorates and experience one or more of these symptoms:

- Confusion
- Restlessness and bizarre behavior
- Permanent amnesia.



1-1-2



Strangulation

During strangulation, the respiratory system is affected, leaving the person cyanotic (see pages 12-13).

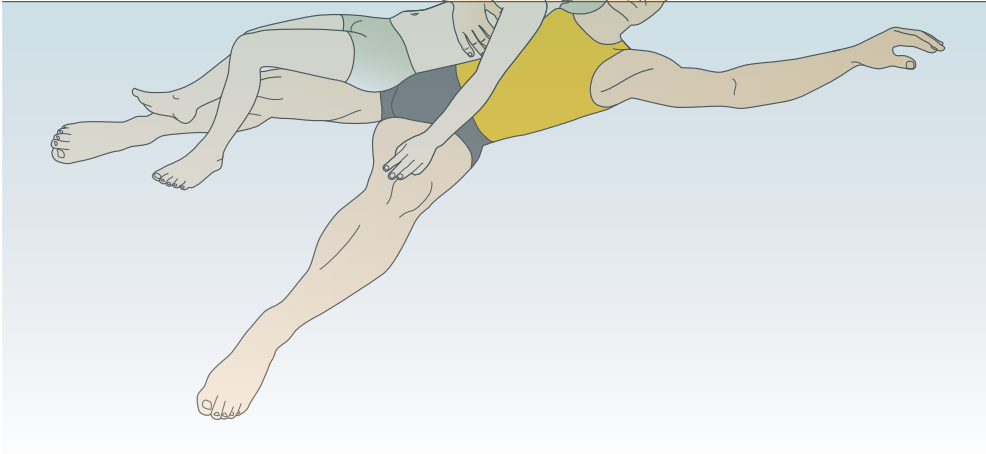
The casualty must be freed of the tightening object, thus relieving pressure off the throat, create a free airway, as with basic resuscitation.

Symptoms:

Cyanosis around lips, ears, and tip of nose
The casualty is unable to talk or cough
Uneasiness
Showing signs of suffocation
Unconsciousness.

First Aid for strangulation:

- Cut the casualty free or remove the tightening object. (this may require assistance when catching the casualty).
- Perform First Aid [A B C].
- If the casualty is conscious: Ask the person to keep their head steady. (if this is not possible, the head can be supported to prevent sudden movement, especially flexing of the neck).
- Call for help: 1-1-2.



Drowning Accidents

When a person's head is immersed under water, they will automatically hold their breath. Eventually the reflex to take a breath causes the person to inhale, thus filling their mouth and throat with water.

The water triggers a reflex in the larynx and vocal chords, causing these to convulsively constrict in order to prevent water from entering the lungs. As the casualty loses consciousness, the vocal chords relax, allowing water to enter the lungs.

Due to oxygen deficiency, the respiratory centre is paralyzed and breathing will not return spontaneously after the person has been rescued from the water. Therefore, it is vital that you provide rescue breaths as soon as you are able to touch the bottom with your feet. Commence basic resuscitation when you are on solid ground.

Symptoms:

Unconsciousness
No breath sounds
Cyanosis around lips, ears, and tip of nose
Paleness
Possible foam around the mouth.

First Aid for drowning accidents:

- If possible, rescue the casualty without risking your own life
- Begin as quickly as possible by checking for unconsciousness and call for help 1-1-2
- Clear the airway and check for normal breathing
- If breathing is not normal, provide 5 rescue breaths
- Commence CPR (30:2)
- If vomit or water appears during CPR, you can quickly turn them onto their side to clear the airway and prevent vomit from entering the lungs during the two rescue breaths.
- Remember to explain that this is a drowning accident and if there are others missing.

fig. a

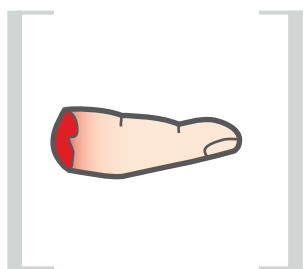
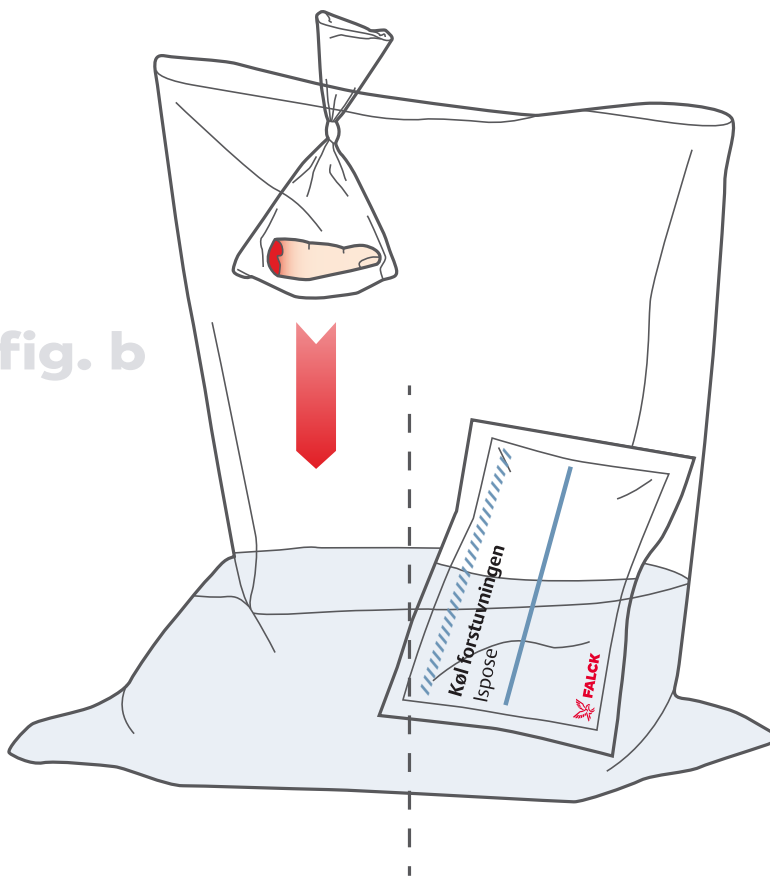


fig. b



Traumatic Amputation

Limbs can be severed in road traffic collisions, chainsaw accidents, and circular saw accidents etc. It may affect fingers, hands or parts of arms and legs.

In many incidents a severed limb can be reattached with complete or partial function, if first aid has been performed immediately after the accident.

First Aid for amputation:

- Stop the bleeding.
- Lie the casualty down and elevate the wound as high as possible.
- Place a dressing.
- Call for help: 1-1-2.
- Keep the severed limb cold (frost free) and dry.
- If situation worsens: perform First Aid [A B C].

Store the severed limb as described below:

Place the severed limb in a clean and dry bag and seal it tight. Place this bag in another bag with cold, frost-free water (see fig. b).

It is extremely important not to let the severed limb come into contact with the ice, as this will damage the tissue and compromise the possible reattachment.

If you are in doubt, or experience difficulties storing the limb, await the Ambulance Service.

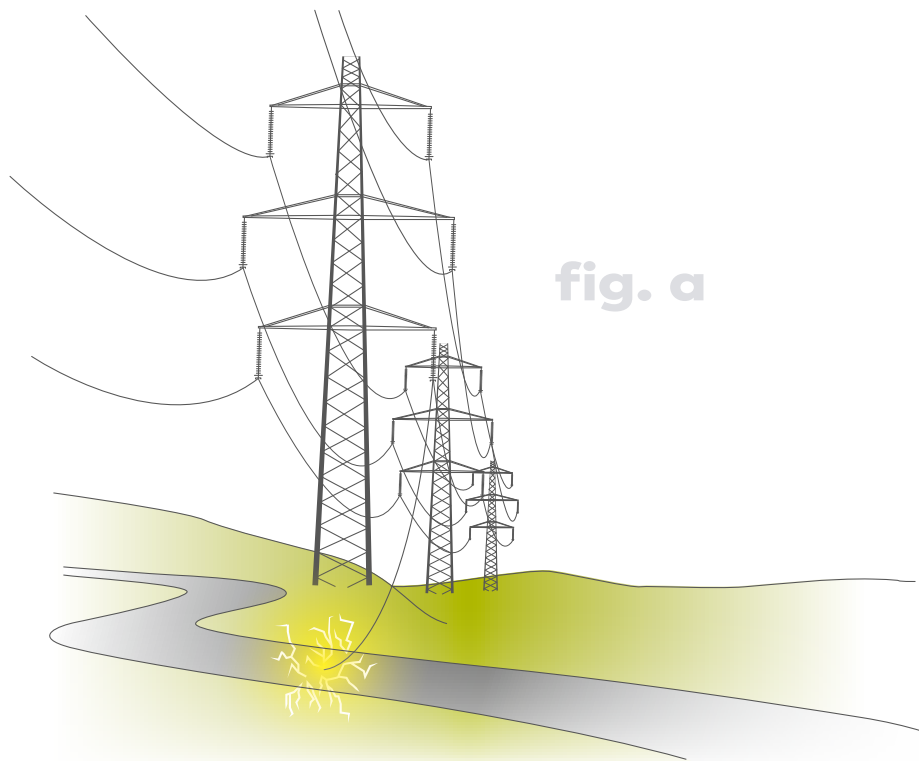


fig. a



fig. b

Electrical Injuries

When an electrical current passes through a person, the vital systems (such as brain, heart and breathing) may be affected. The heart is controlled by electrical impulses and an external electrical pulse (for instance 230 volts) can be life threatening and may disrupt the heart's impulses, several days after the event.

An electrical injury produces heat as the current passes through the person's tissue. This heat may inflict burns. Even though these burns may appear minor on the outside, they can cause massive internal injuries affecting the circulatory and nervous systems.

There is a distinction between **low voltage (fig. b)** (230 - 1000 volts) and **high voltage (fig. a)** (>1000 volts).

Symptoms:

Burns
Unconsciousness
Possible cardiac arrest.

First Aid for electrical injuries from low voltage:

- Ensure safety by switching off the power.
(Remember: do not touch the casualty until power has been switched off).
- Burns: cool by using lukewarm water until professional help takes over.
- Call for help: 1-1-2, explain about the electrical injury.
- If condition worsens: perform First Aid [A B C].

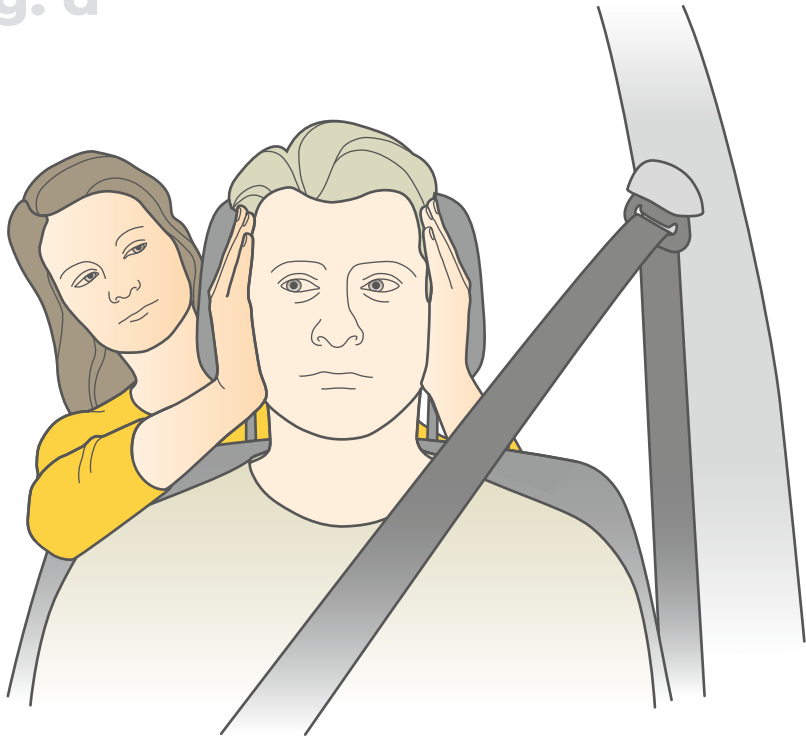
First Aid for electrical injuries from high voltage:

- Keep your distance – at least 10 meters.
- Call for help: 1-1-2.
- Never try to remove electrical wires from the casualty.

Remember: Safety distance is at least 10 meters.

**Individuals suffering from electrical injuries
always require attention from a Doctor/Casualty Dept.**

fig. a



Fractures/joint injuries

Spinal injury

In many road traffic collisions spinal injury is always possible, even though vehicles are equipped with headrests. Therefore, it is vital that the casualty keeps their head still. If it is handled incorrect, it can be catastrophic, leaving the casualty paralysed. However, do not be discouraged from performing an emergency removal if you assess the casualty is in a life threatening situation.

Remember: if you suspect fractures to the neck or spine, you must leave the casualty in the position you found them in.

If you suspect spinal injury in an unconscious casualty: perform First Aid (see page 9).

Symptoms:

Paralysis

Pain or soreness in the neck and/or back

Numbness/loss of sensation.

First Aid when suspecting an injury to the neck or spine:

- If possible, leave the casualty in the position found (if there is no immediate danger).
- Ask the casualty to keep their head still. If this is not possible, the head can be supported to prevent excessive movement, especially flexing the head forward fig. a
- Call for help: 1-1-2, use speaker function on phone.
- If condition worsens: perform First Aid [A B C].

If the casualty is unconscious: perform First Aid [A B C].

fig. a

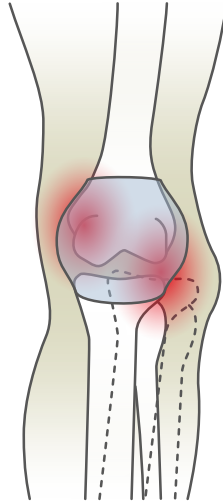
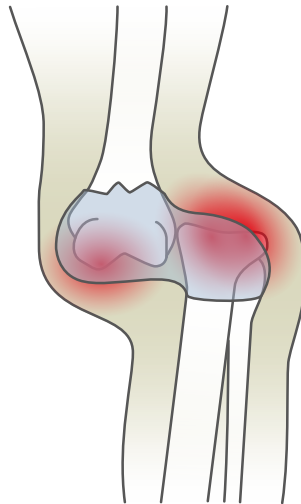


fig. b



Sprains and Dislocations

A sprain (see fig. a.) is an injury to the joint; the joint is stretched out of place and then returned to its normal position. This type of injury can occur during sporting activities. The injury to the joint causes oedema, leading to swelling and pain.

Symptoms:

- Swelling
- Pain/soreness
- Bruising
- Reduced mobility.

Dislocation

Dislocation (see fig. b) is an injury of the joint, removing it from its normal position.

Symptoms:

- Pain
- Joint locked, possibly in an abnormal position.

RICE

Rest:

Stop the activity and rest the injury.

Ice:

Cool the injury to prevent swelling. Max 20 minutes once an hour. This can be done the first 24 hours.

Compression:

Apply a supporting compression bandage.

Elevate

Elevate the injury, but only if it causes no further pain or injury.

First Aid for sprains:

- Lay the casualty down.
- If possible, elevate the injury.
- Keep the injury cool for max 20 minutes once an hour. This can be done the first 24 hours. (ice pack, frozen peas etc.).
- Remember to place e.g. a layer of clothing or a towel between the skin and the ice
- Apply a compression bandage.
- Contact a Doctor.

First Aid for dislocations

- Support the joint in the position found (use e.g. a sling).
- Call for help: 1-1-2.
- Cool the injury to avoid pain and swelling. Max 20 minutes once an hour. This can be done the first 24 hours.

Be extremely careful when dealing with fractures and dislocations. Avoid dressing the injury, as well as elevation. Support the injury in the position you find it.

fig. a

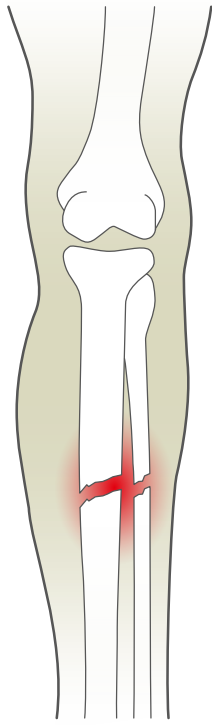
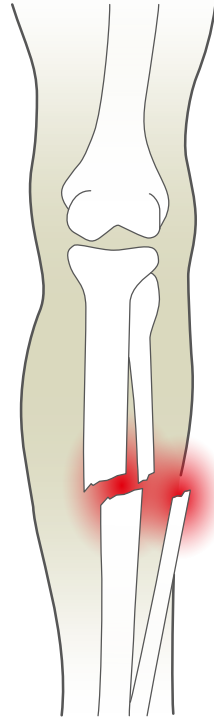


fig. b



Fractures

Defined as:

- Closed fractures (see fig. a).
- Open fractures (see fig. b).

Closed fractures can be blows, twisting, or after a fall resulting in one or several broken bones.

Symptoms of closed fractures:

- Changes in shape
- Pain
- Swelling
- Bruising
- Numbness/loss of sensation
- Looseness.

In open fractures the bone may penetrate the skin. Therefore, the risk of infection and further complications are greater. It is important to make sure that a closed fracture does not evolve into an open fracture.

Symptoms of open fractures:

- Bleeding
- Pain
- Changes in shape
- Numbness/loss of sensation
- Possibly exposed bone(s).

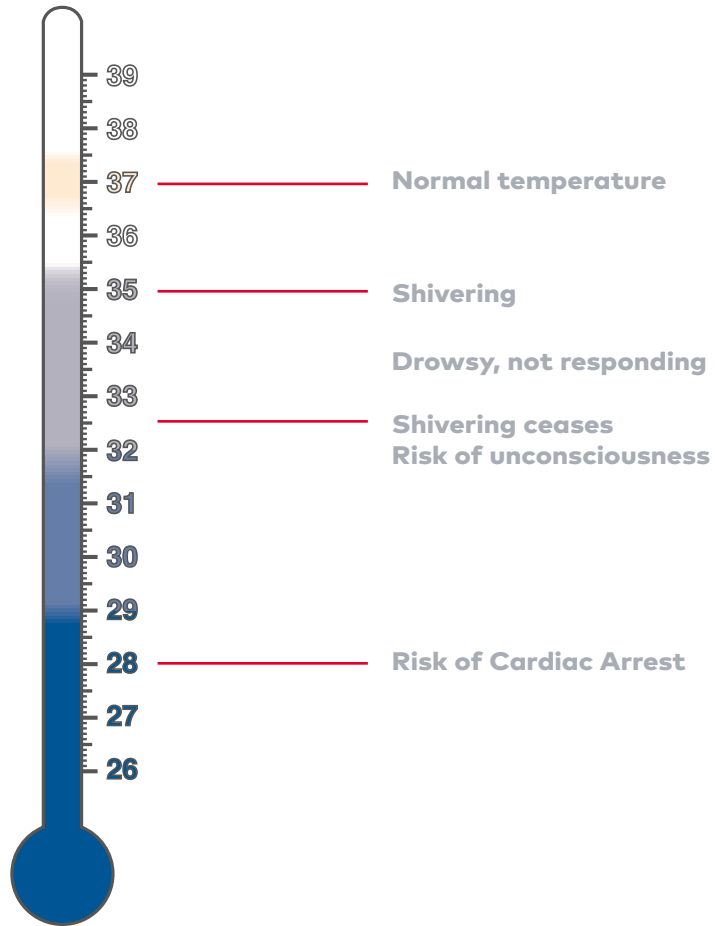
First Aid for closed fractures:

- Comfort the casualty.
- Support injury as found.
- Call for help:
 - Fracture of the pelvis, femur or lower leg: Call 1-1-2.
 - Fracture of e.g. collarbone, arms or fingers:
 - Contact Doctor/Emergency Dept.
- If condition worsens:
 - perform First Aid [A B C].

First Aid for open fractures:

- Comfort the casualty.
- Support injury as found.
- Cover wound with clean dressing.
- Call for help: 1-1-2.
- If condition worsens:
 - perform First Aid [A B C].

Hypothermia thermometer



Cold injuries

The normal body temperature is between 36.5 and 37.5° C. The temperature is controlled by a regulating center in the brain.

If a person, not adequately dressed, is exposed to cold, windy and moist weather, the entire body can be influenced by the cold (hypothermia). If the person is immersed in water, this influence occurs even more rapidly

As the body temperature drops down below the normal temperature level, shivering will occur as the body tries to compensate for the heat loss. If the temperature drops to 33° C, the person's life is in danger, as the vital systems gradually cease to function. The shivering will cease as the body is no longer able to compensate for the heat loss. As the temperature drops even lower, the person will slip into unconsciousness, the heart function will be affected and eventually cease.

What constitutes the Core of the Body?

The core of the body consists of the internal organs – including the heart and the brain. During hypothermia the body will attempt to maintain the core temperature at a normal level by cutting off blood circulation to the extremities.

Hypothermia affects the entire body.

This can be divided into two levels:

- Mild hypothermia
- Severe hypothermia.

In **mild hypothermia**, the casualty will typically feel cold, shiver, have pale skin that may appear blotchy and mottled, and experience reduced mobility in the arms and legs.

In **severe hypothermia**, the casualty may be groggy, confused, have reduced consciousness or be unconscious. Worst case, the shivering may stop, and the casualty risks having a cardiac arrest.

Symptoms:

- Cold
- Shivering
- Groggy
- Stiffness in muscles/joints
- No audible breath sounds
- Reduced consciousness or unconscious

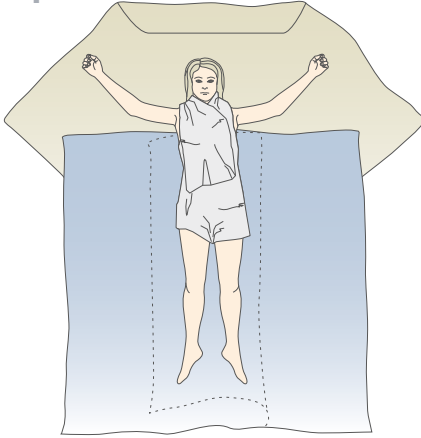
The casualty is conscious:

- Comfort the casualty.
- Shield the casualty from the weather.
- Remove wet clothing.
- If necessary, wrap the body in plastic or foil
- Wrap in blankets (see page 84)
- Give the casualty warm fluids.
- Call for help: 1-1-2.

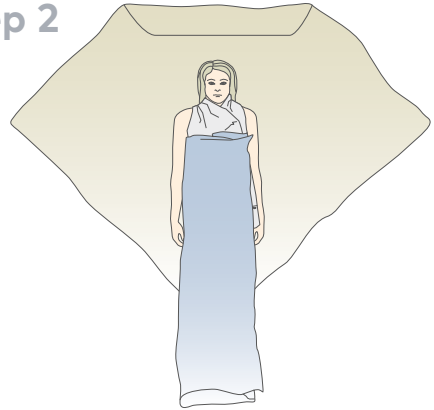
Casualty is unconscious:

- Perform First Aid [A B C].
- Call for help: 1-1-2.

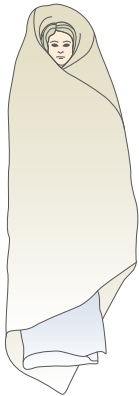
Step 1



Step 2



Step 3



Frostbite

Exposed body areas in cold environments, can cause frostbite.

The most exposed parts of the body such as an unprotected face, hands or feet are at risk.

In frostbite injuries the tissue fluids freeze, causing the tissue, in time, to die.

This can be divided into two levels:

- [Superficial
- Deep.

Symptoms:

Superficial frostbites can cause a tingling sensation in the affected area, which also can be painful. Epidermis may be damaged, and dead skin can peel off, leaving a wound.

Deep frostbites make the skin appear pale, white, hard and cold with a waxy texture. The casualty will not feel any pain.

First Aid for frostbite:

- [For the conscious casualty.
- [Comfort the casualty.
- [For **superficial frostbite**, the affected area is heated passively by body heat.
- [For **deep frostbite**, immerse the affected area in warm water between 40° C and 42° C – should take place at the hospital due to severe pain (effective pain management)
- [Avoid rubbing the skin on the affected area.
- [Call for help 1-1-2.



Heat injuries

Heat injuries can be divided into:

- Sunstroke
- Heat exhaustion
- Burns
- Scalding.

If the body's temperature exceeds 41° C, it will affect nerve cells in the central nervous system.

The casualty will become groggy, headache, nausea.

This can lead to unconsciousness and seizures. If the temperature exceeds 44° C, the central nervous system stops functioning.

Sunstroke

Sunstroke occurs due to a local heat impact on the skull. Typically caused by exposure to the sun on an unprotected head. These symptoms develop rapidly.

Heat exhaustion

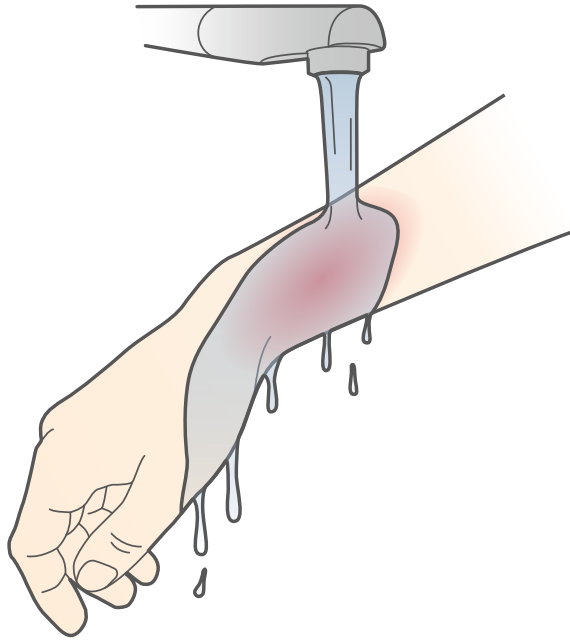
Heat exhaustion can occur from hard physical labour or staying in warm, humid environment, thus denying the body's ability to regulate its temperature. These symptoms develop slowly. Children can suffer from heat exhaustion if they are wearing too much clothes – especially during illness with high temperature.

Symptoms:

- Tiredness
- Dizziness
- Headache
- Nausea/vomiting
- Seizures and unconsciousness
- Red and warm skin.

First Aid for Sunstroke/Heat exhaustion:

- Comfort the casualty.
- Place casualty in the shade.
- Loosen tight clothing, remove shoes and socks.
- Cool the casualty by spraying with cold water (1° - 26° C) or place arms and legs in a bucket/basin with cold water, or place cold cloths on ankles, wrists and head.
- Give the casualty something to drink.
- Contact Doctor/Emergency Dept, if the condition does not improve.
- If the casualty's state of consciousness is affected:
Perform First Aid [A B C] and call 1-1-2.



ALWAYS REMEMBER: Water – Water – Water - Never discontinue the cooling

Burns/Scalds

The sun is a common cause of burns. When a burn occurs, the skin is exposed to heat, causing the temperature to rise. This causes the metabolism in the skin cells to increase. The cells in the affected area will therefore have an increased need for oxygen, leading to tissue acidosis. This will affect the sensitive nerve endings of the skin, causing the casualty to feel pain.

Treatment

Flush as quickly as possible with cold water, thus lowering the temperature. Remove loose clothing while you continue rinsing. As the temperature falls, pain subsides, the metabolism is normalized and acidosis ceases.

The body has a kind of thermometer that tells you when the area is cooled enough. Therefore, keep flushing as long as the person is in pain – and always a minimum of 20 minutes.

If possible: flush with lukewarm water (approx. 15°- 20° C) or find a pleasant temperature.

Important: Burns lead to massive heat loss. Make sure you keep the unburned areas warm. This especially applies to children.

There are three burn classifications:

First-degree burns

Redness and stinging sensation (i.e. sunburn).

Second-degree burns

Redness, stinging and blistering.

Third-degree burns

Carbonised area and lack of pain as the nerve endings have perished. Scalds leave the skin white (the casualty may feel pain around the edges of the burn area where both first and second degree burns usually occur).

Burns may cause shock/circulatory failure, due to the massive loss of fluids.

Symptoms:

Redness, stinging and blistering
Carbonisation and white skin
Pain.

Thermal injuries – Continued –**First Aid for burns/scalds:**

- Cool with water – immediately.
- Remove loose clothing.
- Be aware of general cooling.
- Continue to cool with water until the pain subsides, but for at least 20 minutes
- After cooling, cover the burn with a loose, sterile dressing or plastic wrap.
- Seek medical attention:
 - For **first-degree burns**, do not seek Doctor/Emergency Dept, but aftersun lotion can be used as treatment afterwards.
 - For **second-degree burns**, seek medical attention at the Emergency Dept. if:
The burn is larger than 5-7 cm. in diameter, or if it is on hands, feet, groin, buttocks or over joints and near body openings.
 - For **third-degree burns**, always call 1-1-2.
- If the condition worsens: perform First Aid [A B C].

Psychological events



When people lose someone close to them - or experience a serious accident, most find that their reactions are different than usual. Professional crisis counselling is an addition to the comfort, we as fellow human beings can offer each other. This type of aid is commonly known as psychological comfort or psychological first aid.

Normal reactions to an accident

In the days and weeks after a sudden incident, the person involved may lose their sense of control, energy, and capacity. The person may need other people to take over for a while, focusing on their own thoughts.

Psychological comfort can take many forms. It can be a good friend, colleague or family member, who is able to maintain the overview and who can help with the most pressing tasks in the days and weeks following the unfortunate incident.

Share your thoughts and feelings with others

In the time following the incident, many people find that the more they talk about what happened, the less (embarrassing and) uncomfortable their thoughts about it become. Talking to others is often experienced as a relief.

Most people, with the help of their own resources, family and friends, can get through the difficult time and gradually return to a normal everyday life, where the incident naturally fades into the background.

Some incidents impact our lives profoundly that speaking with a professional can be a valuable and necessary supplement to the support, we provide each other.

Psychological first aid requires the use of common sense and the ability to put yourself in another person's situation, "If I was him, what would I need right now?"

3 important words when structuring Psychological First Aid:

Structure

Control the situation and organize your needs.

Comfort

Comfort and support the affected person and their nearest.

Information

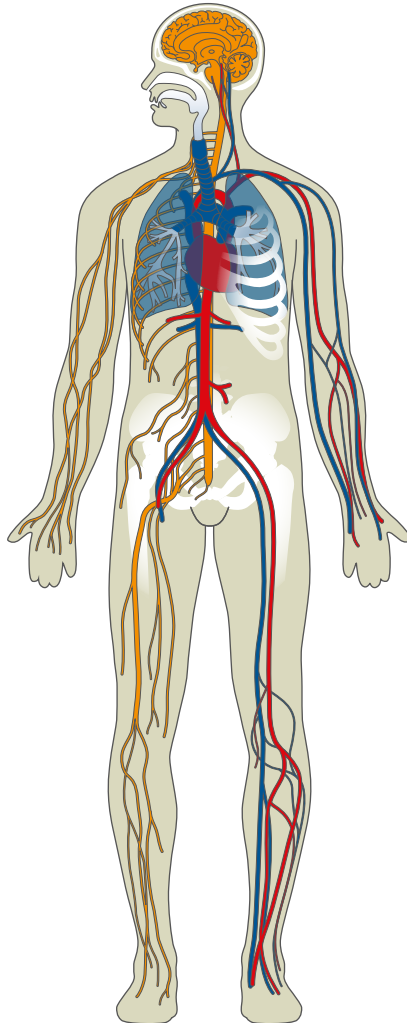
Inform the affected person what has happened and what is going to happen. Pay special attention to the shock reaction as this may occur immediately after the incident.

Use your common sense

Physical contact can be very reassuring for the affected person if he or she is comfortable with it. Trust your own sense of boundaries and the needs of the person you are supporting.

Allow them to share what has happened to the extent and in the way they feel ready for.

Illnesses in the Vital Systems



Stroke

This condition is caused either by a bleeding blood vessel in the brain, or a blood clot in one or several of these blood vessels. The oxygen supply to that area of the brain is impaired or blocked, causing damage or death to the affected part of the brain, this is due to oxygen starvation.

The extent of the injury depends on the size of the area affected.

As a First Aider you are not able to determine whether it is a bleed or a blood clot which has occurred. The first aid is the same either way.

Symptoms:

Paralysis of the arms/legs, often one sided

Possible speech impairment

Partial facial paralysis

Loss of vision in one or both eyes

Double vision

Confusion or difficulty understanding the surroundings

Difficulty controlling movements or fine motor skills

Headache without any apparent cause

First Aid for stroke

- Place the casualty in a seated position.
- Loosen tight clothing.
- Comfort the casualty.
- Call for help: 1-1-2.
- If the condition worsens: perform First Aid [A B C].

CALL AN AMBULANCE IMMEDIATELY 1-1-2

Easy mnemonic for recognising STROKE symptoms

STRETCH – SPEAK – SMILE

- STRETCH – Ask the person to hold their arms outstretched.
- SPEAK – Speech impairment is a common symptom with stroke.
- SMILE – Facial paralysis can also be seen.
- If just one of these symptoms are present you should call for help – even if they have passed.

Febrile seizures

The normal body temperature is between 36.5°- 37.5° C. Temperatures above 38° C are considered a fever.

Febrile seizures are often seen in children between 6 months and 5 years old. In rare cases it has been observed in children up to the age of 12.

The seizures may occur if the body temperature rapidly exceeds 38.5° C as is the case with infectious diseases where the thermo-regulatory centre of the brain is unable compensate. Even though the condition can be very frightening and dramatic for the parents to witness, it is not life threatening. However, the condition must be taken seriously as seizures can be caused by other illnesses, such as epilepsy.

Symptoms:

Rapid changes in temperature exceeding 38.5° C

Seizures

Unconsciousness.

First Aid for Febrile Seizures:

- Undress the child (cooling).
- Ensure the child does not hurt itself
- Open the window or wipe the child with a wet cloth.
- Call for help: 1-1-2.
- If the condition worsens: perform First Aid [A B C].

**PLEASE NOTE: Do not interrupt the child's movements – this may harm the child.
Do not place anything in the child's mouth**

Seizures/Epilepsy

Epilepsy is an illness in the central nervous system and is characterized by unconsciousness and seizures that vary in length.

The person suddenly collapses and becomes unconscious. Froth may appear in the corners of the mouth and the casualty may urinate. All muscles tense up simultaneously for a moment, followed by convulsive seizures. During the seizure, the casualty's lips and nails may turn blue.

Often the casualty has experienced seizures before, the duration is normally a couple of minutes, but it may take 10 minutes or more before the casualty has regained conscious-

ness. After the seizure, the casualty will be tired and sore, as well as suffering a headache and feeling drowsy. Those suffering from seizures, regardless of the cause, should be attended to by a Doctor, Ambulance personnel, or Casualty Dept. staff. In known epilepsy, emergency medical assistance is not always necessary.

Symptoms:

Unconsciousness
Seizures
Froth in the corners of the mouth
Cyanosis around the lips, ears.

PLEASE NOTE: Seizures are a symptom that may be caused by disorders other than epilepsy. Short seizures can be a forerunner to Cardiac Arrest.

First Aid for seizures:

- Keep calm. The casualty is not in pain or in danger.
- If the casualty is not lying down: then attempt to lie them down and loosen tight clothing around the neck area. Protect the head from striking the ground.
- Do not place anything in the mouth as it will not help and can injure the casualty.
- Do not attempt to stop the seizure(s) or to "resuscitate" the casualty. The seizure passes on its own.
- Do not try to give the casualty fluids.
- Do not be afraid to touch a casualty with seizures.
- After the seizures: perform First Aid.
- Call for help: 1-1-2.
- Stay with the casualty until professional help arrives.
- Protect the casualty from curious onlookers.

Diabetes

There are 2 types of diabetes

- The insulin-dependent (type 1).
- The non-insulin-dependent (type 2).

A person with non-insulin-dependent diabetes is able to produce the insulin hormone. However, the production is insufficient or the body's cells fail to use the insulin correctly. In most cases this can be controlled by the use of medicine, combined with a new diet.

The insulin-dependent diabetic is not able to produce insulin and must have daily insulin injections.

Both types of diabetes may result in too high or too low blood sugar levels.

Causes of high blood sugar levels:

Infection/fever, insulin deficiency and wrong diet. This condition develops slowly.

Symptoms:

Increased thirst
Frequent urination
Tiredness/weakness
Lack of appetite/nausea
Acetone smelling breath.

First Aid: Seek Doctor

Causes of low blood sugar levels:

Not eating according to schedule
Hard physical labour/exercise or too much insulin. This condition may escalate into a life threatening situation.

Symptoms:

Slight trembling/uneasiness
Tendency to sweat
Sensation of hunger
Aggression or laughter/crying
Possible unconsciousness with seizures.

First Aid for low blood sugar level (Hypoglycaemia):

- Comfort the casualty.
- Give the casualty sugar in the form of glucose tablets/dextrose (equivalent to 15-20 g glucose)/sugar in another form, something to drink – 2 or 3 glasses milk/juice or a slice of bread.
- If the condition improves with sugar intake the following minutes, help is not needed.
- If the condition worsens: perform First Aid [A B C] and call for help: 1-1-2.

If the casualty is unconscious: DO NOT give anything to eat or drink
Place the casualty in the recovery position.

PLEASE NOTE: The symptoms of Hypoglycaemia may wrongly be mistaken for intoxication

Asthma

Asthma is a lung illness, typically triggered by an allergic reaction, resulting in bouts of breathing difficulties. This is caused by an increased mucus production and muscle contractions in the bronchi.

If the person is not treated, the condition worsens. Treatment is so advanced that most people are able to avoid or limit violent asthma attacks.

Symptoms:

Wheezing and trouble exhaling
 Limited exhaling capacity
 Anxiety/uneasiness
 Impaired speech, due to difficulty breathing
 Cyanosis around the lips, ears and tip of nose.

Chronic Bronchitis

Chronic bronchitis is an inflammation of the bronchi, mainly caused by long term air pollution and smoking. Many sufferers of chronic bronchitis will also, to some extent, suffer from asthma.

Symptoms:

Expectorating cough (phlegm producing cough)
 Troubled and wheezing breathing
 Anxiety with possible speech difficulties, laboured breathing.

First Aid for asthma and bronchitis

- Comfort the casualty.
- Let the casualty sit or stand – depending on their preference.
- Help the casualty find and use their asthma medication.
- Loosen tight clothing.
- Provide fresh air, eliminate smoke and strong odour.
- If the condition improves with medication the following minutes, help is not needed.
- If the condition worsens: perform First Aid [A B C] and call for help: 1-1-2

Croup

Croup is seen in young children who are suffering from a virus infection in the upper airway, in the area surrounding the larynx. It may be caused by a cold or an infection (bronchitis). Young children are particularly susceptible as their airway is narrower.

Symptoms:

Gasping and wheezing respiration
Characteristic "Barking seal" cough
Possible grey-bluish face colouration.

First Aid for croup:

- Keep calm.
- Try to comfort the child.
- Expose the child to cold air.
- Sit with the child next to an open window.
- Place the child in a seated position.
- If the condition improves with the provided first aid within the following minutes, help is not needed.
- If the condition worsens: perform First Aid [A B C] and call for help 1-1-2

Allergic reactions

Allergy is often a hereditary condition, such as asthma, allergic rhinitis (hay fever) and atopic eczema. The risk of developing an allergy is higher if your parents or siblings have allergies. However, allergies can also occur without having a family history of allergy.

An allergy is an overreaction of the immune system to common, harmless substances called allergens. Normally, the immune system protects against harmful microorganisms, but in the case of an allergy, the body produces antibodies against harmless substances. The most common allergens are furry pets, dust mites, pollen, and food. Allergies can also be triggered by work-related substances.

Symptoms:

Blocked or runny nose
Fatigue
Cough
Rash (hives)
Itching in the mouth and throat.

First Aid to allergic reactions:

- Ask if the person has known allergies
- Help the person take their own medication for allergies if they have any
- Over-the-counter allergy medication in the form of antihistamines should be taken if available
- If the condition worsens: Contact Doctor/Casualty Dept.
- In case of a severe allergic reaction or worsening condition:
 - Perform First Aid [A B C] and call for help: 1-1-2.

Heart Disease

Angina and Heart attack

These illnesses are caused by different things such as, atherosclerosis caused by smoking, stress, high blood pressure, or it may be hereditary.

Atherosclerosis in the Coronary Arteries (Angina Pectoris)

If a coronary artery is blocked or partly closed, the blood supply to the underlying heart muscle is affected and the oxygen delivery is impaired causing central chest pain.

Symptoms:

The person suddenly feels out of breath after minor exertion
Pain radiating towards the neck, jaw and left arm
Possible pain in the right arm, back or toward the stomach.

The pain typically subsides when the person rests.

First Aid for Angina Pectoris:

- Comfort the casualty.
- Get the person to sit down to avoid the pulse increasing
- Loosen tight clothing.
- If necessary, help the casualty take their medicine.
- Call for help: 1-1-2.
- If the condition worsens: perform First Aid [A B C].

CALL AN AMBULANCE IMMEDIATELY 1-1-2

Heart Disease – continued –**Heart attack**

A blood clot in one of the coronary arteries (these supply blood to the heart) will rapidly reduce the flow of blood to the part of the heart muscle it supplies. When blood supply to this area fails, it will rapidly (within 5 to 15 minutes), be damaged and perish due to oxygen starvation, thereby increasing the risk of cardiac arrest.

Symptoms:

Constant central chest pain, radiating to the neck and jaw
Possible pain radiating to the left or right arm, or towards the stomach
Anxiety, paleness, and cold sweat (risk of shock/circulatory failure)
Rapid breathing
The pain does not pass when resting.

First Aid for Heart Attack:

- Comfort the casualty.
- Get the casualty to sit down.
- Loosen tight clothing.
- If necessary, help the casualty take their medicine.
- Call for help: 1-1-2.
- If the condition worsens: perform First Aid [A B C].

CALL AN AMBULANCE IMMEDIATELY 1-1-2

Vomiting blood

Bleeding in the stomach is the number one cause of vomiting blood. This could be caused i.e. by an ulcer or cancer. The bleeding may be fresh and light red in colour, or there may be vomit that looks like coffee grounds, depending on the location of the bleeding. The bleeding may be so severe that the casualty develops shock/circulatory failure.

Symptoms:

- Light red bleeding or vomit that looks like coffee grounds
- Abdominal pain
- Generally affected with rapid and weak pulse
- Conspicuously pale
- Cold and sweaty skin.

First Aid for vomiting blood:

- Place the casualty in a supportive half sitting position or in a position with the least pain (fetal position) (see figure b on page 28).
- Call for help: 1-1-2.
- If the condition worsens: perform First Aid [A B C]

Dehydration

In the body, water is found inside the cells and in the tissue, and in the blood surrounding them. Water makes up about 2/3 of an adult's weight. Normally, there is a balance between water intake and excretion. Dehydration occurs when the body contains too little water. It most commonly affects sick individuals, infants, the elderly, and people with diarrhea, vomiting or fever, who do not drink enough. Intense physical labour, especially in hot weather, can also lead to dehydration.

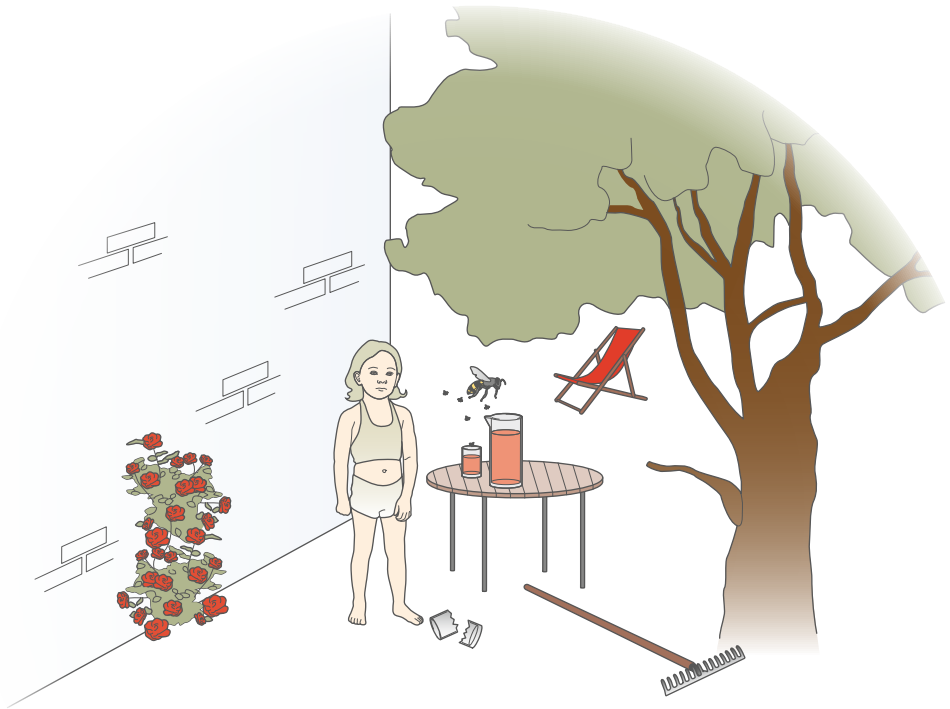
Symptoms:

- Thirst and nausea
- Muscle cramps
- Reduced level of consciousness

First Aid for dehydration:

- Give small sips of water and continue until the casualty is no longer thirsty.
- Plain water is fine. If the casualty has been sweating a lot or has had diarrhea, it is best to provide fluids that contain salts.
- If the casualty's condition does not improve, contact Doctor/Casualty Dept.
- If the condition worsens: Perform First Aid [A B C] and call for help: 1-1-2

Minor Injuries – How to act



Many minor injuries are often easily treated. They rarely require a Doctor or Casualty Dept. attention. However, you must ensure that none of the Vital Systems are compromised.

On the following pages you can read about first aid for the most common types of injuries.

Nosebleed

Nosebleeds may occur spontaneously or due to a blow to the nose. Most often, it can be stopped without medical attention.

First Aid for nosebleed

- Place the casualty in a seated position maybe with their head tilted slightly forward.
- Pinch the nose for 5 to 10 minutes. If possible, the casualty can do this.
- If the bleeding continues: Place ice cubes wrapped in a cloth and place this above the nose/forehead while you keep pinching the nose. The casualty can also suck on an ice cube.

Contact Doctor or Casualty Dept. if the bleeding does not subside after a few attempts (2x10 minutes), or the person starts to feel ill.

Dental Injuries

Blows to the face often involve dental injuries. Knocked-out teeth can often be recovered and must always be brought to the Casualty Dept.

First Aid for dental injuries (permanent teeth)

If the tooth is broken, knocked loose/crooked/up or you cannot bite down:

- Leave the tooth in its place.
- Contact a dentist.

If the tooth has been knocked out:

- It is best to put the tooth back in its place.
- Hold it by the crown, not the root.
- If the tooth is dirty (e.g. soil), then rinse carefully for 10 seconds in running water or saline 0,9%.
- Put the tooth back in the jaw and seek a dentist immediately.

How to store a tooth/fragment:

- If possible, the tooth/fragment should be kept moist and warm.
- Place the tooth or the fragment in a glass with saline 0,9% , milk or saliva or
- Place the tooth in the mouth of the casualty between lower lip and teeth (only applies to teeth, not fragments)
- Seek a dentist immediately
- Do not place teeth or fragments in mouths of children or unconscious casualties, due to airway risk.

Always contact a Dentist

The quicker the tooth is re-attached the better the chance of full recovery

Swelling/bruising

Swelling and bruising occurs after a blow, due to bleeding below the skin. This can cause pain and discolouration of the skin (bruising).

First Aid for swelling/bruising

- ┌ Cool the area (this reduces pain and swelling).
- ┌ Wrap ice cube(s) in a cloth, or take a bag of frozen peas and place upon the swelling.
- ┌ If altered level of consciousness: perform First Aid [A B C].
- ┌ If the casualty suffers from headache, nausea and vomiting as a sign of a concussion, or if you are in doubt.

Seek medical attention.

Cuts

Cuts can be caused by sharp objects, shattered glass, sharp metal edges.

First Aid for cuts

If the wound is larger than 1-2 centimetres in length, or if it is deep, open, in the face, or near a joint:

- ┌ Stop the bleeding and dress the wound.

Contact Doctor/Casualty Dept.

Other/minor cuts require very little treatment:

- ┌ Cleanse the wound with clean water. Try avoiding getting soap directly into the wound-this can cause irritation. You can also use Wipes or cleansing serviettes.
- ┌ Dress the wound or apply a Band-Aid.

Abrasions

Falling on asphalt or concrete often causes abrasions. Uncovered skin is particularly exposed.

First Aid for abrasions

If the abrasion is extensive, in the face, or there are foreign bodies, that cannot be removed:

Contact Doctor/Casualty Dept.

First Aid for abrasions on hands or knees etc:

Cleanse the wound thoroughly with clean water. Try avoiding getting soap directly into the wound-this can cause irritation. You can also use Wipes or cleansing serviettes.

Cover with sterile dressing or plaster.

Minor burns

Hot metal, iron, cooker, etc., are often the cause of minor burns.

First Aid for minor burns

If the burns are second or third degree, or larger than 5-7 centimeters in diameter (or approximately the size of the persons own hand), in the face, near a joint, or near body openings.

Cool with water immediately.

Burns always require, Doctor/ Casualty Dept.

Other minor burns:

Cool as soon as possible with water of 15°- 20° C (must feel comfortable).

Remove loose clothing around the area of the burn while flushing.

Cool until the pain subsides – min. 20 minutes.

Stings and Bites

Bites can be caused by animals or people. Bites may cause muscle damage, also, an infection can occur in the wound. A tetanus injection therefore, is important.

First Aid for bite injuries

If the skin has been broken or the bite is located in the face:

▮ Apply a sterile dressing if the wound is open.

Contact Doctor/Casualty Dept.

Insect stings – bees/wasps

Bee or wasp stings are not normally dangerous, unless the person is allergic.

Special condition: with bee or wasp stings you must pay attention to:

Severe swelling.

Rashes on the body.

Uneasiness.

Difficulty breathing.

Stings inside the mouth.

If the person is known to have severe allergic reactions to insect bites.

First Aid for Bee or Wasp stings, if the sting is in the mouth, throat or there are signs of an allergic reaction:

Call for help: 1-1-2. See First Aid on page 100.

First Aid for bee or wasp stings if the general condition is NOT affected:

- ▮ If necessary, remove the barb (bee stings) with a needle, or scrape it off with a knife.
- ▮ Do not use tweezers (it only increases the amount of venom injected into the body).
- ▮ Reduce pain and swelling with ice.
- ▮ If stung inside the mouth: have the person chew on an ice cube.

Adder Bites

The Adder lives in areas of heather and sand dunes and is very active on sunny summer days. The Adder only bites if it has no possibility of escape. An Adder bite is normally harmless, unless the person is allergic to the venom. However, swelling and pain in the area of the bite is normal.

First Aid for Adder bites

If severe swelling, rashes on the body, uneasiness, and difficulties breathing occur:

CALL AN AMBULANCE IMMEDIATELY: 1-1-2

- ┌ Keep the bitten area rested.
- └ Do NOT cool the bite area.

Everyone who has been bitten by an adder should be observed at the hospital, as poisoning symptoms may develop.

Weever Fish Stings

A weever fish is found in shallow waters along the coastline where it buries itself in the sand and is very difficult to locate. It has a poisonous spine on its dorsal fin, which it raises when threatened, for instance, a bather comes near it.

First Aid for Weever Fish stings

If the person falls ill:

Always contact Doctor/Casualty Dept.

- ┌ Immerse the foot in as hot water as possible. Hot water is an effective treatment. The heat will break down the venom and reduce the pain.

Ticks

A Tick is a mite that bites into the skin leaving only the rear part of the body visible and is found in shrubbery, low vegetation etc. In areas like these the tick will drop down and land on animals or people.

The tick can be a carrier of the Borrelia bacteria or the TBE virus, and left untreated, these bacteria may cause inflammation of the brain, although it is rare. Children must always be examined for ticks after a picnic, etc.

If the tick is removed within 24 hours the risk of Borrelia infection is minimal, and overall, the likelihood of an individual being infected with the TBE virus in Denmark and developing encephalitis is very low.

First Aid for Tick bites

- Remove the tick by using a tick card or tick forceps, which can be found in Falck First Aid kit "Nature" (grab the tick as close to the head as possible),
- Do not follow old folk remedies (burning it with a cigarette, apply grease, etc.), as this may cause the tick to regurgitate its stomach contents, adding to the risk of infection.
- Visit the Doctor if you are unable to remove the tick yourself.

Always visit the Doctor in case of swelling, redness, and/or rashes around the area of the bite.

Removal of Small Foreign Objects

Splinters:

Gardening and woodwork are common causes of splinters, the hands are particularly exposed.

First Aid for splinters

- Remove the splinter with a pair of tweezers (if you can locate and judge its length).
- Pull out in the same direction as the splinter entered.
- Wash with soap and water.

Visit the Doctor if the splinter is hidden, if it is stuck in the wound, or if there is swelling and redness which are signs of infection.

Foreign Objects and trauma to the Eye

Foreign objects in the eye can be wooden splinters from a chainsaw etc. These injuries often happen because the person forgets to wear safety glasses.

Always contact Doctor/Casualty Dept. when:

- [Visible foreign objects are stuck in the eye.
- [There is bleeding or pain in the eye.
- [Double vision.
- [Constant eye watering.

First Aid for visible foreign objects in the eye:

- [Try to remove the foreign object using a cotton bud, unless the object is stuck.
- [Flush the eye from the nose outward.

Foreign objects in the ear

Foreign objects in the ear are common for children as they tend to put small objects into the ear canal. In rare cases a small insect may also enter the ear canal. If the foreign object is not removed, it may cause an infection in the ear, or it may damage the eardrum.

First Aid for foreign objects in the ear

If you cannot see or remove the foreign object with tweezers, or if the person feels pain or soreness in the ear:

Visit Casualty Dept.

- [Remove the foreign object with tweezers etc., if you can see it.
- [Remove insects by carefully flushing the ear using an aural syringe, ensuring the insect comes out.

Minor Injuries – Continued –

Foreign objects in the nose

Foreign objects in the nasal cavity, as with foreign objects in the ear, occur most often with children. Days may pass by before you notice the problem. Perhaps the child has a nosebleed or blood soaked, foul-smelling discharge may appear from the nose. The foreign object may cause inflammation in the nose, or the child may swallow the object and risk choking.

First Aid for foreign objects in the nose

- [Remove the foreign object with tweezers, if the object is visible.
- [Get the person to blow the foreign object out through the nose.

Always contact Doctor or Casualty/Dept. if:

- [You cannot see or remove the foreign object with tweezers.
- [A foul-smelling discharge appears from the nose.

If a foreign object enters the airway: perform First Aid [A B C].

Vaccinations:

The majority of people in Denmark have received basic vaccinations when they were children. These vaccines are in effect until you get your next vaccine, as recommended by the National Board of Health. Make sure that your vaccinations are "up to date".

Minor injuries may pose a slight risk of infection. Therefore, a Tetanus injection is recommended.

Consult a Doctor if you are in doubt whether or not your vaccination, or the vaccination of someone else, provides full coverage.

Hygiene and Infections

Microorganisms are the collective term for bacteria, viruses and fungi. They are found in soil, water, air and on all surfaces. The majority of microorganisms are harmless. Even harmless microorganisms can cause infection for people with reduced immune system function. The skin provides good protection against intruding bacteria. If the skin is damaged, bacteria may enter the underlying tissue causing an infection. Bacteria are found on the object of penetration as well as on the surface of the skin. As the skin is damaged, the risk of infection may slow down the healing.

Signs of inflammation:

Swelling
Redness
Soreness
Warm skin
Pain.

First Aid for an infected wound

- Never touch the wound with your fingers.
- Protect the wound with a sterile dressing.
- Ensure good hygiene (water and soap).

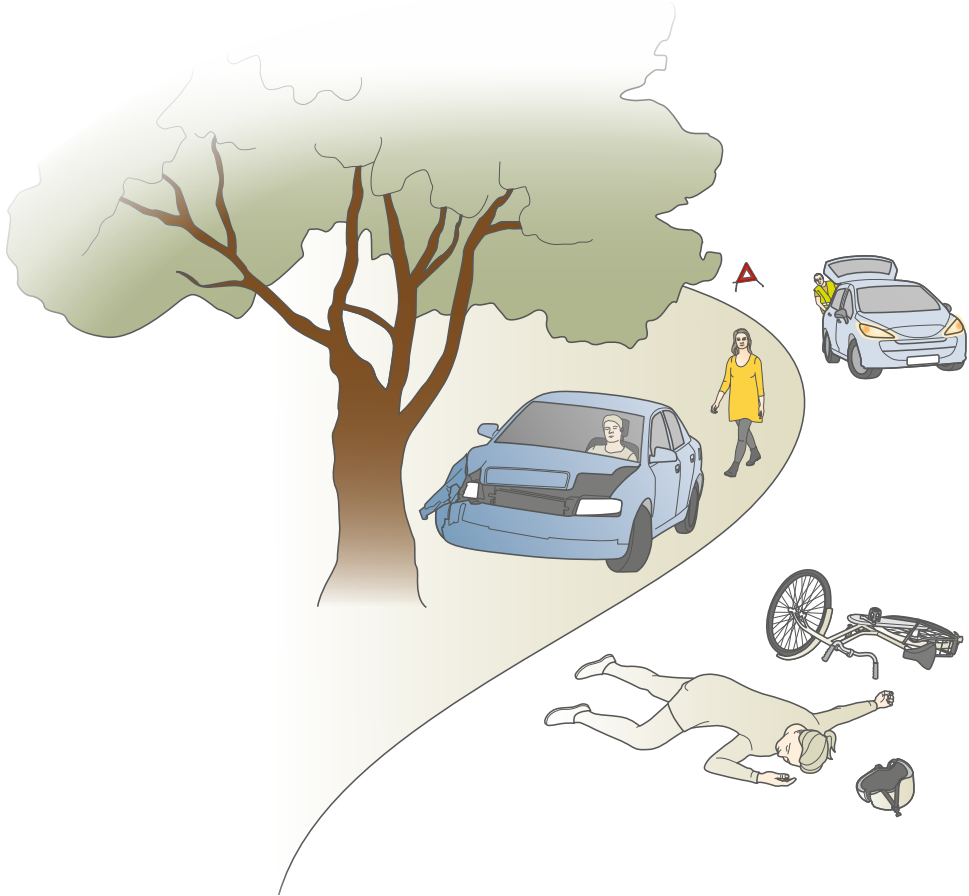
When paying attention to the above points you can avoid further infection.

Important: When dealing with massive bleeding, do not worry about infection, but stop the bleeding by inserting your finger, or hand, directly onto the wound.

Infection risk of HIV and Hepatitis?

It has been a widely held view that you can be infected with Hepatitis or HIV when performing first aid. The risk of an infection is very small and should not prevent you from performing first aid.

Good hand hygiene is the best prevention against infection



Dealing with Minor and Major Accidents

Most accidents we come across are minor accidents.

Some incidents involve several injured casualties, such as road traffic collision with several cars involved. In situations like these, it is vital that you keep calm and get an overview of the extent of the accident. Follow the 3 Main Points of First Aid carefully.

When dealing with major accidents, it can be difficult to get an overview of the extent of the accident. In some situations, it may be necessary to call for help first before trying to rescue people.

Safety on the scene of the accident

There is always a risk aspect at the scene of an accident and the situation may escalate. The ever increasing traffic may pose a threat to the casualties, as well as the first-aider, as long as the oncoming traffic has not been stopped or regulated.

It is important to secure the scene of the accident.

How to secure the scene of the accident:

- Place your car at a distance to the accident and turn on the hazard warning lights.
- Place a warning triangle.
- Stop any running machinery.
- Switch off running engines.
- Bring a powder extinguisher (a minimum of 2 kgs).

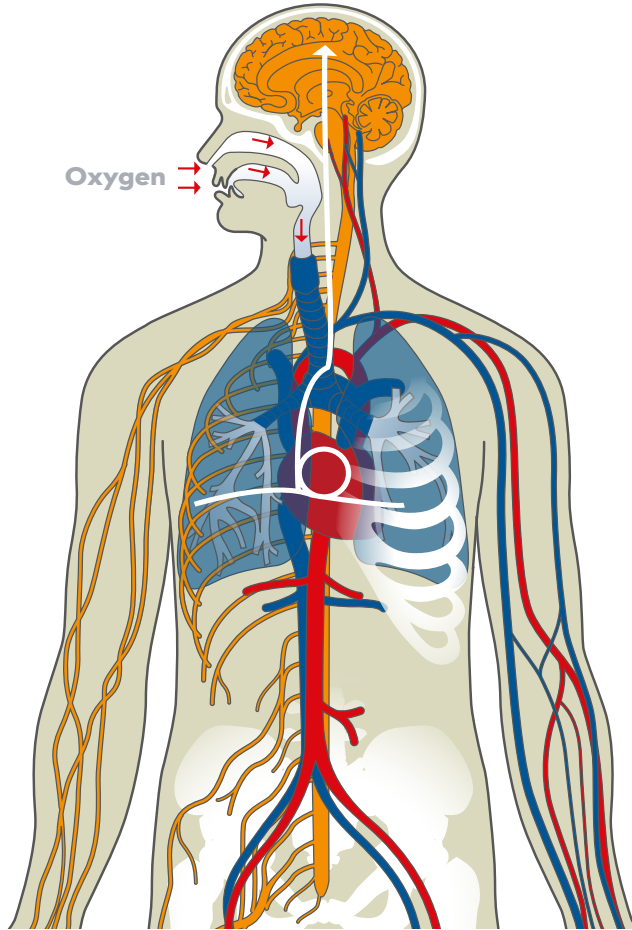
Major Accidents

In a major accident the conditions vary compared to minor day-to-day accidents. It is vital to follow the 3 Main Points of First Aid.

When there are several casualties, it is vital to determine who gets treated first. It is vital that you react according to the A B C rule, thus securing the vital systems for as many casualties as possible

The Emergency Dispatch Centre will connect your call to a medical professional who will guide you through triage and first aid.

fig. a



The Vital Transportation of Oxygen

All cells of the body need oxygen to maintain their functions. Some cells can only survive a few minutes without oxygen before suffering damage, these include the brain cells. Brain cells have a great need for oxygen and are particularly sensitive to lack of oxygen. Should the brain cells perish due to lack of oxygen, it will influence the rest of the body, as the brain controls the functions of the body.

The Brain Cells are without oxygen if:

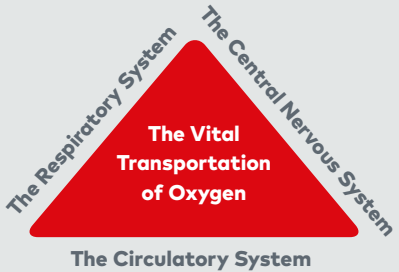
- ┌ The lungs are not supplied with oxygenated air
- └ The brain is not supplied with oxygenated blood.

Therefore, always try to maintain the functions of "The Vital Systems":

These 3 systems make up "The Vital Transportation of Oxygen". All 3 systems are essential in order to maintain normal life functions. (see fig. a).

The following must be done:

- ┌ Secure the casualty's breathing
- └ Secure the casualty's circulation.



If one of the vital functions suffers injury in an accident or illness the system may fail, leaving the person in mortal danger. Assess the casualty; evaluate the need for first aid.

Example:

If a person hits their head, this can affect the central nervous system. Their consciousness may be affected and breathing may be compromised.

The central nervous System, the respiratory system and the circulatory system are called "the vital systems," these can only be without oxygen for a short amount of time before the body functions cease. It is vital that these systems function as well as possible. Therefore, treatment of these systems has first priority in a first aid situation.

THE CENTRAL NERVOUS SYSTEM

The central nervous system controls all functions of the body through the aid of the different senses (touch, sight, hearing, taste and smell). This system perceives all that goes on around us. The central nervous system processes all these impressions and tells the body how to react.

You may compare this system to an electrical system where the spinal cord is one big power cable. Instead of metal wires, it consists of nerves that send signals to and from the brain.

Some functions of the central nervous system are carried out autonomously, while others are actively produced, such as when driving your car and the light changes to red, which in turn, makes you move your foot from the accelerator to the brake pedal.

THE RESPIRATORY SYSTEM

The respiratory system supplies the cells with oxygen. In the lungs, the oxygen gets transferred into the bloodstream and the bloodstream transfers new oxygen to the cells of the body. The respiratory system also transfers waste products (carbon dioxide) away from the lungs.

THE CIRCULATORY SYSTEM

The circulatory system is the internal transportation system of the body. This system transfers oxygen, nutrients to the area of energy exchange in the other organs of the body, this is vital for their ability to function.

THE DIGESTIVE SYSTEM

The digestive system processes and breaks down the nutrients in order for them to be absorbed into the bloodstream and transported around the body. The surplus food (not being utilised) is expelled through the rectum as faeces.

THE ENDOCRINE SYSTEM

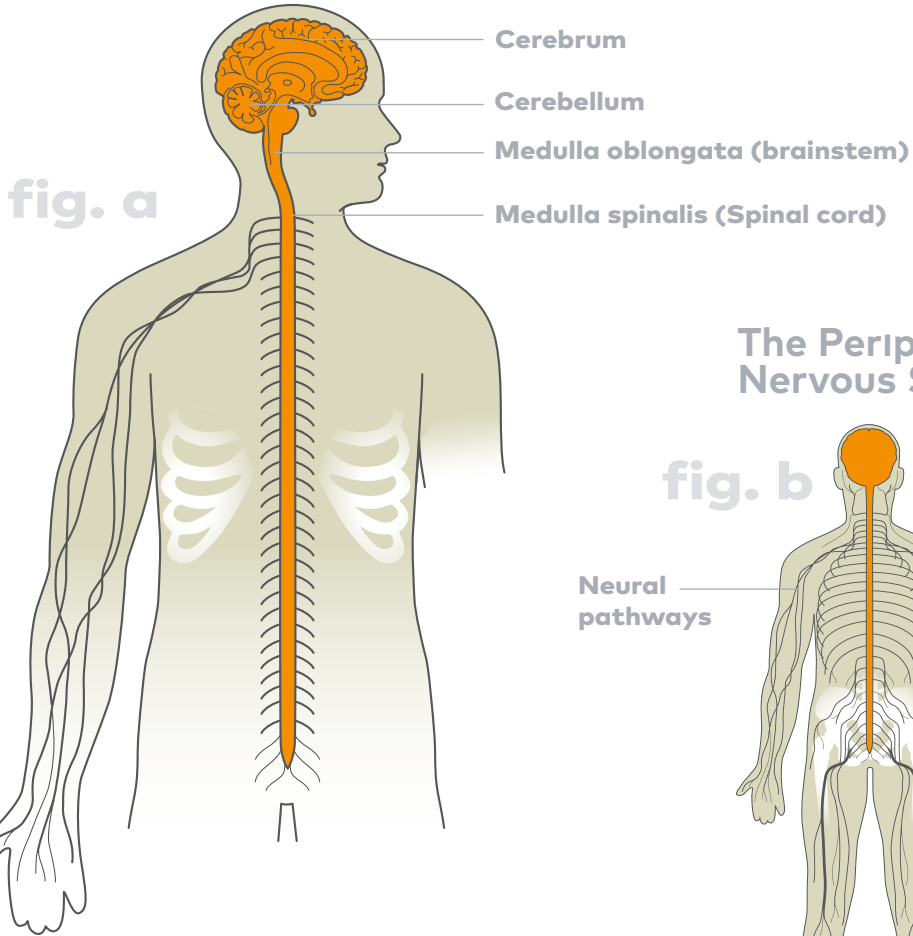
Waste products from cellular metabolism are expelled through urination. A number of mechanisms cooperate in regulating the fluid balance in the body, the kidneys playing a central role. Water and salt are expelled during urination and sweating. Small amounts of fluid are also lost during the breathing process and through the bowels. Furthermore the endocrine system aids the regulation of the acidity in the blood.

THE SKELETAL-MUSCULAR SYSTEM

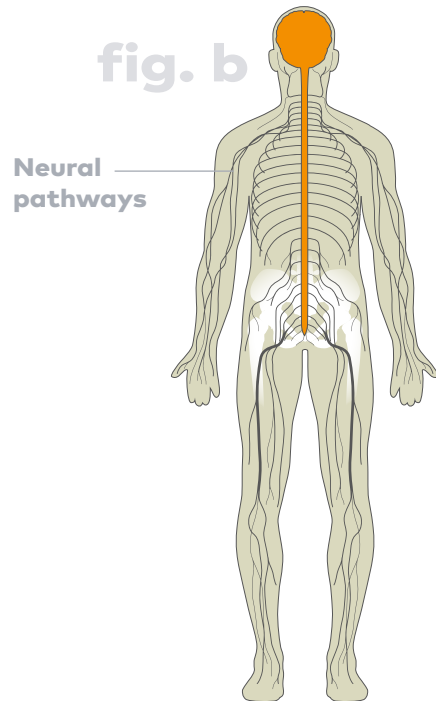
The skeleton is the framework that gives the body its shape and provides stability. The skeleton also has a protective function, as it shields the vital organs.

Muscles enable us to move. Muscles and tendons are connected to the bones. Muscle contraction and relaxation provide movement. This can be done actively or autonomously (see section on central nervous system).

The Central Nervous System



The Peripheral Nervous System



The central nervous system plays a vital part in human existence and behaviour.

The Nervous System is divided into 2 main areas:

- [The Central Nervous System.
- [The Peripheral Nervous System.

The Central Nervous System

The Central Nervous System consists of the cerebrum, cerebellum, medulla oblongata and medulla spinalis (see fig. a). This system is protected by the skull and the vertebrae. The system is enclosed in spinal meninges, cerebral meninges, and cerebrospinal fluid.

In the cerebrum or the cerebellum the human sensory perceptions are converted into actions or reactions. The medulla oblongata houses the respiratory centre, circulatory centre, and the centre controlling consciousness.

The Peripheral Nervous System

The Peripheral Nervous System is the distal part of the nervous system that exits from the spinal cord to reach all parts of the body. These neural pathways exit the spinal cord through small holes in between the vertebrae. These neural pathways are made up of bundles of nerves going to and from the central nervous system (see fig. b). From the spinal cord, the nerve pathways branch out to the rest of the body (see fig. a).

Topographical anatomy

Where is the Central Nervous System located?

(Location from external landmarks)

The Central Nervous System is protected by the skull, as well as the vertebrae of the spine.

Consciousness is divided into 4 levels:

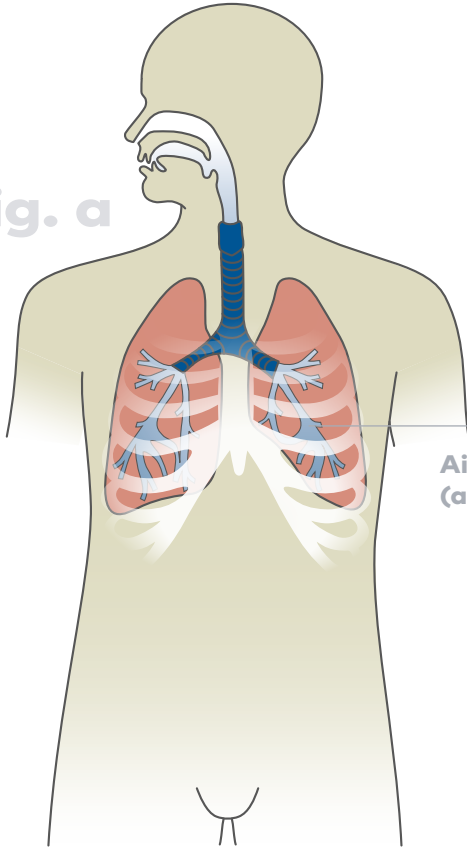
- 1) Awake
- 2) Groggy
- 3) Sleeping
- 4) Unconscious

A casualty at level 1, 2 or 3 can be woken. This enables you to ask the person what has happened. An unconscious casualty will not wake up if you speak, shout, or gently shake. Therefore, it is vital to perform first aid immediately.

Why is it dangerous to be unconscious?

Unconsciousness is a result of an injury to the central nervous system. An unconscious person will relax all muscles, and vital reflexes will stop functioning. If the unconscious casualty vomits, the withdrawal reflex is not functioning, leaving the casualty in danger of suffocating, as the vomit may enter the trachea (see page 10). If the casualty is lying on their back, their tongue may fall into the back of the throat, cutting off air supply. Without basic resuscitation this can cause suffocation and death.

fig. a



Air sacs (alveoli)

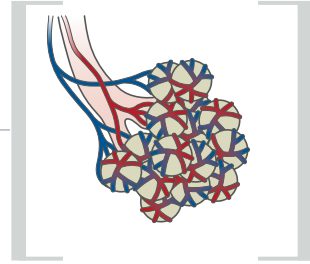
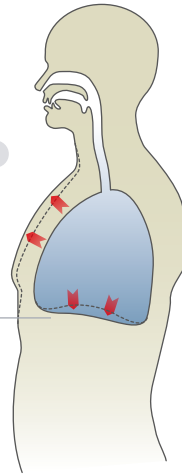


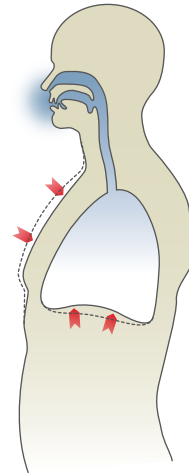
fig. c

fig. b

Diaphragm



Inhaling



Exhaling

The respiratory system transports oxygen from the air into the body, through inhaling, then transporting waste products (carbon dioxide) in the other direction, through exhaling. Furthermore, the respiratory system allows us to talk and stimulates the sense of smell.

The respiratory organs are:

- Respiratory muscles
- Lungs
- Airways.

The respiratory muscles

The respiratory muscles comprise of the intercostal muscles and the diaphragm.

Inhaling is when the diaphragm is lowered and the intercostal muscles contract, thus enlarging the thoracic cavity and lungs. Air enters through the trachea and the bronchi. The bronchi divide into smaller and smaller branches, ending in the alveoli (smallest structures of the lungs, see fig. a).

Exhaling is when the intercostal muscles and the diaphragm relax, thus decreasing the thoracic cavity, allowing the lungs to squeeze out the air. Breathing alternates between inhaling and exhaling. Oxygen uptake occurs during inhaling and is used in cellular metabolism.

Carbon dioxide (CO₂) the waste product from the metabolism, is expelled from the body during exhaling.

If a person experiences difficulty breathing it may prove necessary to use the auxiliary breathing muscles, such as the neck, back and abdominal muscles.

Lungs:

Each lung is enveloped by a two-layered membrane (pleura). The inner pleura is attached to the lung tissue while the outer pleura is attached to the diaphragm and the inside of the chest wall (thorax). The space between the two pleurae hold a vacuum that keeps the lungs expanded. Fluid between the pleurae prevents friction during inhaling and exhaling. This way the lungs are "glued" to the respiratory muscles.

An adult at rest breathes between 12 and 20 times per minute. The inhaled air contains 21% oxygen and the exhaled air contains 17% oxygen. The body only uses 4% of the inhaled oxygen and the high level of oxygen in our exhaled air makes rescue breaths possible.

The airways:

The airways consists of the upper and lower airway.

The upper airway consists of:

- Nasal cavity
- Pharynx
- Larynx and Epiglottis.

Foreign objects in the airway

fig. a

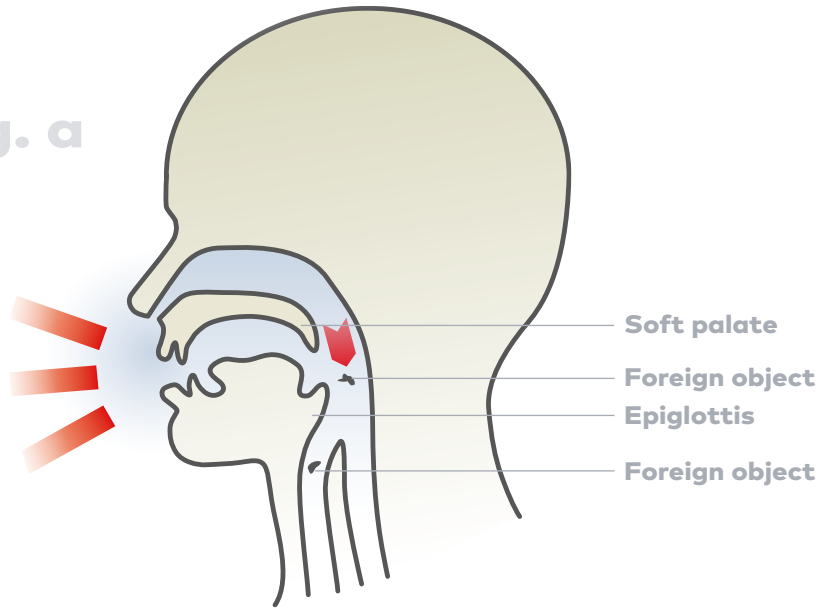
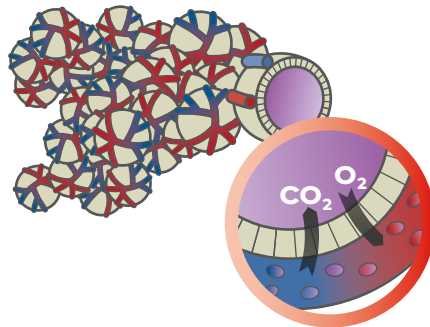


fig. b



The Nasal Cavity

The nasal cavity cleanses, moistens and warms up the inhaled air.

The pharynx houses the larynx and the epiglottis. The epiglottis prevents food from entering the trachea. The food is chewed into a food pellet and is pushed, by the tongue, toward the pharynx. The soft palate closes off, preventing the food from entering the nasal cavity. Simultaneously, the epiglottis folds down to prevent food from entering the trachea. Now the food only has one way to go, down the oesophagus.

Larynx

The Larynx has reflexes protecting the trachea from foreign objects. If a foreign object enters the trachea, a powerful cough reflex is triggered. This coughing reflex ensures that the foreign object is immediately ejected from the Pharynx (see fig. a).

The lower airways consists of:

- Trachea
- Two main bronchial branches.

Trachea

The Trachea is held open by cartilage rings and muscles. Located inside the trachea are small hairs, (cilia) these cilia prevent particles from entering the lungs. These particles can then be coughed up.

The trachea branches out into two main branches called bronchus. From here they divide into numerous smaller branches, called bronchi, down to the smallest units of the lungs, called alveoli. The lower airway can be compared to a tree, where the stem corresponds to the trachea, and the branches to the bronchi and the leaves to the alveoli.

The gas exchange between oxygen and carbon dioxide (from the metabolism in the cells) takes place in the alveoli. The walls between the alveoli and the blood vessels are very thin allowing gas exchange. The inhaled oxygen in the alveoli enters the bloodstream this way. The carbon dioxide is also able to enter the alveoli and leaves the body through exhaling (see fig. b).

Topographical anatomy

Where are the lungs located?

(Location from external landmarks)

The top of the lungs start where the collarbone and breastbone join one another. They fill up most of the chest cavity. On the forward side, the lungs end by the 5th or 6th rib resting on top of the diaphragm, approximately a hand's breadth below the armpit, or in a straight line between the nipples. On the rear side, they reach the 9th or 10th rib, almost at the edge of the rib cage. The lungs are well protected by the ribs.

fig. a

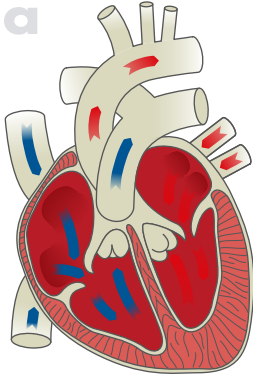


fig. b

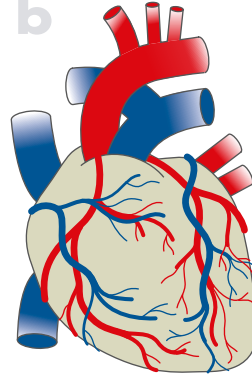
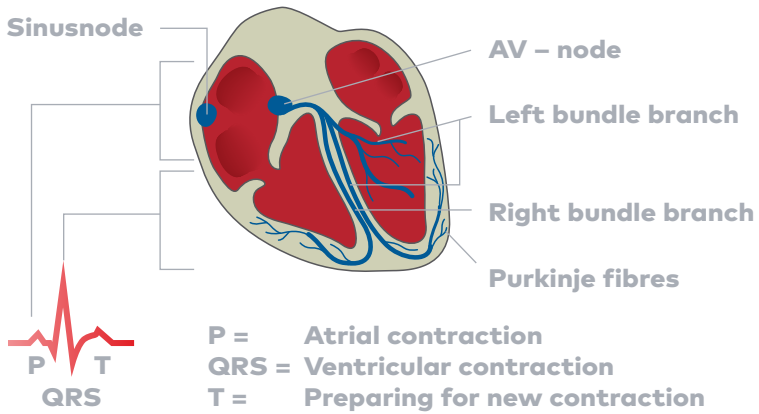


fig. c



The Circulatory System Consists of:

- The heart
- Blood vessels
- Blood.

The Heart

The heart is a large muscle, about the size of your own fist. The resting pulse of an adult is about 60-80 times per minute, each time ejecting approximately 70 ml of blood in the space of 1 min. In this time the heart has pumped 5 or 6 litres (the total blood volume).

The heart itself is divided into a right and left side by a wall (septum) (see fig. a). Each side is again divided into two chambers, the atria and ventricles. The atria and ventricles are separated by a flap valve, allowing the blood to move in only one direction. The oxygen supply to the heart muscle takes place in the heart's own blood vessels, the coronary arteries. They exit from the very start of the Aorta just after leaving the left ventricle.

The coronary arteries create a network of blood vessels which embrace the entire heart muscle, (see fig. b). These vessels in turn divide into capillaries to cover the entire coronary network supplying the underlying cells with oxygen. On the illustration you can see the different branches of both the arteries and veins. One of the most common causes of heart failure is a blockage, either total or partially in one of these vessels.

The Hearts Electrical System (see fig. c)

The hearts contractions are triggered through electrical impulses, these cause the muscles in the heart chambers to contract in a precise orderly way. The hearts rhythm is controlled by the sinus node, this is placed high up on the right atrium. The sinus node sends impulses down through both atria, causing them to contract, the impulse is then passed to the AV node (Atrioventricular node). The AV node is a centre in the septum, lying between the atria and ventricles. This centre ensures the impulse is passed, through fibres, telling the ventricles to contract. In the AV node, the signal is slightly delayed ensuring that the atria and ventricles do not contract simultaneously.

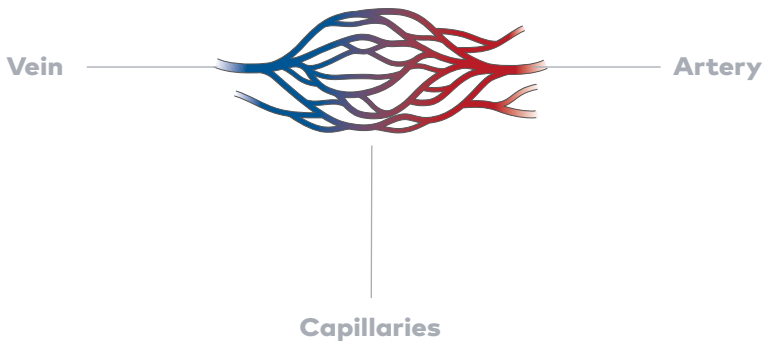
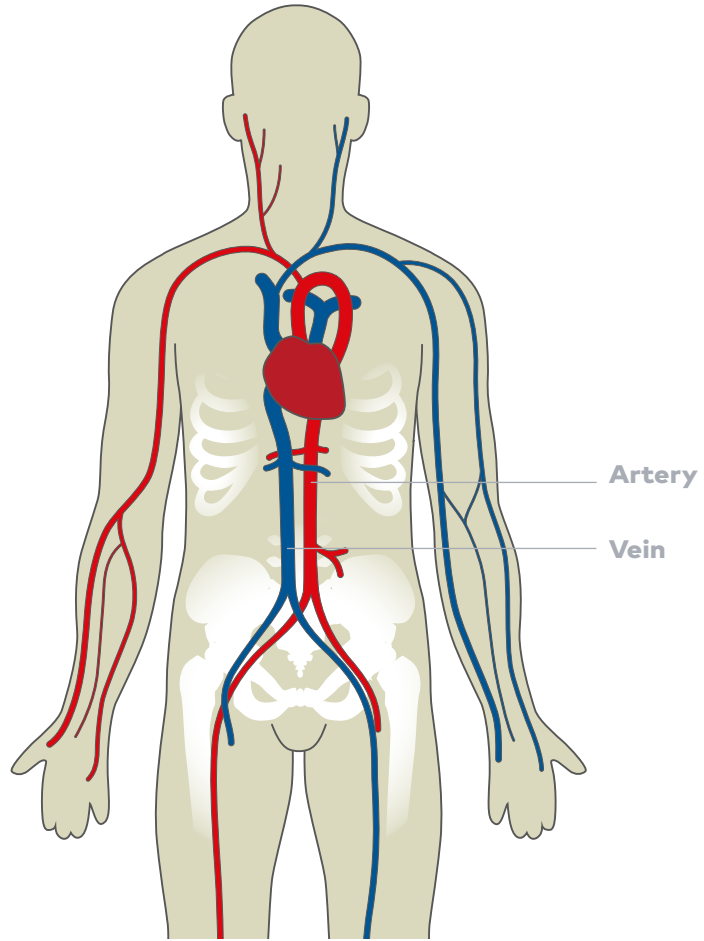
Topographical anatomy

Where is the heart located?

(Location from external landmarks)

The heart is well protected behind the breastbone. In an adult person, the heart is placed three finger widths from the lower part of the breastbone. The lower part of the heart is placed right above the diaphragm muscle, slightly turned to the left. This corresponds to a hand's breadth below the armpit or a straight line between the nipples.

When giving CPR you should press in the centre of the chest, the area explained above.



Heart – Continued –

When the heart chambers contract they send blood simultaneously from the left and right ventricle into the systemic and pulmonary systems. It is the electrical impulse from these contractions that you can see on an ECG.

These impulses are identified with the letters, **P QRS T** and are a picture of the hearts electrical discharge. See illustration on page 126 (fig. c).

When a defect occurs in the electrical system, you can in some cases, restart the heart again with an electric shock from an AED.

The blood vessels:

Transportation of blood occurs through 3 types of blood vessels:

- [Arteries
- [Capillaries
- [Veins.

Arteries

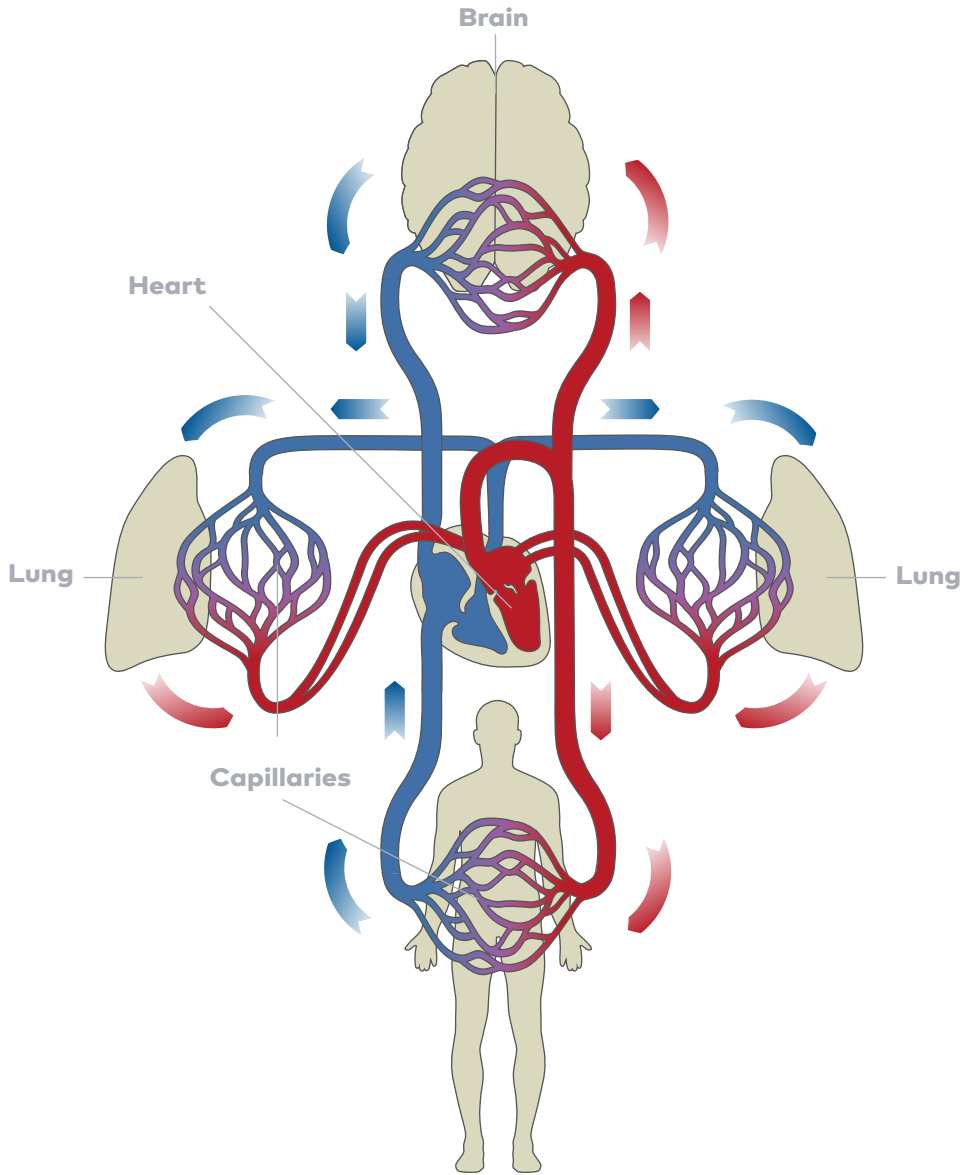
Arteries belong to the systemic part of the circulatory system supplying oxygenated blood and nutrients from the heart (left ventricle) to the cells, as well as non-oxidized blood from the heart (the right ventricle) to the lungs.

The Capillaries

The arteries reduce in size eventually becoming capillaries which are blood vessels where oxygen and nutrient uptake to the cells occur. Waste products from the cells are expelled also utilizing the capillaries. The capillaries then merge into larger vessels called veins (see the above mentioned). Waste products in the veins are expelled through the kidneys, liver, breathing, etc. (see page 131). The exchange of oxygen and waste products between blood and cells occurs in the capillary network.

Veins

Veins transport blood, low on oxygen, back from the cells (to the right atrium) and oxygenated blood from the lungs to the heart (the left ventricle).



De - oxygenated blood ■
Oxygenated blood ■

The Blood

In an adult person weighing 80 kg, the total blood volume is approximately 5-6 litres (8% of the person's weight). The blood consists of two main parts, blood plasma and blood cells.

Blood plasma is a liquid that carries the blood cells around the body. Blood plasma by the muscles close to the also carries nutrients and waste products.

The blood cells may carry oxygen, nutrients and waste products. Other blood cells help fight infections and stop bleeding. The blood cells are divided into 3 subgroups:

- Red blood cells – transportation of oxygen
- White blood cells – defence against infection
- Platelets – coagulation of blood.

The Circulatory System

The circulatory system can be divided into the systemic and the pulmonary.

The Systemic System

The systemic system, carries oxygen rich blood from the left ventricle to the entire body, supplying oxygen and nutrients to the body's cells, this blood is then returned to the right atrium.

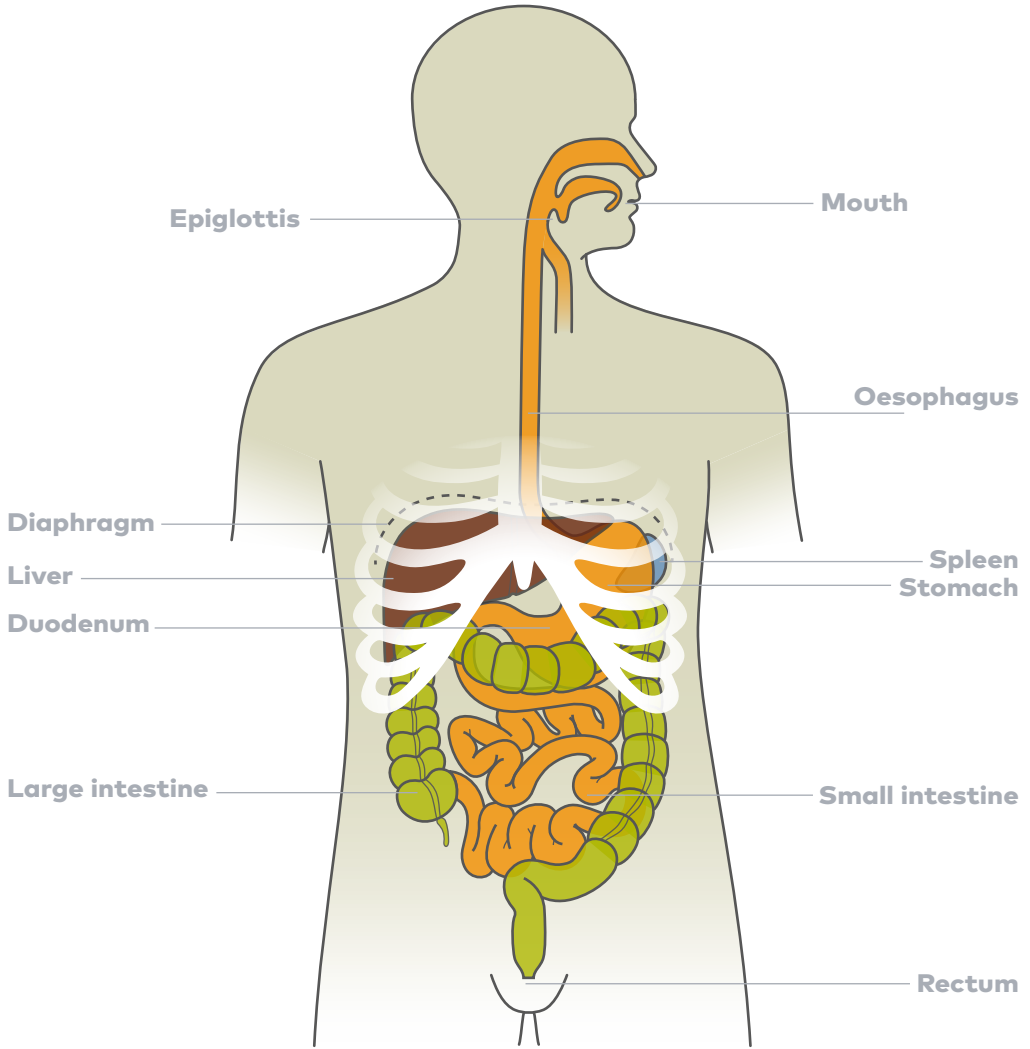
As the oxygen and nutrients are metabolised in the cells, the blood filled with waste products from the metabolism (in the cells) is carried back to the right side of the heart. This happens through the veins, partly by the aid of a vacuum that builds up in the chest during breathing and is partly due to the pressure provided thin walls of the veins, also called the "Vein pump".

Internally the veins are equipped with one-way venous valves ensuring that the blood returns to the heart.

The Pulmonary System

The pulmonary system carries the non-oxidized blood from the right side of the heart into the lungs where oxygenation of the blood occurs. The blood is then carried back to the left side of the heart. The exchange of carbon dioxide(CO₂) and oxygen occurs in the lungs (see section about the respiratory system).

Furthermore, the circulatory system helps regulate the body's temperature and fight infection.



The Digestive System consists of:

- Mouth
- Oesophagus
- Stomach
- Duodenum, small and large intestine
- Pancreas
- Liver
- Gallbladder
- Rectum.

Nutrients are derived from the food and liquids you consume. The body needs nutrients in order to grow, repair and produce energy.

The stomach and intestines process the food and liquids consumed by chemically moulding, grinding and dividing the nutrients in order for them to be digested through the intestines.

The blood carries the nutrients around the body. Many of the nutrients are converted and deposited for later use.

The liver is comparable to a chemical factory. It metabolises, converts and deposits the nutrients in order to use them in other areas of the body. Non-digested food and liquids are expelled from the body as faeces or urine.

Topographical anatomy

Where are the Stomach and Liver located?

(Location from external landmarks)

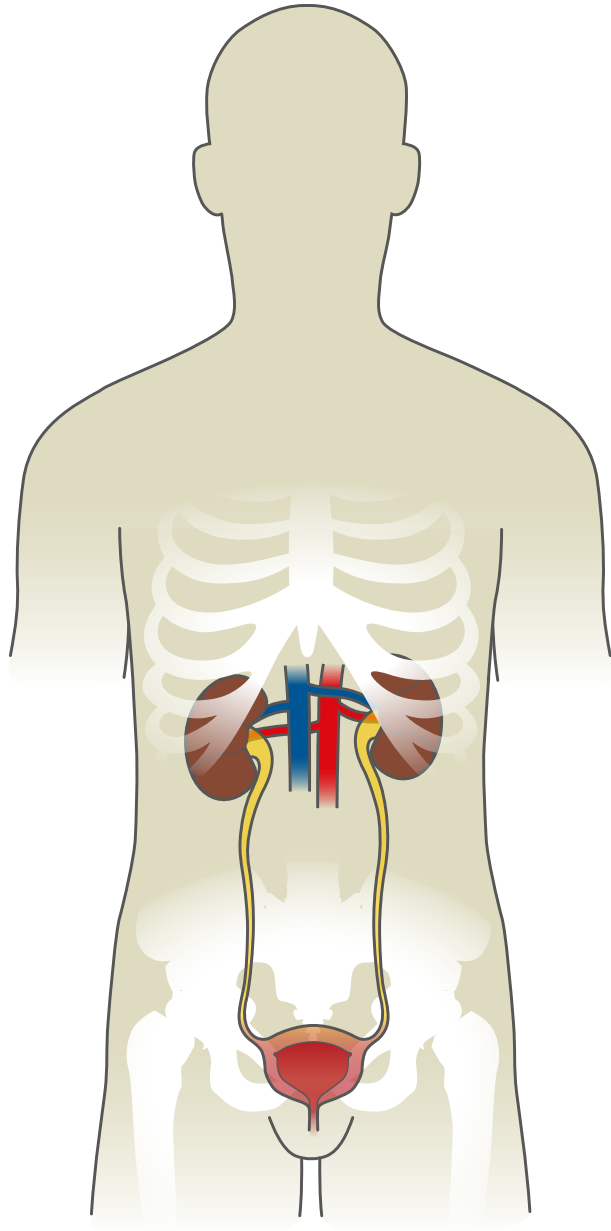
The Stomach

The stomach is located in the upper left side of the abdominal cavity. It is placed at the back and is resting upon the spleen. The stomach is located just below the diaphragm and is very close to the heart only separated by the diaphragm, making it difficult to sometimes determine whether pain is located in the heart or the stomach.

The diaphragm muscle is located by "drawing" a line above the chest, one finger's width below the nipple. You may also place a hand under the armpit. Follow the lower edge of your hand across the chest. This corresponds to the location of the diaphragm muscle.

The liver

The liver is located in the upper right part of the abdominal cavity just below the diaphragm. You can visualise the location of the liver by "drawing" a triangle from the lower part of the rib cage in the right side, across to the right nipple, across to the left nipple and back to the lower part of the rib cage.



Waste products from the cells are expelled through the urine, a number of mechanisms cooperate in keeping the organisms natural fluid balance in control, the kidneys play a vital role in this. Water and salt are expelled during urination and sweating. Small amounts of fluids are also expelled during breathing and faeces. The endocrine system also helps regulate the acidity of the blood.

The Endocrine System Consists of:

- Kidneys
- Spleen.

The Kidneys

In order for the body's different fluids to remain optimal in volume, concentration and composition, the kidneys must:

- Expel waste products from the metabolism of the cells
- Regulate the body's fluid balance
- Regulate the concentration of salt in the blood
- Help regulate the acidity of the blood (pH).

The Spleen

The spleen completes production of the white blood cells and destroys older red blood cells. The spleen also functions as storage for red blood cells.

When the body needs an increased amount of red blood cells to transport oxygen, the spleen releases its deposit into the bloodstream by muscle contractions. This is felt as pain in the side (stitch) and is often experienced during hard physical exercise.

Topographical anatomy

Where are the kidneys and spleen located?

(Location from external landmarks)

The Kidneys

The kidneys are located upwards in the rear of the abdominal cavity. They are located against the three lowest ribs on each side of the spine. Approximately two thirds of the kidneys are protected by the ribs.

The Spleen

The spleen is located in the top left part of the abdominal cavity, just below the diaphragm and the rear part of the ribs. It is located close to the 9th, 10th and 11th rib.

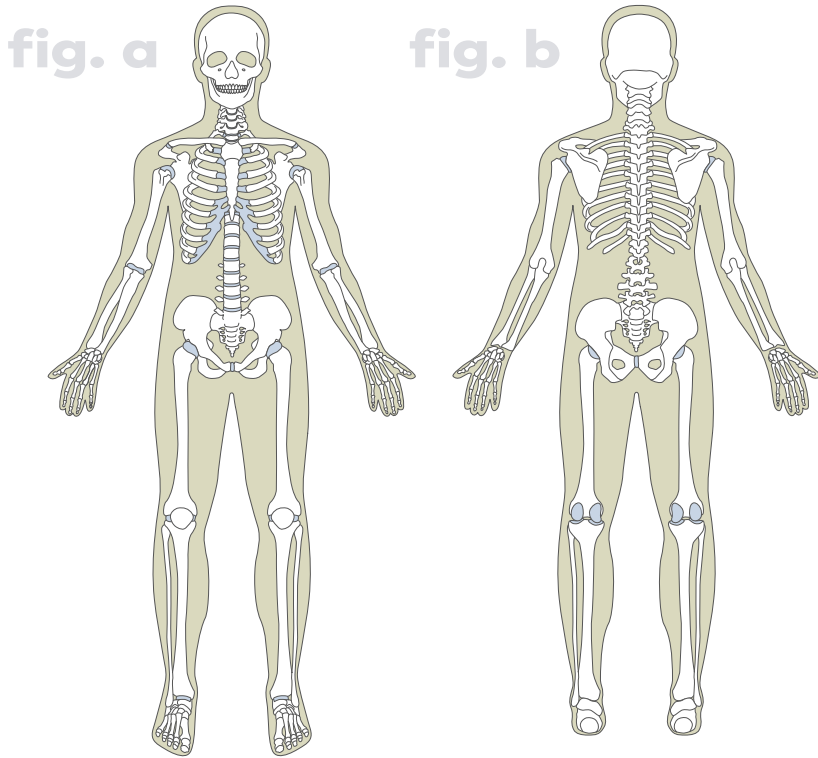
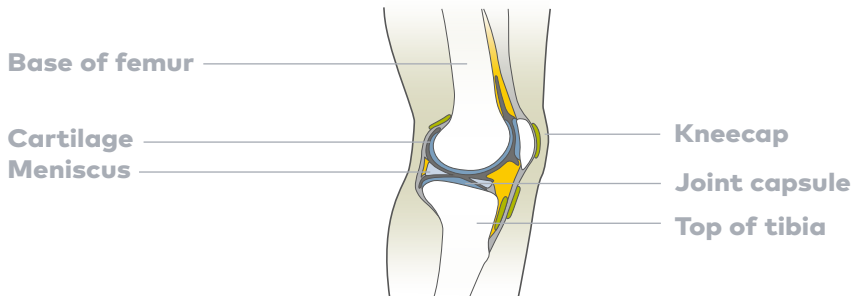


fig. c Knee joint



The Skeletal-Muscular System Consists of:

- Bones
- Joints
- Muscles.

Bones

The skeleton consists of approximately 200 bones and makes up for 20% of the body weight. The skeleton is the body's largest mineral deposit.

The Bones Function

The bones stiffen the body and provide a place of attachment for muscles, as well as some soft organs. The bones provide protection for vital organs, such as brain, heart and lungs.

Combined with the joints, the bones form a system of weights and rods that convert muscle contractions into movements of the body and limbs.

Some bones contain red bone marrow where the blood cells are produced (red and white as well as platelets). The bones are covered by a tissue called periosteum, which is rich blood vessels that supply the bone cells with oxygen and nutrition.

Bones are divided into 3 types according to appearance:

- Tubular bones**
Located in arms and legs
- Flat bones**
As in shoulder blades, pelvis and breastbone
- Irregular bones**
As in the vertebrae and bones in the hands and feet.

Bones are built from osseous tissue. Even though osseous tissue seems stiff and dead it is a living tissue in constant decomposition and regeneration.

Joints

The part of the bone that connects to a joint is covered with a thick layer of cartilage, easing movement between the bones. A joint is the location where two or more bones connect. This construction allows movement.

Joints are divided into:

- Synovial joints**
- Fibrous joints.**

Synovial joints

Synovial joints consist of bone extremities covered with cartilage and a joint capsule, creating a cavity filled with synovial fluid. The synovial fluid lubricates the joint and nourishes the cells of the cartilage. Strong ligaments cover the joint capsule crosswise, they stabilise the joint and prevent extreme movements. The joints on the fingers are good examples of synovial joints.

The knee joint is one of the largest and most complex joints in the body. Two small disks, (menisci) cover the joint in order to distribute the pressure from the body over a larger area.

fig. a

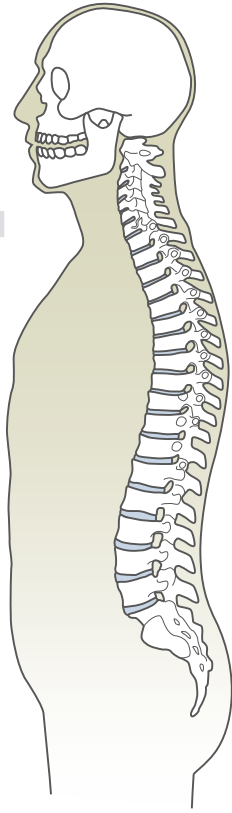


fig. b

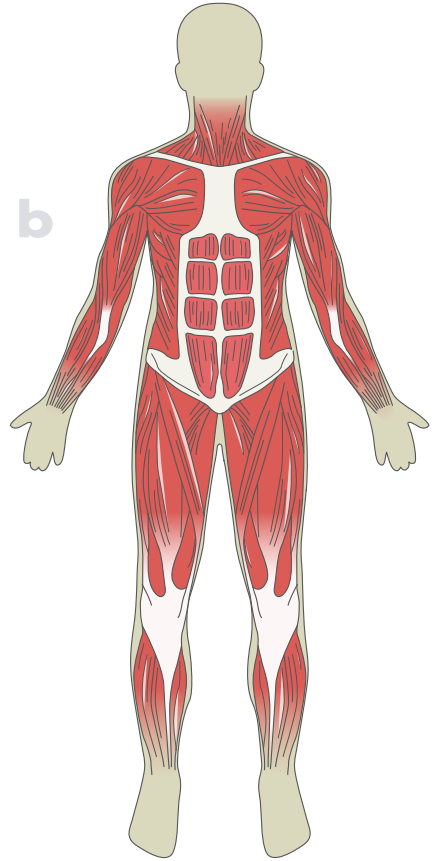


fig. c

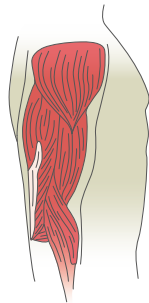
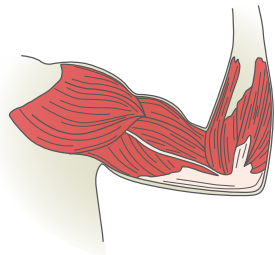


fig. d



Fibrous joints

Fibrous joints consist of the extremities of two bones that are directly connected by cartilage or connective tissue of various thicknesses. The movement of fibrous joints are very limited, as in between the cranial bones, the vertebrae and pubic bones.

The spine consists of vertebrae, these are irregular bones placed on top of each other. Between the vertebrae are cartilage disks, allowing the spine a certain amount of mobility.

Muscles

The muscle tissue takes up almost half the body weight in a fit person. Besides movement, the muscles:

- Assist in balance and support
- Protect body and organs
- Perform peristaltic movements (i.e. bowel and oesophageal movements)
- Regulate the bloodstream and body temperature.

Muscular exertion requires large amounts of oxygen and many nutrients.

Skeletal muscles – they keep the body in balance

Skeletal muscles consist of cells held together by bundles of connective tissue. In the muscle extremities the connective tissue connects with tendons. The tendons are attached to the bones, thus one muscle extends over one or several joints.

As the muscle changes in length by either tension or relaxation, the joint is moved. The skeletal muscles constantly adjust the position of the different body parts, keeping the body in balance.

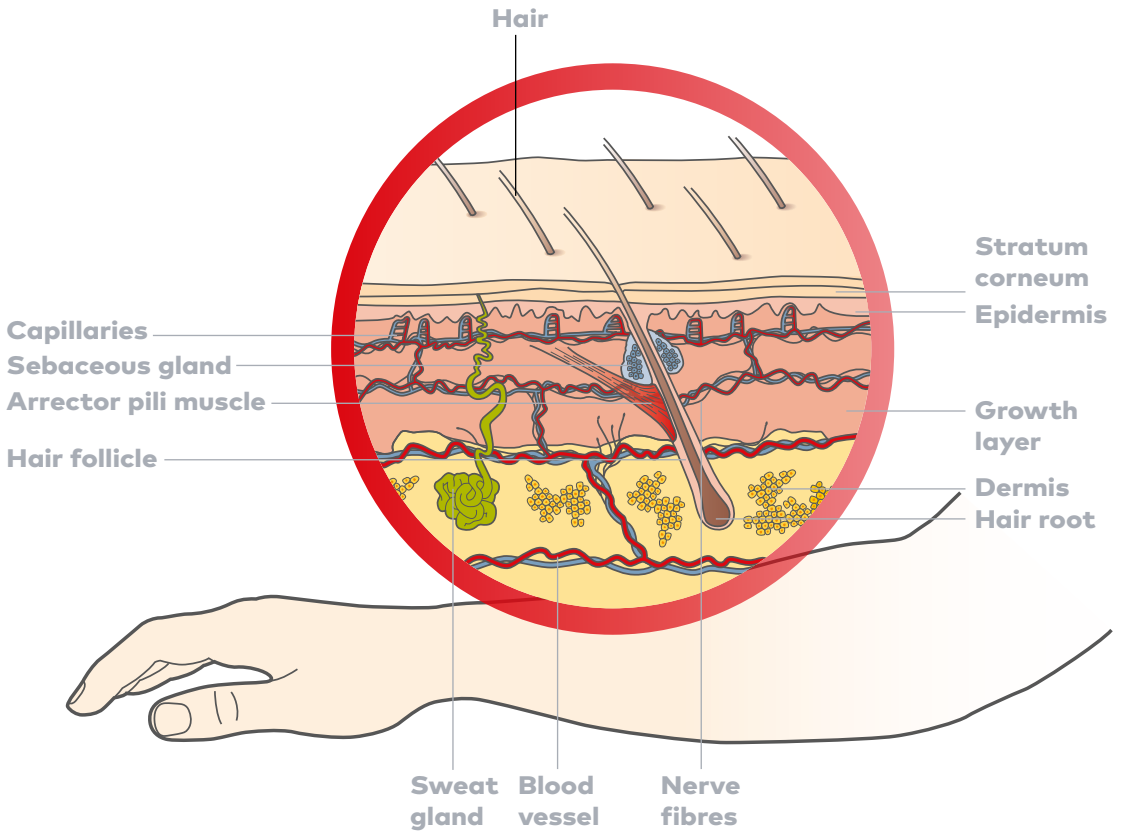
Lactic acid build-up

With hard physical exercise the muscles tap into their own glucose deposits, metabolizing the glucose without oxygen and converting the waste product into lactic acid. Lactic acid build-up causes pain and muscular fatigue.

The Muscles are controlled by the Nervous System

We decide what actions we wish to perform but the autonomic nervous system ensures a constant state of muscle tone, making sure that they are always ready to react.

When muscles are in motion, heat is produced in order to maintain a normal body temperature. When the muscles in the arms and legs are in motion they add pressure to the veins. The muscles in the arms and legs are part of the "Vein pump".



The Skin

The surface of the body is made up of skin and mucous membranes and acts as protection against injury. The thickness of the skin varies, depending on the body part it is covering. The skin is thickest under the feet and in the palms of the hands and thinnest on the eyelids.

The skin helps regulate the body temperature and deposits water and fat. The skin perceives injury through sensory cells and is a vital part of the communication process with other individuals. A person's appearance changes according to their emotional state, state of health as well as age.

The Influence of Hormones

Hormones are chemical components produced in different glands around the body. The hormones are carried by the blood to the area where the desired affect is required. The body produces its own pain relief, Endorphins, when subjected to pain.

If a gland produces too much or too little of a certain hormone, it most often results in a bodily dysfunction.

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Frequently asked questions

Can I, in any way, worsen the casualty's condition?

No you cannot worsen the condition of a person in Cardiac arrest. On the contrary you can only improve their chances.

You run to get the AED, but drop it. What happens? Will it still function?

The AED's sold through Falck can withstand being dropped from 1 meter.

What happens if I place the electrodes incorrectly?

If the electrodes are switched around it will not matter.

What about heavy body hair? What if I can't remove it?

There is a razor with the AED. If for some reason there is not, the electrodes may not make proper contact with the skin.

How do the electrodes stick and what if they won't stick?

The electrodes have an expiry date. They stick using the gel backing, these can dry out if the expiry date is ignored.

How long should I continue?

Until you are too exhausted, or until other help takes over, such as an ambulance.

Should I provide compressions or rescue breaths first?

Follow the procedure from your training and start with compressions.

Am I at risk of receiving a shock?

No, as long as you follow the safety guidelines. Remember do not touch the casualty during shock delivery. Also ensure that others maintain a safe distance.

If the casualty is breathing, can I use an AED?

No, the casualty must be unconscious without normal breathing = cardiac arrest. The AED will aid you with this as it is not possible to make a mistake.

Shall electrodes be placed on skin or on top of clothing?

The electrodes MUST be placed directly onto the skin.

Should I perform CPR while the AED is analysing?

No, when the AED is analyzing the heart rhythm, do not touch the casualty. Always follow the instructions from the AED. If a shock is delivered, or if no shock is advised, continue CPR immediately afterward.

Some AED's, including the type that Falck provides, can analyze while CPR is being performed, so in that case, you only need to stand clear or deliver a shock when instructed. The Ambulance crew will ask you about the situation i.e. how many shocks have been delivered and for how long you have been giving CPR.

Can I use an AED without prior training?

Anyone can use an AED, but it is recommended by all organisations to undergo a training course beforehand.

How do I start treatment?

Just follow the guidelines you learnt on your course as soon as you realise the casualty is unconscious.

What if the AED states "Shock not advised"

If the AED will not shock then it is because there is no shockable rhythm. Continue CPR until next analysis.

Can I use an AED on a child?

All AED's can be used on children. Just ensure a minimum width of three fingers between electrodes. Place them front and back on small infants.

first aid guidelines are also subject to change, therefore, you must remember:
-ammendments may have occurred since you last attended a course

Remember: It pays to help



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