Sanitätsschule Nord

State- and BG ("Employer's Liability Insurance Association")-recognised and certified educational institution

First Aid Manual

Contents according to DGUV-G 304-001 and first aid in educational and care facilities for children and FeV ("Driving Licence Regulation") recognised.

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First Aid Manual
Table of contents

How to use this book 3

Correct behaviour in accidents and emergencies 4

The obligation to help 4

Behaviour in traffic accidents 6

First measures for responsive victims 9

Emergency call / Alerting the rescue service 11

Emergency life-saving measures 13

Disturbances of the consciousness 14

Respiratory and circulatory disorders 17

Cardiopulmonary resuscitation 18

Shock 20

Dangers due to suffocation 22

Bleedings, head, abdominal and thorax injuries 24

Dangerours bleeding 25

Amputation injuries 27

Head injuries 28

Abdominal injuries 29

Thorax injuries 30

Wound care for minor injuries 31

Principles of wound care 32

Dressing types and dressing techniques 32

Muscle, joint injuries and fractures 37

Typical muscle and joint injuries 38

Bone fractures 40

Thermal injuries 43

Damage due to heat 44

Burns/scalds 46

Electrical accidents 48

Hazards due to electric current 49

Poisoning and chemical burns 51

Dangers of poisoning 52

Gas poisoning 53

Chemical burns 54

Acute illness 56

Cardiac diseases 57

Stroke 58

Diabetes mellitus 59

Acute illness of abdominal organs 60

Emergency patient child 62

Prevention of emergencies involving children 62

First contact with sick child 63

Finding an unconscious child 64

Disturbed consciousness in children 65

Seizures, Respiratory disorders 65

Foreign Objects 66

Insect bites in mouth/throat 67

Pseudocroup 68

Epiglottitis 68

Vaccination Schedule 70

Common childhood diseases 71

First aid at work 74

Material measures 75

First aid material 76

Offered training 78

Product overview 79

How to use this book

Every year, the professional associations and public-sector accident insurance institutions train more than 900,000 insured persons in first aid and provide them with regular further training.

This "First Aid Manual" is intended to motivate people to participate in first aid training. For those who have already learnt first aid, the book is a valuable reference book, so that the knowledge can be maintained, consolidated and deepened.

The expert committee >>First Aid<< of the German Social Accident Insurance (Deutsche Gesetzliche Unfallversicherung) has incorporated the >>First Aid Manual<< into the literature of the accident insurance institutions with amendments and supplements for the field of occupational first aid.

The manual is divided into nine chapters in which emergencies, injuries due to mechanical, thermal or chemical effects, accidents caused by electric current as well as acute illnesses and the corresponding measures are summarised. The appendix contains information on how to ensure effective first aid in the workplace.

Emergencies, illnesses and first aid measures can be found both via the table of contents and the register.

Explained step by step

Starting with the behaviour in the event of an accident, the initial measures to be taken at the scene of the accident, the life-saving emergency measures, right through to wound care, measures for typical injuries to muscles, joints and bones or acute illnesses - the right measures are listed step by step in each chapter. They are easy to find - namely highlighted in colour - under the heading: The best thing is to book a first aid course or, if you have already learned first aid, a first aid further training course and learn and practice how to help properly.

Tips and advice from the experts

This book was compiled with the greatest care. The information is in accordance with current medical standards. The contents are based on the teaching contents of first aid courses, but in some cases go beyond that. The recommendations of the German Advisory Council for First Aid and Resuscitation at the German Medical Association have been taken into account.

Correct behaviour in accidents and emergencies

People in need require help. This is not only a question of morality, but also a legal requirement. We are obliged to help in an emergency, an accident - within the bounds of our possibilities. The first chapter explains the most important rescue and behavioural measures in the event of an accident. It introduces the initial measures that apply to all possible situations (not just traffic accidents). It is important to alert the rescue service quickly and correctly so that the rescue chain can intervene as fast as possible.

The obligation to help

What do we humans fear more than disturbances of our well-being, illnesses or even accidents with their often terrible consequences! How quickly the thought that something can happen is repressed. And yet accidents are part of our everyday life in all areas of our lives, such as household, work, road traffic, leisure, sport, etc.

The legal situation of first responders

- Rest assured that a first responder has nothing to do with the handling of costs - even if they request rescue equipment in good faith and it later turns out that it is not needed.
- Every first aider is automatically insured against physical injury by law. Property damage or expenses are usually reimbursed by the insurance policies of the parties involved in the accident/causer.
- Even if, in the midst of the commotion, a first aid technique is not applied properly, a lay helper cannot be prosecuted for this.
- Only those who do not help at all (failure to render assistance), act with gross negligence or deliberately cause damage to someone are liable to prosecution.

First responders are extremely important

Many people still believe that rescue or emergency medical services are responsible for providing help in accidents, forgetting that the right help in the first minute - until the arrival of the rescue service - can almost always be decisive for the severity of the consequences of the accident or even for survival. But who has ever attended a first aid course and learned how to help properly? According to § 323c StGB (German Criminal Code) we are also legally obliged to help (see box below). For most of us it is obvious to help people in need within the scope of our possibilities, even without being legally obliged to do so.

German Criminal Code
Section 323c - Failure to render assistance; obstruction of persons rendering assistance

(1) Whoever does not render assistance in the case of an accident or a common danger or emergency although it is necessary and can reasonably be expected under the circumstances, in particular if it is possible without substantial danger to that person and without breaching other important duties, incurs a penalty of imprisonment for a term not exceeding one year or a fine.
(2) Whoever obstructs a person who is rendering or wishes to render assistance to another person in such a situation incurs the same penalty.

Accidents during leisure time and at work

All too often we associate the term >> first aid << with accidents on the road and think of having to help some strangers; but this is rarely necessary.
Of the approximately eight million accidents per year in Germany (one in ten is thus statistically affected), less than ten percent occur in road traffic.

First aid is much more often required in our immediate living environment. You need to be able to give first aid in your family, at work or in your leisure time and during sports where you are with friends and acquaintances.

Anyone can be affected
A woman should be able to help her husband who suddenly suffers a heart attack. A mother should be able to give first aid to her child who has injured themself while playing. And colleagues at work should also be able to help if an accident happens at work.

Requirements for helpers
Not every emergency or accident is as spectacular as it might be known from films or relevant television programmes. Most accidents are minor and it is not difficult to provide the right first aid.

How to get it right

- Stay calm. First get an overview of the situation you have found.
- Do not act "headlessly". Call for help loudly, thereby drawing attention to the emergency situation. In most cases you are not alone at the scene of an accident; bystanders are certainly willing to help. Address them directly and ask for their help. It is always important that someone takes the initiative.
- Reassure those affected and, if necessary, those around you.
- It is essential that you prevent incorrect intervention and imprudent, "headless" actions by other helpers.

In the event of an accident, act prudently and get an overview of the situation first. Then ask other people for help if necessary

Own safety / own protective behaviour

In some accident situations it is necessary to rescue the casualties from an acute danger situation or have them rescued, for example in the case of:

Fire
Traffic accidents
Falling into waters
Breaking through ice
Burial accidents
Chemical accidents
Electricity accidents (also in households)

Always secure the accident site
Time and again, people who want to help in an accident put their own lives in danger - e.g. if an accident site on the motorway is not or insufficiently secured. Make sure that you do not smoke at accident sites because of possible leaking petrol and that the engine or ignition is switched off when the vehicle is involved in the accident (but leave the key in the ignition!). Not only traffic accidents need to be secured, this is important for other accident sites, too, such as at the workplace or on skiing slopes.

Important
You are legally and morally obliged to provide first aid.

1. **Observe your own safety, secure the scene of the accident**
2. **Provide first aid**
3. **The sequence of action "When finding a person" can be found on page 77**

Remember safety

More people are now killed on the motorway as a result of careless behaviour in breakdowns and accidents or when helping others than by the accidents themselves. Always think of your own safety first. Only if you as a helper do not suffer any damage yourself, can you help the injured.

Behaviour in traffic accidents

How to get it right

Stop to help:

Especially in traffic accidents, you as a helper must pay attention to your own safety - from the very first moment.

- When you approach an accident site, warn the following road users by switching on your hazard lights in good time.
- Do not drive too close to the accident site. Maintain a safe distance of at least 10 to 20 metres from the accident site.
- Park your vehicle at the edge of the road for example in the dark in such a way that the accident site is illuminated by the headlights of your vehicle.

Secure the accident site:

In the interest of the safety of all involved, you must secure the scene of the accident.

- For your safety it is preferable to wear a high-visibility vest at accident sites.
- Take your hazard triangle out of the car, fold it open, hold it in front of your body and walk towards the traffic.
- Set up the hazard triangle at a sufficient distance - i.e. at least 100 to 200 metres before the accident site in the case of dual carriageways and motorways - so that it is clearly visible on the right edge of the road. If you have a hazard warning light, set it up additionally.
- On bends and mountain tops, you need to be particularly careful with safety. Your life is at stake! Place the warning triangle in front of each bend or hilltop.
- You can also warn following vehicles by waving your arm up and down.
- Ask other road users to help you and warn oncoming traffic as well.
- If there are several helpers at the scene of the accident, make sure that their tasks are shared.
- In an emergency, burning people can be extinguished with a powder extinguisher. Never point the extinguisher at the face of the person concerned.

The warning triangle must be placed 100 to 200 metres in front of the accident site. Hold it in front of your body when you walk down the street - or better: wear a safety vest as well.

Please note

Carrying a high visibility vest is mandatory since 2015. Although the hazard warning flasher lamp is not part of the mandatory equipment in motor vehicles, it is very useful at accident sites. It is also useful to equip the vehicle with a fire extinguisher. As fires usually develop relatively slowly, the early and targeted use of a vehicle fire extinguisher can extinguish some fires quickly and sometimes even save vehicle occupants.

Rescue from acute danger

After securing the accident site, you provide first aid to the person affected. Sometimes you first have to save the injured person from acute danger by using the Rautek maneuver.

How to get it right

- Speak to the injured person. If they are conscious, inform them of the intended action.
- Take hold of the person lying on the floor from behind under the neck and shoulders and make them sit with appropriate momentum. Make sure that you support the head with your forearms and that the patient does not fall to the side.
- Now step closer behind the patient and with both arms reach underneath their armpits. Place one of the patient's forearms crosswise in front of their body and grab this arm with both hands from above. Do not grab the forearm, but rake over it with all fingers (also thumbs).
- Bend your knees and keep your back straight to relieve the spine, pull the person concerned close to your own body onto your thighs.
- Then pull them to a safe place and carefully lay them down preferably on a blanket.
- Then talk to the patient again and administer the necessary first aid.

Rautek Maneuver

1. ***Speak*** *to the person concerned and determine their state of consciousness*
2. ***Hold*** *the injured person from behind under the neck and shoulders and made them sit up.*
3. ***Place*** *one forearm crosswise and grab it with both hands from above.*
4. ***Pull*** *the injured person onto your thighs.*
5. ***Lay*** *the injured person down on a blanket (preferably on the rescue blanket) and calm them down. Depending on the situation initiate first aid measures.*

Rescue from motor vehicles

In road accidents, people are often unable to get out of their cars on their own because of their injuries. Especially if their life is in danger e.g. because of an acute fire hazard, they must be rescued from their vehicle.

How to get it right

- Open the car door. Speak to the injured person and tell them what you are going to do.
- Loosen or cut the belt. If necessary, put the seat back. Make sure that the feet of the injured person are not trapped.
- Grab the injured person by the hip and the knee near to you and turn them on the seat with their back to the door.
- Hold the injured person with the previously described Rautek maneuvre and carefully pull them out of their vehicle. If another helper is present ask them to take hold of the legs so that you can pull the injured person from the vehicle together.
- Carefully lay down the injured person ideally on a blanket at a safe distance from the scene of the accident.
- Talk to the injured person again and provide further first aid if necessary.

Trapped person

If people are trapped in vehicles you must call for technical assistance as soon as possible (rescue service / fire brigade). Until they arrive you have to remain with the victim and, if possible, carry out the necessary first aid measures. Please note the possibility of danger from undeployed airbags.

Using the Rautek maneuvre in vehicles

1. Speak to the injured person and explain what you are going to do. Then loosen the belt first.
2. Using the Rautek maneuvre, carefully pull the injured person out of the vehicle and then onto your thighs.
3. Lay the injured person down on a blanket at a safe location. If a second rescuer is there carry out these steps together.
4. Cover the injured person and then alert the rescue service. Provide further first aid if necessary.

First measures for responsive victims

The first contact

Usually no technical aids are required to learn about the condition of an injured person. As already mentioned, most of the victims are conscious and therefore responsive. They can provide details about their injuries, pain or their condition. However, it must be taken into account that injured, but also acutely ill people, are usually emotionally very tense. First-aiders have to be prepared for different reactions like fear, shame and aggression. It is therefore important to build up trust between the first-aider and the person affected.

Dealing with victims

Get yourself on eye-level with the victim.
Often there are several people standing around the person concerned. This is very unpleasant for them, especially if someone bends over them from above. Kneel or squat down when the person is lying on the floor. Do not approach them from behind but preferably always in a way that allows eye contact.

Look at the person concerned.
This will give you an overall impression of the person's condition. You can see if they are agitated, cold, in pain or have visible injuries.

Tell them your name.
By establishing contact like this you make them feel noticed, this builds trust. Ask them for their name.

First contact

Take the initiative.
Ask other people for help.

This is a sign of respect and compassion. Ask the person what has happened and whether they are in pain. You will receive important information about the accident or the medical history. Symptoms and injuries can be identified. Mental state and anxieties become aparent.

Carefully establish physical contact.
Hold the patient's hand or place your hand on their shoulder. Wiping their forehead is also usually positively received.

Always tell the person concerned what you are doing.
Coordinate any further action with the patient. Always tell them what you intend to do and ask them if they consent and might be able to help. Also tell them what has already been done, e.g. that the ambulance service or emergency doctor has already been informed. Be helpful if they want to contact a trusted doctor or relatives.

Ask bystanders for help.
Usually you are not alone at the scene of an accident. Address others directly and ask for their assistance. It is important for someone to take the initiative and coordinate first aid until the rescue service / emergency doctor arrives.

Care and attention

Care and attention by first-aiders until the rescue service arrives is particularly important for the general condition of those affected. This is often underestimated and unfortunately all too often neglected. For children in particular, care and attention, if possible from familiar caregivers, is of paramount importance.

- Therefore, if possible, do not leave a person affected alone, reassure them and offer them comfort.
- Many of those affected report that the human attention of first-aiders was the most important help for them.

Good care always has a positive effect on the overall condition of a person affected.

Covering the injured and sick

Important

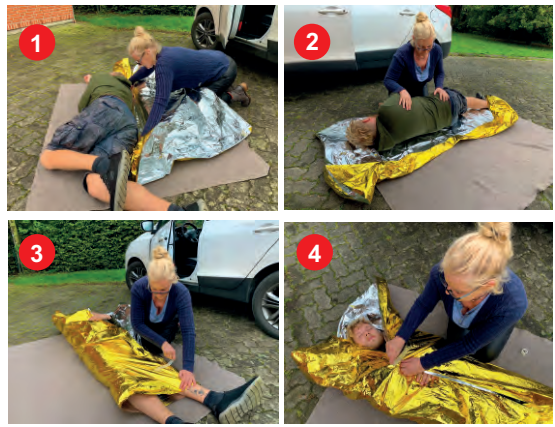
Covering up victims (preventing heat loss) is one of the most important measures of first-aiders in an emergency situation.

Due to their injuries and the psychological strain victims freeze even at normal air temperature, especially if their circulation is impaired by the accident or illness. In addition, until rescue services arrive they often have to lie on the ground where additional heat is lost. If possible always lay the person affected on a blanket or rescue blanket (or a coat if nothing else is available).

Particularly advantageous

are the rescue blankets (rescue foils) in the first aid kit. They offer protection against heat, cold, moisture and sun and they reduce the risk of infection for victims and first-aiders.

Cover the injured with the rescue blanket



1 2 *The rescue blanket is very suitable for covering victims. To do this, turn the victim on their side (if necessary prepare them for the noise which should not be underestimated) and pull the gathered rescue blanket close to their back.*

3 4 *Then turn them back on their back and wrap them completely in the rescue blanket. This can be additionally fixed with the help of plaster strips.*

How to get it right

- Talk to the victim and tell them what you are going to do. Ask them for help.
- Fold or gather a rescue blanket (or even a normal blanket) in two thirds and lay it lengthwise close to one side of the person.
- Carefully turn them onto the other side and pull the blanket close to their back.
- Carefully turn the person back on their back. You can now pull the folded part of the blanket out from underneath their body.
- Wrap the person with the protruding sides of the blanket as tightly as possible.

Emergency call / Alerting the rescue service

Alerting the rescue service as fast as possible is almost always an important part of first aid. Every eyewitness of an accident must be able to alert the rescue service correctly. There are very different >>public<< accident reporting devices, all of which are provided with comprehensible operating instructions. Even if you are nervous you can hardly do anything wrong.

Important
Emergency calls can be made from all public payphones without inserting money or a phone card.

Special features of mobile phones
Nowadays, most accident reports are made from mobile phones. This means that you can always reach an emergency control centre or the police by calling 112 or 110, but not always the nearest emergency service. For this reason, it is always necessary to give particularly precise location information when making an emergency call from a mobile phone.

The emergency call pillars
On motorways and on some main roads there are emergency call points approximately every two to four kilometres. Small arrows on the crash barrier posts indicate the nearest emergency call pillar.
Other ways to call: Emergency calls as well as alerting rescue services can also be done from buses, taxis and car telephones.

Poison - what to do?

In case of poisoning, first call the emergency services and then the information centre for posion:

Berlin:	**030 - 19 24 0**
Bonn:	**0228 - 19 240**
Erfurt:	**0361 - 730 730**
Freiburg:	**0761 - 19 240**
Göttingen:	**0551 - 19 240**
Homburg/ Saar:	**06841 - 19 240**
Mainz:	**06131 - 19 240**
Munich:	**089 - 19 240**

Emergency numbers

The uniform nationwide emergency numbers are **112**
The emergency call then goes to the responsible rescue control centre.
Or: **110**
The emergency call then goes to the nearest police control centre and is passed on to the rescue service.

Other emergency numbers

112 is valid in all European countries. For stays outside Europe please enquire about the applicable emergency numbers in advance.

The accident report

The accident report should contain the following information:

- Where is the emergency?
  Specify the exact location of the emergency: town, street, house number, floor etc.
- What has happened?
  Describe briefly the emergency situation. The rescue directing centre has to be able to identify what measures need to be taken (rescue helicopter, fire brigade etc.)..
- How many injured/victims need to be taken care of?
  These details are important to dispatch enough vehicles and personnel to the site of emergency.
- Which type of injuries or symptoms do the viticms have?
  Is anybody in a life-threatening condition? The rescue directing centre needs these details to dispatch the right vehicles and necessary personnel, e.g. emergency doctor.
- Wait for any questions the dispatcher might have!
  Only hang up when they have ended the call on their end.

The dispatcher will usually lead the conversation with a fixed set of questions.

Instructing the rescue service

It is advisable to send one person to meet arriving rescue services on the street and have them instruct them when facing difficult local conditions, for example confusing road layout in large industrial areas or on an extensive factory site.

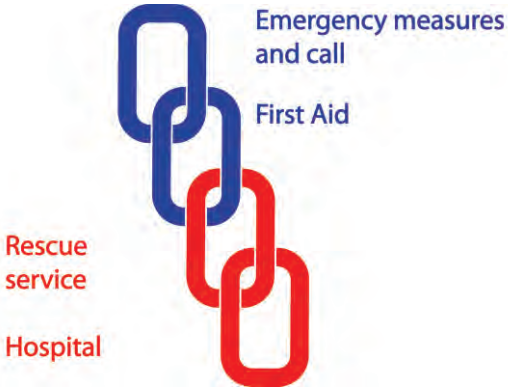
Special case: accidents with hazardous goods

If a hazardous goods truck with an orange warning sign is involved in an accident, the sign and its number combination should be pointed out during the emergency call. Warn bystanders and keep as much safety distance from the accident site as possible. Smoking and fire are prohibited!

In the event of a so-called >> hazardous goods accident << the orange warning signs must be pointed out in the emergency call.

The rescue chain

Every step of first aid is connected to the next and so they build a rescue chain for providing victims with fast, appropriate help right from the start up until treatment in hospital. The first two elements of the rescue chain show the importance of first aid. Emergency measures plus emergency call and first aid. Only being trained in first aid makes the rescue chain strong.



Emergency life-saving measures

During the course of a lifetime we face many illnesses that are mostly of harmless nature. However, life threatening instances that severely impact our organism's functions are rather rare. Only those who recognise these quickly and act correctly can save lives.
Life-saving measures are always necessary when an accident causes acute illness or poisoning of the most important vital functions.

This chapter describes step by step the life-saving emergency measures - rescue breaths, cardiopulmonary resuscitation (CPR), recovery position, shock position and more.

Disturbances of the consciousness

If the various areas of the nervous system interact undisturbed a person is conscious.
Causes for disturbances of consciousness can be for example impairment of brain functions after severe head injuries, heat stroke, but also vascular occlusions or strokes.
[redacted]
Typical examples are accidents and conditions with respiratory and circulatory disorders such as thorax injuries or heart attack.
Poisoning can also lead to unconsciousness.

Recognising unconsciousness - The person is unresponsive, they no longer react to physical contact, such as shaking their shoulders.

Dangers of unconsciousness - protective reflexes are not functional and muscles are relaxed. Due to lost muscle tone the tounge can block the airway.
Vomit or blood can enter the airway and - due to lack of a cough reflex - can lead to suffocation.

Measures in case of unconsciousness
How to get it right
Speak to and touch person concerned

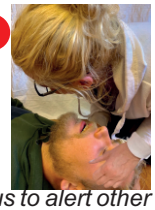
➤ Speak to the person loud and clear, touch their choulders and shake them carefully to check their consciousness.
If the person does not react to this, they are unconscious.

1

Check breathing in case of unconsciousness

2

3



if the person is unconscious to alert other people near you to the emergency situation and need for help.

Check a person's state of consciousness:

2 *Speak to the person loud and clear, touch their shoulders and shake them carefully.*

Check breathing:

3 *Clear their airway. With your cheek and ear you can feel and hear the breaths. A rising and falling chest indicates moving air, thus breathing.*

Atemkontrolle durchführen

➤ Breathing of unconcscious people must be checked immediately.
Turn the person to lie on their back, if that has not already been done.

➤ Place one hand on the person´s forehead and the other hand under the chin, with the thumb resting in the chin recess and the other fingers on the underside of the chin. Gently tilt the patient's head back (overstretching the neck) while lifting the chin and pulling it forward to clear the airways.

➤ To check breathing and hear breathing sounds hold your cheek and ear close over person's mouth and nose. As you do this, also look at the chest and see how chest and abdomen rise and fall as they breathe. A breathing check should not take longer than 10 seconds.

Recovery position

If you notice that an unconscious person is still breathing normally, they must never lie on their back.There is a danger of e.g. suffocation. The even bigger but imperceptible danger is a silent aspiration of gastric juices leading to pneumonia with a high mortality. Gently but quickly the person concerned needs to be put into a position in which bodily fluids (saliva, vomit, blood) can flow from the mouth and and the toungue cannot obstruct the airway. This is achieved by the recovery position.

How to get it right

- 1 Kneel down at the side of the person. Place the arm closer to you up next to their head in an angle and with their palm facing upwards.
- 2 Take the arm farther from you across the person's chest and place the back of their hand on their cheek.
- 3 Hold their hand in this position, raise the thigh (do not grab the joint) farther from you to bend the leg.
- 4 Turn the patient towards you so that the thigh of the now upper leg is at a right angle to the hip.
- 5 Clear the airway by tilting the head backwards and opening the mouth slightly. If needed use the hand resting on their cheek to stabilise the patient's position.
- **Alert emergency/ rescue service**
  If you discover that a person is unconscious, immediately alert emergency services. At the latest, make the emergency call after putting the person into recovery position.
- 6 Cover the person and regularly check consciousness and breathing until emergency services arrive.
- If the person wakes up, they must remain lying down. Anyone who has been unconscious needs medical treatment. If the unconscious person also stops to breathe, turn them on their back and start CPR (see page 18/19).

Illustration of recovery position

1. Position the arm closest to you in a right angle to the body, the palm is facing upwards.
2. Take the arm farther from you across the person's chest and place the back of their hand on the closer cheek.
3. Bend the leg farther from you by pulling the thigh (not the joint).
4. Pull the unconscious person towards you so that the thigh is positioned at a right angle to the hip and that the hand on the cheek maintains its position.
5. Clear the airway and stabilise the position with the hand on the cheek.
6. Cover the person and regularly check their breathing.

Special case: helmet removal

The removal of the helmet by first responders at the scene of the accident is mandatory for motorcyclists who are unconscious in order to avert the risk of suffocation. Although the helmet limits the head injuries, the entire spine can be severely strained. It can be injured, although very rarely. The following procedure places minimal strain on the spine and prevents further damage. In principle, unconsciousness is to be considered a higher risk. It would be wrong to do nothing at all.

Important

This maneuvre ideally should be performed by two people, however, it is possible to do it alone.

How to get it right

- Speak to the victim and check their consciousness (also page 14).
- If they are unconscious ensure that the head is sufficiently stabilised and open the visor. Open the chin rest or chin strap and if present remove their glasses (ensure these will be taken to the hospital also).
- Now carefully remove the helmet by pulling it off of the head (beware of the nose!).
- Then check the breathing (see page 14). If the victim is breathing put them into recovery piosition (see page 15). When turning the body into recovery position guide the head in a stabilised manner along with the turning move.
- If the victim is not breathing normally or not at all immediately start CPR.
- Cover them with a blanket and regularly check consciousness and breathing.

1 Helper 1 opens visor and chin rest/strap and removes glasses if present.
Helper 2 ensures stabilisation of head.

2 Helper 1 stabilises head and spine and Helper 2 removes helmet pulling upwards. Take particular care of the nose.

3 If you are alone you need to stabilise the neck with one hand when removing the helmet and then carefully put the head down.

4 Removing a helmet with two people is less straining. Carefully put the head down.

Respiratory and circulatory disorders

Breathing supplies the body with vital oxygen. At the same time carbon dioxide is excreted from the body. Breathing is controlled by the respiratory centre located in the extended spinal cord.

The causes for a respiratory arrest are manifold. For example, the danger of suffocation due to unconsciousness, choking on foreign objects or drowning can be reasons as well as lung injuries or allergic reactions with swelling of the airways, for example after an insect bite in the mouth and throat. But also acute illnesses and poisoning can lead to respiratory arrest.

Life threatening oxygen deficiency (hypoxia)

The lack of oxygen caused by respiratory arrest can very quickly lead to death because the body has no oxygen reserves. After only a few minutes irreparable (permanent) damage to the brain occurs.

What you should know about breathing

An adult breathes about 15 times a minute. During this process, about 500 millilitres of air per breath are inhaled and exhaled again.
A child breathes about 20 to 30 times a minute about 100 to 400 millilitres of air per breath (depending on age and size).
An infant breathes about 40 times a minute about 20 to 40 millilitres of air per breath.

Cardiovascular disorders

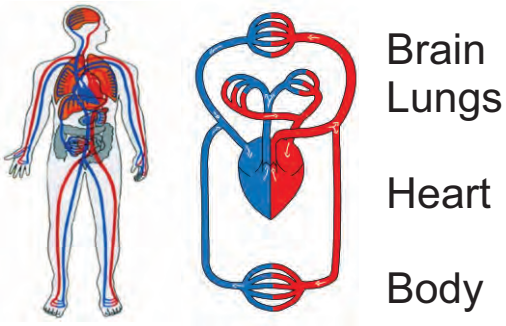
The cardiovascular system

The cardiovascular system consists of heart, blood vessels and blood. The heart, a hollow muscular organ, is located approximately in the middle of the rib cage behind the breastbone.

The tip of the heart lies on the diaphragm, the axis is slightly offset to the left. The heart has four chambers. With its valves and rhythmic contractions of its muscles the heart functions as a pump for the cardiovascular system.

It has its own conduction system creating the required electrical impulses and is supplied with oxygen and nutrients by the coronary vessels (coronary arteries).

At a frequency of approx. 70 beats per minute (resting state) the heart of an adult pumps about five to seven litres of blood per minute.



Circulatory disorder and cardiac arrest

The most frequent causes of serious disturbances of the cardiovascular system are the vascular changes caused by the so-called risk factors. Especially in the area of the coronary vessels (the coronary arteries) they lead to vasoconstriction and finally to vascular occlusion. A heart attack can be the result. In the worst case, a complete cardiovascular arrest occurs. But accidents, e.g. with massive bleeding, can also weaken the cardiovascular system dangerously. The same applies to electrical accidents and severe poisoning.

- In the event of cardiovascular arrest, the person concerned becomes unconscious within a few seconds.
- Breathing stops almost simultaneously.
- All vital functions are missing.
- The patient's face has a bluish pale sometimes pale grey skin colour. If the brain is not supplied with oxygen for only a few minutes permanent damage occurs; the patient's life is in acute danger.

Act fast and correctly

The medical treatment options for patients with heart attacks have been continuously improved in recent years. However, the patient has to survive the period of time until medical help can take effect. This requires fast and correct first aid. Besides the immediate emergency call, the most important thing is resuscitation until arrival of the rescue service staff and the emergency doctor.

Fortunately, not every heart attack requires resuscitation or early defibrillation. If the patient remains conscious, proceed as described in this manual on page 59.

The chances of survival for patients with cardiovascular arrest (ventricular fibrillation) are significantly improved with early defibrillation. With an automated external defibrillation device (AED), the ventricular fibrillation of the heart, which is usually present, can be interrupted.

Respiratory and circulatory disorders

When you find a motionless person, immediately check their vital functions (consciousness and breathing, see page 14).
If the person does not respond to the stimulus and their breathing is not normal or if no breathing is detected, you must assume that their circulation has stopped and start resuscitation measures immediately.

Call the emergency number (112) immediately!
If there is a defibrillation device (AED: Automatic External Defibrillator) in the vicinity, it must be brought to the scene of the emergency immediately.

Early defibrillation
Alert the emergency services immediately. One first responder should carry out the resuscitation measures.
If a defibrillation device (AED) is available nearby, another first responder should bring it to the scene and use it.
Stick the electrodes on the device to the naked chest of the person affected and switch the device on.
It will diagnose the heart activity. Only if there is ventricular fibrillation you can trigger a shock - with voice-guided instruction.
This simple operation means that the device can be used even by tained layperson first responders.

Cardiopulmonary resuscitation
The patient should lie on their back and on a hard surface.
Kneel at their side and as close as possible to the ribcage. Bare the chest and locate where to apply pressure: this is located in the middle of the ribcage, i.e. on the lower third of the sternum.

Here you place the heel of one hand and on the back of this hand place the other heel of the hand interlocking your fingers. With arms stretched out, now perform 30 pushes, during which the sternum is compressed at a frequency of approx. 100 compressions per minute. The depth of the pushes is 5 - 6 cm. Completely relieve the sternum after each compression, whereby the pressure and relief phases are of equal length and the heel of your hand is always in contact with the breastbone, even during relief.

Combine the compressions with two breaths each.

Important

If the patient's chest does not rise during the first donation of breath, as it would with normal breathing, check the mouth and remove any foreign objects. No more than two attempts at breathing should be made. If it appears that ventilating this way is not possible continue with chest compressions.

Depth of compressions 5-6 cm.

For this purpose open the airways by carefully tilting the head of the patient backwards while lifting and pulling the chin forward. (Head tilt/chin lift maneuvre.) With thumb and indexfinger of the hand resting on the patient's forehead close the soft part of their nose.

Open your mouth, breathe normally and place your lips tightly around the person's mouth. Blow air evenly into the mouth for one second, keeping your eyes on the patient's chest checking that it is rising. Breathe in again without changing the position of the patient's head and check that the chest is lowered again. Breathe in a second time.

Then perform 30 compressions alternating with 2 breaths until the patient begins to breathe normally, the rescue service or emergency doctor arrives or a defibrillation device can be used on site. After putting the defibrillation device into operation, follow the voice instructions until the rescue service takes over the patient. In any case, two minutes of resuscitation (pressure massage and ventilation alternating 30:2) should be carried out between the subsequent defibrillations. After successful resuscitation (normal breathing has resumed), the patient must be brought into a recovery position.

Implementation by several helpers

If several helpers are present they should alternate regularly (approx. every two minutes) carrying out the necessary measures in order to prevent possible fatigue.

Resuscitation for babies and children

Layperson first responders who are trained in first aid measures for adults, but who have no further knowledge of how to proceed with children, can proceed in the same way as adults.

However, with the exception that **initially 5 breaths** must be given first, followed by checking the breathing and then further action is to be taken according to the situation. If the breathing check shows that normal breathing is still not taking place, cardiopulmonary resuscitation is to be started immediately in a 30:2 ratio. (See children) On the other hand, if the patient breathes normally again, place them in recovery position. Also see page 67!

Important

Layperson first-aiders who are only trained in first aid measures for adults can and should apply this knowledge when treating children, too. However, the have to ensure to give 5 breaths initially before continuing with a breath check and then appropriately to the situation at hand.

Take note:

Never shake babies or infants to check their consciousness, there is a risk of serious brain damage. Babies' heads do not get overextended for ventilation but positioned in >>neutral position<<, the tip of the chin is raised slightly with two fingers. Breath donation is done in mouth and nose simultaneously. In older children, the head is slightly bent in the neck and the lower jaw is raised (sniffing position). Further information can be obtained in a training course >>First Aid for Children<< at Sanitätsschule Nord.

Stopping cardiopulmonary resuscitation
Cardiopulmonary resuscitation is stopped when the patient is taken over by the rescue service/emergency doctor, has started breathing normally again or the first responder is exhausted. The appropriate follow-up measures - such as establishing recovery position - must then be initiated.

Respiration can also be administered with the help of a respirator cloth.

Reanimation at a glance (one helper)

1. Speak to/ touch (no reaction, unconscious)
2. Call for help
3. Check breathing

If the patient does not breathe normally:

4. Call emergency services
5. Place the patient on the ground
6. Bare the chest area
7. Locate the correct spot and perform 30 chest compressions at a rate of 100 per minute; the pressure and release phases should be of equal length
8. Give two rescue breaths beween chest compressions

Important
It is best to attend a first aid course or - if you have already been trained in first aid - a further training first aid course. Learn and practice proper resuscitation. This knowledge could save a person's life.

Shock

Regardless of the causes, a shock is always based on an imbalance between the required and actual blood supply to the body. The associated reduction in blood pressure leads to an undersupply of oxygen and inadequate disposal of the body's cells, resulting in threatening metabolic disorders. The lives of accident victims are often endangered not by the injury but by the shock it causes.

Important
Early and correct first aid at the scene of an emergency can effectively counteract the shock and its causes. This can possibly save the lives of those affected.

What causes the shock?
A disorder of the circulatory system can have very different causes. The decisive factor is which part of the circulatory system is damaged.

- Significant blood loss due to injuries or plasma loss because of severe burns lead to a reduction in the total blood volume and thus to shock.
- Sudden fright, fear, pain, etc., can cause the blood vessels to dilate due to nervous malfunction thus triggering a shock.

The distinguishing features of a shock are:

- A pulse that is increasingly rapid and due to the simultaneous drop in blood pressure increasingly weak. In a state of shock the pulse rate is usually over 100 beats per minute (tachycardia).
- Due to the lack of blood circulation in the skin the patient turns very pale.
- The skin is cold, sweaty and the patient is freezing. At the beginning they are usually restless, nervous and afraid. However, later they become calm and apathetic until finally falling unconscious.

Organs that are sensitive to a lack of blood supply, such as kidneys and lungs, are damaged (shock kidneys, shock lungs). Without timely countermeasures a circulatory collapse and even death can occur.

Measures in the event of a shock

How to get it right

Even if the shock initially does not appear to be dramatic and threatening the patient's life is in mortal danger and is in urgent need of first aid and medical care.

- Emergency call/alert the rescue service.
- Since the affected person feels helpless and often fears death, human attention, sympathy and constant care are initially the most important things.

Shock position

- You will also need to eliminate possible causes of the shock as far as possible, e.g. stop major bleeding, interrupt any medication (e.g. in the event of an allergic reaction to medication) or cool burns with lukewarm water.
- Immediately cover the patient with a warm blanket appropriate to weather condiotions. Ideally use the rescue blanket from the first aid kit. It is large enough to wrap the person completely thus protecting them from the cold ground and prevent loss of body heat. Of course, a woollen blanket or warm clothing can also be used - depending on what is available. However, you must never actively supply heat (hot water bottle or similar)!
- Afterwards, position the patient on their backs with their legs raised. This is the shock position that supports the circulation. For this purpose, the legs should be comfortably positioned about 20 to 30 centimetres higher.

1 *Wrap the patient in the rescue blanket and - if no suitable objects can be found - place their raised legs on your own leg.*

1

2 *You can use suitcases, shopping bags, etc. to keep the patient's legs elevated.*

2

Dangers due to suffocation

Foreign objects in trachea and oesophagus

- Foreign objects in the trachea cause severe coughing and possibly wheezing.
- Foreign objects in the oesophagus cause difficulty swallowing or nausea. Due to its flexible posterior wall these can also constrict the trachea. The person affected has a purple-red face and tries to breathe without a breath being taken.

How to get it right

- If the patient is breathing, talking and coughing ask them to cough vigorously. If you are unsuccessful, call the emergency services immediately.
- If the patient is not able to get rid of the foreign object by coughing, the situation appears to be threatening and they do neither breathe nor speak, have them bend over with their upper body.
  With the heel of your hand give 5 strong blows to the back between the shoulder blades to unlodge the foreign object. Check after each blow whether the object has been removed.
- If not successfull wit this maneuvre, call emergency services immediately. If the patient's condition is not improving and is at risk of suffocating the following can be attempted as a >>special measure<<:
- Stand behind the person. Tip the person forward slightly. Wrap your arms around the waist.
- Make a fist with one hand. Position it below the sternum (between navel and sternum).
- Grab the fist with the other hand. Press hard into the abdomen with a quick, upward thrust for up to five times.
- If you cannot remove the airway obstruction with the abdominal thrusts alone, repeat these measures alternating between blows to the back and abdominal thrust at maximum five times each respectively until emergency services arrive.
- If the patient is unconscious initiate resuscitation measures immediately.

If a CPR mask (here Quick-Aid) is available and correctly used it can help to overcome psychological barriers. Additionally by self-protecting with the mask, the risk of infection for the first responder is reduced.

Giving rescue breaths can also be done with the help of a respirator cloth.

Important

If the patient is in danger of suffocating you have to call emergency services immediately.

Insect bites in the mouth or throat

Insect bites in the area of mouth or throat (often caused by accidentally swallowing a wasp when drinking) can be life threatening. The poison of insects lets the sensitive mucous membranes in the mouth and throat area swell dangerously or the toungue is swelling up. The patient's airways narrow or are in danger of closing up entirely. There is an acute danger of asphyxiation.

How to get it right

- Emergency call/alert the rescue service.
- Life-saving help can come from cooling with ice. Let the patient suck ice or ice cubes and apply a cold compress around throat.
- If respiratory arrest occurs you must carry out CPR immediately until the rescue service arrives.

Preventing insect bites

Insect bites can very quickly cause swelling and obstruction of the respiratory tract. Immediate cooling (cold compresses, sucking on ice cubes or ice cream) and alerting the rescue service can prevent worse.

Don't let it come that far in the first place. Prevent insect bites e.g. by avoiding eating outside during warm weather and do not drink sweet drinks from cans or otherwise unclear canisters.

>> Near-drowning<<

Contrary to popular belief you don't need to first "pump" water out of the lung of victims rescued from the water. Only start resuscitation if respiratory arrest has been detected!
Water does not enter the lung that easily and an atempt to "pump" it out as well as any other similar approaches only delay the start of resuscitation unnecessarily.
Especially for victims with hypothermia the chances of successfull resuscitation are still pretty high even after some time.

How to get it right

- Emergency call/alert the rescue service as quickly as possible.
- Start resuscitation measures immediately after the rescue from the water.

Even if victims regain conscisousness after the >>near-drowning<< and appear to be symptom-free it is absolutely necessary for them to get medical attention.

Bleedings, head, abdominal and thorax injuries

Bleeding - especially if it is severe - can cause a shock-like reaction for victims and first responders alike.
In fact the blood loss can be significant. And the loss of one litre of blood can already lead to life-threatening shock.
Hence fast and proper haemostasis is one of the priority tasks of first aid.
This chapter also familiarises you with the measures to be taken in the event of serious head, abdominal and thoracic injuries.
In any of these cases rescue services need to be called.

Dangerous bleeding

Dangerous bleeding is caused by violent impact on the body. Vessels are injured as a result. It bleeds from a visible wound. Internal bleeding can also take place in the muscular system, the abdominal or thoracic area. The danger of inner bleeding lies within leading to shock and its described consequences. On average this happens at a blood loss of 15-20% (the equivalent to approx. one litre in an adult). The victim may bleed to death.

- An external dangerous bleeding is quite easy to detect. You can see blood flowing from an open wound. Depending on the size and type of the injured blood vessel the blood might come out of the wound pulsating or occasionally spraying.
- Often a pool of blood has formed around the person and/or the person's clothes have large blood stains.

Note
Escaping blood is often smeared and spread over clothing and the surrounding area. Due to the intense colour of the blood oftentimes the situation looks much worse than it is.

Haemostasis on the arm

How to get it right

1. Pressure dressing

- As with any normal bandage you place the dressing of the first bandage pack on the wound and wrap it around the wound two or three times.
- Then place the second dressing pack unopened as a pressure pad directly over the wound area.
- Wrap the remaining bandage around the pressure pad making sure that the bandage wrappings are congruent and not too tight.
- Finally fasten the end of the bandage and raise the arm slightly.
- Now you have to cover the patient (rescue blanket or jacket), care for them and position the legs slightly elevated (see shock position, page 21).
- Emergency call / alert the rescue service.

Haemostasis on the arm

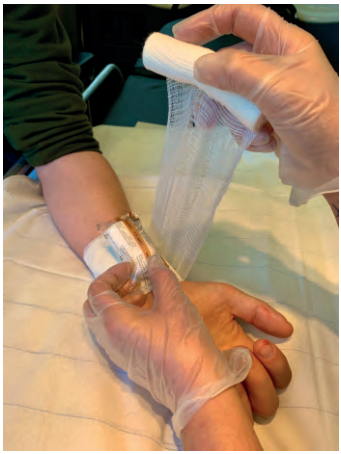
How to get it right, see page 25

- Put on disposable gloves.
- To stop the blood loss immediately you must first press a cloth onto the wound and then, if possible, replace it with a pressure bandage.
- Emergency call / alert the emergency services.
- Raise the legs a little, cover the person with a warm blanket (ideally with a rescue blanket) and stay with them until the ambulance arrives.

Important

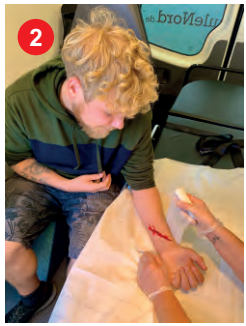
Stay calm. It often looks worse than it is. Bleeding can usually be easily treated. And you can save a life in this way.

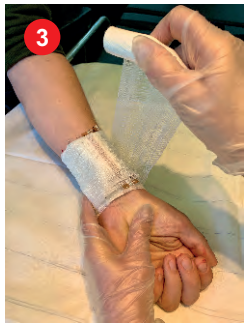
If a pressure bandage on the arm or leg is seeping through very badly simply wrap a second pressure bandage over it and slightly increase the pressure. Light seeping (just discolouring of the dressing) is not problematic.

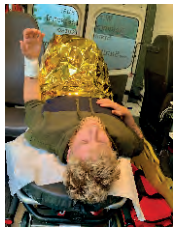


Place the pressure pad (made of elastic, non-absorbent material, e.g. bandage packs) on the wound area and wrap it tightly, but not too tightly, with further bandage wrapping. If bleeding continues, apply a second pressure bandage over the first one.

Haemostasis on the arm - pressure bandage







1. The best way to do this is in pairs: one helper holds the arm the other places the wound pad of the dressing pack.
2. Wrap the bandage around for two to three times. Then apply the second dressing pack as a pressure pad.
3. Wrap the remainder of the first bandage, finally fixating it with a knot.
4. Position the affected arm slightly elevated and cover the patient. You may also place their legs slightly elevated.

Stopping bleeding on head and torso

How to get it right

- Put on disposable gloves.
- To treat dangerous bleeding of the head and torso you first press cloths directly onto or into the bleeding area. You may have to maintain the pressure until the emergency services arrive.
- Sometimes it is also possible to apply a pressure bandage.
- Emergency call / alert the rescue service.

Important -
Haemostasis has priority!
Only then take care of the amputated part!

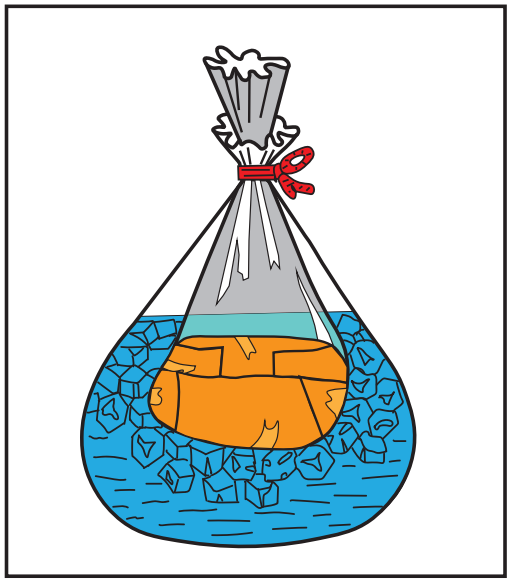
If there is bleeding from body cavities - nose, mouth etc. - you must not cover the wound. The blood must be able to drain off so that the person affected is not in danger of suffocating.

Amputation injuries

When dealing with a severed (amputated) body part (e.g. a finger or a whole hand) the wound needs to be cared for first in order to prevent the affected person from going into shock. Do not be put off by the situation but give priority to stopping the bleeding.

Amputation care

As severed body parts often can be reattached they need to be wrapped in a clean cloth (e.g. from the first aid kit) and handed over to the rescue service for them to take it to the hospital.



Care for the amputated part: The severed part should not be cleaned and must not get in contact with water. The rescue service will take care of cooling when transferring to the hospital.

The amputated part gets wrapped in a clean cloth. The rescue service will transport it to the hospital appropriately cooled.

How to get it right.

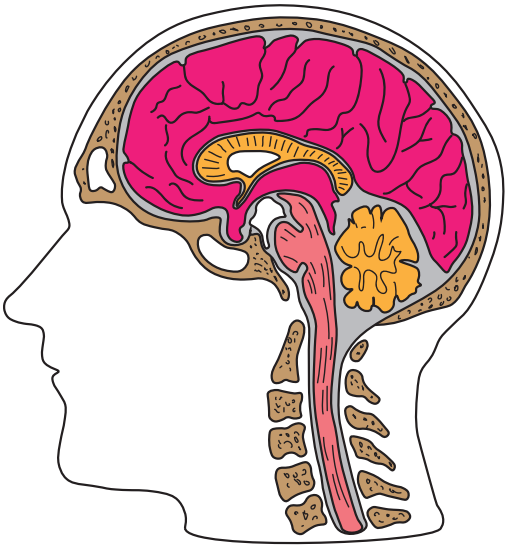
- First apply a pressure dressing to the bleeding wound, if possible. If not, press a cloth on the bleeding.
- Only then you should look after the severed body part. Wrap it into a clean cloth (ideally a sterile one from the first aid kit).
- Look after the patient and do not leave them alone. Check whether they show signs of going into shock (paleness, patient freezing).
- Keep them warm by covering them and if they show signs of going into shock bring them into shock position (see page 21).
- Emergency call / alert the rescue service.

Head injuries

Measures in case of concussion

Within the cranial bone the brain is surrounded by the cerebrospinal fluid which functions as a buffer when the head gets bumped. When the head is violently impacted, e.g. after a fall, the brain hits the wall of the skull. Depending on the force of the impact the brain can be damaged to a greater or lesser degree.

Concussion is the >> mildest << and most common type of head injury. Often the patient is unconscious for just seconds up to a few minutes. Helpers do not necessarily even notice this unconsciousness. Afterwards the patient shows typical symptoms of a concussion such as dizziness, headaches, memory gaps regarding the accident, nausea and vomitting.



How to get it right

- If the person is responsive you need to keep them calm and their head elevated.
- Emergency call / alert the rescue service.
- If possible, do not leave the patient alone.
- Cover the person with a warm blanket. Treatment in a hospital is essential.

Important
Concussion associated vomitting can present with a delay.

Measures for head injuries involving unconsciousness

How to get it right

Carry out these measures as in the case of unconsciousness:

- Approach/touch the person concerned (no reaction)
- Check their breathing (patient breathes) Place them in recovery position
- Emergency call / rescue service alarm
- Treat external injuries to the head with a sterile bandage
- Cover the patient (ideally with a rescue blanket) and observe them

Persistent deep unconsciousness (coma)

If a patient is unconscious after violent impact on the head and does not regain consciousness or if someone is losing consciousness a while after the impact their life is in danger. An impact on the head can cause swelling of the brain or bleeding underneath the skull resulting in increased intracranial pressure leading to unconsciousness.

Important
Shaking a baby can already result in severe brain damage.

Abdominal injuries

Abdominal injuries and internal bleeding occur after violent impact to the abdomen or back. Organs such as the liver, spleen, stomach, intestines, bladder etc., but also large blood vessels can be injured and bleed into the abdominal cavity.
Such bleeding is particularly dangerous because the first responder cannot see it and cannot stop the bleeding from the outside. This is life threatening. The injured person can bleed to death or die from the consequences of shock. Sometimes the accident situation provides a clue though:

- Contusions to abdomen or back, combined with a deterioation of the general state of health.
- Development of shock.
- Abdominal pain and an often painfully tense abdominal wall.

Measures for abdominal injuries

How to do it right

- Emergency call / alert the emergency services immediately. The affected person must be transferred to a hospital as fast as possible.
- If there is an open abdominal wound it needs to be covered with ideally sterile material (e.g. dressing cloth).
- Often patients crouch and turn onto their side by themselves due to the pain. In this case, leave and support the patient in the relieving position they have adopted.

Important

Leave a patient with an abdominal injury in their self-assumed position. Do not try to turn them on their back if that makes them uncomfortable. Generally you may turn patients onto their back but only if the expressively want that. Place some padding underneath the knees for support.

- If the person is lying on their back you should support this position by bending their legs comfortably and supporting their feet (e.g. with a bag or suitcase). This relaxes the abdominal wall and relieves pain.
- Cover and look after the patient until the rescue service arrives.

For your information

People with abdominal injuries sometimes complain of being very thirsty and want to drink something. However, because immediate surgery is often necessary, patients are not allowed to drink or eat anything. The measures described here are also to be used for acute abdominal diseases.

Thorax injuries

Thorax injuries can be caused by a violent impact such as a stab wound or a strong collision of the chest with a hard object or surface (as it would happen in traffic accidents or falls). Broken ribs are not uncommon with these types of accidents as well. If the lungs are also injured in the accident it is life-threatening. If a wound has damaged the chest wall or the lung is damaged air and blood enters the thoracic cavity. This causes pressure on the lung and breathing gets hindered.

Important

Under no circumstances should one eat, drink or smoke in any acutely life-threatening conditions regarding thorax or abdomen.

- In the case of contusions or an open wound in or on the thorax, the increasing shortness of breath of the affected person is easily noticable.
- The affected person turns bluish pale and wants to sit up in order to breathe more easily. They are scared to death.
- If the lung is damaged sometimes foamy blood can be coughed up. Their life is in danger.

Measures in the event of thoracic injuries

How to get it right

- Emergency call / alert the rescue service immediately.
- Position the person concerned in a semi-seated position so that they can lean on a chair and support themselves with their arms to the back. This will raise their shoulder girdle and make it easier for them to breathe.
- You treat a thorax wound by applying some sterile wound dressing that is as germ-free as possible or a clean cloth to the wound and holding it in place until the rescue service arrives or loosely securing it with strips of plaster.

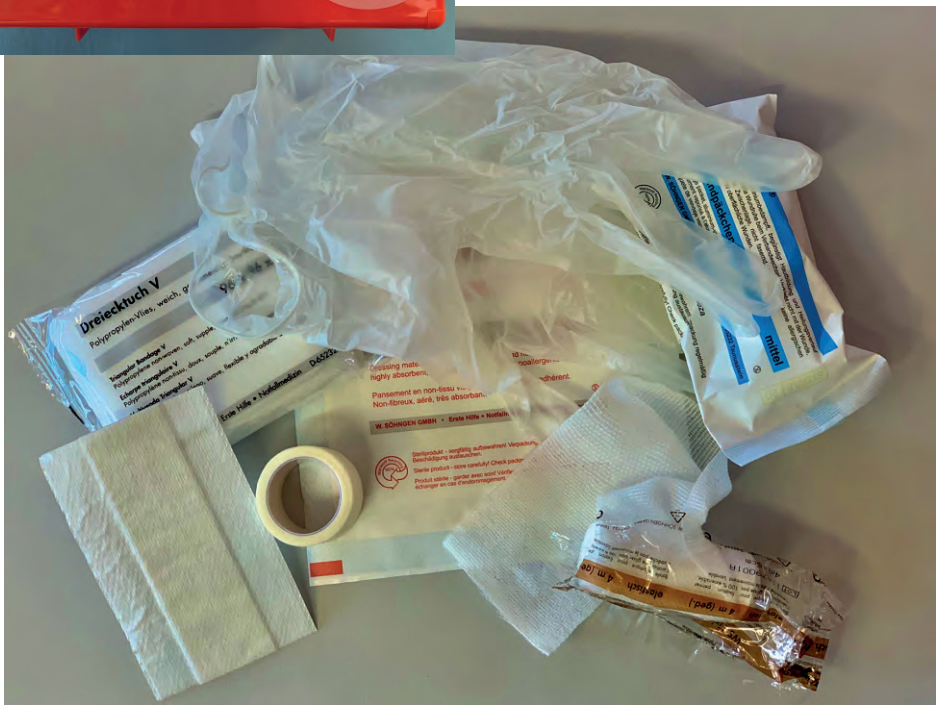
Patient positioning with thoracic injuries

- Foreign objects (e.g. a knife) always have to remein in the wound and get padded if necessary!
- Cover the affected person and calm and care for them until the rescue service arrives.
- If you need to reposition a patient with breathing difficulties so they can lean more comfortably onto a wall or a car you must not embrace their thorax. Instead, the patient must be lifted under the armpits and carefully pulled away.

1. If you need to reposition a patient with thoracic injuries ideally two helpers should hold them under their armpits (under no circumstances embarcing their thorax) and pull them.
2. Position them half sitting so they can lean on something and support themselves with their arms to the back. This will relieve the shortness of breath. Stay with them - shortness of breath easily leads to fear of suffocation and panic.

Wound care for minor injuries

Briefly not paying attention - and it has already happened: You cut yourself with a knife or slipped and fell down and got a laceration. Even these small everyday accidents need to be treated appropriately. This chapter deals with various, rather minor injuries and wounds and their dressing types and techniques. You will find almost all materials in the first aid kit.



Principles of wound care

When providing first aid treatment for wounds the following rules apply:

- Your hands must not touch the wound as they could contaminate and infect it.
- When treating wounds you should wear disposable gloves from the first aid kit for your own and the patient's protection.
- Do not rinse or clean the wound. An exception is the treatment with water for burns or chemical burns.
- Without medical instruction you must not treat the wound with any powder, ointment, spray, desinfectant or similar.
- Foreign objects have to remain in the wound; these should be removed by a doctor.
- Every wound should be treated with sterile dressing.

The three principles of wound care

Regardless of the type of injury, good wound care always fulfils three tasks.

1. The wound is not further contaminated with germs and pathogens
2. The bleeding is stopped.
3. The wound area is immobilised to relieve the pain of the person affected.

Dressing types and dressing techniques

Below you will find an overview of the dressing types and techniques. A proper wound dressing, which ensures undisturbed wound healing and protects the wound from mechanical impact and germ colonisation, always consists of:

- germ-free wound dressing,
- individual fastening with e.g. adhesive plaster, gauze bandage, triangular scarf

Germ-free wound dressings

Extensive skin injuries must be covered with a gauze wound dressing that is as sterile as possible or with a dressing sheet. Such sterile dressing can be found individually packaged in first aid kits. In order to ensure that the dressing remains sterile be careful only to touch the edge of the dressing with your finger tips and place it directly onto the wound.

- You can fix wound dressings with adhesive plaster strips, gauze bandages or triangular scarfs.

Dressing sheet

Large wounds such as abrasions or burn wounds but also those injuries that should only be covered loosely such as open abdominal wounds or head injuries are treated with dressings sheets. They are available in different sizes (40 x 60 cm/60 x 80cm/ 80 x 120 cm) and are made from various materials.

Emergency bandage

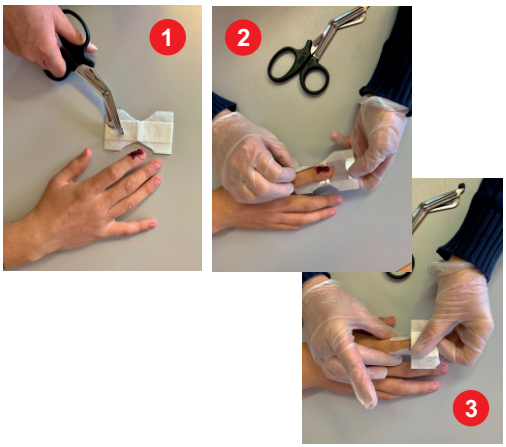
For small injuries with only little bleeding a simple plaster is usually sufficient. You will find suitably prepared plasters in the first aid kit.

How to get it right

- Cut off a sufficiently large strip of plaster. The dressing should always be larger than the wound.
- First remove the protective film from the adhesive strips. Make sure that you do not touch the wound dressing.
- Place the plaster with the wound dressing on the wound and fasten it without wrinkles.

Particularly tricky is the dressing of fingertips. With this approach you can easily apply a fingertip bandage.

- First cut off a sufficiently large piece of adhesive plaster (eight to ten centimetres long).



1 *Cut out a v-shape in the middle of each patch.*

2 *Then stick one half around the finger.*

3 *Finally, fold the protruding half of the patch over your fingertip and stick it together.*

Handling of wound dressings

- Cut out a wedge-shaped piece in the middle of each adhesive strip.
- Remove both protective foils from the adhesive surfaces.
- Stick half of the plaster wound dressing around the injured finger.
- Then fold the other half over the fingertip and stick it to the finger on the other side.

1. + 2. For smaller, easily accessible wounds, e.g. on the leg, a wound dressing is fixed to the body with two sufficiently long adhesive plasters.

3. + 4. Wounds like this toenail injury get treated with a wound dressing and fixed with a gauze bandage, which in this case runs over the heel.

Bandage with adhesive plaster (strip bandage)

When dressing with adhesive plaster a wound dressing gets placed on the wound and then fixed with two sufficiently long and parallelly placed strips of adhesive plaster from the roll.

Gauze bandages

Gauze bandages are not sterile. Therefore they must not be placed directly to a wound. Sterile wound dressings get fixed with gauze bandages.

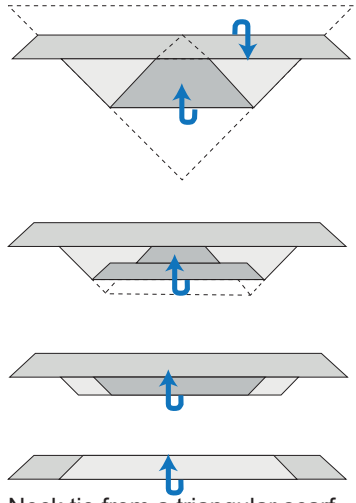
Triangular scarf

A triangular scarf is very versatile. It is not sterile, however it is suitable for fixing bandages or immobilising bone fractures. Triangular scarfs can be used as bandages for hand, arm, feet, knee and head injuries. The triangular scarf can also be used for larger injuries on forehead/head.

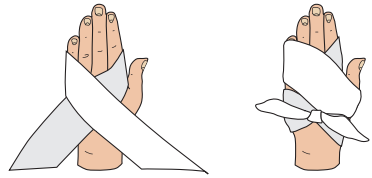
How to get it right

- Put on disposable gloves.
- It is best to sit the affected person down so that they can lean on something if necessary.
- Place a wound dressing on the injured area.
- Fold the triangular scarf into a >> neck tie<< (approx. 5 cm wide). To do this, fold the edge of the triangle towards the base with the width of about three fingers. Then fold it from the other side until you created a >>neck tie<<.
- With this >>triangular scarf tie<< the dressing is fixed to the head. The ends of the >>tie<< are then tied off into a knot.

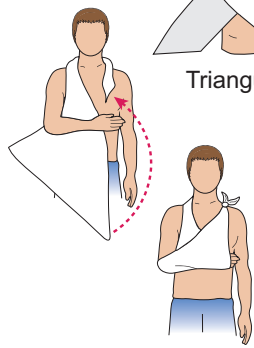
Bandages with the triangular scarf



Neck tie from a triangular scarf



Triangular scarf bandage on a hand



Arms sling from a triangular scarf

What else you need to know about wounds

With a bandage you can immobilise the wound area and thus relieve pain. As every wound is at risk of infection, first aid does not end with the application of a bandage.

It is also important to check whether there is sufficient vaccination protection against tetanus.




What is shown here with a compress and gauze bandage is even easier to achieve with a bandage pack.

1. *A bandage pack has an integrated sterile wound dressing which gets placed onto the wound and then wrapped with the bandage.*
2. *Wrap the wound compress several times (if necessary crosswise). The bandage should be firm but not too tightly wrapped.*
3. *Finally fasten the endings with a double knot. Or fix the end of the bandage with a plaster.*

Hand bandage with bandagage pack

Bandage pack

An ideal dressing material is the bandage pack. It is sterile and already contains a wound dressing which is attached to a bandage. This makes handling easier for you. Bandage packs are available in various sizes and are particularly suitable for treating bleeding wounds and for applying pressure in the event of dangerous bleedings. Dressing packs can be used on all kinds of body parts, the hand bandage is explained below.

How to get it right

- Always wear disposable gloves for your own protection when handling wounds.
- Open the packaging of the bandage pack and unfold the ending of the bandage with the wound dressing.
- Place the wound dressing onto the wound and fasten it by wrapping the bandage around it (not too tightly).
- Finally fix the bandage e.g. with a plaster

Foreign objects in wounds

Foreign objects in wounds, e.g. wood or glass splinters, but also larger objects, should never be removed by first responders. Otherwise there is a risk of additional (nerve) injuries or heavy bleeding.

How to get it right

- Carefully place one or more wound dressings around the foreign object. Make sure that the foreign object is not moved. If necessary, place some padding material around the foreign object and fasten it with a bandage or adhesive tape.
- The fixated foreign object can then be removed appropriately by a doctor.

Foreign objects in the eye

How to get it right

- When dealing with a persisting foreign object in the eye a sterile wound compress needs to be applied. Then both eyes must be bandaged with an approx. 5 cm wide folded triangular scarf from the first aid kit. Only by bandaging both eyes immobiliation of the injured eye can be achieved and thus pain be alleviated. The patient needs to see an ophthalmologist.

Measures for nosebleeds

Nosebleeds are quite common, especially in children. Besides mechanical injuries (often caused by picking ones nose) illnesses (high blood pressure) or ingredients in blood thinning medication can be the reason. Most often the bleeding is not heavy and thus harmless.

How to get it right

- Let the patient bend their head slightly forward, supporting their head if necessary.
- Place **cold compresses, an ice or cold packs** on their neck. Via the nervous system the cooling causes a constriction of the vessles thus stopping the bleed.
- Do not stuff the nose with anything (cotton wool, gauze or similar). It is better if the blood can flow outwards.
- When experiencing stronger, persistent or more frequent nose bleeds medical consultation is necessary (emergency services).
- In this case as well as with other severe bleeding in the facial area or from the mouth, position the patient face-down with the face resting on their crossed arms.

Treating a nose bleed

1. *In the event of a nosebleed lean your head slightly foward (do not tilt your head backwards).*
2. *Cold compresses in the neck help to stop the bleeding.*

Wound infections and animal bites

Tetanus infection

A particularly dreaded infection of wounds is tetanus, caused by the tetanus pathogen. Such a risk of infection exists even with small wounds, particularly when contaminated with garden or forest soil. The only preventive measure is vaccination. Therefore everybody should be vaccinated against tetanus.

Note

Bruises will not be addressed here but within the chapter >>Muscle, joint injuries and fractures<< (see page 38).

Bite wounds

How to get it right

- Bite wounds always need to be dressed sterile and immediately need medical attention.

Muscle, joint injuries and fractures

Strains, sprains, bruises - often it hits the >>hobby sportsmen<< who did not warm up properly. But also in everyday life or at work it happens - we stumble and twist our ankle.

The human musculoskeletal system consists of bones, joints, muscles, tendons and ligaments. In the event of an accident, unfavourable mechanical effects can lead to bone fractures or injuries to joints and soft tissues. This chapter gives you an overview of the necessary measures.

Typical muscle and joint injuries

Strains, torn muscle fibres, muscle tears, overstrechted or torn ligaments and haematomas in the muscles rate amongst the most typical injuries.

Signs of muscle and joint injuries

Almost all the injuries mentioned above after violent impacts on the musculoskeletal system are accompanied by bleeding into the affected tissue or joint. A haematoma develops in the tissue or area of the joint capsule. To the first responder injuries such as contusions, strains etc. present in various degrees of intensity but are comparable in general for identification.

- The main indicator is the sudden onset of often severe pain.
- The affected muscle region becomes weak and movement is restricted or impossible.
- The bleeding that usually occurs in the tissue causes swelling with sensitivity to pressure.

A more accurate and differentiated diagnosis by the first responder is usually neither possible nor necessary. A physician will diagnose properly later on. What is important is the immediate and correct first aid. It can positively influence the entire healing process and prevent further damage. There is a simple formula for this:

Rest
Ice
Compression
Elevation

For muscle and joint injuries, cool and elevate.

1. *Cooling 1: Fill a plastic bag with ice and some water, wrap it with cloth and place it on the injury.*
   ***Important:** Coolants must not be placed directly onto skin.*
2. *Cooling 2: Instant cool packs are practical. They are best fixated with an elastic bandage.*
3. *Cooling 3: You can also place pre-cooled hot-cold packs from the freezer on the injury and fasten them with an elastic bandage.*

Measures for muscle and joint injuries

How to get it right

- First of all, any activity (movement) should be stopped immediately. The affected body area should be immobilised.
- Immediate cooling is crucial for the entire following course of treatment and healing. For this purpose apply instant cooling packs, ice bags or cold compresses on the affected area.
- Never place cold packs or ice bags directly on the skin. Always place a cloth or some wrappings from a compression bandage on the skin first and then apply the cold pack.

- If the cooling is to take effect it needs to be continuous and effective in depth. Therefore the first cooling phase should last at least 30 to 45 minutes, afterwards cooling should continue sporadically for some time. The cooling is intended to prevent bleeding into the tissue and relieve pain.
- Fixate the cooling pack with a compression bandage and if possible with a short-stretch elastic bandage.
- To support hemostasis the affected body part should - if possible - be elevated for as long as possible and if at all only very gently be moved.
- Subsequently the patient has to seek medical attention for an acurate diagnosis.

Joint injuries

Violent impact on joints can cause sprains, dislocations, torn ligaments or even fractures close to joints (for fractures, see page 40).

Injuries to blood vessels often cause considerable swelling. Mobility gets restricted. Joint injuries are very painful. A basic distinction can be made between sprains and dislocations.

Sprains and dislocations

- In the event of a sprain (distortion), joint parts are moved against each other with force! Dislocated joints may only be repositioned by a doctor!
- Do not put any more strain on the injured joint, but cool it with appropriate means, keep it still and, if necessary, elevate it.
- The patient must see a doctor so that a reliable diagnosis can be made and they can be treated accordingly. Only the doctor can rule out injuries such as torn ligaments or a joint fracture.

Bone fractures

Usually a fracture is caused by violent impact such as a fall or a twist. So-called spontaneous bone fractures are rare, e.g. fatigue fractures after overloading or due to bone diseases. In general a distinction is made between closed and open fractures.
There are no open wounds **in closed fractures** and as such they do note pose a risk of infection.
However, with **open fractures** there is a wound near the broken bone: skin and muscles are damaged. Occasionally the bone is exposed and is also clearly visible in the wound. With an open fracture there is a considerable risk of infection with complications and negative effects on the healing process.

Signs of bone fractures

- Patients experience severe pain around the area of the fracture. They will not be able to move the affected body region at all or only to a limited extent, or rather avoid movement and adopt a relieving posture.
- Typical signs of a bone fracture are abnormal position or abnormal mobility around the fracture area as well as shortening of limbs.
- Sometimes there are open wound areas in which bone parts may be visible.
- Often the area around the fracture swells due to injured blood vessels.

Danger of bone fractures

The danger of fractures is that nerves and blood vessels can be injured by the accident itself, but also by unnecessary movements afterwards. Due to the pain and often underestimated bleeding into the tissue, shock can quickly develop - this means danger to life.

Measures for fractures (leg / arm)

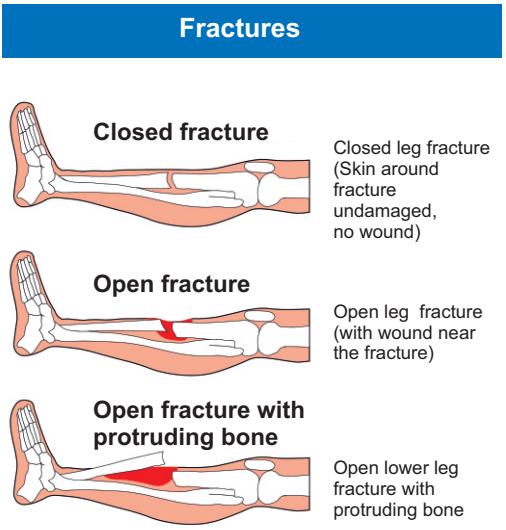
Patients with suspected fractures should be moved as little as possible. If there is no immediate danger to their life where they are, they should not be moved unneccessarily until the rescue service arrives. However, if the patient is in a hazardous zone they need to be removed from it first (see technique for rescue: Rautek maneuvre).

If the forearm is broken or the shoulder joint is dislocated, the arm can be fixed with a triangular cloth (see page 34).

Important

The risk of fractures due to osteoporosis increases with age. Femoral neck fractures are dreaded in older patients.

Closed and open fractures



Measures for leg fractures

How to get it right

- Due to the risk of infection open fractures quickly need to be tended to with a sterile wound dressing. Use the wound dressings or dressing tissues from a first aid kit.
- The fracture area gets immobilised beyond the adjacent joints with suitable soft padding material.
- For temporary immobilisation, e.g. on the leg, materials such as rolled up blankets or pieces of clothing, pillows, bags etc. are suitable as these are usually available at an accident scene. Pad the broken body part with the available material and leave it in the position it was found in. Further measures are to be left to the rescue service.
- Closed fractures often cause swelling. To prevent this, the fracture area should be carefully cooled with cold compresses or similar. This can reduce bleeding into the tissue and alleviate the patient's pain.
- Emergency call / alert the rescue service.
- Cover the patient and care for them until the rescue service arrives.
- If the patient goes into shock place them flat on the floor, however, without elevating their legs (as one would normally do with shock).

A broken leg ideally should be left in the position it was found in. Just immobilise it with padding material.

Until the rescue service arrives look after and calm the patient. Shock may also develop under certain circumstances.

Measures for fractures in hand, arm and shoulder

In case of fractures in the shoulder area - collarbone and shoulder joint - but also with arm or hand fractures, patients will initially hold their injured arm and shoulder firmly to their body with the uninjured hand. This way movement of the fractured area is prevented and thus pain alleviated.

Do not cause unnecessary pain! The patient can hold their arm like this until rescue services arrive.

Measures for suspected pelvic or spinal fractures

Signs of a pelvic fracture

- Severe pain in the lower abdomen and inability to move legs after a violent impact on the pelvic area can indicate a pelvic fracture.
- Please note: due to the possibility of severe internal bleeding there is an increasing possibility of the patient going into shock.

Typical signs of a spinal fracture

- If the patient has severe back pain and can hardly move their body after a corresponding accident (e.g. head jump into water, motorcycle accident) you have to consider fractured vertebrae.
- If the spinal cord is affected signs of paralysis with numbness and inability to move arms and/or legs is usually noticeable.
- If the patient is unconscious a spinal injury can only be suspected based on the accident situation. In this case carrying out immediate life saving measures has priority (such as placing the patient into recovery position or removing the helmet from motorcycle riders).

How to do it right

- If the patient is responsive leave them in the position you found them in and do not move them unnecessarily. The rescue service has techniques and equipment for optimal treatment, stabilisation and safe transportation of patients with spinal injuries.
- Emergency call / alert the rescue service.
- Cover the patient and look after them. They are afraid to be paralysed.
- If their vital functions are threatened by unconsciousness, respiratory or cardiovascular arrest initiate immediate life-saving measures - recovery position, resuscitation etc.

Important

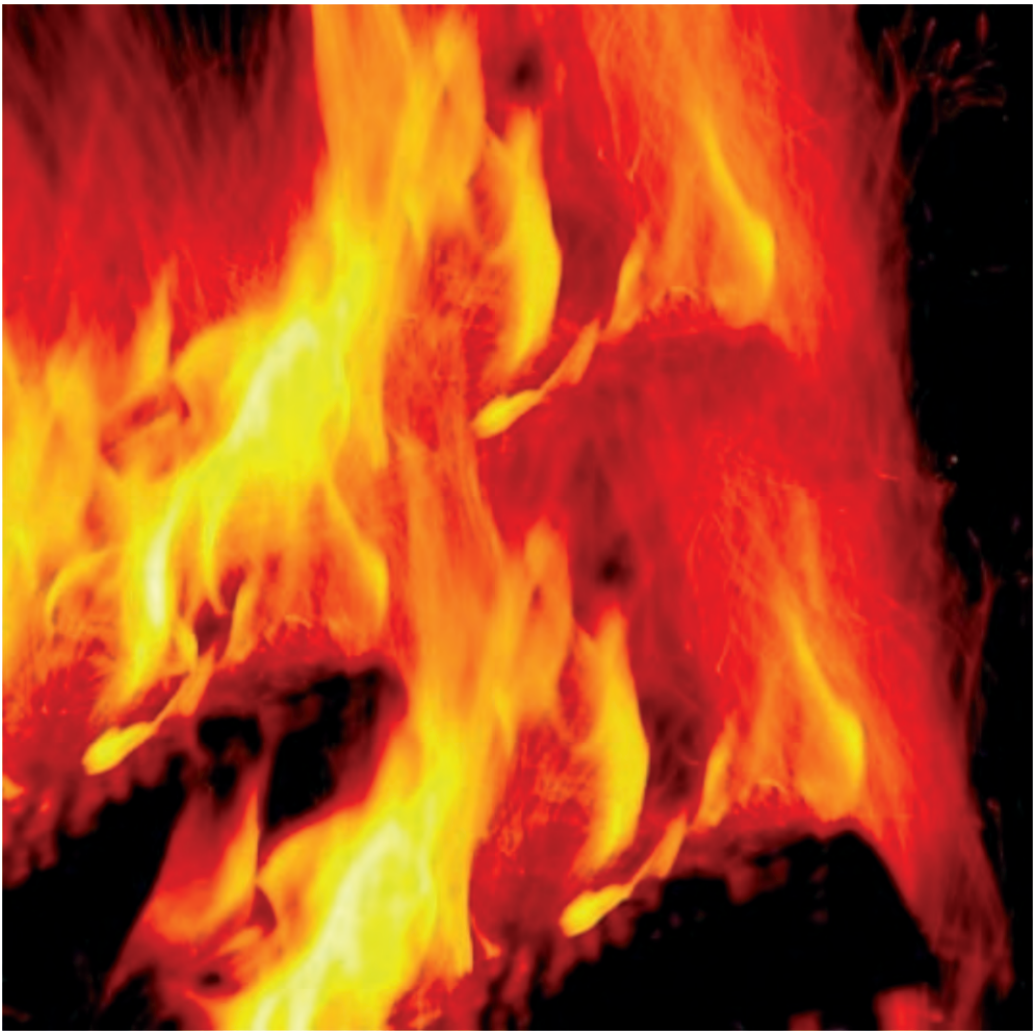
For unconscious patients with suspected spinal injuries immediate life-saving measures (such as recovery position) still have priority.

Life-saving measures have priority.

Under no circumstances may providing life-saving measures, such as rescuing victims from additional dangers, removing the helmet of motorcycle riders involved in an accident or placing a patient in recovery position, be refrained from on suspicion of a spinal injury.

Thermal injuries

Heat and cold can influence the human organism positively or negatively and can even lead to direct damages. This chapter describes the most important damages caused by thermal effects and explains the measures to be taken in case of heat damage, hypothermia/frostbites and burns/scalding. The chapter also includes measures to be taken in the event of sunburn.



Damage due to heat

Measures in case of sunstroke

If the sun's UV rays hit your uncovered head or neck over a prolonged period the brain and cerebral membrane can become irritated. People with sparse hair growth (without head covering) are particularly susceptible to sunstroke, especially infants or babies. Typical signs of sunstroke are as follows:

- Dizziness, headaches, neck stiffness, nausea and vomiting
- Bright red head
- Possibly unconsciousness

How to get it right

- Patients need to lie down flat in the shade but with their head elevated.
- Cool the patient's head with damp, cold cloths, instant cold packs or simply an ice bag (ice cubes and some water in a plastic bag). In order to protect the skin do not put the cooling packs directly onto it but wrap some cloth around it.
- If the patient is unconscuious move them into recovery position and call the rescue service.

Observing infants

Young children may develop delayed symptoms some hours after exposure to the sun such as vomiting and a fever. In this case a (paediatric) doctor should be consulted immediately, as at worst a meningitis could be developing.

Damage due to cold

Measures in case of hypothermia

Hypothermia occurs when the heat loss of the body is greater than the heat production over a longer period of time. Classic causation for hypothermia are mountain accidents with sudden change of weather, skiing accidents, avalanche burial in winter or a fall into waters with the victim remaining in the cold water for longer.

Also accident victims, particularly those in shock, can get hypothermia. Poisoning or the influence of alcohol and drugs often has an accelerating effect.

1st stage of hypothermia: The person is conscious and often shivers visibly. At this stage first responders can warm them up.

How to get it right

- Bring a hypothermic patient to a warm location and slowly warm them up from the core. If applicable remove cold, wet clothing first and wrap them in warm blankets or similar (the rescue blanket from the first aid kit is ideal for this). Do not actively warm them up by rubbing or using a hot-water bottle.
- If the patient is conscious give them warm, especially well-sugared drinks, e.g. tea.

No alcohol

Contrary to popular belief, alcoholic beverages are strictly forbidden in this situation (alcohol dilates the blood vessels and also accelerates hypothermia).

- Observe consciousness, breathing and body temperature and avoid further exposure to cold.
- If the patient's condition does not improve, alert the emergency services..

2nd stage of hypothermia: The patient gets increasingly tired and finally loses consciousness. Additionally respiratory and cardiovascular arrest can occur.

How to get it right

- At this stage first responders must not attempt to warm up the patient. The body temperature would continue to drop if warmed up improperly and the person would die. Attempts at rescue, where the person is moved intensively, also lead to a further drop in temperature and thus to death.
- Emergency call / alert the rescue service as soon as possible.In the mountains call for moutain rescue services and appropriate water safety services on waters respectively. Rewarming should be carried out under medical supervision (in the hospital).
- If the patient is unconscious place them in rescue position and prevent further loss of temperature by covering them (with a rescue blanket from the first aid kit).
- Constantly check their consciousness and breathing and if you notice any irregularities initiate immediate life support measures.

Measures in case of frostbite

Friostbites are localised tissue damages. This is caused by longer lasting exposure to the cold (often in combination with moisture and wind) which restricts proper blood circulation. The first responder can usually only see the early signs of frostbite damage. Typical indications are as follows:

- The affected body parts, often fingers, toes, nose, ears and cheeks, are coloured bluish-red, later white-yellow or white-grey. They are cold and initially soft and painful, later hard and numb.
- Consequential damages with blistering and necrotic tissue only presents after several hours.

How to get it right

- Emergency call/alert the rescue service.
- The frostbitten body region and extremeties of the patient must not be moved under any circumstances.
- Do not under any circumstances attempt to actively warm up the patient e.g. with a hot water bottle or similar. All further steps have to be clinical treatment.
- Cover frostbitten body parts with sterile dressing (e.g. bandaghe cloth).
- Since frostbites are usually associated with general hypothermia measures to treat the latter have priority.

Burns/scalds

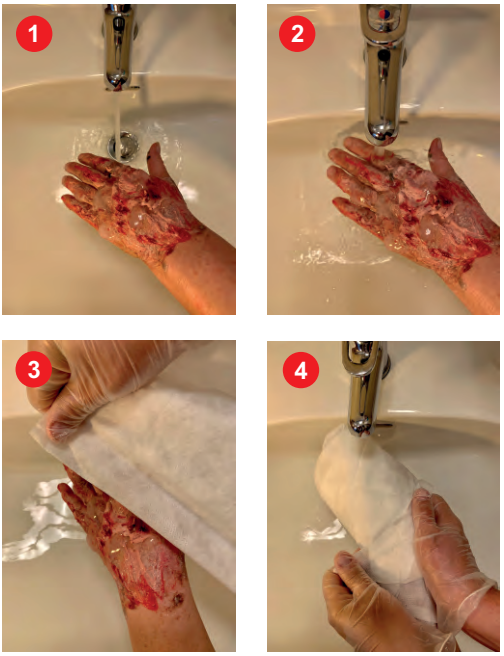
Burns are the most lasting and painful external injuries impacting the entire organism. Burns and scalds are severe injuries of the skin and deeper layers of tissue caused by high temperatures.

Measures for burns

How to do it right

- If a person is burning the fire needs to be extinguished immediately. Pour water over the victim, smother the flames with a blanket or similar, roll them on the floor or extinguish the flasmes with a fire extinguisher.
- Use of water: Only palm-sized burns may be cooled.
- In case of scalding the victim's clothing should quickly but very carefully be removed to prevent further unnecessary delay.

Measures in case of burns



1 First and second degree burns can be accompanied by redness but also by blistering.

2 Only cool small burns.

3 + 4 Due to risk of infection cover the affected area with sterile dressing. Do not open blisters under any circumstances. Medical treatment is advisable for all burns.

- Do not pull off clothes that are burned-in or stuck to skin. Cut off the fabric outside of the wound with a pair of scissors.
- After treatment with water cover the burn injuries with sterile dressing (from the first aid kit) to reduce risk of infection.
- Do not open burn blisters!
- Emergency call / alert the rescue service quickly.
- Carefully cover the patient. The rescue blanket from the first aid kit is ideal for this.
- If the patient is showing signs of shock slightly elevate their legs.
- Until emergency services arrive and take over the patient needs to be constantly monitored and looked after.
- Severe, extensive burns as well as burns on the face often come with respiratory and circulatory disturbances. Thus monitor consciousness and breathing constantly.

You can counteract the organ damage (also called burn disease) that occurs as a result of a severe burn by providing immediate first aid, especially by water treatment, and thus help the patient immensely.

Important

Applying any household remedies is strictly prohibited when dealing with burns and scalds.

Measures for sunburn

An intensive sunburn is a 1st degree, sometimes even 2nd degree burn. It is not only unpleasant but also associated with severe cell damage in the skin. It is now known that this is associated with an increased risk of skin cancer.

Sunburn has a particularly harmful effect on children. Their skin is still thin and less pigmented, making it less resistant to the sun's rays; the risk of sunburn is therefore particularly high for them. Make sure that your child never suffers a sunburn!

How to get it right

- Severe sunburns with fever and chills require medical treatment.
- To relieve the agonising sunburn, you can put moist and cooling cloths on the skin.
- Avoid the sun for at least one week.

Tips for the prevention of sunburn in children

- Babies under one year of age must remain in the shade.
- For children a sun cream with a high sun protection factor (at least SPF 20) is suitable, in addition you should use sunblockers for sensitive areas.
- Some head covering (head or cap with wide brim) and a t-shirt are a must when going out in the sun.

Electrical accidents

Electrical accidents can be divided into two catgeories: Low voltage accidents and high voltage accidents. Electricity causes damage in different ways: There can be skin and tissue damage with so-called current marks, burns and in extreme cases cauterization.
Electricity disrupts the heart's activity, resulting in cardiac fibrillation and even cardiac arrest. It causes muscle spasms and damage to the brain and nervous system, resulting in convulsions, paralysis and unconsciousness.

Hazards due to electric current

Electricity and electronic devices play an important role in many areas of our daily lives. Many accidents are caused by careless handling of electrical appliances, e.g. in damp rooms, or by unprofessional handicraft and repair work.

In the electric circuit

Dangers due to electric current exist in our domestic environment as well as in trade and industry. In case of an electrical accident the body becomes part of an electrical circuit. It does not matter whether the circuit is closed, e.g. by touching live parts or through the development of an electric arc when getting too close to a power line.

Measures in the event of electrical accidents

How to do it right

- First and foremost, you must think of your own safety. There is danger to life! Under no circumstances should you become part of the cuircuit as well otherwise you will suffer the same fate as the victim.
- In any case, the electric circuit must be broken because as long as the victim is connected to the power source they are part of a life circuit.
- The easiest way to interrupt the circuit is to pull the plug or switch off the electrical appliance. If this is not possible you must switch off the main fuse of the circuit (circuit breaker).
- If the interruption of the circuit is not successful, you can try to pull the patient away from the power source. Never touch the patient directly with your hands! Instead, try to use insulating objects - such as a chair or wooden board - to disconnect the person from the power source without endangering yourself.
- Special care should be taken in damp rooms because the conductivity of liquids, and therefore also of damp, misty air, is greater than that of dry air.
- After the rescue immediately check the victim's consciousness and breathing and carry out any immediate life-saving measures that may be necessary, such as those described under >>cardiopulmonary resuscitation<< or >>recovery position<<. These emergency measures have priority over treatment of burns.
- Emergency call/alert the rescue service as quickly as possible. Or arrange for a second person to do so.

Important

Never touch a person who is part of a live circuit. Do not reach for this person in reflex. Otherwise you will be electrocuted yourself and will not be able to help the person.

Note

After an electric shock the patient must always seek medical treatment - no matter how they feel. The use of a defibrillation device can also save lives in the event of an electrical accident.

Treatment for high voltage accidents

Accidents in the high-voltage range (more than 1000 volts) are basically only possible if the safety regulations are not observed, e.g. by climbing a high-voltage pylon, intruding substations or climbing around on railway wagons underneath an overhead line. High voltage lines that have been torn or are hanging down are also dangerous, as a so-called voltage funnel can form on the ground. Only a sufficiently large safety distance of at least 5 metres can prevent you from getting into the circuit! To prevent accidents all high voltage installations are marked with warning signs.

Under no circumstances should you take such warning signs lightly. Anyone who overcomes safety barriers is playing with their life.

How to get it right

- In all accidents involving high voltage, it is important that you as a helper do not put your own life at risk. So first and foremost think of your own safety.
- The current jumps over to an approaching person in the form of an electric arc. For this reason a safety distance of at least 5 metres from the power source must be maintained.
- Emergency call/alert the emergency services as quickly as possible, pointing out a high-voltage accident and giving precise location information.
- The rescue of the person concerned from the danger zone is only to be carried out by qualified personnel.
- After rescuing the victim (exclusively by qualified personnel treatment takes place. Besides any resuscitation procedures, first aid measures focus on the treatment of burns, which are usually life-threatening.

Poisoning and chemical burns

Ranging from obvious to insidious: poisoning may not always be a first responder's first guess to be the cause of breathing and circulatory problems.
Particular caution is required with >>invisible<< toxins, such as fumes and contact poisons. In the case of poisoning of the air and contact poisons, the principle of self-protection must be observed.

This chapter deals with the main forms of poisoning and chemical burns and the corresponding first aid measures.

Dangers of poisoning

Whether we are dealing with chemicals, pharmaceuticals, pesticides, insecticides, poisonous plants, berries, fungi or spoiled food, they can each contain several thousand toxic compounds. This almost unmanageable quantity of different substances in varying concentrations and toxic effects makes it extremely difficult to provide assistance.

Interpreting symptoms correctly

It is crucial for successful first aid that even the first signs of an initially unclear health impairment are linked to a possible poisoning in order to enable a differentiated diagnosis and assistance. However, this is not easy, especially in the case of poisoning:

- Nausea, vomiting, abdominal pain, diarrhoea, intense sweating, respiratory and circulatory problems, dizziness, cramps, disorientation up to respiratory and circulatory arrest are only the most important symptoms.
- It often requires skillful questioning by the first responder until the cause of an initially unclear finding is determined.

Dealing with hazardous substances

Never fill hazardous substances into beverage bottles. Always use the required protective gear when handling chemicals. Observe the relevant safety regulations when handling chemicals. Keep hazardous substances in the household out of the reach of children.

Six questions when dealing with poisoning

When calling the poison control centre you should be able to answer the following questions. In this context you should pay attention to food leftovers, empty packaging of pharmaceuticals etc. in the patient's vicinity.

Who?	Who got poisoned? (Age and weight)
What with?	Which poison was consumed? (Description of poison)
How much?	Quantity or rather concentration of the consumed poison.
When?	Precise time of consumption.
Which symptoms?	What symptoms is the patient showing?
What aid?	What first aid steps have already been taken?

Measures for poisoning

How to get it right

- Observe self protection!
- Above all, keep calm. Your level-headedness also calms the patient.
- If necessary, rescue the patient from the danger zone.
- Remove clothing to which poisons have stuck to.
- Secure any residues of the poison.
- Check consciousness and breathing first and initiate immediatel life-saving measures as required.
- If necessary, support the patient in vomiting.
- Emergency call / alert the emergency services as soon as possible
- Cover the victim warmly (rescue blanket).

Important

Milk was once considered a household remedy against poisoning, but it is harmful. Milk allows the poison to enter the bloodstream through the stomach even more quickly.

- Without competent instruction from e.g. the poison control centre or a physician do not give the patient anything to drink, especially not milk.
- Inducing vomiting is usually harmful, especially for infants and children and especially after taking corrosive or foaming substances. Only induce vomiting if a physician or the poison control centre has explicitly advised you to.
- Under no circumstances induce vomitting if the patient's consciousness is disturbed as they would be at acute risk of suffocation.
- If the patient starts vomitting on their own accord support them. Save the vomit and hand it over to the rescue service for later examination regarding possible cause of poisoning.
- Particular care has to be taken when dealing with insecticide poisoning. Some of these affect the nervous system and can cause respiratory and cardiovascular arrest. As these are so-called contact poisons self-protection for first responders has particular importance in these cases. When caring for patients with insecticide poisoning ensure to at least wear disposable gloves.
- Ventilation of patients with >>contact poisoning<< always has to be done with a ventilator in order to avoid direct contact with the poisoned patient. Special teaching and instructions are required for this.

Poison control centre

If you are not sure whether an ingested substance is poisonous or not you can get more specific information from the call centre of the poison control centre. (Information you should be able to provide is listed on the previous page under "Six questions when dealing with poisoning").

There are poison control centres in nearly all federal states. You can find their respective phone numbers online at www.bvl.bund.de or via directory assistance. The primary poison control centre - especially for emergencies with children involved - is located at the University Children's Hospital in Berlin and can be reached under the following phone number:

030 / 19 24 0

Gas poisoning

Inhaling certain poisonous corrosive gases, e.g. chlorine and nitrous gases, can cause damage to the respiratory tract and direct lung damage. Oedema of the lungs often develops with a time lag (accumulation of water in the lungs). People who have inhaled such gases have to be admitted to hospital for observation even if they show no signs of poisoning.

How to get it right

- If there are symptoms of poisoning with shortness of breath, position the person with raised upper body.
- Emergency call/alert the rescue service as soon as possible.

Measures in the case of carbon monoxide poisoning

The carbon monoxide produced by every combustion, especially by incomplete burning when lacking oxygen, poisons the body. It forms an intensive compound with the red blood cells so they cannot bind oxygen anymore thus not being able to distribute it the body's cells. In enclosed spaces carbon monoxide can reach explosive concentrations.

How to get it right

- Victims of carbon monoxide poisoning initially get headaches, nausea and vomit before finally falling unconscious. Their face is rosy despite the lack of oxygen. High concentrations of carbon monixide can quickly lead to a life-threatening condition.
- Make sure that the affected rooms are ventilated first.
- Emergency call / alert the rescue service.
- While observing your own safety bring the patient outside into the fresh air.
- Check the victim's consciousness and breathing and if necessary initiate immediate life-saving measures: recovery position (see page 15) and rescue breathing (see page 19).

Measures in the case of carbon dioxide poisoning

Under certain circumstances carbon dioxide is a particularly treacherous gas. It develops during fermentation and biological decomposition processes, is invisible, odourless and heavier than air. It displaces air and thus oxygen in lower-lying rooms, e.g. in a fermenting cellar, closed containers or shafts so that people who end up in this >>carbon monoxide lake<< suffocate within a very short time.

How to get it right

- Do not attempt any rescue operations in closed rooms or containers without special, self-contained breathing apparatus and appropriate safety equipment.
- Since this type of equipment is usually not available to you, alert the rescue service as soon as possible (emergency call).

Chemical burns

Measures for eye burns

Eye burns are extremely painful and can lead to blindness. The patient will squint strongly wich makes providing aid even more difficult.

How to get it right

- Rinse the eye extensively - ideally together with a second helper. The patient should sit or better still lie down.
- One helper holds the eye open (please wear acid-resistant gloves for this) while the other pours water from approx. 10cm above from the inner corner of the eye outwards. Make absolutely sure that the healthy eye does not get damaged as well in this process.
- Afterwards cover the affected eye with a sterile dressing and bandage both eyes for protection and immobilisation. Ensure prompt medical treatment (emergency call).

Important

Special eye showers should be available in businesses with corresponding risk potential and accident risk (e.g. chemical industry) .

Measures for skin burns

Burns of skin and tissue caused by chemicals such as acids and lyes vary in their damaging effect depending on the type of chemial, its concetnration, quantity and exposure time. The patient is in severe pain.

Treatment of skin burns

1. Chemical burns can be very painful; therefore you must act quickly and calmly.
2. Hold the affected area under running water so that other parts of the body do not get sprinkled and also damaged.
3. After sufficiently rinsing the burned area with water, loosely bandage the burned area with a bandage cloth.

How to get it right

- Removing or at least dilution of the substances helps. Start by removing clothes (if necessary also shoes and socks) that came in touch with the acide or lye. Be careful not to burn yourself while helping (wear acid-resistant gloves).
- Then thoroughly rinse the affected body parts under luke-warm running water until the pain subsides. Ensure that the running water runs off directly from the affected wound area and does not additionally burn any healthy skin areas.
- If water is not available try to dab off the substance with gauze swabs. Observce self-protection (acid-restistant gloves) and only use each swab once.
- Apply sterile dressing afterwards.
- Then immediately call the emergency services (emergency call).

Measures for gastro-intestinal burns

If acids or lyes have been accidently ingested severe pains and increased salivation occur. The mucous membranes in mouth and throat turn white or bloody and swell up.

How to do it right

- Do not provoke any vomitting, the mouth-throat area would be burned again.
- In order to rinse mouth and oesphagus and to dilute the substance give the patient some water to drink in small sips.
- Emergency call/alert the rescue service immediately, as there is an acute risk of a stomach or intestinal perforation.

Acute illness

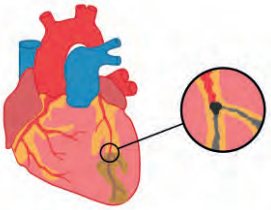
Important human organs can be damaged not only by accidents, but also by (chronic) illnesses. Often these cause acute symptoms suddenly and unexpectedly with immediate danger to life. Heart attacks and strokes are the most prominent examples of this. This chapter will familiarise you with first aid measures in such acute cases - most of them are emergencies that require immediate alerting of the emergency services/emergency doctor.

Cardiac diseases

Causes of heart attack

A heart attack is one of the most common heart diseases. It is caused by the sudden closure of a coronary artery. The heart muscle (myocardium) is supplied with oxygen and nutrients via these vessels. Such an occlusion is favoured by years of exposure to certain risk factors, including:

- Hereditary predisposition
- Stress
- Arteriosclerosis
- Obesity
- High blood pressure
- Smoking
- Diabetes mellitus
- Lack of exercise
- High cholesterol levels



Clogged coronary artery

Deposits form in the vessels, which is called arteriosclerosis. If these deposits eventually lead to the closure of a coronary artery, part of the heart muscle is no longer supplied with blood. It dies. Sometimes an occlusion is caused by a blood clot (thrombus) that gets stuck in a coronary artery and blocks it. Depending on size and location of the blocked coronary artery, a part of the heart muscle is cut off to a greater or lesser extent from the oxygen and nutrient supply.
Thus the severity and the consequences of an infarction can vary a lot. The patient may not notice anything if the affected area is very small, however, immediate cardiac arrest can also be the case. Often the heart goes from a normal heart rhythm into a >> flickering state <<. It cannot pump properly anymore.

Measures for heart attack

First of all, it is important to understand the situation correctly and recognise the heart attack.

- Often patients suffer from severe pain located behind their sternum. The pain radiates to the left arm, shoulder, jaw and upper abdomen.
- Patients tend to be very restless but sometimes also very calm. They are scared to death.
- The face is pale grey, usually wet with sweat.
- They are weakened and complain about shortness of breath, nausea and occasionally vomiting.

Important
Nowadays there are good medical possibilities to treat heart attack patients. The prerequisite, however, is that the patient reaches the hospital alive. You can make a significant contribution to this as a first responder.

As a heart attack can have different degrees of severity, the signs are also differentiated and more or less prominent. Worst case scenario a sudden cardiovascular arrest occurs. Those affected suddenly lose consciousness and take a few more breaths at increasing intervals until respiratory arrest occurs.

Dealing with angina pectoris

Angina pectoris (chest tightness) can be described as a kind of precursor of a heart attack. Under stress or excitement constricted coronary arteries can cause sudden pain behind the sternum, accompanied by a strong feeling of tightness in the chest as well as restlessness and fear.
The measures for angina pectoris are the same as for heart attacks (positioning with raised upper body, emergency call, etc.) If necessary, help the person affected to take their medication (usually nitro sprays). Ensure oxygen supply (fresh air). Resuscitation measures become necessary if the person concerned becomes unconscious and cannot breathe normally.

How to get it right

- Emergency call/ Alert the rescue service as soon as possible or have another helper alert them.
- Check consciousness and breathing.
- If the patient is responsive gently get them into a comfortable position with elevated upper body. This relieves the weakened heart. As the patient is already weakened they must not overexert themselves any further.
- Open tight clothing (tie, shirt collar, etc.) and open the window for air supply.
- Schield off the patient from their surroundings. They need rest.
- Until the rescue service arrives you must constantly look after the patient and above all monitor their circulation.
- Stress and agitation strictly need to be avoided. Calm the patient and do not leave them alone.
- In case of cardiovascular arrest initiate CPR immediately and keep it up until the rescue service arrives.
- If a defibrillation device is available and you have been trained how to use one promptly make use of it.

Stroke

Causes for stroke are usually changes to the blood vessels. Deposits in brain arteries, often in conjunction with high blood pressure, are prerequisites for a stroke. High blood pressure can cause brain arteries to burst sudddenly. Sometimes the cause is a blood clot which gets stuck in a brain artery and clogs it up. In either case the blood supply and thus oxygen supply to parts of the brain get interrupted and certain functions get damaged.

Measures for stroke

The symptoms for a stroke are not always as pronounced and easy to detect as described in the following:

- Often patients complain about sudden, severe headaches with nausea and vomiting, sometimes accompanied by a stiff neck.
- Paralysis of extremeties (hemiplegia); facial paralysis with a drooping mouth and closed eye lid on one side are symptoms of a stroke.
- Vision impairment, aphasia and difficulty swallowing with risk of suffocation can occur.
- At worst unconsciousness as well as respiratory and circulatory distrubances occur.

How to get it right

- Emergency call / alert the rescue service immediately.
- Check consciousness, respiration and circulation and if needed initiate the necessary life-saving measures.
- If the patient is conscious place them comforatbly with elevated upper body.
- Pad the paralysed body parts, observe and care for the patient continuously until the rescue service arrive.
- Calm conscious patients. Consciously experiencing a stroke is a terrible experience.

Stroke = emergency

A stroke is a very serious emergency. Unfortunately it is sometimes not recognised because the signs are not always as severe as described. When people are conscious, they are often thought to be drunk because they sway, fall off their chair and sometimes have speech problems. Across Germany more and more so-called Stroke Units get set up, which specialise in diagnostic of and therapy for apoplexy. The work of these units contributes massively to a more positive progression and consequently fewer or milder possible long-term effects.

Diabetes mellitus

Diabetes mellitus is a metabolic disorder caused by a lack of insulin (a hormone of the pancreas). A precise description of the very complex metabolic system of the human organism is beyond the scope of this manual and it is also not necessary for providing correct first aid. However, it is important to know that the functionality of human cells depend on the proper functioning of the carbohydrate metabolism.
(For example, sugar is a carbohydrate.) This metabolism is regulated by insulin, among other things. If there is not enough insulin available to the organism, for example because not enough is produced, or (as is more common with people with diabetes) the amount of insulin supplied from outside is too small in relation to the amount of carbohydrates ingested, then the body cells don't receive enough carbohydrates and their function is impaired.

Measures for diabetic coma

If the blood sugar level has been too high for a longer period of time a so-called diabetic coma can occur. Consequences of this metabolic disorder are particularly noticable in its adverse effect on the brain cells. The patient after initially breathing more deeply, loses consciousness and a strong sweet, fruity odour in their breath (smell of acetone) can be noticed. The patient falls into deep unconsciousness - a coma.

How to do it right

- If the patient is unconscious (in a coma) check their breathing.
- If they are breathing turn them into the recovery position.
- Ensure that they keep breathing.
- Cover the patient, ideally with a rescue blanket.
- Emergency call / alert the rescue service as all further treatment has to be done by a physician.

Treatment of hypoglycaemia

Much more common than the diabetic coma are emergency situations caused by hypoglycaemia. If a diabetic's insulin intake does not match the carbohydrate intake the carbohydrate, get metabolised too quickly so that the blood sugar level drops. The resulting low blood sugar level can cause a hypoglaecemic shock. Often there are warning signs:

- Patients with low blood sugar levels are restless, have trouble concentrating, impaired vision, a ravenous appetite and experience profuse sweating.
- Without ingestion of sugar (glucose), food or sugary drinks the patient will get cramps and finally fall unconscious.

Diabetes mellitus

Typ-1-diabetes is hereditary insulin deficiency diabetes, which usually occurs in childhood and adolescence, but is also increasingly affecting older adults (absolute insulin deficiency).

Typ-2-diabetes mainly affects older people (adult-onset diabetes). It develops slowly over several years, but also affects younger people in increasing numbers (relative insulin deficiency or insulin resistance). Other types have various causes and affect all age groups.

Gestational diabetes occurs in women of childbearing age during pregnancy for the first time (glucose tolerance disorder).

How to get it right

- If the first signs of hypoglycaemia are noticed, the patient must immediately start eating carbohydrates (food, glucose, sugary drinks such as lemonades or juices). Symptoms should subside quickly thereafter. However, the family physician should be consulted anyway.
- If the patient is already unconscious, they should not be given any more. Check their breathing. If they are breathing turn them into recovery position.
- Emergency call / alert the emergency services immediately.
- Until the emergency doctor/rescue service arrives check the patients breathing regularly and cover them with a blanket.

Acute illness of abdominal organs

Sudden onset of acute abdominal illness can have many causes, such as pancreatitis, gall bladder or ovarian inflammation, often also appendicitis.

Also ulcers in the gastrointenstinal tract, trapped gall or kidney stones as well as intestinal obstructions cause severe abdominal pains.

When experiencing acute illness of abdominal organs patients often turn onto their side and draw up their knees. This position relives strain from the abdomen thus easing pain.

Measures for acute abdominal illness

Occasionally the pain comes and goes in periodic waves. These pains are called colics. The following symptoms accompany colics and acute abdominal illness:

- The abdominal wall is tense, the patient is noticably pale. There is cold sweat on their forehead.
- Often they bring themselves into a relieving position with drawn-up knees. They usually lie on their side. In this position the abdominal wall gets relaxed thus easing the pain.

How to get it right

- Paying attention to the patient is most important when dealing with acute illnesses. Look after and calm the patient.
- Especially acutely ill children require care and attention.
- Cover the patient to keep them warm. Avoid hectic and disturbances.
- Emergency call / alert the emergency services.
- Bring the patient in their preferred position, often that means just supporting them in their already self-chosen relieving position by providing a knee role for relaxation of the abdominal wall.
- If the patient has diffiulty breathing sit them up and open restrictive clothes if necessary.

1. *Patients with acute abdominal diseases often get themselves into a relieving position, usually with drawn-up knees.*

2. *Children especially need to be calmed and well looked after. Unclear abdominal pain means patients must not eat, drink or smoke.*

Please note

The patient must not eat, drink or smoke because of the likellihood of immediately needed surgery. Taking any medications such as pain killer is also prohobited as it would complicate and delay the medical diagnosis.

Emergency patient child / age groups for children

Depending on their age and stage of development, children can have different emergency pictures compared to adults due to various physiological, anatomical and psychomotor differences. The age groups up to 8 years of age are particularly affected - children are not small adults. Accordingly, assistance must be adapted to the child on several levels and satisfy their needs.

Age groups for children

- Newborn (up to 14 days)
- Baby (up to 1 year)
- Infant (up to 6 years)
- School child (up to 14 years)
- Adolescent (up to 18 years)

Characteristics of children up to the age of 8

Body temperature

- Due to their relatively larger body surface children lose body heat more quickly.
- Infants cannot effectively compensate for cold by shivering.
- Infants sweat insufficiently which makes them extremely prone to overheating e.g. in a closed, parked cars.

Breathing

- The breathing rate is significantly higher than in adults (babies: approx. 40 to 60x/min).
- The respiratory muscles are not yet fully developed, which means that they are exhausted more quickly, especially in cases of respiratory distress, which can lead to fatal conditions.
- Newborns and babies can breath and swallow at the same time in order to ease nursing, however, this also increases the danger of choking.
- Airways are narrower which favours diseases such as pseudocroup.

Circulation

- The heart rate is relatively higher and the blood pressure correspondingly lower.
- In relation to body weight the amount of blood circulating is equivalent to that of an adult, however, for a newborn of approx. 3 kg this equates to just about 240ml. Children are like small pots, they overflow quickly. Infusions placed by emergency services or in the hospital are also empty quickly (bleeding, loss of fluids through sweating, diarrhea etc.)
- Newborns and babies have more haemoglobin, which gets metabolised excessivley after the birth and can lead to neonatal jaundice.

Prevention of emergencies involving children

Hazards in households

Kitchen

- Keep electrical appliances (kettles, toasters) and cables always out of reach of children.
- Use a cooker guard when using pans and pots.
- Always keep chemicals out of reach, children may manage to open bottles!
- Spices need to be treated the same way as chemical. They can, depending on the dosage, be considerably toxic.

- It goes without saying to keep knives and other sharp objects out of children‘s reach.

Bathroom

- Never leave small children unattended in the bath tub.
- Also check the bath water temperature.
- Medications can have fatal consequences for children, even if they are over-the-counter drugs.
- The same applies to cosmetics, particularly depilatory cream.

Living room

- Cigarettes and aclohol are pure poison for children due to their low tolerance.
- Do you have poisonous plants in your living room?

- Additionally secure all heavy cupboards/ shelves with an anti-tilt device.

Garage and basement

- Store tools and chemicals safely.
- Do not ever refill chemicals into other containers.
- Even a short car journey on your property must be carried out carefully and cautiously, ideally supported by a rear view camera.

Garden

- Do you have any poisonous plants in the garden? (e.g. laburnum, hogweed, henbane, trumpet vine, thorn apple and others)
- Securely cover any ponds, rainwater barrels or possible shafts.
- Store any barbecue equipment, barbecue lighter or lamp oil out of reach! Danger to life!

Pets

- Do not let babies or infants alone with dogs and cats, animals can act agressively all of a sudden.
- Pets can foster infections and parasitic diseases /infestations (e.g. fleas).
- Ensure that your pets regularly get treated for worms and other parasites.

Insects, ticks, spiders

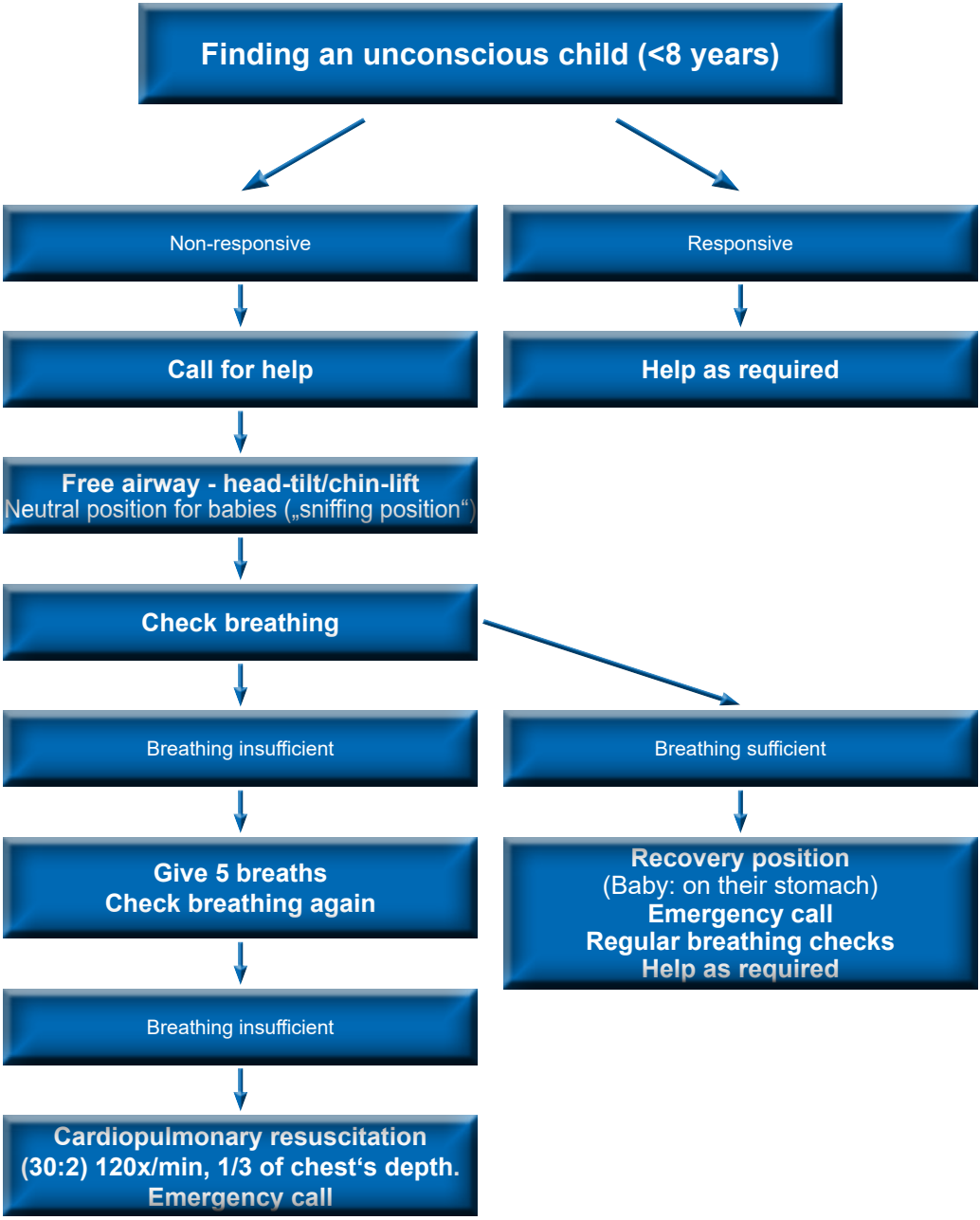
- Stinging and biting insects are common for the region so stings/bites cannot be avoided all together: As long as there are no prevalent allergies these are usually harmless
- Wasps, bees, hornets, bumblebees can be resettled so killing them can no longer be justified
- Do not ever approach or let your children get close to insect nests, the animals will attack in defense
- Both you as well as your children should only drink from containers that you can check easily or have insect protection
- Collect fallen fruit
- Cover food
- Tics lurk in brushes and grass, remove them as soon as detected

Miscellaneous

- Weapons need to be securely stored according to regulations.
- Secure power sources from children‘s access.
- Secure any stairs and other hazards.
- Remember helmets and other protectors for leisure activities (such as bike helmets or for skiing).

First contact with sick child

- Get down to the child‘s level and establish eye contact.
- Establish subtle physical contact observing skin colour and temperature.
- Explain to the child what you already have done and also what you intend to do.
- Calm the child and also the parents as their anxiety will transfer to the child.
- Try to radiate calm yourself, your fears and physical reactions are transferred to the child.
- Attention and care is your most important aid measure.
- Do not leave the child alone.
- If you have even the slightest doubt, dial the emergency number (112).
- Ensure that the child keeps warm (wrap them in a blanket).


Finding an unconscious child (<8 years)
Non-responsive
Responsive
Call for help
Help as required
Free airway - head-tilt/chin-lift
Neutral position for babies („sniffing position“)
Check breathing
Breathing insufficient
Breathing sufficient
Give 5 breaths
Check breathing again
Recovery position
(Baby: on their stomach)
Emergency call
Regular breathing checks
Help as required
Breathing insufficient
Cardiopulmonary resuscitation
(30:2) 120x/min, 1/3 of chest‘s depth.
Emergency call

Disturbed consciousness in children

The risks correspond to those for adults:

- Tongue falling backwards
- Inhalation of vomit
- Breakdown of defense reflexes
- Accompanying injuries due to a fall

What to do

- Contact verbatly
- Touch (carefully on the shoulder / stimulate underneath a foot. Never shake!)
- Remove visible foreign objects from the mouth.
- For children do not use head-tilt/chin-lift maneuvre, just position their head in neutral position, turn babies on their stomach.
- Recovery position for children.
- Continuously check their breathing.
- If they are breathing, place them in recovery position.
- Ensure conservation of body heat, children of all age groups tend to lose a lot of body heat quickly.
- Emergency call (112).

Seizures

Seizures are a relatively common emergency scenario in Germany. Children mainly present with so-called febrile seizures or fever fits, breath-holding spells and smaller seizures.

Causes

- Quickly rising fever (febrile seizure)
- Congenital brain damage
- Traumatic brain injury
- Infections of the brain and/or cerebral membranes
- Lack of oxygen (e.g. also due to breath-holding spells)
- Poison

Symptoms

- Aura
- Initial scream
- Extension spasm (with respiratory arrest, fall, blue discolouration of the skin, defecation, urination, biting of tongue, unconsciousness)
- Stretch/bending cramps
- Possibly saliva/foam around the mouth

Dangers

- Respiratory arrest
- Aspiration
- Accompanying injuries

Child is still seizing:

- Protect the child from injuries and falling
- Never fixate arms or legs
- Call 112
- Do not put anything between the teeth
- Trained parents can administer antispasmodic medication (prescribed by a paediatrician) if seizures occur more often
- Stay with the child even after the seizure and continue to monitor their breathing

Respiratory disorders in children

Respiratory disorders in children dominate the emergencies that occur in this age group, in contrast to cardiovascular disorders, which are the main concern in adults. Different mechanisms can be the cause for this.

Disturbances in ventilation

Basically, the airways are restricted in their function of letting air through or at worst are totally closed off.
This is a common occurrence in children:

- Asthma attacks with narrowing of the bronchi
- Aspiration or swallowing of foreign objects
- Insect bites in the mouth/throat area
- Allergic reactions
- Pseudo-croup with mucosal swelling in the larynx and trachea

- Inflammation (epiglottitis) and massive swelling of the epiglottis
- Diphtheria with life-threatening swelling of the throat and other complications

Disturbances of gas exchange in pulmonary alveoli

This is usually caused by fluid accumulation in the pulmonary alveoli.

The causes are here:

- Near drowning
- Inflammations

Disturbances in the respiratory control system

Respiration is controlled in the cervical spine area by the extended medulla, this area is

relatively sensitive to injury or the effects of various toxins. No matter whether it is an injury or poison, it is possible that the respiratory centre is permanently disturbed and, in the worst case, the respiratory stimulus does not occur.

Causes can be:

- Injuries of the brain and spinal cord
- Strokes (rare in children).
- Vapours of various substances (alcohol, codeine or other painkiller/ sedatives).
- Anxiety/stress could also cause the opposite reaction in form of hyperventilation.

Bronchial asthma in childhood

A good 7% of our children suffer from bronchial asthma. Different factors can trigger this condition: Family exposure, allergens (pollen, mould, food), painkillers, stress or infections. Statistically, allergens appear to be the main cause among children. A common feature of all asthma attacks is the simultaneous occurrence of the following factors:

- Sudden cramping of the bronchial muscles
- Swelling of the bronchial mucous membranes
- Overproduction of viscous mucus.

General recognition and action in case of respiratory distress

Recognize

- The child sits or stands to use all available muscles to breathe
- Breath sounds when breathing in or out
- Bluish discolouration of the skin
- Panic/ anxiety
- Breathing is accelerated

Action

- Self protection
- Emergency call
- Keep the child in an upright position
- Make sure to calm the child and provide a calm atmosphere
- Remove restrictive clothing
- Apply a lip brake. To do this, let the child blow against a finger placed on their lips.
- Do not leave the child alone
- In case of respiratory arrest, cardiopulmonary resuscitation will be necessary.

Foreign objects

Children explore many things with their mouths, so the risk of aspiration or swallowing foreign objects is quite high. When aspirating a foreign object it enters the airways - this leads to respiratory distress. If a foreign object has been swallowed it is not easy to detect for laymen why this can also cause respiratory distress. While small swallowed objects usually reappear naturally, large foreign objects, such as a marble, can get stuck in the oesophagus and compress the soft posterior tissue of the trachea. In order to avoid these incidents, it is important to keep dangerous small parts away from children in the household, but also e.g. in kindergarten. Provide only age-appropriate toys and avoid unsuitable food (e.g. peanuts).

Foreign objects can also be stuck in ears or nose. Have these removed by an ENT specialist.

Recognise

- Sudden severe shortness of breath
- Severe unproductive cough
- Possible swallowing problems/gagging

- Bluish discolouration of the skin
- Unconsciousness/ possibly immediate respiratory arrest

Action

- Remove visible foreign objects immediately
- Make the emergency call immediately
- Children and teenagers: have them stand slightly bend over and tap between the shoulderblades
- Small children: place them over your knee, head down, tap between shoulderblades
- If given measures are uncsussessfull, use the Heimlich maneuvre for teenagers
- Do not use the Heimlich maneuvre on small children. Initiate CPR immediately and carry on consistenly

Insect bites in the mouth and throat

Mainly responsible for this threatening scenario are the common and the German wasp, which become a nuisance especially in the (late) summer near food and drinks. But also hornets, the immigrated Asian hornet, bees and bumblebees can get into the oral cavity and sting there. The focus is on the local effect of the poison with a rapidly developing inflammatory reaction and the associated swelling of the mucous membranes. Additionally allergy sufferers can experience a life-threatening general reaction. The swelling poses a direct threat requiring immediate action.

Recognise

- Mostly situational while eating or drinking
- Sudden onset of pain in the mouth and throat area

- Rapidly developing resporatory distress
- Visible sting apparatus
- Insect spat out or visible in the mouth

Action

- Make the emergency call immediately
- Remove stings and insects (wasps/ hornets and bumblebees can sting several times)
- If there are still flying insects nearby, leave the place (with the child), the sting releases substances that provoke other animals to attack
- Let the child suck something cold
- Cool the neck with damp towels or a cool pack
- If necessary give rescure breaths or, if in doubt, start cardiopulmonary resuscitation

Pseudocroup

A normal viral cold often causes swelling of the mucous membranes in the larynx and upper trachea. The resulting narrowing of the air-

ways can lead to moderate respiratory distress. Affected are mostly children from 0 up to 3 years, but older children may also be affected.

Recognize

- Often in autumn or winter with a previous cold
- Frequently in the evening or night hours
- No or low fever
- Hoarseness
- Restlessness
- Typical barking cough
- Breath sounds when breathing in
- Rarely severe form with blue skin colouring, nostrils, ribs clearly visible when inhaling and exhaustion.

Action

- Keep calm and reassure the child
- Position the child with a raised upper body or take it in your arms
- Cool, humid air helps, you will find this outside (after you have dressed the child)
- Emergency call
- If your child is a „repeat offender“, your paediatrician may have prescribed a cortisone suppository for this purpose (e.g. Infektocorti-Krupp®/ Infekto-Krupp®). The sooner you administer this the quicker the condition will be regulated.
- In rare cases giving rescue breaths or cardiopulmonary resuscitation is necessary.

Epiglottitis (Inflammation of the epiglottis)

In 97% of cases this rare but serious disease is caused by the bacterium Haemophilus influenzae B (HiB), but other common bacteria are also possible causes.
The disease has been reduced through vaccination prevention, but still occurs, especially among unvaccinated people. In contrast to pseudocroup, older children are more likely to be affected here (1-7 years) and the occurrence does not adhere to a specific season, it can lead to illness all year round. The infection usually occurs as a droplet infection, while the children interact at school or kindergarten. The pathogen can also cause other threatening complications such as meningitis and pneumonia.

Recognize

- Possibly unvaccinated child
- Rapid malignant development (hours)
- High fever, severe feeling of illness
- Lazy voice
- Breath sounds when breathing in
- Little to no cough
- Upright posture
- Nasal wings
- The ribs become visible when inhaling
- Possibly severe exhaustion with respiratory arrest
- The swollen epiglottis might be visible as

a „red cherry“ in the throat. Don‘t let this knowledge tempt you to search for it with fingers or spatulas (danger to life).

Action

- Call emergency services on he slightles suspition
- Ensure peace and quiet
- Support the child in sitting upright
- Refrain from any manipulation in the throat area
- Have vaccination documents ready
- In case of respiratory arrest mouth-to-mouth/ mouth-nose ventilation is promising (despite the risk of infection: ventilate and contact your family doctor or the doctor in the clinic, taking antibiotic prophylaxis is a possibility).

The rescue service will urgently transport the child to the hospital without delay. A simple paediatric clinic without an intensive care unit is unsuitable for epiglottitis, so the rescue service will also transport to a more distant clinic if necessary. In this condition the child requires intensive medical care in the form of anaesthesia and respiration.

elle 1: Impfkalender (Standardimpfungen) für Säuglinge, Kinder, Jugendliche und Erwachsene

Impfung	Alter in Wochen	Alter in Monaten					Alter in Jahren						
	6	2	3	4	11–14	15–23	2–4	5–6	9–14	15–16	17	ab 18	ab 60
Tetanus		G1	G2	G3	G4	N	N	A1	A2		N	A (ggf. N) [e]	
Diphtherie		G1	G2	G3	G4	N	N	A1	A2		N	A (ggf. N) [e]	
Pertussis		G1	G2	G3	G4	N	N	A1	A2		N	A (ggf. N) [e]	
Hib *H. influenzae* Typ b		G1	G2 [c]	G3	G4	N	N						
Poliomyelitis		G1	G2 [c]	G3	G4	N	N		A1		N	ggf. N	
Hepatitis B		G1	G2 [c]	G3	G4	N	N						
Pneumokokken [g]		G1		G2	G3	N							S [g]
Rotaviren	G1 [b]	G2	(G3)										
Meningokokken C					G1 (ab 12 Monaten)		N						
Masern					G1	G2	N					S [f]	
Mumps, Röteln					G1	G2	N						
Varizellen					G1	G2	N						
Influenza													S (jährlich)
HPV Humane Papillomviren									G1 [d]	G2 [d]	N [d]		

NEU: Standardimpfung gegen Herpes zoster mit Totimpfstoff empfohlen für Personen ab 60 Jahren; weitere Informationen hier: (Epid. Bull. 30/2008)

Erläuterungen

G Grundimmunisierung (in bis zu 4 Teilimpfungen G1–G4)

A Auffrischimpfung

S Standardimpfung

N Nachholimpfung
(Grund- bzw. Erstimmunisierung aller noch nicht Geimpften bzw. Komplettierung einer unvollständigen Impfserie)

a Frühgeborene erhalten eine zusätzliche Impfstoffdosis im Alter von 3 Monaten, d. h. insgesamt 4 Impfstoffdosen.

b Die 1. Impfung sollte bereits ab dem Alter von 6 Wochen erfolgen, je nach verwendetem Impfstoff sind 2 bzw. 3 Impfstoffdosen im Abstand von mindestens 4 Wochen erforderlich.

c Bei Anwendung eines monovalenten Impfstoffes kann diese Dosis entfallen.

d Standardimpfung für Mädchen und Jungen im Alter von 9–14 Jahren mit 2 Impfstoffdosen im Abstand von mindestens 5 Monaten, bei Nachholimpfung beginnend im Alter > 14 Jahren oder bei einem Impfabstand von < 5 Monaten zwischen 1. und 2. Dosis ist eine 3. Dosis erforderlich (Fachinformation beachten).

e Td-Auffrischimpfung alle 10 Jahre. Die nächste fällige Td-Impfung einmalig als Tdap- bzw. bei entsprechender Indikation als Tdap-IPV-Kombinationsimpfung.

f Einmalige Impfung mit einem MMR-Impfstoff für alle nach 1970 geborenen Personen ≥ 18 Jahre mit unklarem Impfstatus, ohne Impfung oder mit nur einer Impfung in der Kindheit.

g Impfung mit dem 23-valenten Polysaccharid-Impfstoff.

Common childhood diseases

General symptoms and measures for infections

Depending on the disease symptoms may appear with certain delays (incubation period).
Infections often begin with „flu-like“ symptoms, such as increased temperature, fatigue, headaches and aching limbs.
As the illness progresses, typical symptoms (leading symptoms) for the various illnesses may appear.
For all infectious diseases you should consult a doctor or, depending on your condition, alert emergency services, as some of these diseases can take an unexpected course or cause serious complications.
Under no circumstances may the child continue to attend day care, school or other community facilities.
In general the sick child needs bed rest, fluids and a balanced diet. Follow your paediatrician's instructions exactly, in particular, please administer the prescribed medication exactly as planned and in full.

Measles

Measles is caused by the Morbilli virus. It is transmitted by droplet or smear infection.

Symptoms
- Fever, chills
- Nausea, sore throat, headache
- Inflammation of the upper and lower respiratory tract (e.g. bronchitis)
- After approx. 14 days the typical rash develops (large spots starting behind the ear and spreading over the whole body within 24 hours).

Complications
- Diarrhoea
- Middle ear infection (Otitis media)
- Pneumonia
- Inflammation of the brain and meninges

Treatment
The treatment of measles belongs in the hands of the paediatrician. The infection is caused by viruses and can therefore only be treated symptomatically. A protective vaccination is possible.

Please remember:
Adults can also be infected, even if you have had measles before. Complications that can occur here are usually more severe than in children.

Mumps

Mumps is caused by the mumps virus. It is an inflammation of the parotid gland, often accompanied by an inflammation of the testicles. It is transmitted by droplet or smear infection.

Symptoms:
- Swelling of the parotid gland
- Pain when chewing
- Possibly abdominal pain
- Nausea, diarrhoea
- The latter symptoms indicate an involvement of the pancreas.

Complications:
- Meningitis
- Hearing Loss
- Pancreatitis
- Infertility in boys/men

Treatment
The treatment of mumps belongs in the hands of the paediatrician. The infection is caused by viruses and can therefore only be treated symptomatically. A protective vaccination is possible.
- Fever reduction
- In severe cases cortisone

Please remember:
Adults can also get infected and fall ill.

German measles (Rubella)

Highly contagious disease caused by the Rubella virus. Transmission takes place by droplet or smear infection. An infection during pregnancy is particularly feared.
In the unborn child, rubella
can cause the

Rubella – Gregg – Triad:

1. Malformation of the heart
2. Hearing loss
3. Cataract

Symptoms:

- Raised reddish spots, starting in the face
- Cold-like symptoms, fever
- Swelling of lymph nodes
- Conjunctivitis

Complications:

- Meningitis
- Bleeding tendency
- Heart inflammations
- Bronchitis

Treatment

Again, only the symptoms can be treated, mainly by the paediatrician.
Fever reduction
A vaccination is available

Please remember:

- Adults can also get infected.
- Unvaccinated pregnant women must stay away.

Chickenpox

Chickenpox is a highly infectious disease caused by herpes zoster viruses (varicella). It is mainly transmitted by droplet infection.

Symptoms:

- Red, very itchy blisters, all over the body
- Headache and aching limbs
- Fever

Complications:

- Pneumonia
- Meningitis
- Secondary infections by scratching the itchy areas

Treatment

Chickenpox must be treated by a doctor, the itching can be reduced with medication. A protective vaccination is available.

Please remember:

- Herpes viruses are life-threatening for newborns and babies
- Adults can also get infected, and re-infection (if you have had chickenpox before) can cause shingles (herpes zoster), but this risk generally exists even if you do not get infected again.
- Unvaccinated pregnant women must stay away as this is also dangerous for the unborn child.

Scarlet fever

Scarlet fever is a bacterial disease caused by streptococci. The peak age is between the fourth and seventh year of life. The transmission takes place through droplet and smear infections, but dust is also possible (e.g. when shaking out bedding).

Symptoms:

- High fever, chills, vomiting
- Abdominal pain and headaches
- Pharyngitis with deep red discolouration
- „Strawberry tongue“
- Rash with deep red coloured spots (except in the mouth-chin area, „scarlet triangle“)
- After approx. 14 days scaling of the skin rash

Complications:

- Scarlet fever must be treated thoroughly as secondary diseases are particularly feared: renal dysfunction
- Inflammations of the inner heart skin
- Rheumatism
- Scarlet fever can also be associated with certain nervous disorders. (PANDAS=Pediatric Autoimmune Neuropsychiatric Disorders Associated with Streptococcal Infections with anxiety, irritability, aggression, inappropriate behaviour, regression in maturity, bed-wetting, deterioration in school performance, deterioration in handwriting, insomnia, tics)

Treatment:

- The treatment is carried out by the paediatrician
- Fever reduction
- Lozenges against swallowing difficulties and sore throat
- Consistent therapy with penicillin
- Scarlet fever is not preventable by vaccination, and there is no immunity from the disease. Getting sick and healthy children together („scarlet fever party“) is therefore

not only dangerous but also pointless.

Remember this:

- One can fall ill with scarlet fever several times
- Adults also get ill and direct contact persons may also have to be treated with penicillin.

Whooping cough

Pertussis is a highly contagious infection caused by the bacterium Bordetella pertussis. It is transmitted via droplet and smear infections. The disease usually progresses persistently over several weeks and in various stages.

Symptoms:

- Stage 1: In the first two weeks flu-like symptoms with fever and chesty cough. The patient is highly infectious.
- Stage 2: In the third to sixth week a sudden severe hacking cough with blue discolouration of the skin and subsequent vomiting occurs. Instead of coughing, babies often simply stop breathing.
- Stage 3: The coughing attacks become less severe and less frequent.

Complications:

- Pneumonia
- Middle ear infection (Otitis media)
- Secondary infections
- Brain diseases
- The mortality rate is about 1 /1000

Treatment:

- Whooping cough must be treated by the paediatrician.
- Fever reduction
- Early antibiotics
- A vaccination is available

Please remember:

- Adults can also get infected, the probability of infection is extremely high, but the disease then often goes unnoticed! But they are still contagious.

Diphteria

(real croup, croup, „choking angel of children“)

Diphtheria is a severe, contagious, bacterial infection mainly of the upper respiratory tract. It is caused by the corynebacterium diphteriae and its toxin. Particularly feared are the complications that are mainly caused by the toxin produced by the bacterium, which can have catastrophic effects and can also trigger late effects. Diphteria is usually transmitted by droplets.

Symptoms:

- Swallowing difficulties
- Abdominal and limb pain
- Barking cough, hoarseness
- Increasing fever
- Swelling of lymph nodes (massive caesarean neck)
- Brown, foul-smelling coating in the throat

Complications:

- Heart muscle inflammation with malignant rhythm disturbances
- Sudden cardiac death (even after the symptoms have subsided)
- Pneumonia
- Nephritis
- Sepsis, „blood poisoning“
- Asphyxiation

Treatment

- Diphtheria must be treated with intensive care
- Call rescue service even on suspicion
- Fever reduction
- Penicillin
- Diphteria antitoxin (antidote)
- The airway might need to be secured with minimal surgical intervention
- Vaccination is available

Remember this:

- Adults can also get infected and fall ill
- There is danger to life

First aid at work

Every year more than one million notifiable accidents at work occur in companies in the industrial economy of which an estimated 1-2% are emergencies. The purpose of the accident prevention regulation >>Principles of Prevention<< DGUV regulation 1 "Principles of Prevention", particularly in the third section >>First Aid<<, is to ensure that the conditions needed to provide best possible care of an injurued or sick person are met in the company.

First aid at work includes:

- Personnel measures
- Material measures
- Organisational measures

Personnel measures

First responder

Trained first responders are the most important element of operational first aid. The training as first responder comprises 9 teaching units and covers the entire range of accidents that may occur at work, from minor accidents to emergencies, from injuries caused by mechanical impact, thermal and chemical effects to accidents caused by electric current.

The first responder in the company must also be prepared for an emergency due to an acute, non-operational illness. To ensure that the knowledge acquired by the company first responders is not gradually forgotten over the years, regular further training courses (comprising 9 teaching units) within two years are necessary and mandatory.The course fees for first aid training and further training are partly covered by the accident insurance institutions upon application.

Number of first responders at work:

- one first responder for 2 to 20 insured persons present
- If more than 20 insured persons are present:
  - in administrative and commercial establishments 5% of the number of insured persons present
  - in other establishments 10% of the number of insured persons present

Company paramedic

The main activity of a company paramedic is in the field of extended first aid. In addition to the basic first aid measures they are also proficient in the use and application of equipment, e.g. resuscitator bags etc. The training for a company paramedic is divided into two stages:

While the first stage comprises the basic general paramedic training (in 63 teaching units), the second stage, the advanced training course (32 teaching units), focuses on the operational tasks.

At least one company paramedic is required in companies:

- with more than 1,500 insured persons present
- with more than 250 insured persons present (if the nature, seriousness and number of accidents so require)
- with more than 100 insured persons present on construction sites.

Material measures

Alarm devices

To ensure that the rescue chain functions safely, suitable emergency call devices must be provided for alerting the rescue service. The most common reporting device in operation is the telephone. The emergency call numbers should be clearly visible on the telephone or in the immediate vicinity of the telephone. If the emergency numbers cannot be dialled from every company telephone connection a reporting centre must be permanently available during working hours to receive the internal emergency call and, if necessary, to alert rescue services.

Even if work is carried out by only one person, the managing director must ensure first aid by taking effective measures. Depending on the risk assessment, the corresponding alarm devices can range from telephones and radiotelephones to independent personal emergency signal systems.

First aid material

First aid material is primarily dressing material which is stored in suitable containers (e.g. first aid kit). Depending on the size of the company and the operational hazards one or more first aid kits must be kept readily accessible. The minimum contents in the first-aid kit are specified in standards, e.g. DIN 13157 (small first aid kit C) and DIN 13169 (large first aid kit E). Both first aid boxes do not differ in the type of dressing material, only in quantity. Two small first aid kits can replace a large one. For work in the field, in particular for carrying first aid material in workshop vehicles and emergency vehicles, the motor vehicle first aid kit can also be used as a small first aid kit, e.g. according to DIN 13164.

This way every driver can see you even at night: The high visibility vest serves your own safety.

Number of first aid kits to be available			
Type of business	Number of employees	Small first aid kit	Large first aid kit
Administrative and commercial establishments	1-50	1	
	51-300		1
	from 301 for every 300 further employees one additional large first aid kit		2
Manufacturing, processing and similar establishments	1-20	1	
	21-100		1
	from 101 for every 100 further employees one additional large first aid kit		2
Construction sites and construction site-like facilities	1-10	1	
	11-50		1
	from 51 for every 50 further employees one additional large first aid kit		2

DIN 13164 Motor vehicle first aid kit	DIN 13157 Small company first aid kit	DIN 13164 Large company first aid kit	Description
1	1	2	Adhesive plaster 500x2,5cm, reel with external protection
			Ready-to-use plaster set consisting of:
4	8	16	Rapid wound dressing 10 cm x 6 cm
2	4	8	Fingertip dressings
2	4	8	Finger dressings 12 cm x 2 cm
2	4	8	Plaster strips 1,9 cm x 7,2 cm
4	8	16	Plaster strips 2,5 cm x 7,2 cm
1	1	2	Dressing pack DIN 13151 - K, 300 cm x 6 cm with compress 6 cm x 8 cm
2	3	6	Dressing pack DIN 13151 - M,
1	1	2	Dressing pack DIN 13151-G, 400 cm x 10 cm with compress 10 cm x 12 cm
1	-	-	Dressing cloth DIN 13152 - BR, 40 cm x 60 cm
1	1	2	Dressing cloth DIN 13152-A, 60 cm x 80 cm
2	2	4	Fixation bandage DIN 61634-FB 6, 400 cm x 6 cm
3	2	4	Fixation bandage DIN 61634-FB 8, 400 cm x 8 cm
1	1	2	Rescue blanket at least 210 cm x 160 cm
6	6	12	Compress 10 cm x 10 cm
-	2	4	Eye compress 5 cm x 7 cm
-	1	2	Instant cold compress at least 200 cm2
2	2	4	Triangular cloth DIN 13168 - D
1	-	-	First aid kit scissors DIN 58279-A 145
-	1	1	First aid kit scissors DIN 58279 - B 190
4	4	8	Medical gloves for single use
-	2	4	Foil bags
-	5	10	Non-woven cloth
2	-	-	Wet wipe for cleaning uninjured skin
1	1	1	First aid booklet / first aid instructions
1	1	1	Table of contents

Motor vehicle - first aid kit - DIN 13164 "First aid material - First aid kit B"
Small company - first aid kit - DIN 13157 "First aid material - First aid kit C"
Large company - first aid kit - DIN 13169 "First aid material - First aid kit E"

First aid rooms

First aid rooms are set up in large companies depending on the number of employees and the type, severity and number of accidents.

At least one first aid room is required in companies:

- with more than 1,000 insured persons
- with more than 100 insured persons (if required by the type of company and nature of accidents occurring)
- with more than 50 insured persons on building sites

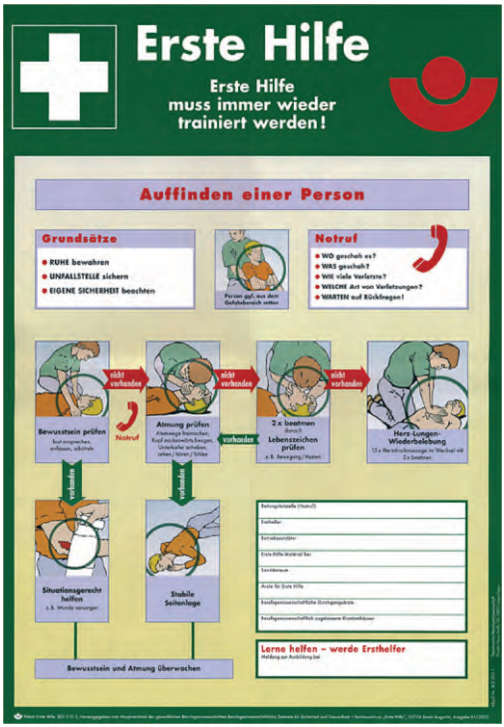
Organisational measures

To ensure effective first aid at work and to guarantee a functioning rescue chain the following measures must be taken in the company:

- Scheduling of first responders over the entire working time (observe shift times)
- Labelling of first aid facilities
- Please note that first aid kits should be checked regularly.
  The composition of the first aid kits is also regularly adjusted by the accident insurance company.

Giving medication in schools and day care facilities:

- The DGUV has issued its own guidelines for the administration of medication in day care facilities and schools. These can be found in the DGUV information 202-091 (administration of medication in schools) and 202-092 (administration of medication in day care facilities).
- Instruction of employees on the correct behaviour in case of accidents and on the use of first aid facilities.
- Documentation of all first aid services with the necessary details (e.g. in a bandage cloth).
- Notification of emergency numbers, first aid staff and first aid facilities via the "First Aid" notice board. This notice contains a short and concise summary of the most important first aid measures, especially in emergencies.



We offer training for:

- **First aid courses (§ 68 FeV)**
  ("Driving Licence Regulation")
  for driving licence applicants
- **First Aid Basic Education and Training**
  DGUV-G 304-001 for companies, schools and administrations
- **Drug Commissioner**
- **Instructor for company paramedics**
- **Consultant Crisis Intervention**
- **Company paramedic basic** (63 hours)
- **and advanced training course**
  (32 hours), DGUV 304-002
- **Disinfector**
  (certificate issued by the State Office for Social Services)
- **Dispatcher in rescue control centres**
- **First aid instructor** (55 hours), DGUV 304-001
- **First Responder**
- **Hygiene Officer**
- **Lecturer for first aid and company paramedics**
- **Head of rescue service**
- **Air Rescue**
- **MPG** ("German Medical Devices Act") **Representative**
- **Mega-Code Trainer**
- **Employees Intensive Coach**
- **Organisational Manager Rescue Service**
- **Healthcare Practice Manager**
- **Paramedic, state certified** (520 hours)
- **Rescue Station Supervisor**
- **Paramedics** (48 hours)
- **Vision Tester**
- **Crime scene cleaner**

www.SanitaetsschuleNord.de

Training material from our Online Shop

Leitfaden
Aus-/Fortbildung in der Ersten Hilfe

Foliensatz
Aus-/ Fortbildung in der Ersten Hilfe

Leitfaden
Betriebssanitäter Grund-/ Aufbaukurs

Leitfaden
Ausbildung Erste Hilfe in Bildungs- und Betreuungs-einrichtungen

EH am Kind-Leitfaden für den Ausbilder. Alle BG-Neuerungen zum 01.04.2015 sind berücksichtigt.

Foliensatz
Ausbildung Erste Hilfe am Kind

EH am Kind-Leitfaden für den Ausbilder. Alle BG-Neuerungen zum 01.04.2015 sind berücksichtigt.

Curriculum
Lehrstättenqualifizierung

Erste-Hilfe sowie Erste-Hilfe in Bildungs- und Betreuungseinrichtungen für Kinder" zur eigenen Nutzung (Vervielfältigung und Weitergabe sind ausgeschlossen). Dieses Curriculum umfasst 54 Seiten und ist von der VBG gem. der neuen DGUV 304-001 (01.01.2020) zur Aus- und Weiterbildung anerkannt.

Sanitätsschule Nord

State- and BG ("Employer's Liability Insurance Association") - recognised and certified educational institution

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