Main Course

Emergency Response Officer

Global Index

Chapter 1 The Emergency Response Team

1 The Emergency Response Team

1.1 Why Emergency Response Services?

The Dutch Civil Code, Book 7, Article 611, states that both the employer and the employee are obliged to act as a good employer and employee. Article 658, the "Employer's Civil Duty of Care," further defines that the employer must ensure an optimal level of protection for the employee. These articles are reflected in Article 3 of the Dutch Working Conditions Act (Arbo-wet), which requires employers to ensure proper working conditions. Article 3 outlines the policy aspects, including emergency response service (ERT/BHV).

The employer is required to be assisted by one or more employees who have been designated as emergency response officers (ERO/BHV-ers).

The Working Conditions Act (*Dutch*: Arbo-wet) also mandates that every employer must conduct a Risk Assessment & Evaluation (*Dutch*: RI&E) for their company. An RI&E is an assessment of hazards and an estimate of the likelihood that these hazards will occur. Based on the RI&E, so-called residual risks will become apparent. Residual risks are risks that cannot be prevented by taking preventive measures. The emergency response services must be designed based on these residual risks. Examples of residual risks present in every company include fire, acute illness, conditions, and accidents. Additionally, there may be specific risks in a company, such as the potential release of hazardous substances.

1.2 Number of Emergency Response Officers (ERO)

Emergency Response Services is customized. The required number of emergency response officers depends on the nature and size of the activities, the location of the company, and the employees present.

The (residual) risks are simulated through scenarios. Based on the progression of these scenarios, the necessary emergency response organization can be determined. There must be enough emergency response officers to ensure that the BHV organization can function during shift work, sickness, and leave.

In small companies, an employer can perform the BHV duties themselves. However, they must ensure that a substitute is available during their absence to meet the requirement that an emergency response officer is always present.

1.3 Tasks of the Emergency Response Team (ERT/BHV)

In case of a calamity, on a big or small scale, the Emergency Response Team is able to assist/act when necessary. This means:

- Provide first aid in case of accidents and acute illnesses;
- To limit and fight small fires, and minimize its consequences;
- To alert and evacuate all employees and other persons in the company in cases of emergency (example: fire or bomb alert);
- To alarm and cooperate with emergency services such as police, ambulance and fire brigade.

1.4 Alerting the Emergency Response Team (ERT/BHV)

The method of alerting the BHV depends on the agreements within the company. The ERO can be alerted as followed

- An incident is reported directly to an Emergency Response Officer (verbal);
- The evacuation alarm is triggered. In response, the ERO begins his/her task as outlined in the evacuation plan;
- An incident is reported via the internal emergency number, which then triggers the BHV organization to be alerted.

1.5 Procedure for the Emergency Response Team BHV

The procedure the ERO must follow is a continuous process of **"OBSERVE – THINK – ACT"** When the ERO is faced with a problem, they proceed according to this process:

OBSERVE Assess the situation based on facts such as:
- Safety;
- Severity of the fire, injury or illness;
- Availability of colleagues and materials;

THINK
- How can I ensure safety?
- In what order should I act?
- What materials do I need for each action?

ACT
- Ensure safety.
- Address high-priority issues first, then handle lower priorities ("*Treat first what kills first")*.

During the incident, the ERO should regularly follow this process. This allows them to evaluate their actions based on results and adjust as needed.

1.6 National Emergency Number 112.

What happens when you call 112?

When you call 112 from your phone, the call is directed to the national emergency control center in Driebergen. When you call 112, the operator asks:

- What is happening?;
- What help do you need?
- What have you done so far?;
- Which emergency service is necessary: police, ambulance and/or fire brigade.

The operator will immediately connect you to the relevant control center in your region.

Call recording

The control room records all conversations. This allows the operator to listen to the call again if needed.

Caller ID

Your phone number automatically appears on the control room operator's computer screen, even if you have a private number. This allows the operator to call you back, for example, if the connection is poor. Caller ID also helps prevent misuse of the 112 emergency line.

Calling 112 without credit or a SIM card
You can always reach 112, even if you call from a mobile phone without credit or a (valid) SIM card. All 112 calls are given priority over other calls. If the connection suddenly drops, the control room operator will call you back if your information was sent with the call. Your details will not be sent if there is no SIM card in your phone.

How does the control room know the exact location of 112 callers?
When you call 112, the control room automatically receives your location. The current system determines the caller's location by calculating the distance to cell towers, which can be up to three kilometers.

1.7 Aftercare following a BHV Incident

Sometimes, days or weeks after an incident, you or your colleagues may struggle to process the impact of the incident. It is helpful to talk about it with others. Some companies have a Company Support Team (*Dutch:* Bedrijfsopvangteam, BOT) that can provide aftercare following an incident.

Be vigilant for unusual behavior from those involved after an incident. For example, a colleague who is unusually quiet or has trouble concentrating.

As an ERO, remember that while you can lend a listening ear, you are not an expert in trauma treatment. Seek professional help in a timely manner, such as from a general practitioner, occupational health doctor, or Victim Support Netherlands (*Dutch*: Slachtofferhulp Nederland).

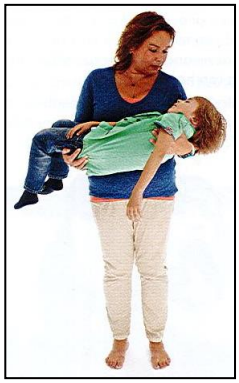
Chapter 2 Emergency First Aid

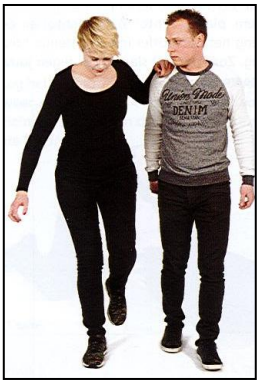
2 Emergency first aid

2.1 Moving a victim

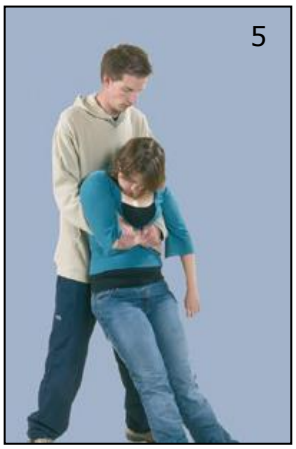
Only move a victim if absolutely necessary due to danger, as moving them can worsen their injuries. Remove the victim from a dangerous situation by supporting them while they hop, or use the Rautek technique if walking or hopping is not possible.

Moving by carrying/hopping





Rautek technique



2.2 Approaching and assessing a victim

When you arrive at the scene of a victim, it is important to quickly determine whether there is a life-threatening situation.

Approach the victim primarily from the side of their face. This is to prevent the victim from moving their head. Then proceed as follows:

1. Check consciousness by loudly and clearly calling the victim and gently shaking their shoulders with both hands. If the victim does not respond, immediately have someone call emergency number 112. Preferably, call yourself and put the phone on speaker. This allows you to keep your hands free and follow the instructions given by the dispatcher.

2. Next, check the victims breathing.
   - Place your hand on the victim's forehead.
   - Place two fingers of your other hand under the victim's chin.
   - Gently tilt the victim's head slightly backward.
   - Position yourself so that your own cheek and ear are just above the victim's mouth and nose.
   - Look for 10 seconds to see if the victim's chest and upper abdomen are rising and falling regularly.
   - Listen for breathing sounds.
   - Feel with your cheek if there is any airflow.

If the victim is breathing properly, place him/her in the recovery position. However, if breathing is absent, abnormal, or you are unsure, start CPR.

Turning a victim from stomach to back

Recovery position

From recovery position to supine position
If the victim is in the recovery position, you should regularly check their breathing. If you are unsure whether the breathing is still present, turn the victim onto their back and check the breathing using the chin lift method.

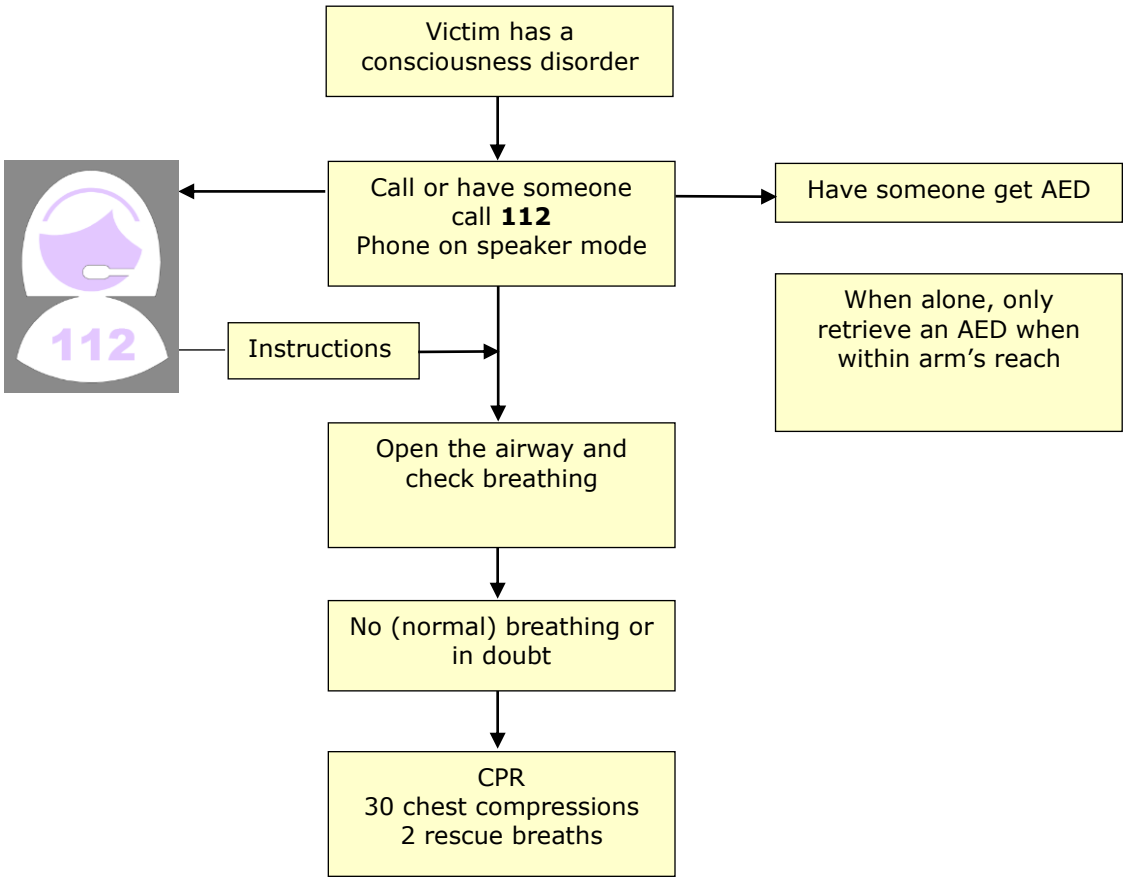


If the victim has good breathing, place them in the recovery position on their other side. However, if breathing is absent, abnormal, or you have doubts, begin CPR

2.2 CPR (Cardiopulmonary Resuscitation)

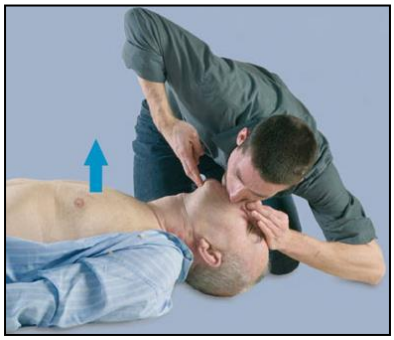
It is important that you quickly recognize when a victim needs to be resuscitated. The situation usually occurs very unexpectedly and can cause a strong shock reaction, leaving you unsure of what to do immediately. By performing CPR and using an automated external defibrillator (AED), the victim has a chance to survive circulatory arrest.

Sequence of actions for CPR

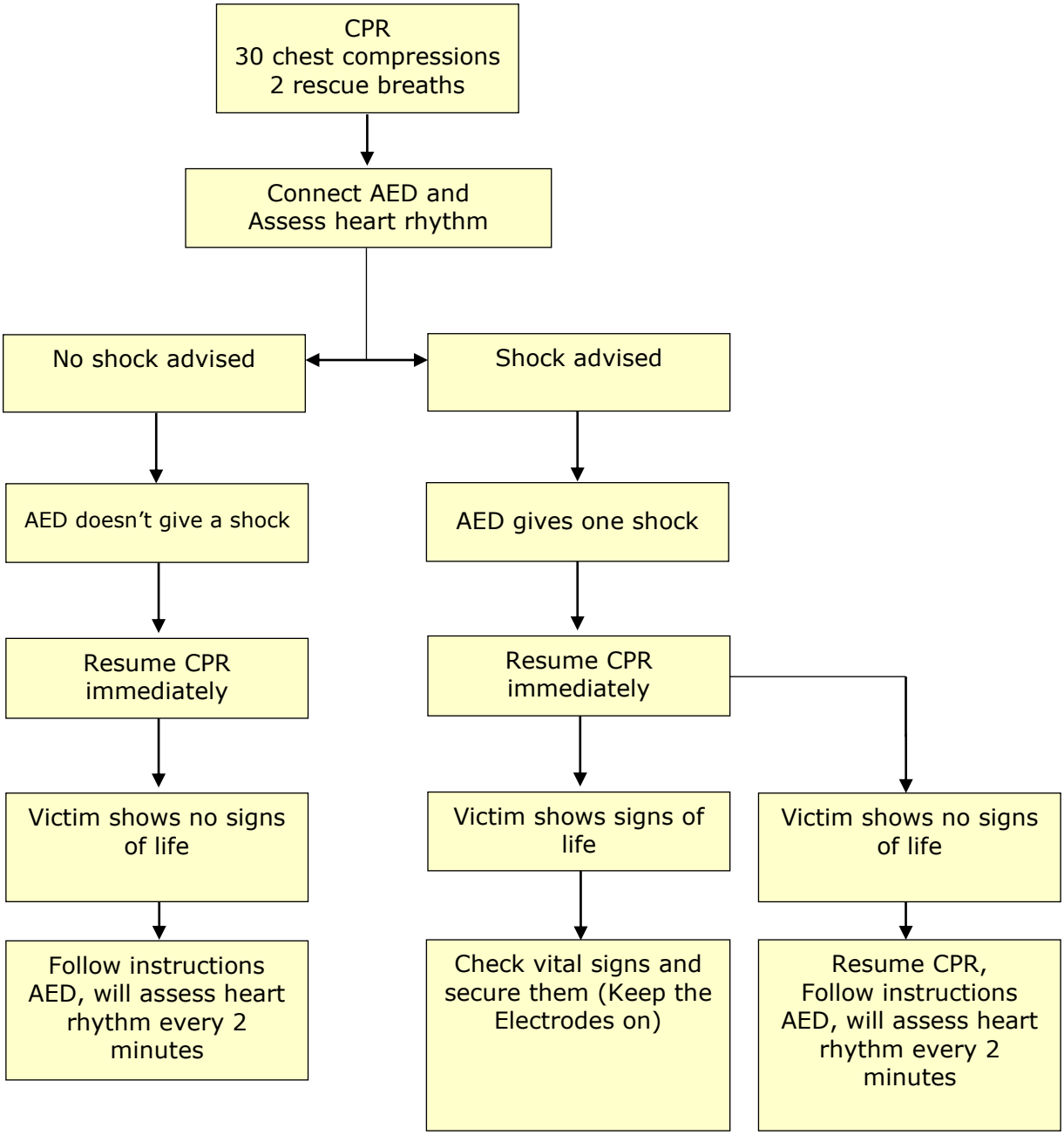


CPR Procedures

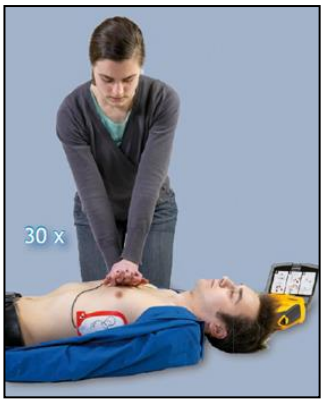
- Ensure the victim is on a firm surface.
- Place your hands in the center of the chest.
- Straighten your elbows and position your shoulders directly above your hands.
- Compress the chest straight down by 5 to 6 centimeters (2 to 2.5 inches).
- Allow the chest to fully recoil between compressions.
- Perform chest compressions at a rate of 100 to 120 per minute.
- After 30 compressions, give 2 rescue breaths immediately.
- Clear the airway: tilt the head back and lift the chin.
- Pinch the nose.
- Give 2 breaths within 10 seconds.
- Continue cycles of 30 chest compressions and 2 breaths.



Sequence of Actions for CPR with AED



- Expose the chest, remove clothing
- Dry the chest if wet or moist.
- Shave excessive hair on the chest so the pads will be placed having good contact
- Turn on the AED.
- Place the pads on the victim's chest on the locations indicated on the pads.
- AED will analyse the heart rhythm and give instructions.
- **NO SHOCK** > Resume CPR. AED will assess heart rhythm every 2 minutes.
- **SHOCK** > Gives a shock and resume CPR. You may recieve two responses from the victim:
    - Victim shows no signs of life > Resume CPR, Follow instructions from AED. AED will assess heart rhythm every 2 minutes.
    - Victim shows signs of life > Check vital signs and secure them (keep the electrodes on).



Tools for CPR and the use of AED
In certain situations, you may need to take extra steps before attaching the electrodes, but only if it's absolutely necessary. Avoid unnecessary delays.

- Scissors
- Razor blade
- Small towel
- Gloves

Resuscitation tools

Kiss of life

Pocket mask

Points of interest
Moist chest: If the chest is wet, the electrodes will not adhere properly to the skin. Dry the chest first.

Hairy chest: If the victim has a very hairy chest, it can cause poor contact between the electrodes and the skin. You should shave the areas where the electrodes will be placed.

Pacemaker and Internal Defibrillator (ICD): These devices may sometimes be noticeable as a bump under the skin. If you recognize one and it is in the location where the electrode should be placed, apply the electrode just next to or below the device.

CPR: Key points

1. **Agonal breathing (gasping)**
   In the first minutes of cardiac arrest, the victim may irregularly and/or loudly gasp for air without visible chest movement. This is called agonal breathing or gasping. Do not mistake this for normal breathing. Start CPR, even if you are unsure.

2. **Seizures**
   In the first minutes, the victim may have jerky movements resembling a seizure. Unless the victim is known to have epilepsy, you should begin CPR immediately. Only if the victim quickly regains consciousness and responds, will you know there is no cardiac arrest.

3. **If rescue breathing fails**
   If the chest does not rise during the first breath of the two rescue breaths:
   - Check the mouth for any object that you can easily remove. If found, remove it.
   - Try tilting the head back slightly further and lift the chin a bit more. If the chest still does not rise on the second breath, continue with chest compressions. After 30 compressions, rescue breaths may succeed. Do not waste extra time with more breathing attempts.

4. **CPR with two rescuers**
   If multiple trained rescuers are present, it is best to alternate during CPR. Performing chest compressions is tiring, and the quality often decreases after a few minutes. The rescuer may not always notice this. To maintain high-quality compressions, switch every 2 minutes. Minimize losing time during the transitions.

5. **Chest compressions without rescue breaths**
   Rescue breaths provide the circulating blood with sufficient oxygen, but the airway must be clear for this to work. Many people admit they are uncomfortable with mouth-to-mouth ventilation. It is always better to give only chest compressions than to do nothing at all. Even without rescue breaths, the victim's chances of survival will improve. If you cannot or do not want to give rescue breaths, continue with chest compressions only.

6. **Starting or stopping CPR**
   Basically, start CPR when you notice abnormal breathing. You do not need to start if:
   - there is a danger to your life;
   - the victim has a do-not-resuscitate (DNR) order.

   You may stop CPR if:
   - the victim shows signs of life;
   - you are too exhausted to continue;
   - an ambulance nurse instructs you to stop;
   - the victim has a do-not-resuscitate order (DNR).

2.3 Choking and Airway Obstruction

Choking can occur when a piece of food, a candy, or another foreign object gets stuck in the windpipe, partially or completely blocking the airway.

The victim is choking but can still cough

In this case, the airway is partially blocked. The victim is anxious and has difficulty breathing. This partial obstruction is usually cleared by coughing. As a first responder, you should:

- Encourage the victim to keep coughing, but do not take any further action;
- Call for help or get help while keeping an eye on the victim.

In most cases, the problem resolves on its own through the victim's coughing. However, in some cases, the situation may worsen, and the airway may become completely blocked.

The victim is choking and cannot cough effectively

In this case, the airway is fully blocked. The victim is anxious, grabs their throat, and often starts walking around. You will see a victim who can no longer talk, breathe, or cough. Eventually, the victim will lose consciousness.

As a first responder, you should:

- Have someone call 112 or call 112 yourself and put your phone on speaker;
- Administer five back blows. If ineffective;
- Administer up to 5 abdominal thrusts.
- If the foreign object still does not come loose, alternate five back blows with five abdominal thrusts.
- If the foreign object still doesn't come out and the victim loses consciousness, begin chest compressions and rescue breaths. Due to muscle relaxation, it may be possible to push air into the lungs.

What to do if an infant is seriously choking

Have someone call 112, or if you call yourself, put your phone on speaker. This way, you can follow the dispatcher's instructions without being hindered by your phone.
Then proceed as shown in the pictures below.

- Place the child face down on your forearm.
- Support the head, ensuring the mouth is unobstructed.
- Using the heel of your hand, give up to five blows between the shoulder blades.

- Place one hand or arm on the back of the child's head and back.
- Turn the child over carefully.

- In 5 seconds, use two fingers to give five chest compressions.
- If the object has not dislodged, alternate between five back blows and five chest thrusts.

2.4 Severe Bleeding

In case of heavy blood loss, apply direct pressure to the wound immediately. Use sterile or clean material for this, and if possible, let the victim do it themselves. Afterwards; apply a pressure bandage to the wound.

- Cover the wound with a quick bandage. Make sure all four sides of the gauze are secured with the bandage.

- Now take a firm bandage.
- Make the first wrap below the wound.

- The following wraps should overlap each other by three-quarters and move toward the torso.
- Apply these wraps firmly.

- The final wrap should be placed well above the wound.
- Secure the bandage with adhesive tape..

2.5 Shock

Significant blood loss can lead to shock; a life-threatening condition where the victim's blood pressure is too low. As a result, the body's cells receive insufficient oxygen and sustain damage.

The main causes of shock include:

- Poor heart function
- Significant blood loss
- Allergic reactions
- Severe infections
- Severe diarrhea, vomiting, fever
- Fluid loss from serious burns
- Extreme fluid loss during exercise



A victim in shock will appear unwell and have a sickly appearance. They may have a pale, gray, or ashen complexion and pale nail beds. The victim feels miserable and weak, may feel cold, and have clammy skin, and they might experience thirst.

First Aid:

- Have someone call 112. If you call by yourself, put the phone on speaker.
- Position the victim in the way they feel most comfortable.
- Control any severe external bleeding.
- Stay with the victim and reassure them.
- Prevent cooling down.

2.6 Severe Heart Conditions

In the case of a heart attack, there is a sudden problem with the blood flow in the heart's blood vessels. This can occur due to severe narrowing or a blood clot that gets stuck in a coronary artery. As a result, the heart muscle receives insufficient oxygen, which can lead to heart muscle damage.

The victim may experience a pressing, squeezing, or tight feeling in the chest. They might also have pain in the center of the chest that can radiate to the jaw and/or arms. The victim may be short of breath, sweating, appear pale, feel dizzy or nauseous, and may be anxious. The painful or tight sensation lasts longer than a few minutes.

In women, the symptoms are often different from those in men, which can lead to heart diseases in women being recognized more slowly. These symptoms are:

- (Aching) pain, especially in the back and upper abdomen
- Shortness of breath
- Flu-like symptoms; nausea, vomiting, and cold sweat
- (Unexplained) fatigue and weakness
- Loss of appetite

First Aid

- Call 112 and put the phone on speaker mode.
- Encourage the victim to move as little as possible.
- Position the victim in a way that feels most comfortable for them.

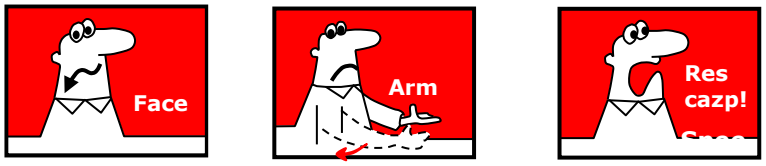
2.7 Stroke

During a stroke, the brain does not function properly due to a blood clot blocking a brain artery (ischemic stroke) or a blood vessel bursting (hemorrhagic stroke), which increases pressure on the brain.

A victim experiencing a stroke may appear confused, and you may find it difficult to understand them, or they might suddenly fail to comprehend what you're saying. They may also struggle to find the right words, leading to panic. Additionally, they could have difficulty seeing clearly in one or both eyes.

Signs of a stroke may include:
- Sudden facial drooping, particularly when smiling, showing that one corner of the mouth droops.
- Inability to lift both arms simultaneously; one arm may drop down or barely rise.
- Weakness in one leg, making it difficult or impossible to stand.
- Possible headache, dizziness, or balance issues.
- The victim may eventually lose consciousness.

First Aid for Stroke
- Call 112 if you suspect a stroke or if the victim experiences sudden, severe headache accompanied by nausea and/or vomiting.
- If the victim is unconscious, place them in the recovery position (stable side position).
- If the symptoms are unclear but you suspect a stroke, perform the **Face-Arm-Speech(Time) test (FAS):**
    - **Face:** Ask the person to smile; look for facial drooping.
    - **Arm:** Ask them to raise both arms; see if one arm drifts downward.
    - **Speech:** Ask them to repeat a simple phrase; listen for slurred or strange speech.
    - **(Time:** Ask how long the symptoms have been present. Call 112 as fast as possible.)



2.8 Epilepsy

Epilepsy is a brain disorder characterized by large or small seizures.

Grand mal seizure

During a grand mal seizure, the victim suddenly loses consciousness. Typically, there is a contraction of all muscles, which then progresses to jerking, uncontrolled movements of the arms, legs, and head. The victim may lose control of their bladder and bowels. In severe cases, the victim may appear blue.

First aid during the seizure

- Call 112 and follow the dispatcher's instructions.
- Protect the victim. Remove any objects from their vicinity that they might injure themselves on.
- Support the head by placing something soft like a pillow underneath it.
-
-
- Loosen any tight clothing.
- Do not try to restrain the jerking movements.
- Do not put anything between their teeth.

First Aid After the Seizure

- If the victim is unconscious, place them in the recovery position (Recovery Positon).
- If the victim is not unconscious, assist them into a comfortable position.
- Check for injuries.
- Protect the victim from hypothermia.

Petit Mal Seizure

There are many types of petit mal seizures, ranging from brief lapses in consciousness to uncontrolled movements in one or more limbs. The victim may also experience strange sounds or sudden feelings of fear.

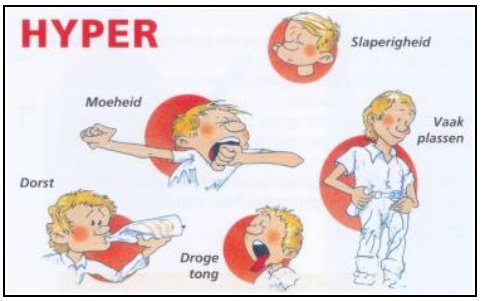
First Aid

- Stay with the victim.
- Remain calm and speak gently.
- Do not attempt to restrain their uncontrolled movements.
- Call the family doctor if the victim does not respond clearly within a few minutes.
- Advise the victim to contact their doctor if this is their first seizure.

2.9 Diabetes

High blood sugar

In first aid situations, we rarely encounter individuals with high blood sugar levels. The symptoms often develop over a longer period and tend to be vague. Because these symptoms do not go away, the individual eventually contacts their doctor, who then diagnoses the condition.

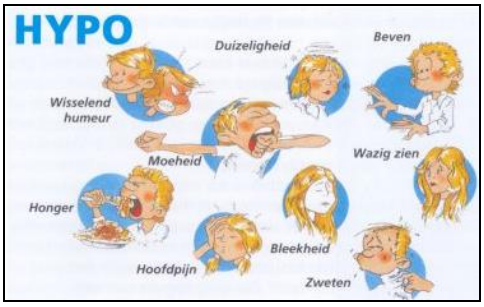


Low blood sugar

Low blood sugar levels (hypoglycemia) are more commonly encountered in first aid situations. This usually involves individuals who have exerted themselves too much, eaten too little, or failed to adjust their insulin accordingly.

First Aid for low blood sugar

- If the victim is unconscious, call 112 and put the phone on speaker mode.
- If you are certain the victim has diabetes, administer:
- First: glucose tablets or lemonade.
- Then: A sandwich or custard.
- If the victim is less alert, you may attempt to apply honey or syrup inside their cheek pouch.



This prompt administration of sugar can help raise their blood sugar levels and alleviate symptoms.

2.10 Skull and brain injury

If someone has had an accident, hit their head, or fallen awkwardly, they may exhibit symptoms such as confusion or drowsiness. They may have been briefly unconscious and may complain of headaches and/or dizziness. The victim might respond slowly and have difficulty recalling events, frequently asking what happened. Additional symptoms can include fatigue, double vision, ringing in the ears (tinnitus), nausea, and vomiting. They may also become irritable and, in some cases, experience an epileptic seizure.

Sometimes, symptoms may not appear until several hours after the accident. The victim may suddenly have trouble recalling the incident and might struggle with concentration, as well as be sensitive to bright lights or loud noises.

First Aid

- Always call 112 in the event of a serious accident.
- Call 112 if the victim experiences severe headaches (even after some time) or if the headaches worsen after the accident.
- Ensure the victim remains still; they may have not only a skull and brain injury but also a spinal injury.
- Contact a doctor for minor traumatic brain injuries.

Chapter 3 Non Urgent First Aid

3 Non-urgent first aid

3.1 Faintness

Fainting occurs when there is a temporary decrease in blood flow to the brain, leading to a brief disturbance in consciousness. Possible causes of fainting:

- Standing up too quickly
- Exhaustion due to fatigue, hunger, or weakness after illness
- Dehydration
- Psychological factors, such as: sudden fright or intense emotions, The sight of blood
- Anemia
- A stuffy or crowded space
- Medication use
- Standing for too long

A person experiencing fainting may appear pale or sallow, sweat, and exhibit yawning. They may feel lightheaded, experience tinnitus (ringing in the ears), and feel weak, nauseous, or see dark spots. Eventually, the victim may become unresponsive and lose consciousness, possibly displaying twitching movements resembling seizures, and may also lose control of their bladder.

First Aid:

- Call 112 if the victim experiences:
    - Unconsciousness
    - Fainting accompanied by chest pain and/or palpitations
    - Fainting along with severe abdominal or back pain
- For a brief loss of consciousness, follow these steps:
    - Allow the victim to lie down and loosen any tight clothing.
    - Ensure they receive fresh air.
    - Keep them lying down for 10 minutes.
    - If symptoms do not resolve after 10 minutes, allow them to lie down for another 10 minutes.
    - The victim may only eat or drink once they are fully alert and can hold food or drink on their own.

Fainting in children under 6 years and in individuals over 40 years always call 112.

3.2 Wounds

A person with a wound has damaged skin and may experience pain. The wound can bleed and can appear sharp, deep, and well-defined, or it may look ragged and messy. There may be a piece of skin that is torn away, and the surrounding skin can appear red and swollen.



First Aid for Wounds

- Call a doctor if:
  - There are large wounds.
  - There are large blisters.
  - The wounds are deep.
  - The wounds are dirty or bite wounds.
  - The wounds continue to bleed.
- Clean the wounds:
  - Rinse wounds with running tap water to remove any dirt or debris.
- Cover the wounds:
  - Dress the wounds as sterile as possible to prevent infection. Use clean bandages or dressings to cover the wound securely.

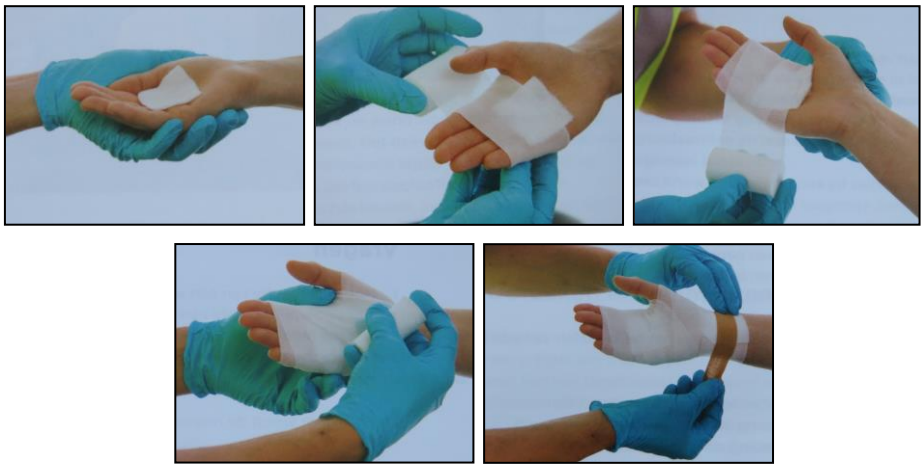
Applying a Quick Bandage




Applying a Finger Bandage




Applying a Dressing Bandage



3.3 Nosebleed

A nosebleed can occur from blowing the nose too hard, nose picking, a blow or punch to the nose, or due to sudden changes in temperature.

Nosebleeds can also occur spontaneously.

First aid:

- Have the person sit slightly forward (leaning posture).
- Ask them to blow their nose.
- Instruct them to pinch their nose for five minutes.
- Contact a doctor if the bleeding hasn't stopped after five minutes of pinching.

3.3 Eye Injury

A person is experiencing pain in one or both eyes. You notice that their eye(s) is/are red, and they may be tearing up. The person is squinting both eyes shut, and the eyelids may be swollen. Occasionally, you might see bleeding or a deformed pupil. They may also mention that their vision is impaired.

First aid for dirt in the eye

- Use your thumb and forefinger to gently separate the eyelids.
- Remove any loose object with the tip of a sterile compress or a clean tissue.
- Never wipe the object across the colored part of the eye.
- If the object is on the colored part of the eye, or if you're unable to remove it, contact a doctor.

First aid in Cse of a foreign object in the eye (splinter)

- Call a doctor immediately.
- Do not remove objects that have penetrated the eye.
- Do not remove contact lenses.
- Ensure the person does not rub their eyes.
- Cover the affected eye with a shield or protective cover.
- Have the person remain seated.

3.4 Bruising / Sprain

When bruised, the muscles and connective tissue between the skin and bone are damaged. In a sprain, the ligaments and joint capsule are stretched or torn.

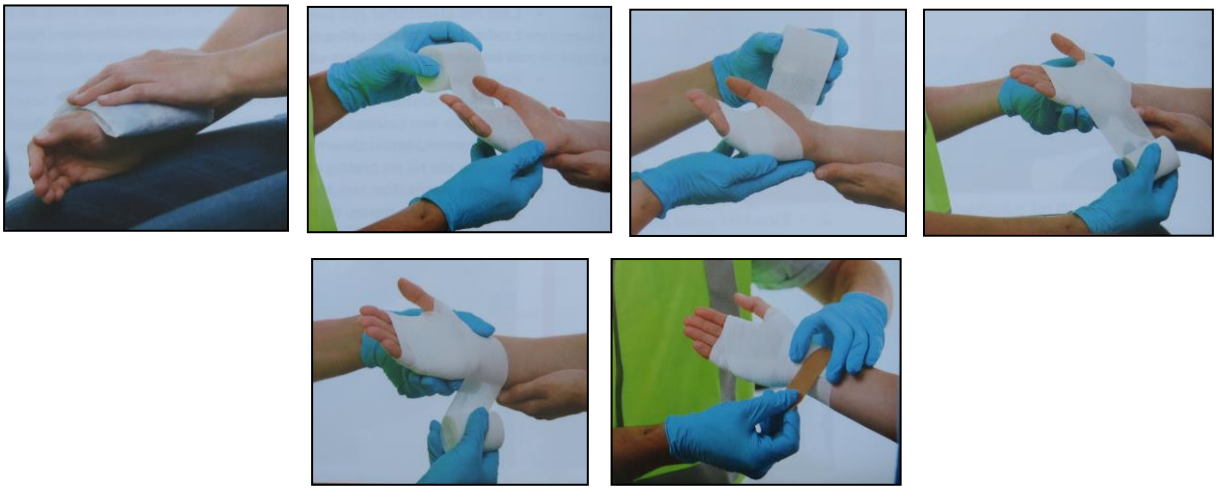
The person may have misstepped, fallen, landed awkwardly after a jump, or collided with something. Initially, they feel pain in the affected muscle group or injured joint. There may be swelling, and sometimes a blue discoloration is visible if there is tissue tearing. Movement is usually limited but painful.

First Aid

- Have the person remove any jewelry from the injured area.
- If there is an injury to the foot, ask them to remove their shoe.
- Cool the painful area for about 10 to 20 minutes. You can do this 4 to 5 times on the first day.
- If the person wishes, apply a compression bandage.
- If the pain and swelling have not reduced after four or five days, contact a doctor.

Support bandage for the ankle

Support bandage for the wrist



3.5 Fractures/ dislocations

Fractures and dislocations cause damage to the tissues surrounding the bone or joint (muscles, nerves, blood vessels, and skin).
It can sometimes be difficult to distinguish between a fracture and a bruise or sprain. If in doubt, the person should visit a doctor.

The injured person experience (a lot of) pain and may have difficulty or be unable to move the affected body part. Sometimes, the injured part may move in an abnormal way. Swelling is often visible at the site of the fracture, and sometimes there may be a wound.

First Aid

- Call 112 in the following cases:
  - Open fracture;
  - Pale or blue skin;
  - Broken leg, hip, or pelvis.
- Call a doctor for:
  - Broken arm, knee, foot, or ankle.
- Support a broken leg with a rolled-up blanket, clothing, or bags.
- Cover any wounds with a sterile dressing



3.6 Spinal injury

Spinal injuries can occur from falls from a height. They can also result from a blow to the neck, a significant force on the vertebrae due to a collision, or diving into shallow water. A fall of a heavy object onto the head can also cause a spinal injury.

Even the slightest movement can lead to a worsening of the injury. In any back injury, you should be aware of the possibility of spinal damage.

The victim complains of pain in the neck or back. They may experience tingling in one or both legs and/or arms, and possibly a feeling of heaviness or fatigue in one or both legs and/or arms. In severe cases, the victim may experience paralysis in one or both legs and/or arms.

First aid

- Have someone call 112, or call 112 yourself and put the phone on speaker mode.
- Approach the victim in a way that allows them to look at you without having to turn their head.
- Support the victim's head in the position it is currently in.
- If the victim is agitated, do not hold their head still, as this increases the risk of unwanted movements of the spine.

3.7 Burns

Burns can occur due to various causes. The initial response to a burn is always to cool it as quickly as possible, regardless of its severity or cause.

Types of Burns:

- 1st degree: Painful, red, and slightly swollen.
- 2nd degree: Same as 1st degree, but with blisters.
- 3rd degree: Grayish-white to black skin, surrounded by 1st and 2nd degree burns.

First Aid:

- Call 112 for large 2nd degree burns and for **all** 3rd degree burns.
- Call 112 if smoke or hot gases have been inhaled, even if the victim has no complaints.
- Contact a doctor if there is any doubt or if the burns are on joints or the face.
- Remove any jewelry from the affected area.
- Remove clothing (also consider diapers and incontinence materials).
- Cut away the clothes around clothing that has melted to the skin.
- Cool the burn for 10 to 20 minutes under lukewarm running water. Cooling is beneficial up to three hours after the burn occurs.
- After cooling, cover the burn with a sterile non-stick dressing. If you do not have this, use a clean towel or plastic wrap.

3.8 Hypothermia

Hypothermia can occur in someone who has fallen into water or after prolonged exposure to a cold environment. It is also commonly seen in the sick and accident victims.

Signs of Hypothermia:

- The sick person or accident victim feels cold and shivers.
- Pale and cold skin.
- Sometimes, there may be blue patches on the skin.

First Aid

- Move the victim to a warm or sheltered environment.
- Remove wet clothing.
- Wrap the victim in a (rescue) blanket, making sure to cover the head as well.
- Possible warming methods include:
- Warm shower (maximum 38°C);
- Hot water bottles;
- Warm drinks/food (no alcohol).

Chapter 4 Fire Safety

4.1 Introduction
- Definition of fire
- The fire triangle
- Extinguishing a fire
- Dangers of fire
- Checking for a fire
- Doorprocedure
- Types of fires
- Fire classes

4.2 Small fire extinguishing devices
- Fire blanket
- Fire hose reel
- Powder fire extinguisher
- Carbon dioxide fire extinguisher (CO_2)
- Spray foam fire extinguisher
- Fat fire extinguisher
- General rules for extinguishing a fire

4 Fire Safety

4.1 Introduction

Fires can spread rapidly, so it is crucial to alert the fire department as soon as possible. The quicker the fire department is notified, the faster firefighting efforts can begin, and the sooner the fire can be contained.

Only small fires, such as those in waste bins, that can be safely managed with available firefighting equipment, should be handled by individuals. In these cases, there is no need to contact the fire department. However, after extinguishing the fire, ensure it is fully extinguished and there is no risk of re-ignition. If you are uncertain, always prioritize contacting the fire department first, then attempt to extinguish the fire.

The safety of people is always the top priority. If individuals or animals are at risk due to fire or smoke, immediately contact the fire department and then ensure everyone is moved to safety.

Definition of Fire

Fire is a process that produces flames and:

- Is unwanted;
- Causes damage or poses a danger;
- Can spread uncontrollably.

Fire can be observed in different ways:

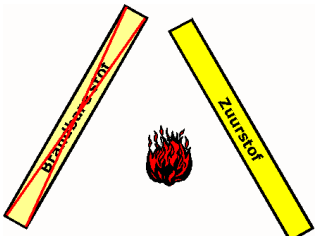
- You see flickering light, flames, and smoke;
- You feel the heat;
- You hear the crackling of the flames;
- You smell the burning.

The Fire Triangle

For a fire to start, three factors are needed: oxygen, a flammable material, and the ignition temperature.
For example, take a piece of paper or a cloth (flammable material), hold a burning match near it (ignition temperature), and the paper or cloth will catch fire (helped by the oxygen present in the air).
Thus, there are always three factors required for a fire to start. These three factors are represented in a triangle: the Fire Triangle.

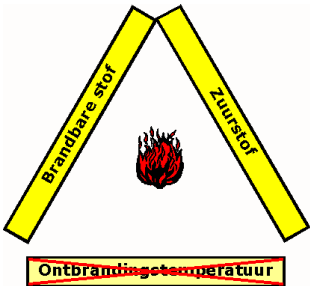
Extinguishing a Fire
Before attempting to extinguish a fire, take a moment to think about what you should and should not do. When putting out a fire, it is important to first *observe*, then *think*, and only then *act*.
OBSERVE > THINK > DO
By following this approach, you can avoid many mistakes. You are trained to extinguish the early stages of a fire. The term "early stages of a fire" can be difficult to define, but as a rule of thumb, it refers to when the fire is still confined to the area where it started.
For example: the fire is limited to a trash bin and has not yet spread to the surrounding area. If the fire has already spread, first alert the fire department, then assess whether you can start extinguishing the fire or if you need to ensure that you and others are safely evacuated.
To sustain a fire, all sides of the fire triangle must be present. If we remove one side of the triangle, the fire will go out. Therefore, extinguishing a fire is like removing at least one side of the fire triangle.

Removing the flammable material
At first glance, removing the flammable material may seem very difficult, and for most fires, it is. However, it is very possible in the case of gas fires.
For gas fires, turning off the gas supply is the only way to extinguish the fire. By closing the gas valve, the flammable material is removed, and the fire will stop.



Removing the oxygen
This may seem difficult because there is always oxygen present in a fire. However, we can smother a fire so that no more oxygen can reach it.
Examples of this include closing windows and doors, covering a burning deep fryer with a lid, or covering a burning trash can with a fire blanket. Foam and carbon dioxide (CO2) snow also have a smothering effect.

Lowering the temperature
By spraying water or foam on a fire, the temperature is lowered, which removes the "ignition temperature" from the fire triangle.



Dangers of Fire

Some dangers in a fire are obvious, such as heat and smoke. However, there are other potentially dangerous threats that may be less immediately apparent, such as the risk of explosions, the reactions of hazardous materials, and electricity. Always keep in mind: if you take unnecessary risks, there will be one less rescuer and one more victim.

Smoke

During a fire, the development and spread of smoke typically occur faster than the spread of the flames. The greatest danger is inhaling smoke. Smoke is hot and can cause burns to the airways. Additionally, smoke contains toxic gases that can cause chemical burns in the airways when inhaled. Most fire victims die from smoke inhalation, not from the fire itself.
Smoke is life-threatening, so it is essential to prevent people from inhaling it. The dangers of smoke apply not only to the fire victims but also to you as a rescuer.
While fleeing, you should avoid walking through smoke for more than thirty seconds, and stay low to the ground. Evacuation routes are planned with this in mind.

Carbon Monoxide

Carbon monoxide is a colorless, odorless gas. It forms at the start of a fire and during incomplete burning of fuels like oil, gas, and wood. Incomplete burning happens when there isn't enough oxygen for a proper burn.
Carbon monoxide can also be released from gas dryers, boilers, water heaters (especially ventless ones), fireplaces, stoves, gas cookers, and car exhaust in garages.
This gas is both flammable and toxic. When you breathe it in, it enters the bloodstream and attaches to red blood cells, which carry oxygen. Carbon monoxide binds to red blood cells much more easily than oxygen, which means less oxygen is transported through the body. Organs that need a lot of oxygen, like the heart and brain, are most affected. In the case of pregnant women, the babies are most affected. Mild poisoning causes fatigue, headache, nausea, and faster breathing and heart rate, similar to flu symptoms without the fever. At higher levels, you can faint or become unconscious, which can lead to coma or death. This can happen very quickly.

Heat

Heat is a natural part of fire. If a fire burns long enough, heat can build up at the top of a room. In high-ceilinged rooms, you may not feel much heat or see much smoke at first. But be careful—the fire can suddenly spread due to this heat. The heat will then drop like a blanket, causing burns to anyone in the room. Heat can also set other materials or people on fire, causing the fire to spread rapidly.

Electricity

Electricity adds an extra risk during a fire. In an emergency, there is a danger that machines, metal cabinets, doors, or desks could become electrified, especially if cables break or the insulation on wires is damaged. Touching these can be fatal. That’s why it’s important to immediately turn off the power

in case of a fire or accident.
A fire in an electrical device, fuse box, or meter box should never be put out with water. Water conducts electricity, which could cause electrocution. A CO2 (carbon dioxide) or powder fire extinguisher is safe to use in this situation. However, it's better to call experts, like the fire department, for help.
Electrical panels should always have a black-and-yellow striped symbol on them. Most businesses have high-voltage rooms because industrial equipment like elevators and air-conditioning systems require high-voltage power. High-voltage rooms are marked with a black-and-yellow striped sign, often with a lightning bolt symbol.
In any case, avoid contact with water around electrical equipment. On the outside of high-voltage panels, you will find a main switch. Your first action should be to turn off the switch. This will immediately reduce the danger.

Loss of orientation

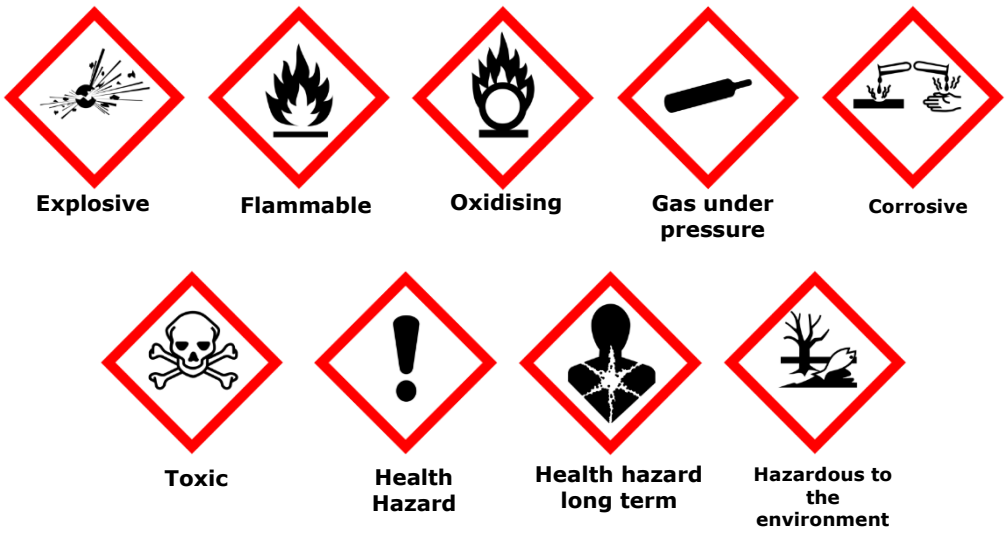
Even in a familiar environment, there is a real risk that you may lose your sense of direction during a fire. This can happen due to smoke or the loss of lighting, which makes it hard to see. If visibility is poor, always feel your way along the walls from door to door, and never try to cross a room blindly.

Explosion Risk

Explosion risks can occur from leaking gases or vapors from flammable liquids (such as gasoline). If you suspect this situation, avoid using open flames, sparks, or anything that could cause an ignition. Even flipping a light switch or turning on a refrigerator can trigger an explosion.
If you suspect a gas or vapor leak, always alert the fire department, as they have the proper equipment and expertise to handle it.

Dangerous Goods

The presence of hazardous materials adds extra danger during a fire. These can include harmful liquids, vapors, and gases. Some substances should never come into contact with water. If this happens, a chemical reaction may produce dangerous gases.
Make sure you know what materials are used in your workplace and be aware of their specific hazards. Firefighting equipment should be suitable for these risks.



Checking for a fire

Before attempting to extinguish a fire, ask yourself what you should and should not do.

OBSERVE > THINK > DO

When fighting a fire, it's important to first *observe*, then *think*, and only then *act*.

- If it's a small fire with no risk of spreading, you can try to put it out. Afterward, make sure to carefully check if the fire is really out.
- If there is a risk of the fire spreading, first call for help and make sure others are safely evacuated. Then, assess whether you can begin extinguishing the fire.
- Before trying to put out a fire, you must know what is burning and which fire extinguisher is appropriate for that type of fire. Not all fires can be put out with all extinguishers. For example, never throw water on a pan of burning fat (this can cause a large flare-up), and never spray water on an electrical fire (risk of electrocution).
- Before using a fire extinguisher, always check that it's working properly.
- Keep in mind that most handheld fire extinguishers only last between 6 and 20 seconds (depending on the type and size of the extinguisher). If the fire isn't out by then, leave the room as quickly as possible.
- Never use the elevator, and warn others not to use it either.
- Keep windows and doors closed to limit the oxygen supply to the fire. The more oxygen, the more the fire will spread. Also, make sure others know to keep doors and windows closed, as not everyone may realize that this will help prevent the fire from growing.
- If you see smoke coming out from under a door, keep the door closed. The room behind it is most likely filled with smoke.

Door Procedure

- Check if you see signs of fire.
- Call through the closed door and listen for a response. If you don't get an answer, follow the door procedure.
- Place the back of your hand as close and as high as possible near the door, and near the gap (since the door may be hot, do not place your hand directly on the door)
- Move the back of your hand from the top to the bottom along the door and the gap.
- If you feel heat, assume that there is a fire in the room behind the door. If the door feels warm, heat or smoke is coming through the cracks, or the door handle is hot, there is likely a fire. In this case, you need to prevent the fire from spreading. Here's what to do:
  1. Keep the door closed.
  2. Stay in a safe area yourself.
  3. Warn those nearby.
  4. Inform reception or the fire department about the situation.

- If the door does not feel warm, place the back of your hand on the door handle. If the handle feels cool, open the door following the "door procedure''.

"If there is a fire further along in the room, opening the door could cause a flashover, with flames potentially coming out through the gap at the top of the door. If you have positioned yourself correctly, taking cover and crouching, the risk of injury is minimal. The flames would

escape upwards, away from your direction. Additionally, crouching has the advantage of keeping you low to the ground, reducing your exposure to any smoke."

- First, check where the hinges are located.
  If the hinges are visible, the door swings towards you (Outward swinging door).
  If the hinges are not visible, the door swings away from you (Inward swinging door)."

Outward swinging door

- With an outward swinging door, kneel on the side of the hinges, behind the door.
- Place one foot across the door (as shown in the picture), preventing it from opening any further than a few centimeters.

Inward swinging door

- With an inward swinging door, crouch behind the wall next to the door handle.
- Turn your head away and slowly open the door a small amount, but keep a firm grip on the handle so you can quickly close the door if necessary.
- Wait a few seconds, then check to see if smoke and/or fire is coming through the open door.
- Call out to see if anyone is inside.

If there is a response to your calls and, upon checking, no fire or smoke is visible, you can enter to investigate the cause of the fire alarm.
If there is a response to your calls and you suspect fire or smoke, do not enter. Keep the door closed. Instruct the victim to crawl towards your voice. Continue calling out to the victim. Try to determine the victim's location by asking specific questions. Report to the internal alarm number or the fire department that there are victims.
Never put yourself in danger. Always prioritize your own safety.

Types of Fires

Before attempting to extinguish a fire, you must first identify what material is burning in order to choose the appropriate extinguishing agent. Not all fires can be put out with the same type of extinguishing substance. Using the wrong agent can lead to dangerous situations. For example, trying to extinguish a burning deep fryer with water can cause a large flash fire. If you try to put out a fire in an electrical device with a water stream, you risk electrocution.
The effectiveness of extinguishing agents is based on one or more of the fire suppression principles in the fire triangle. There are different types of extinguishing agents, each with its specific application. The material that is burning determines which extinguishing agent is most suitable.
Fires are classified into the so-called "fire classes": A, B, C, D, and F.

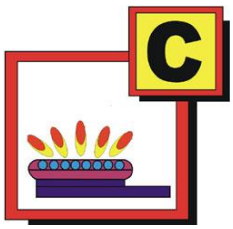
Fire Classes

Each fire class is represented by a pictogram. These pictograms are used internationally and can be found on portable fire extinguishers. The pictograms indicate which fire class the extinguisher is suitable for.

Always make sure you're using the right extinguisher before trying to put out a fire.

Fire Class A
This class includes fires involving solid materials.
For example: kindling wood, paper, and textiles.
Examples of solid material fires are burning curtains, computers, and furniture.

Fire Class B
This class includes fires involving liquids.
For example: gasoline, diesel, turpentine, heating oil, and alcohol.



Fire Class C
This class includes fires involving gases.
For example: camping gas, natural gas, butane, and LPG.

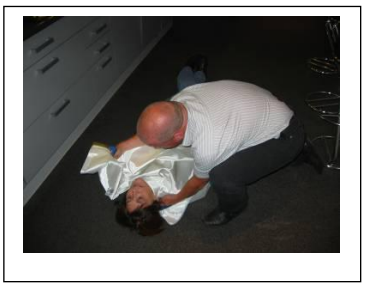
Fire Class D
This class includes fires involving metals.
For example: magnesium, aluminum, and sodium.

Brandklasse F
This class inculdes fires involving fats. For example: frying oil, vegetable and animal fats, bitumen, and paraffin.

4.2 Small fire extinguishing devices

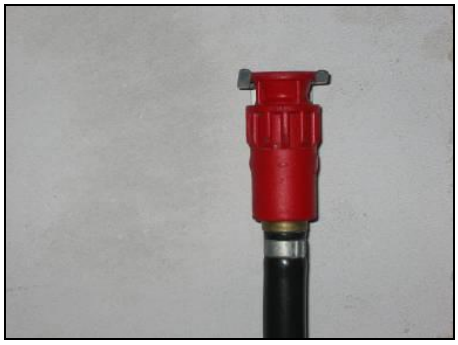
Fire Blanket
Fire blankets are made from fire-resistant or even non-combustible materials. They come in various sizes and are often found in workshops, laboratories, and commercial kitchens. Fire blankets cover the burning object, cutting off its supply of oxygen. They were originally designed to wrap around people who are on fire, but they are also very effective for quickly smothering small fires.




Fire Hose reel
Water is still the most commonly used extinguishing agent. For a very small fire, a glass of water from the tap may be enough. But if more water is needed, you could use a fire hose reel. Fire hose reels are the familiar round red drums mounted on walls, with a coiled hose attached. The hose reels are connected to the water supply system, with the main advantage being that the amount of extinguishing agent is unlimited. When you grab the hose and pull on it, the reel will automatically unwind.
The hose is typically twenty to thirty meters long.

Old model spray nozzle



New model spray nozzle

Water lowers the temperature and thereby extinguishes the fire. Water removes heat from the fire triangle. By using a spray nozzle, the water is broken into small droplets. This increases the contact surface of the water with the fire. As a result, evaporation (and thus cooling) is greater.

Another effect of extinguishing with water is suffocation. A portion of the water will evaporate into steam during the process. This steam then displaces the oxygen.

A disadvantage of using water to extinguish fires is the water damage it causes. Water also poses a problem when fighting fires involving electrical equipment. If water should not be used to extinguish a fire, this is indicated with a warning sign. On an electrical panel, a pictogram must be displayed to show that using water to extinguish the fire is dangerous.

How to Extinguish a Fire with a Hose Reel?

- Open the main valve (located above or below the hose reel) completely.
- Unroll about 2 meters of hose and fully open the nozzle for at least 1 second.
- Continue unrolling the hose in the direction of the fire. Make sure you have enough hose length to reach the fire.
- Approach the fire from behind the spray to protect yourself from the heat with the water spray.
- Stay low to avoid inhaling smoke or steam while extinguishing the fire.
- Stay within 5 meters of the fire. Put out the fire from that distance, or try to prevent it from spreading.
- Wait until the temperature has dropped before you begin actively extinguishing the fire with a solid water stream.
- Aim the water stream at the base of the flames for the most effective suppression. If steam builds up and blocks your view of the fire, or if your efforts aren't working and the heat and smoke are increasing, it is unsafe to stay in the area. In that case, evacuate and let the fire department handle the situation.

Powder Fire extinguisher

Powder fire extinguishers are commonly used in industrial environme
on trucks, and for home use. They have a high extinguishing power
are suitable for different types of fires.

- Powder is effective for liquid fires and fires involving electrical systems because it does not conduct electricity.
- For gas fires, you should only use the powder extinguisher to reach and shut off the gas supply.

However, one disadvantage of using powder extinguishers is that th
can cause significant secondary damage. The powder is very fine an
can easily spread to many areas, potentially causing harm to the surrounding environment.

There are different types of fire extinguishing powders:

- ABC powder: Suitable for Class A, B, and C fires (solid materials, liquids, and gases).
- BC powder: Suitable for Class B and C fires (liquids and gases).
- D powder: Specifically designed for metal fires.

These types of powder extinguishers are versatile and can handle a wide range of fire scenarios, but they should be used carefully to minimize damage.

How to Extinguish a Fire with a Powder Fire Extinguisher

- Break the seal and remove the safety pin from the handle.
- Test the extinguisher by giving a short burst to ensure it's working properly.
- Apply the powder completely over the fire. Spray from all sides—left, right, front, and behind the fire. Move the nozzle back and forth to quickly cover the flames with a cloud of powder.
- Keep a distance of 3 to 5 meters from the fire while using the extinguisher.

CO2 (Carbon Dioxide) Fire Extinguisher

CO2 fire extinguishers are primarily used for Class B fires (liquid fires) and are especially useful in environments where other types of extinguishers might cause unnecessary damage, such as around electrical equipment.

The CO2 cylinders are relatively heavy, which is why they typically contain no more than 6 kilograms of CO2.
These extinguishers have a large discharge horn, or blasting nozzle.
Due to the high pressure inside the cylinder, the CO2 gas is initially in a liquid form. When it is released into the nozzle, it turns into gas, and part of it freezes, creating
the "snow" that you see when using the extinguisher. This CO2 snow has a temperature of -78.5°C.

Do not touch the discharge horn or nozzle, as it can cause frostbite due to the extreme cold.
Never spray directly on people.
In small, enclosed spaces, there is a risk of oxygen loss. CO2 displaces oxygen, which can make the air harder to breathe and cause suffocation.

How CO2 Works:
CO2 extinguishers work by displacing oxygen around the fire, smothering the flames and stopping combustion. They are ideal for electrical fires or fires involving flammable liquids (e.g., kitchen fires).

CO2 extinguishers are not effective for fires that have reached the glowing stage, such as with burning wood or solid materials (Class A fires).
This makes CO2 fire extinguishers very effective in protecting electrical devices, but they are not suitable for all types of fires, particularly those involving solid materials.

How to Extinguish a Fire with a CO2 Fire Extinguisher

- Break the seal and remove the safety pin from the extinguisher.
- Test the extinguisher by giving a short burst to ensure it is working properly.
- Approach the fire closely, but maintain a safe distance of about 1.5 meters.
- Aim the discharge horn at the flames and squeeze the handle to release the CO2. Always hold the horn by the handle and never touch the nozzle itself, as it can become extremely cold.
- Use a continuous stream to direct the CO2 at the base of the flames. Never use short bursts. Move the nozzle from side to side—left, right, in front, and behind the fire to cover the entire area.
- When extinguishing liquid fires, avoid spraying directly onto the liquid from a short distance, as this could cause the liquid to splash and spread the fire.
- Continue extinguishing the fire until it is completely out.
- **Check for re-ignition** after extinguishing the fire and perform a follow-up inspection to ensure the fire is fully extinguished.

Spray Foam Fire Extinguisher

A spray foam fire extinguisher is filled with water that has a foam-forming agent added to it. It has a special nozzle that sprays the water/foam mixture in very fine droplets. This helps the foam quickly soak into burning solid materials like **paper, wood, and textiles**, making it very effective for **Class A fires** (solid material fires).
The foam also floats on flammable liquids, so it can be used for **Class B fires** (liquid fires).
Electrical Fires: You can use a spray foam extinguisher on electrical devices, unless the label says it is **not suitable for electrical fires**. Since the water and foam come out as a mist of tiny droplets, there is **no risk of electrocution** because the water stream is broken up and doesn't conduct electricity.
Key Points:

- **Class A fires**: Good for burning solids (like paper, wood, textiles).
- **Class B fires**: Good for burning liquids (like oils or gasoline).
- **Electrical fires**: Safe to use unless the label says not to.
- **No electrocution risk**: Due to the mist of fine droplets.

This type of extinguisher is versatile, effective on solid and liquid fires, and safe for electrical equipment when used correctly.

The extinguishing effect of the spray foam fire extinguisher works by **cooling** through the mist of foam and water. Spray foam extinguishers **remove heat** from the fire triangle, which helps to put out the fire.
In the case of burning liquids, spray foam **covers** the liquid, which prevents further evaporation of the flammable liquid and stops more **oxygen** from reaching the burning material.
This helps to smother the fire.

Extinguishing a fire with Spray Foam

- Break the seal and remove the safety pin.
- Test the extinguisher by giving a short burst to check that it works properly.

- Stand at a safe distance from the fire. The stream will reach 3 to 5 meters initially.
- Do not spray directly on the flames, but aim as low as possible near the base of the fire.
- Spray continuously to cover the fire.
- Continue spraying until the fire is completely out.

Fat Fire Extinguisher

The fat fire extinguisher is an easy-to-use extinguisher for putting out deep fat fryer and oil fires.
It is an innovation in the field of fire extinguishers. Places where cooking and/or frying takes place are often the most **high-risk** areas. The fat fire extinguisher is a useful tool in these situations. Due to its cooling effect and the way the extinguishing agent reacts with the fat or oil, it provides effective fire suppression.

The extinguishing agent creates a gas-tight layer that puts out the flame ignition.
The fat fire extinguisher removes oxygen and heat from the fire triangle

Extinguish a Fire with a Fat Fire Extinguisher

- Break the seal and remove the safety pin.
- Test the extinguisher by giving a short burst to check that it works properly.
- Stand at a safe distance, making sure the nozzle reaches above the pan with burning fat.
- Empty the extinguisher completely.

A fire in a deep fryer is best extinguished by **placing the lid** on top.

If you don't have a suitable lid, use a **roasting pan**.

General Rules for Extinguishing a Fire
When attempting to extinguish a fire, always remember: first observe, then think, and only then act.

- Prioritize your own safety.
- Take an extinguisher with you.
- Always check for a fire with 2 people.
- Approach the fire from a safe distance. A safe distance is one where you have a good view of the fire and are not exposed to smoke or heat.
- Identify what is burning.
- Assess the fire. Is it a small, manageable fire that you can extinguish?
- If you decide not to extinguish the fire, close the door to prevent the fire from spreading.
- Ensure you have the correct fire extinguisher.
- Test the extinguisher by giving a short burst.
- If you decide to extinguish the fire, stay low and maintain a safe distance.
- Make use of the extinguisher's effective range.
- Never pass the burning object. Always ensure you have an escape route.
- Continue extinguishing until the fire is completely out.
- Check all sides of the burning object to make sure there are no hidden flames.
- Walk backward from the object until you are at a safe distance.
- Close the door when you leave the room.

Chapter 5 Evacuation

5.1 People's behavior during an evacuation
- Awaremess
- Judgment and decision-making
- Execution
- Behavior of emergency responders (BHV-ers)

5.2 Facilities in the building
- Fire alarm
- Evacuation organization
- Escape routes
- Escape route signs
- Self closing doors
- Emergency exit doors
- Emergency lighting
- Evacuation route drawings
- Fire department entrance
- Fire department key (safe) tube
- Firefighter lif

5.3 Tasks of BHV during an evacuation
- Start of the evacuation
- Room clearing
- Receiving and guiding professional emergency services
- Reception of employees at the assembly point
- Aftercare

5 Evacuation

In an evacuation, how people act in the building is very important for it to be successful. That's why it's important to understand how people behave during an evacuation.
Plans need to be made about what everyone should do during an evacuation, including the emergency helpers (BHV-ers) and workers. These plans are written down in an evacuation plan. The workers must be told about the plan through lessons and instructions. Also, the building needs to have the right fire safety equipment, and if needed, there should be special tools to help save people, depending on the situation in the building.

5.1 People's behavior during an evacuation

Awareness

In a fire, the signs can be very clear, like flames, smoke, and the smell of burning. However, it has been shown many times that people do not always recognize these signs as danger. From different incidents, we see that when something unexpected happens, people first want to keep doing what they were doing. Also, research shows that when the danger is not clear right away, people tend to deny the problem. They believe everything is going as it normally should, even when clear signs from the surroundings suggest otherwise.

Judgment and decision-making

Clear information about how serious the situation is and clear instructions help people make decisions faster. This is partly because many people don't have much experience with fires. The behavior of other people also plays a big role in whether someone leaves their work area during an evacuation.
People who are alone usually respond faster than those with others. They don't want to stand out, so they wait for someone else to react. Also, many people don't know that breathing in smoke can be life-threatening.

Reaction to signals

An evacuation alarm is usually not seen as a sign that people need to leave. Often, people think it is just a drill. Because of this, they respond slowly to the evacuation alarm. For example, if there's a smell of smoke in a restaurant, people are more likely to think the food is burning rather than thinking there's a fire.

Clear information

People are more likely to act when the situation is clearly explained with spoken instructions about what they should do. Instructions from people with authority are also followed more quickly. A strong leader can guide a large group of people to safety in an organized way. When well-trained emergency responders (BHV-ers) are involved, evacuations happen faster than when there is no training.

Execution

Familiarity with the building

People usually leave the building using the route they came in through. They often don't use the shorter escape routes.

Layout of the building

People hardly ever use the green emergency exit signs. They walk through routes they know. The building can be so complicated that people have trouble finding the right escape route.

Building Setup

Emergency exits may be locked, or people may not be allowed to use them because it would trigger an alarm. During an evacuation, people will not use these emergency exits.

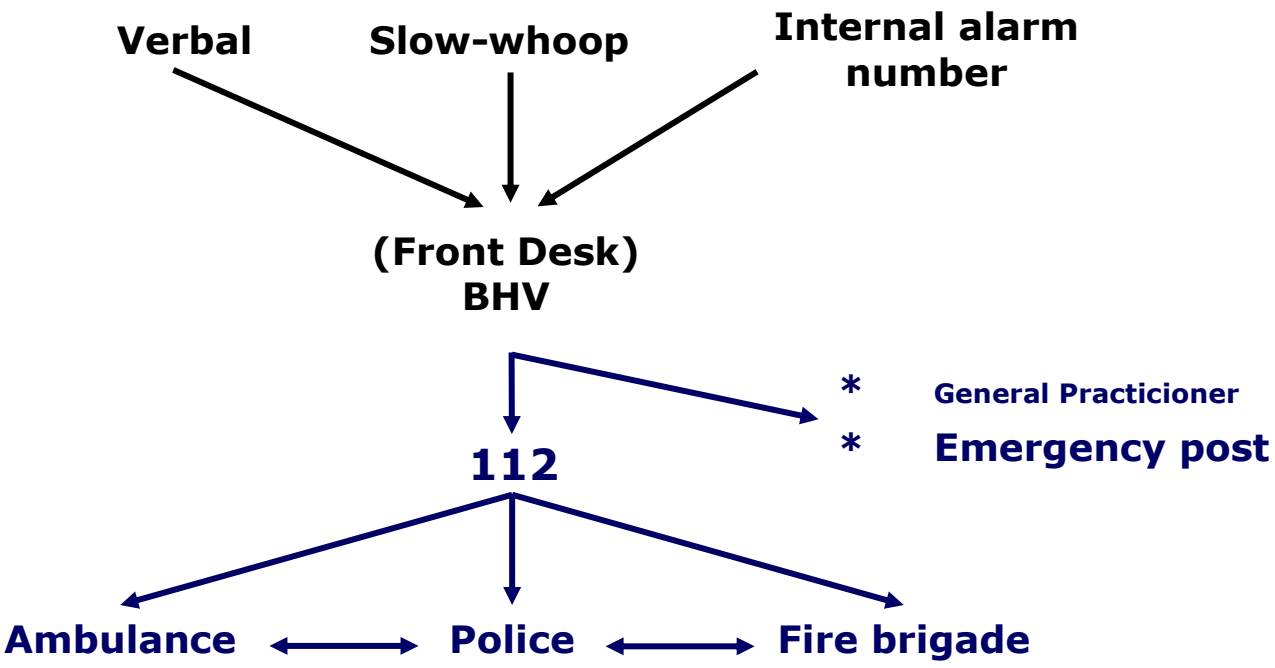
Sometimes, emergency stairwells are used as storage. This means that during a real evacuation, these stairwells may not be usable for escaping.
Also, it turns out that there is almost never panic during an evacuation, and people help each other. Panic and chaos only happen when the situation is so dangerous that survival chances are very low.

Behavior of emergency responders (BHV-ers)
The same factors that affect how staff, visitors, and people behave also affect the behavior of the emergency responders.
It is often difficult for staff to quickly switch from their regular job to the role of an emergency responder.

All these behavior aspects should be turned into clear agreements and instructions, which should be written in the evacuation plan. These agreements, instructions, and roles should be known by the staff and emergency responders.
Emergency responders need to practice their role regularly with training exercises and evacuations. Without training, they cannot be expected to perform well during real emergencies.

5.2 Voorzieningen in het gebouw

Internal Alarm Procedure



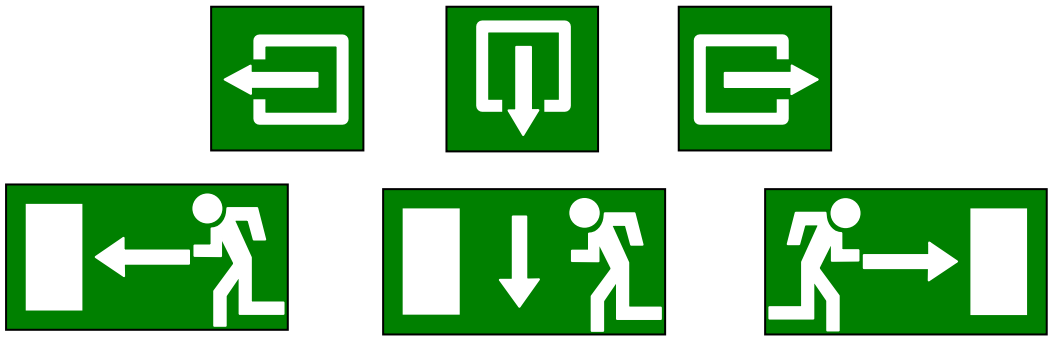
Fire alarm and evacuation organization
In many companies, there is a fire alarm system (BMI) that connects to smoke detectors, manual fire alarms, and an evacuation alarm. The fire alarm panel, where the alerts are shown, is usually placed at the reception. The fire alarm system is triggered when a manual fire alarm is activated or when an automatic smoke detector sends a signal.
When an alarm goes off, a loud sound will come from the system, and a signal will show where the alert is coming from.

Staff and others can be warned through the **Slow-whoop** (evacuation alarm) that something is wrong and action must be taken. The **Slow-whoop** is often connected to the fire alarm system. It makes a sound that starts slowly and then quickly gets louder and lower.
The evacuation alarm can be connected to the fire alarm system. If the system detects a fire, the slow-whoop sound will automatically turn on. If the evacuation alarm is not linked to the fire alarm system, the alarm can be triggered in another way, such as by pressing a manual fire alarm or pressing an evacuation button.

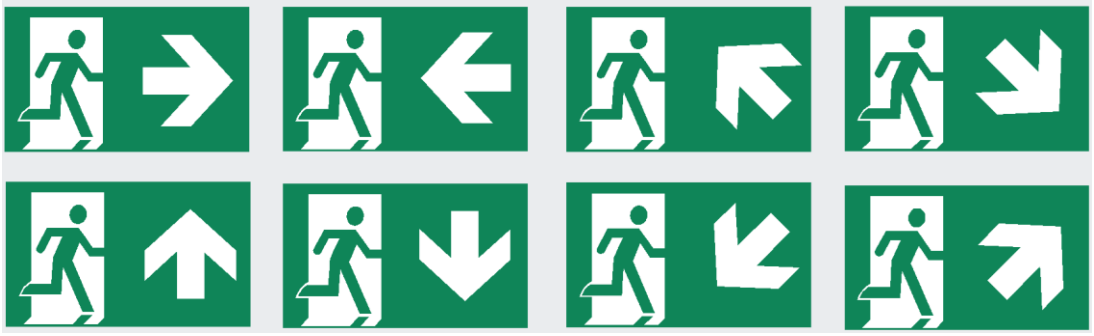
Escape Routes
Every building must have escape routes, like fire stairs (instead of elevators) and pathways to other buildings or parts of the building. Escape routes are an important part of the evacuation plan. During an evacuation, people should only leave the building using the marked escape routes.

In larger buildings, there are different routes. This is to make sure not too many people have to use the same hallways and stairs. All emergency responders (BHV'ers) must know these routes and make sure that during an evacuation, everyone follows them.

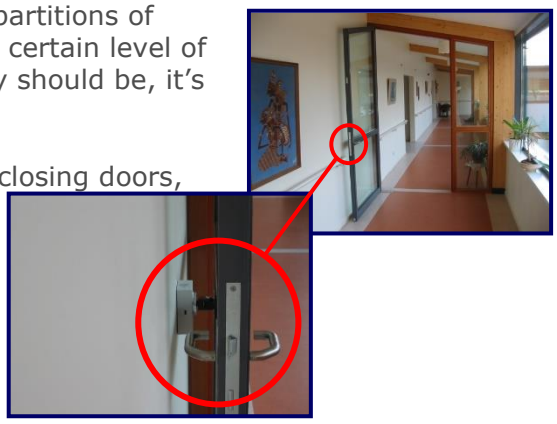
Escape Route signs
Every building must have escape routes. These escape routes should be marked with clear signs and should still be visible even if the power goes out. The better the escape routes are marked and the better the emergency lighting is, the easier it is for people to leave the building. Escape routes outside the building should also be lit.



New European Escape route signs (2015)



Self closing doors



A fire-safe building is designed so that the walls and partitions of different parts of the building (compartments) have a certain level of fire resistance. When deciding how fire-resistant they should be, it's assumed that doors in dividing walls are kept closed.

In large buildings with many hallways, there are self-closing doors, which are designed to stop smoke and fire from spreading. These doors are not mainly meant to block drafts, but to stay closed. This helps prevent smoke from spreading quickly in case of a fire.

Some doors are held open by magnets and will close automatically when a fire alarm goes off. If these doors are not in stairwells, it's allowed, but they must be regularly tested to make sure they work properly.

The door must close quickly, within a few seconds, to be effective.

Emergency exit doors

The exit door to the outside is also called an emergency exit. The emergency exits are the last part of the escape route and must always be able to open without any extra tools.

On the outside of an emergency door, there should be a sign saying "keep emergency exit clear" or "emergency exit," along with lighting to make it easy to see.

Emergency exits can sometimes cause a problem. While they need to allow people to leave the building, they also need to stop people from entering the building through that exit. However, there are now enough systems that make sure people can always exit the building, while also preventing the exit from being used by unwanted visitors, like burglars.

Emergency Lighting

Emergency lighting is meant to help an evacuation go smoothly if the electricity goes out. The emergency lights turn on automatically when the power fails. The goal is to provide enough light so people can still see when the regular lights are not working. This helps prevent panic and accidents, and makes sure the building can still be safely evacuated.
Emergency lighting can be divided into four groups

Emergency Response Officer

- General emergency lighting
- Clear lighting
- Step or slope lighting
- Night (emergency) lighting

Clear lighting

- General emergency lighting

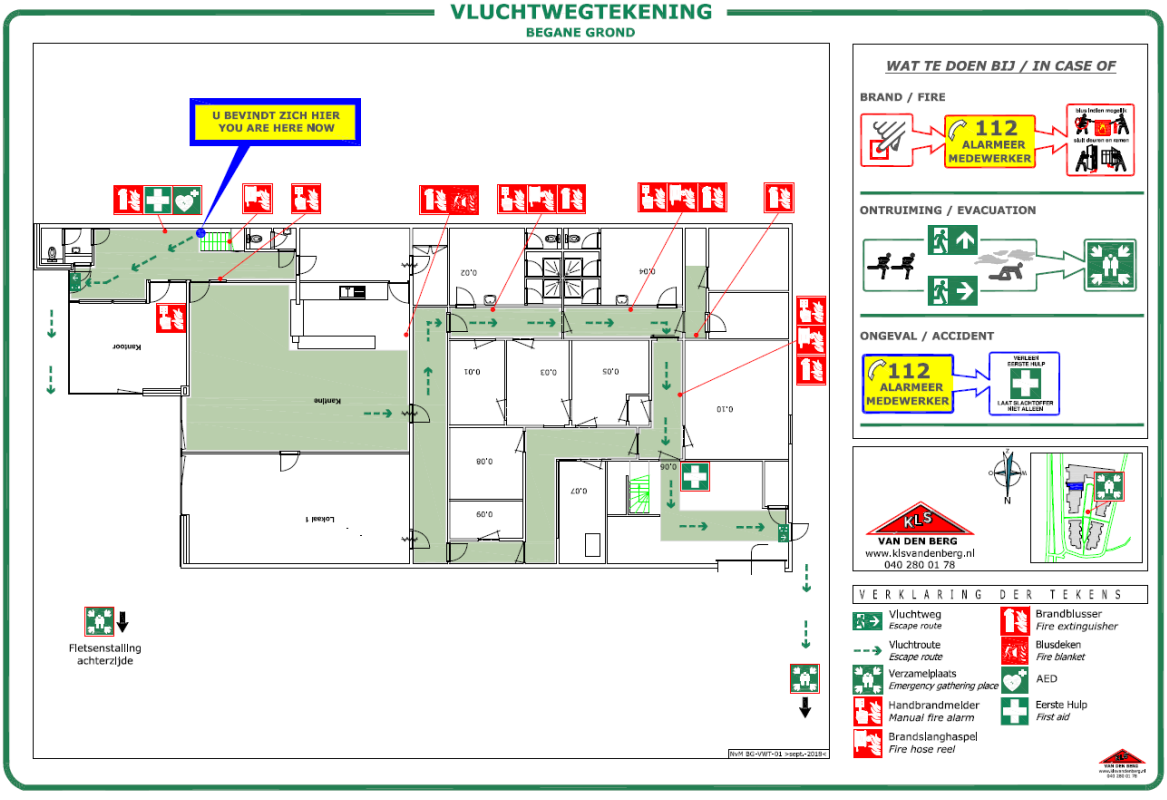
- Step and slope lighting

Evacuation route drawings

At these strategic locations, you will find escape route diagrams showing the escape paths.

These diagrams use pictures of places and devices that can help during an evacuation. For example, green arrows show the escape routes.

By using these pictures, everyone can quickly understand what they need to do.



Fire department entrance
If a building has more than one entrance and a fire alarm system that automatically notifies the fire department or a private alarm center (PAC), at least one of those entrances must be designated as the **fire department entrance** in consultation with the fire department. This fire department entrance must open automatically when a fire alarm goes off, or it can be opened with a system that has been agreed upon with the fire department.

Fire Department Key (Safe) Tube
When a fire alarm goes off, it's possible that no one is left in the building. To let the fire department in quickly and avoid damage from breaking in, many companies have a fire department key (safe) tube. This is a container on the outside of the building that holds the building's key, and the fire department has access to it.

The key tube is often connected to the building's security system. When the fire department opens the tube to get the key, a burglar alarm goes off at the police control room or a security service.

Firefighter elevator
Elevators should or cannot be used during a fire in a building. There is one exception: the **firefighter lift**. The firefighter elevator can be made available to the fire department with a simple action.
Even when the fire department uses it, they will take the necessary safety measures.
Using the firefighter elevator allows the fire department to quick bring equipment to areas that are at risk, or to rescue and take victims to safety.

The **firefighter elevator** is only for the fire department and not for emergency response staff (BHV).
The firefighter elevator has a main stop location (usually on the ground floor). A switch next to the elevator can be turned by the fire department to activate the firefighter mode. This mode ensures:

- The elevator goes to the main stop location.
- From that point on, the elevator can only be operated from inside the elevator itself.

The key switch is located about two meters above the floor next to the elevator.

5.3 Tasks of BHV during an evacuation

There can be many reasons to evacuate a building. For example, a fire, water damage, an accident with dangerous chemicals, a bomb threat, or a danger from outside the building.

Start of the evacuation
The way the emergency response (BHV) team starts the evacuation depends on the company. In some companies, the BHV staff starts by evacuating their own department. In other companies, the BHV staff goes first to the assembly point to get further instructions.

Staff are instructed to go to a safe place on their own when they hear the evacuation alarm. If it's safe, they turn off electrical devices, put away important papers, take their personal belongings, and then go to a pre-agreed safe place, called the assembly point.

- The BHV staff cannot escort every employee to safety, so they focus on the following tasks:
- Fighting or limiting the incident
- Rescuing victims and helping those with disabilities
- Checking rooms to see if anyone is left behind
- Directing employees to the assembly point by the shortest route
- Closing windows and doors that employees may have left open
- Reporting to professional emergency services
- Assisting and guiding professional emergency services
- Managing the assembly point

Last sweep/safety check
When checking rooms, the BHV staff enters each room and checks the entire space for staff members. The BHV staff will turn off equipment if necessary, close windows and doors, and, if possible, turn off the lights.

The following rooms must always be checked:
- Toilets
- Workrooms
- Cabinets
- Lifts
- Technical rooms

If any staff are found inside, they should be told to go to the assembly point by the quickest route.

If the building has multiple floors, the BHV staff members who check the top floor will then go to the floor below and wait by the emergency stairs for the BHV staff member who has checked that floor. This ensures that no staff go up to the higher floors. This process is followed for all lower floors.
Once the BHV staff member has finished their task or finds something unusual, they report it to the team leader of the BHV.

Receiving and guiding professional emergency services
The emergency services enter a building through a pre-agreed location. At this location, there should be a BHV staff member who has the latest information or who can take the emergency services to the BHV team leader.

The BHV staff will give the emergency services the most up-to-date information about the incident and what actions the BHV team has taken. At this location, there may also be additional sources of information for the emergency services, such as maps or details about dangerous substances.

Reception of employees at the assembly point
At the assembly point, the evacuated employees and visitors are registered, and it is checked if anyone is missing. If someone is missing, this information is immediately given to the BHV team leader or the emergency services.

Employees and visitors stay at the assembly point until they are given further instructions on when it is safe to leave.

Aftercare
After the evacuation or incident, the BHV team evaluates the entire response with the BHV staff and the management. If needed, agreements and procedures can be adjusted.
If there are victims in the incident, aftercare can be arranged.