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Practical Guide

Motivation and Volunteer Recruitment/Retention

VIRTUE

Volunteer Initiative for Recruitment, Retention, and Lifesaving

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Module 1 - First Aid and Emergency Intervention Techniques

First aid represents any initial supportive response provided by anyone in a medical emergency, under any circumstances. It is the crucial first step in every medical emergency case, regardless of the severity of the situation.

All first aid maneuvers and resuscitations—whether basic or advanced life support—begin in the same way: recognizing that someone needs help and intervening to assist; rapidly assessing the situation and requesting additional help as needed and providing initial care based on the rescuer's current first aid skills or based on the instructions received from the medical dispatch center.

Basic first aid is generally provided without specific equipment and is performed by any person trained for this purpose or by untrained individuals acting under the guidance of specialized personnel from emergency medical dispatch centers. Its goal is to prevent complications and save lives until an intervention crew arrives.

1.1 Basic Rules for Providing First Aid

Safety first: The rescuer must prioritize their own safety, as well as the safety of the victim and any bystanders.

Request professional help: The rescuer should ensure that specialized medical assistance is requested as promptly as possible.

Do no harm: The rescuer must know what not to do and must avoid any maneuver that could potentially worsen the victim's condition.

Resourcefulness: The rescuer should be prepared to manage the situation even in the absence of specific medical or intervention equipment.

Assisting professionals: The rescuer should know how to effectively assist emergency medical services personnel once they arrive at the scene.

1.2 Basic Life Support (BLS) For Adults

The Purpose of Basic Life Support - To maintain adequate circulation and ventilation to ensure blood perfusion and oxygenation of vital organs—the brain and the heart—and to provide the earliest possible treatment of shockable heart rhythms using an automated external defibrillator (AED) until qualified medical personnel arrive.

Basic Life Support (BLS), or basic cardiopulmonary resuscitation (CPR), is a combination of specific maneuvers consisting of external chest compressions and rescue breaths, as well as the use of an automated external defibrillator (AED) for a victim in cardio-respiratory arrest.

Steps of Basic Life Support

Safety First: Before any intervention, ensure that you are in a safe environment.

Assess the Level of Consciousness:

Verbal stimulus: Ask loudly: "What happened? Are you okay?" or "Open your eyes if you can hear me."



Tactile stimulus: by gently shaking the person by the shoulders

If the person responds, has their eyes open or opens them upon stimulation, or is moving, they are considered conscious. Leave them in the position in which they were found and continue the assessment. If necessary, request professional help by reporting the situation to 112. Reassess the victim's condition periodically until the professional team arrives.

If the person does not respond and is therefore unconscious:

You must call for help from bystanders, if any, and immediately notify the 112-**emergency** dispatch.

If you are alone, call 112 yourself and put your phone on "speaker" or "hands-free" mode, so your hands remain free to continue the assessment or follow the instructions provided by the emergency dispatcher.

Simultaneously with the 112 call, continue assessing the person's condition:

Opening the upper airway (A - Airway) and checking the breathing (B - Breathing)

To do this, the person being assessed must be placed in a supine position (on their back). From this position, perform the airway opening maneuver by using the head-tilt/chin-lift technique (hyperextension of the head and lifting the chin).

Checking the Breathing (B)

While keeping the airway open through head-tilt/hyperextension, move your face close to the person's face and, for 10 seconds:

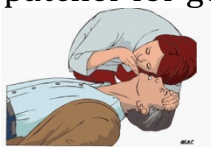
Look for chest expansions;

Listen for breathing sounds;

Feel the airflow from the airways against your cheek and determine if the person is breathing normally.

During these 10 seconds, you must:

- Identify movements of the chest and/or abdominal wall, or the lack thereof.
- Feel the air column exiting the airways against your cheek, or the lack thereof.
- Identify either normal breathing sounds, their absence, or abnormal sounds. The latter may present as gasping, moaning, sighing, gurgling, snoring, or the person struggling to breathe, even with an open mouth. These do not constitute normal breathing! If necessary, ask the emergency dispatcher for guidance.



If the person is **breathing**:

You are facing a person who is breathing but is unconscious. To prevent the relaxed tongue from falling into the pharynx and blocking the airway, or to prevent the aspiration of secretions or vomit into the lower airways, the victim must be placed in the recovery position (lateral safety position).



The person must not be left unattended; re-evaluate their condition and breathing every 2 minutes and continue monitoring until the medical crew arrives.

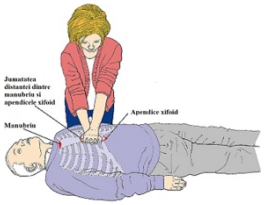
An unconscious person must be repositioned onto their other side every 30 minutes!

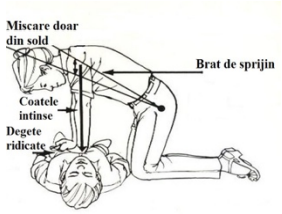
If the person is **NOT breathing:**

Begin cardiopulmonary resuscitation (CPR) as soon as possible by performing external chest compressions. Avoid unnecessary delays and interruptions. Although it is necessary to pause compressions to deliver "rescue breaths," reassess the victim, or perform defibrillation, continuous chest compressions should always be the rescuer's priority!!!

The effectiveness of compressions depends on the hand positioning on the chest (the lower half of the sternum or the center of the chest), the depth of the compressions (5–6 cm for an adult), and the rate at which they are performed (100–120 compressions per minute). Additionally, the duration and depth of the compression must equal the duration and height of the decompression (recoil).

Chest compressions are best performed on a firm surface. Softer surfaces (such as a mattress) will reduce the depth and effectiveness of each compression. When a soft surface is unavoidable, increase the overall force of the compression to compensate.





Rescue Breaths

Place the head in hyperextension (head-tilt), pinch the victim's nose with your fingers, and deliver 2 rescue breaths into the victim's mouth. While doing this, watch for the chest wall to rise. A complete cycle of 2 ventilations consists of: 1 second for inhalation, 1 second for exhalation, another 1 second for inhalation, and 1 second for exhalation. The entire ventilation cycle should not last more than 5 seconds in total. (For maximum success, pauses in chest compressions must be kept as short as possible!)

If you notice that the chest does not rise during ventilations, or if you feel resistance/blockage:

Check the victim's oral cavity (mouth) for foreign objects that might be blocking ventilation and remove them. Under no circumstances should you insert your fingers or cleaning tools beyond the limit of visibility!

If you are unable to clear the oral cavity and/or cannot perform ventilations, remember that the emphasis is on chest compressions and minimizing interruptions. Therefore, continue the maneuvers by performing chest compressions only.



If the rescuer is unwilling or unable to provide rescue breaths, they may perform chest-compression-only CPR, which should be applied continuously at a rate of 100–120 compressions per minute.

Basic life support may be interrupted to re-evaluate the victim's breathing (LLF - Look, Listen, Feel) only if one or more of the following signs occur:

The victim moves, coughs, opens their eyes, or vomits.

If, upon re-evaluation, you find that the victim is breathing, they should be placed in the recovery position, monitored continuously, and the emergency services (112) must be notified.

Basic resuscitation may be stopped if:

Qualified help arrives and takes over the resuscitation maneuvers.

After re-evaluation, you determine that the victim is breathing normally (call 112).

The rescuer becomes exhausted (report this to 112).

The rescuer's life is put in danger (report this to 112).

CPR shall not be started if the victim presents signs of irreversible death, such as:

Decapitation;

Rigor mortis (stiffening of the body);

Livor mortis (cadaveric lividity/post-mortem staining);

Putrefaction (decomposition).

Resuscitation Performed by Two Rescuers

One rescuer performs chest compressions (CC), while the second rescuer provides rescue breaths.

The rescuer performing the ventilations will also operate the AED (Automated External Defibrillator).

The rescuers will switch positions and the maneuvers they perform - from compressions to ventilations and vice-versa every 2 minutes of resuscitation (approximately 5–6 cycles of 30 compressions and 2 ventilations). Each rescuer will remain on their respective side of the victim during the switch.

1.3 Automated External Defibrillator (AED) Usage

As soon as an AED is available, use it immediately!

To do this, turn on the defibrillator, if necessary, connect the pads to the AED, apply the pads to the victim's chest directly on the skin. The pads should be placed with one in the right subclavicular region (below the right collarbone) and the other in the left mid-axillary line (on the left side of the chest, below the armpit). If prompted by the device, press the analysis button. After the analysis, if required, also press the shock button. (or follow the device's voice, graphic, or video prompts). From the moment cardiac arrest occurs, every minute of delay until defibrillation begins reduces the probability of survival by 10%.

Chest compressions and rescue breaths must continue even while the AED is being prepared and even while the defibrillator is charging the energy required for defibrillation! Stop these maneuvers only during the rhythm analysis, during the delivery of rescue breaths and when the shock is being delivered by the defibrillator.

After delivering 3 shocks, it is recommended to change the defibrillation electrodes.

Don’t use the AED in a wet or explosive environment!

1.4 Basic Life Support (BLS) For Children And Infants

Patient age groups, according to the 2025 European Resuscitation Council guidelines:
Newborn: From birth until arriving home.
Infant: From the moment they arrive home until 1 year of age.
Child: From 1 year to 12 years of age.
Adolescent: From 12 years to 18 years of age.

If you cannot determine whether the person in front of you is a youth or an adult, treat them as an adult. Just as with adults, before starting any first aid for a child or infant, ensure that you are not exposed to life-threatening risks.

Assessing the Level of Consciousness:

For children: Proceed as with adults—using verbal and tactile stimulation.

For infants: Signs of consciousness may include: eyes open, babbling, crying, moving arms and legs, or coughing.

If none of the above signs are visible, attempt to stimulate the infant by making noises nearby (using toys, snapping fingers, etc.) and by gently tapping or flicking the sole of the foot with your fingertips.

If the patient reacts:

For children, proceed in the same way as for adults.

For infants and young children: If they are crying, coughing, have their eyes open, or are moving their arms and/or legs, they are considered conscious/reactive. In this case, hold them in your arms, gather additional information from those present, and call 112 if necessary.

If the patient DOES NOT react:

Shout for help and call 112: Follow the same procedure as for adults. If someone is with you, send them to get a defibrillator (AED).

If you are alone and do not have a phone: Continue the assessment of the child/infant by opening the airways and checking for breathing.

Open the Airway

For children, place the head in a neutral position, with a slight extension if necessary, and lift the chin. The maneuver is performed similarly to adults, with the key difference being that you should not hyperextend the head;

For infants place the head in a neutral position and lift the chin. A small towel may be placed under the shoulder blades to help achieve and maintain a neutral head position. If necessary, gently lift only the chin.

Check breathing using the same method as for adults: look, listen, and feel for 10 seconds.

Infants



Children



If the child/infant is breathing (unconscious but breathing):

If the situation permits, place the child in the recovery position (just as you would an adult) and continue the assessment or follow the dispatcher's instructions until the emergency medical teams arrive. (If you are alone and without a phone, go find help.) Re-evaluate their condition periodically.





The infant should be held in your arms, tilted slightly to the side so that the face is oriented towards the rescuer, with the head in a neutral position and kept slightly lower than the rest of the body.

If the child/infant is **NOT breathing**:

Perform 5 rescue breaths (mouth-to-mouth or mouth-to-mouth-and-nose on infant under 6 months old), while maintaining an open airway by keeping the head in a neutral position and the chin lifted.

Inspirations must be performed with great care regarding volume and pressure! Deliver only as much air as is necessary to see a gentle rise of the victim's chest. The rescue breaths must be performed 5 consecutive times.



For infants and young children, rescue breaths should be delivered as "puffs." These consist only of the amount of air contained in the rescuer's mouth, which is sufficient to ventilate them effectively.



If it is difficult to deliver breaths, if you feel increased resistance during ventilations, or if the chest does not rise, open the child's/infant's mouth and look for foreign objects. If necessary, intervene only within the limit of visibility. Forceps would be the most suitable tool for this. Attention! While cleaning the oral cavity, maintain the head in a lateral position and slightly lower than the rest of the body (the infants or the young children should be held in your arms).

If ventilations cannot be performed due to an airway obstruction that cannot be cleared, you must perform chest compressions only.

After the 5 rescue breaths, re-evaluate the breathing for a maximum of 10 seconds.

If necessary, and if a pulse is present, ventilations may be continued until the child/infant breathes effectively on their own (for competent rescuers only).

If breathing resumes, the child/infant should be placed in the recovery position, monitored constantly, and frequently re-evaluated; any change in their condition must be reported to the emergency dispatcher.

If the child/infant is NOT breathing after the 5 rescue breaths: **Begin resuscitation maneuvers consisting of chest compressions**. Depending on the size of the chest, these are performed either with two hands (if the child's chest is well-developed), with one hand (for a slighter chest), or with two fingers in the case of small children and infants.

If you are alone and do not have a phone, perform resuscitation maneuvers for 1 minute, then place the child in the recovery position (or pick up the infant/small child in your arms) and go quickly to find help or a phone.

Chest Compressions for Children:

Compressions can be performed as with adults, using two hands while adapting the force used, or even with a single hand if the victim's chest size allows it.



If you are treating a young child or an infant, chest compressions can be performed in two ways. Pay close attention to the correct position of the fingers: they must press perpendicularly to the chest, not at an angle! As with any such maneuver, the positioning of the compressing fingers is essential.



Depress the sternum to a depth equivalent to one-third of the anteroposterior diameter of the chest. (Example: If the anteroposterior chest diameter is 12 cm, compressions should be performed at a depth of 4 cm).

Resuscitation Ratios:

If you are trained or have the necessary skills: perform 15 chest compressions to 2 ventilations (15:2).

If you do not have the necessary skills or experience: perform 30 chest compressions to 2 ventilations (30:2).

If at least two rescuers are present: the compression-ventilation ratio shall be 15:2.

Technique and Rate:

Compressions for children should be performed at a rate of 100–120 per minute. Ensure full chest recoil, allowing the chest wall to return completely to its original position without lifting the palm or fingers off the chest wall.

If the rescuer's palm is wider than the lower half of the child's sternum, avoid placing the palm on the xiphoid process (the "pit of the stomach"). In such cases, the upper edge of the palm should be placed above the midpoint of the sternum (even if it covers most of the sternum).

1.5 Defibrillation for Children and Infants

Children older than 8 years of age or weighing more than 25 kg should be defibrillated in the same manner as adults.

For young children between 1 and 8 years of age, pediatric defibrillation pads should be used, and their placement should follow the graphic instructions shown on the pad packaging or on the pads themselves. One pad should be placed below the right clavicle, and the other on the left lateral thoracic area, below the armpit.

If only adult pads are available and they are too large, excessively covering the chest, they should be positioned in an anterior-posterior thoracic placement. One pad should be placed on the front of the chest, slightly to the left of the sternum, and the other on the back of the chest, between the shoulder blades.

For small children or infants, the pads should preferably be placed in an anterior-posterior thoracic position.

After delivering a shock, or if no shock is advised, chest compressions must be resumed immediately.

Resuscitation should be stopped under the same conditions as for adults.

Use the defibrillator as soon as possible!

1.6 Special Circumstances In Resuscitation

Special circumstances involve supplementing or modifying basic resuscitation techniques. Rescuers must understand how to adapt resuscitation methods to specific needs when intervening in the following special situations:

1.6.1 Hypothermia

Definition: A hypothermic person is an individual with a core body temperature < 35°C

It must be established from the outset that a hypothermic patient must be handled and moved with extra care, as intense or excessive movement can destabilize the cardiovascular system and induce abnormal heart rhythms - dangerous arrhythmias that can lead to respiratory arrest.

In the event that you find the person's entire body is frozen solid, with an incompressible chest wall, do not begin resuscitation. If these clinical signs are absent, start providing first aid and, if necessary, initiate resuscitation maneuvers, keeping in mind that:

Resuscitation can be greatly prolonged, as warming the patient will begin simultaneously with resuscitation at a rate of 1°C per hour. Consider that "The patient is not dead until they are warm and dead." Based on this, follow the steps below:

Remove the patient from the cold environment.

Remove cold or wet clothing.

Prevent further heat loss (e.g., using an isothermal/space blanket).

External warming (blankets, warm air, bottles with warm liquids, heated rooms, etc.).

All thermal protection measures must be performed simultaneously with the primary assessment and first aid delivery!

Hypothermic individuals must be assessed with extreme caution; checking for vital signs may take up to 1 minute. The clinical characteristics of hypothermia can be misleading during assessment. When evaluating vital signs, keep the following in mind:

Opening the airway may be more difficult due to tissue rigidity.

Checking breathing – observe chest rise very carefully, as the chest wall will be stiffer and the respiratory rate may be significantly lower than normal.

Rescue breaths and chest compressions will also be more difficult due to thoracic rigidity.

Defibrillation may fail if the core temperature is not > 30°C.

Postpone further defibrillation attempts if ventricular fibrillation persists after three shocks, until the core temperature exceeds 30°C.

Resuscitation maneuvers must be sustained throughout transport until the patient reaches the hospital.

1.6.2 Drowning

Above all, call for help or ask someone to call 112 (or the local emergency number).

If you are not specifically trained in water rescue, do not enter the water after the drowning person! Instead, throw them floatation devices or ropes, reach out with branches or long tools, or use a boat.

In drowning cases, always suspect a cervical spine injury!

Keep the patient in a horizontal position, lying on their back (supine).

As you begin providing first aid, pay close attention to thermal protection, especially if the drowning occurred in cold water or the surrounding environment is cold.

Airway opening must be performed using the jaw-thrust maneuver due to the risk of cervical spine injury.

Pay close attention to foreign bodies in the oral cavity (mud, sand, gravel, water, etc.).

Vomiting is frequent; ventilations must be performed with great care to minimize the risk of gastric distension. During rescue breaths, increase the inflation pressure progressively to allow time for air to reach the lungs.

If the primary assessment shows the patient is not breathing, resuscitation must begin with 5 rescue breaths. These should be administered as soon as possible!

Reassess breathing after the initial 5 ventilations.

If the patient is breathing, keep them in a supine position (lying on their back). If they vomit, they must be turned onto their side as a whole (log-roll technique), keeping the head, neck, and torso aligned.

If the patient is not breathing, continue CPR maneuvers appropriate for their age.

To avoid stimulating regurgitation, position your hands correctly on the chest for compressions. Avoid pressing on the xiphoid process (the lower tip of the breastbone).

Defibrillation: Caution! Wipe all water off the victim's chest and be mindful of water dripping from the body or clothing. Water can conduct electricity toward the rescuer.

Hospitalization is mandatory for all drowning victims.

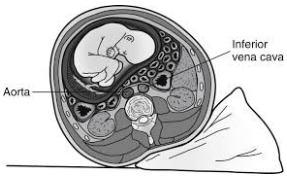
1.6.3 CPR in pregnant women

Resuscitation during pregnancy should ideally be performed by at least two rescuers.

There is an increased risk of regurgitation due to the compression exerted by the uterus on the diaphragm and, consequently, on the stomach. Therefore, early airway management and maintenance are essential.

Rescue breathing may be more difficult because the diaphragm is displaced upward, limiting its movement; a higher inflation pressure may be required, applied with a progressive increase in pressure.

In the supine position (lying on the back), the uterus compresses the inferior vena cava, which runs near the midline on the right side of the body. This pressure hinders blood return to the heart. To avoid this, the uterus must be displaced away from the inferior vena cava specifically, shifted to the patient's left relative to the midline.



Uterine displacement can be performed manually or by placing materials under the patient's pelvis, as follows:

Manual Left Uterine Displacement requires the permanent presence of a second rescuer.



Uterine displacement by placing a blanket, splint, pillow, etc., under the right side of the pelvis or under the rigid support the patient is lying on (e.g., Baxtrap board, scoop stretcher, etc.), so that the pelvis is elevated into a left lateral semi-decubitus position.

External chest compressions must be performed with the rescuer's arms perpendicular to the pregnant woman's chest. The rescuer must pay close attention to the correct positioning of the heel of the hand on the sternum, strictly avoiding compression of the xiphoid process.

1.6.4 Electrocution

The victim may present burns at the electric current's entry and exit points (marks).

Caution regarding the rescuer's personal safety!

Do not touch the victim before the electric current has been disconnected/shut off.

Electrocuted individuals are considered trauma patients, and a cervical spine injury must be assumed. Therefore, the airway should be opened using the jaw-thrust maneuver. All electrocuted patients must be transported to the hospital.

1.6.5 Poisoning / Intoxications

Attention to Rescuer Safety! The toxic agent can be absorbed into the body through any route: cutaneous (skin), respiratory, or digestive.

In some cases, you may notice specific odors emanating from the toxic substance or from the intoxicated person. You may require specialized protective equipment. In the absence of such equipment, you should not approach the contaminated area (especially in cases of mass intoxication/casualties). It is recommended to approach the scene upwind (with the wind blowing from you toward the victim, not vice versa).

In other cases, the toxic substance may be odorless, colorless, and tasteless!

Avoid mouth-to-mouth resuscitation in poisoning cases in general, and specifically with: cyanides, hydrogen sulfide, corrosive substances, and organophosphates.

Be prepared to continue resuscitation for a prolonged period, as the toxin concentration may gradually decrease as it is metabolized or excreted during extended resuscitation efforts.

Caution when using the defibrillator! Toxicity may also involve flammable or explosive gases in the environment.

Protect yourself from direct contact by using personal protective equipment (PPE).

1.7 Soft Tissue Injuries, Hemorrhage, Hemostasis, And Dressings

Trauma is a general medical term describing a physical lesion or bodily injury caused by an external force acting upon the human body with energy that exceeds the physical resistance of the tissues.

Regarding soft tissue injuries, these involve and refer to - as the name suggests - the body's soft tissues. Depending on the condition of the skin, injuries can be:

Closed – contusions (bruises); the skin remains intact.

Open – wounds; the skin is damaged or broken.

1.7.1 Contusions**:** These are injuries resulting from the action of a mechanical wounding agent that causes tissue damage while maintaining the integrity of the skin. Depending on the force of the wounding agent, contusions can be: superficial or deep. (ecchymosis and hematoma)

Ecchymosis (bruising): The simplest form of contusion, occurring due to the rupture of blood vessels in the subcutaneous tissue. It appears as a reddish-blue area that changes color over several days, becoming purple/blue and then yellowish-green.

Hematoma: A painful swelling of varying volume that occurs due to the accumulation of blood and/or plasma between tissues or organs, caused by the accidental rupture of larger blood vessels.

1.7.2 Wounds (Open Injuries)

These are lesions produced by mechanical, physical, or chemical agents that, through their action, destroy the integrity of the skin.

Clinical Signs: pain of varying intensity, hemorrhage (bleeding) of varying intensity, edema (swelling/fluid accumulation), tumefaction (swelling), specific coloration, increased local temperature.

Wound treatment aims to prevent complications and achieve a high-quality, rapid recovery. Treatment consists of local wound cleansing and dressing.

Treatment Principles for Contusions:

Mild contusions do not require treatment (cold compresses may be used immediately after the injury).

Other contusions should be treated by indirect application of ice, cold damp towels, light compression, and elevation of the injured limb.

Because an extensive contusion may mask an underlying fracture, in such cases, the injured limb must be immobilized, and further investigations are recommended.

Treatment Principles for Wounds (Open Injuries):

- Hemorrhage control (bleeding control).
- Prevention of wound superinfection.
- Stabilization of the injured part.
- Stabilization of any penetrating (impaled) object.

1.7.3 Hemostasis (Bleeding Control)

Provisional (temporary) hemostasis can be achieved by:

- Direct pressure on the wound.
- Pressure point compression.
- Elevation of the affected limb.
- Application of a tourniquet.

Direct Pressure on the Wound: Wound compression can be achieved using a pressure dressing.

In the absence of a sterile dressing, a clean handkerchief or cloth can be used to cover the wound, secured with a circular bandage (gauze).

Pressure Point Compression: When bleeding cannot be controlled by direct pressure or when preparing materials takes too long, indirect (distance) compression can be used. This method is only for short-term use and must be supplemented by another technique.

Application of a Tourniquet

This represents the last resort (using a specialized tourniquet or materials like a belt, tie, or scarf). It is used only in extreme cases where bleeding cannot be controlled by other methods (e.g., limb amputation, extensive and severe injuries, major arterial injuries, or gunshot wounds). Apply only as much pressure as is needed to stop the hemorrhage.

Keeping a tourniquet in place for more than 2 hours can lead to extremely serious complications.

Always attach a note to the injured person indicating the exact time of application.

Place the tourniquet around the limb, 5–10 cm above the injury (between the wound and the heart). Every 15 to 30 minutes, loosen the tourniquet slightly to allow blood flow to the underlying limb segment

Do not remove the tourniquet once applied; this should only be done in a hospital setting by competent medical personnel.

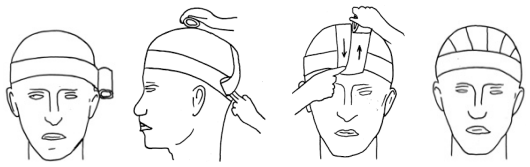
If bleeding continues, apply a second tourniquet above the first one.

1.7.4 Dressings

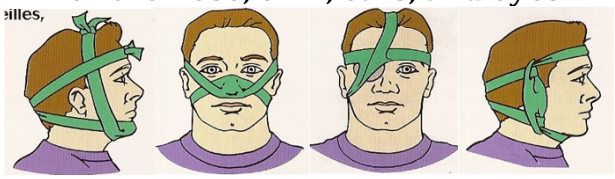
Dressings are applied differently depending on the anatomical region.

Wounds of the face, scalp and neck

You will be able to control the hemorrhage through direct pressure on the wound. If bleeding continues, apply a second compress without removing the first one. Once the bleeding has stopped, apply the bandage or circular gauze around the head.



For the nose, chin, ears, and eyes.



Neck wounds



Chest Wounds

In the case of penetrating chest wounds where blood mixed with air bubbles is escaping (sucking chest wound), use a specialized vented chest seal or an air-impermeable material larger than the wound. Fix the material with adhesive tape (leukoplast) on three sides, ensuring the dressing is attached to the skin without any folds or creases. Examples of materials: the inside of a dressing package, plastic wrap, a piece of a raincoat, etc. The fourth side is left free (unattached), allowing the dressing to function as a one-way valve.





Abdominal Wounds

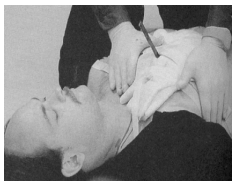
In this case, we will use a dressing that is secured on all four sides.

If the wound is complicated by evisceration (protrusion of abdominal organs), use a dressing moistened with saline solution (saline), rivanol, or the cleanest water available. Do not reinsert the organs into the abdomen! The patient's knees should be bent to reduce tension on the abdominal wall.





If the wound is caused by a penetrating (impaled) object that is still in place, leave it there. It must be immobilized in the position it was found, and the patient must be transported urgently to the hospital.

Limb Wounds

Dressings are applied using circular bandages in a spiral technique.




Wounds of the Inguinal (Genital) area

The genital organs have an extensive blood supply in both females and males; therefore, genital trauma is frequently associated with severe hemorrhage.

Apply direct pressure to the genital wound using a dry, sterile compress. Direct pressure usually stops the bleeding.

A T-bandage can be used, utilizing two rolls of gauze.



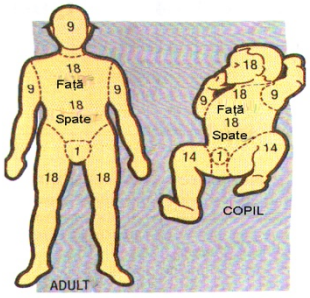
1.8 Burns

Definition: Burns are injuries caused by heat in various forms: chemical agents, electricity, and radiation acting upon the body.

They are classified as thermal, chemical, electrical, and radiation burns.

The injury assessment of a burn patient is based on the total body surface area (TBSA) affected and the depth (degree) of the burn.

To calculate the burned surface area, Wallace's "Rule of Nines" is used. Using this rule, the burned surface area of the body or each individual segment can be expressed as a percentage, represented by the number 9 or multiples of nine.



Depending on the extent of tissue destruction and the burn depth, the following burn degrees are described:

First-Degree Burn (Superficial)

Affects only the superficial layer of the skin (epidermis).

Manifests as skin redness (erythema), local edema, pain, and chills.

It is not included in the calculation of the total burned surface area!

Non-specific treatment (moisturizing lotions; healing occurs within 7 days).

Second-Degree Burn (Partial-Thickness)

- Presents with vesicles (blisters) filled with a yellowish fluid, which is extravasated blood plasma. This is the most painful type because the nerve endings at this level are affected.



Third-Degree Burn (Full-Thickness)

- Affects the skin through its entire depth.
- Characterized by blackened areas (necrosis) or blisters with bloody (sanguineous) content. Pain is no longer as intense and may even be completely absent, as the nerve endings are partially or fully destroyed.



First aid for burn victims:

Remove the patient from the fire or the fire from the patient by extinguishing the flames - essentially, stop the burning process as quickly as possible.

Apply the ABC protocol (Airway, Breathing, Circulation); following the assessment, provide aid based on the situation as follows:

Cool the area, even if the flame is extinguished, or rinse with abundant clean water in the case of chemical burns. If using a water jet, ensure it has moderate to low pressure and is directed only at the heat-affected area—only on the burn itself. Do not spray the patient's entire body.

Remove the patient's clothing, provided it is not stuck to the skin. The removal process must not cause further tissue damage (to skin, muscle, tendons, etc.).

Once the person is undressed, ensure protection against hypothermia using an isothermal blanket, clean sheets, clean towels, or blankets.

If available, use burn gel compresses or similar products.

In the absence of gel compresses, use sterile compresses moistened with saline solution or, if unavailable, use the cleanest possible wet clothes or towels.

Protect the burned areas and, as much as possible, prevent the risk of contamination.

Do not place ice in direct contact with the skin.

If you have medical oxygen available, pay maximum attention to its use. It should only be used after ensuring there is no remaining source of fire (sparks, soot, smoldering clothes, etc.).

Be alert to the potential progression of burns in dangerous locations (face, hands, joints, genitals). Request specialized help promptly.

1.9 Osteoarticular Trauma And Immobilization Devices

The primary objective when treating trauma patients is to ensure early and correct treatment, as this can significantly improve the patient's subsequent rehabilitation.

The fundamental principle that must guide a rescuer’s conduct during an emergency is: DO NOT AGGRAVATE THE VICTIM'S CONDITION!

Joint traumas consist of two major categories: sprains and dislocations.

Sprains:

A sprain is a form of joint trauma where there is no permanent loss of contact between the articular surfaces, but there is a stretching, partial rupture, or total rupture of one or more ligaments within a joint.

First aid consists of provisional immobilization in the position in which the joint was found. This will alleviate the pain, which can be of high intensity.

Specific signs of sprains

Localized pain upon palpation: Pain is often most intense directly over the injured ligament.

Joint instability (in severe Grade II or III sprains): A feeling that the joint "gives way" or buckles under weight because the torn ligament no longer provides support.

Maintained but painful mobility: Unlike a dislocation, where movement is blocked, in a sprain, movement is possible but causes severe pain.

Dislocation (Luxation):

A dislocation is an injury involving the loss of normal contact between the articular surfaces of the bones that form a joint (displacement of the bone ends). Based on the mechanism and severity, dislocations can be complete (total) or incomplete (subluxations).

First Aid consists of the provisional immobilization of the affected limb in the position it was found, without attempting to reduce (realign) the dislocation. The victim must be transported to the hospital.

Specific signs of dislocations

Since a dislocation involves a total or partial loss of joint congruency, additional signs appear, often visible to the naked eye:

Obvious joint deformity: This is the most distinctive sign. The joint looks "out of place" or displaced.

Shortening or lengthening of the limb: The abnormal positioning of the bones can change the apparent length of the affected limb.

Fixed, abnormal limb position: The limb remains locked in a specific position and cannot be moved actively or passively.

Neurological/Vascular signs (Severe): In severe dislocations (elbow, hip, or knee), bone displacement can compress nerves or blood vessels, leading to numbness or tingling (paresthesia) below the injury level.

Pallor or coldness of the extremity: A sign of compromised circulation and a major medical emergency.

Common signs and symptoms (dislocations and sprains)

These manifestations usually appear immediately after the trauma:

Intense Pain: The primary symptom, localized directly at the affected joint. Pain is exacerbated by any attempt at movement.

Tumefaction (Swelling): The joint swells rapidly due to the accumulation of synovial fluid and blood (hemarthrosis) inside or around the joint capsule.

Ecchymosis (Bruising): May appear shortly after the accident or in the following days as blood from injured tissues migrates under the skin.

Functional Impotence: The inability to use or move the affected joint or limb normally. The patient avoids putting weight on the leg (ankle/knee) or using the arm (shoulder/elbow).

Local Heat and Redness: Classic signs of inflammation in the injured area.

Fractures

Fractures are lesions resulting from a strong trauma acting upon the bone, consisting of a break in its continuity. Bone fractures are classified based on several clinical and radiological criteria. From a basic first-aid perspective, the following are of interest:

Closed Fractures: The skin around the fracture site remains intact.

Open Fractures: The fracture site communicates with the exterior through a wound.

To recognize a fracture, we distinguish between two groups of signs:

Probable Signs (Signs of probability)

Spontaneous or Fixed-Point Pain: Increased during palpation or mobilization.

Functional Impotence of the Affected Limb: The patient cannot use the limb (e.g., cannot walk if the leg is broken or cannot lift the arm if the shoulder is fractured).

Deformity and shortening of the region: The shape of the affected area is visibly altered compared to the healthy side of the body. There may be abnormal bending, shortening, or rotation of the limb.

Late-onset ecchymosis (bruising): Blue-purple spots often appear after several hours or days as blood from the injured area spreads under the skin.

Tumefaction, edema, and increased local temperature: The area around the fracture swells rapidly due to internal bleeding and inflammation.

Definitive signs (Signs of certainty):

Abnormal mobility at the fracture site: Presence of movement in a location where a joint should not normally exist (e.g., in the middle of the humerus/arm bone).

Bone crepitus (crepitation) felt upon palpation: The patient may also feel or even hear a grinding or crunching sensation (crepitation) at the fracture site if the bone fragments rub against each other. Movement should not be encouraged to verify this sign!

Failure to transmit movements distal to the fracture site: Movement is not transmitted to the parts of the limb located below the break.

Evident interruption of bone continuity: Observable during inspection or felt during palpation.

The most reliable method for diagnosing a suspected fracture is an X-ray (Radiography).

General principles of provisional fracture immobilization:

Provisional immobilization is performed to prevent the movement of fractured bone fragments and to avoid complications caused by their displacement.

Immobilization devices include specialized splints or, if unavailable, improvised ones of varying lengths and widths depending on the application area. Improvised splints should be lightweight, rigid, or moldable (maintaining the created shape).

To ensure the fracture does not shift longitudinally or laterally, the immobilization must include the joints above and below the fracture site.

For closed fractures, a gentle, painless traction along the long axis of the limb is performed before immobilization.

Open fractures are immobilized in the position they were found, after dressing the wound. Do not attempt to reposition the bone ends through traction or other maneuvers.

Immobilizing a fracture requires at least two rescuers.

When securing open fractures, the fracture site must remain inspectable; it should not be covered by the splint, only by sterile compresses.

If multiple fractures are identified on the same person, immobilization should begin with the most severe fracture or the one posing the greatest risk to the victim.

Before and after applying immobilization devices, check:

The color and temperature of the skin below the fracture site.

The sensory and motor capacity (SMC) of the affected area and below the site.

The peripheral pulse and capillary refill time (CRT) below the fracture.

Immobilization devices must not aggravate the victim's condition.

Skull fractures:

At this level, specifically within the neurocranium, we may encounter a specific type known as a depressed skull fracture. This involves a circular fracture line where the fractured segment detaches from the rest of the skull and is pushed inward.

In such cases, if hemorrhage is present, apply compresses larger than the fracture site without applying downward pressure toward the scalp; they should only be placed in contact with the wound.

Securing the dressing can be done using a capeline bandage (head bandage) or, as an improvisation, an elastic nylon stocking to act as a capeline. This method can also be used for the provisional management of other neurocranial fractures.

Viscerocranial (facial) fractures:

In these situations, the primary objective at the scene is maintaining clear airways. Select the type of airway management device with great care, based on your specific level of competence.

Severe facial fractures can obstruct breathing due to the tongue falling backward, massive bleeding, soft tissue fragments, broken teeth, etc.

Correct head positioning or even emergency intubation is essential to ensure ventilation.

Bleeding control is achieved by applying pressure (if possible) or using sterile dressings.

Minimal immobilization: In general, facial splints are not applied. The patient is transported on a rigid backboard with the neck immobilized (cervical collar) to prevent associated spinal injuries.

Neck and cervical spine fractures:

Suspect a cervical spine injury in the following situations: polytrauma; head trauma; chest trauma near the head; conscious patients complaining of neck pain; presence of crepitus or deformities in the neck area; altered mental status

Key Particulars: In conscious patients whose head is fixed in an antalgic (pain-relieving) or abnormal position, if a gentle attempt at alignment causes pain, paresthesia (numbness/tingling), or resistance, immediately cease the attempt. Manually support the head and secure it in the position found without applying a cervical collar until sedation is administered.

In highly agitated or uncooperative patients, forcing head immobilization can have the opposite effect (movement against pressure). Initially, only provide manual stabilization without rigid fixation until the patient is sedated.

The absence of immobilization or incorrect immobilization can severely aggravate the victim's condition.

For cervical spine immobilization, we use cervical collars.

The first step in neck stabilization is always manual cervical immobilization. Manual stabilization must be maintained until the head and neck are fully secured using a cervical collar plus an additional stabilization device (e.g., head blocks).

Clavicle fractures (Collarbone)

These occur more frequently through indirect trauma and less often through direct impact, most commonly in the middle third of the clavicle.

Provisional immobilization should be performed with the shoulders pulled back: either by pushing the elbow on the affected side backward and upward, or by securing both shoulders in a retracted position using a bandage (figure-eight wrap).

Humerus fractures (Upper arm)

To immobilize a humeral fracture, the patient's chest can serve as a splint by securing the fractured segment to it using a sling.

While vacuum splints are an option, they cannot effectively immobilize the upper joint (shoulder).

The most efficient immobilization is achieved by using a vacuum splint in combination with a vacuum mattress.

Forearm fractures

Immobilization can be performed using any type of specialized splint or improvised materials.

Hand bone fractures

These are immobilized on the palmar side, extending from the elbow to the fingertips.

Femur fractures (Thigh Bone)

A femur fracture is an unstable injury causing significant deformity of the thigh at the fracture site. It can lead to massive internal bleeding with a high risk of hemorrhagic shock. Immobilization is best achieved using a vacuum mattress. For closed fractures occurring from the upper third of the femur downwards, a traction splint combined with a vacuum mattress can be used. If a traction splint is not available and a vacuum splint is used instead, its upper end must be secured as high as possible, towards the groin and hip joint. The vacuum splint can be used for fractures located anywhere on the femur. Since the hip joint cannot be stabilized by a splint alone, a femur fracture requires additional immobilization in a vacuum mattress

Lower leg fractures

These are very common, and their immobilization can be done using improvised or medical splints. To be effective, the splint must include both the knee and the ankle.

Knee area fractures

These should be immobilized in the position they were found. After splinting, a rolled blanket, pillows, or other soft materials can be placed under the injured knee for support.

The injured knee can be immobilized by securing it to the healthy knee (anatomical splinting); to do this, align the healthy limb with the affected one.

Immobilization in the position found should also be practiced for traumas of other joint areas, such as the ankle, wrist (radio-carpal), and elbow.

Rib fractures

This type of fracture is generally not immobilized. The exception is a flail chest. A flail chest consists of at least two fractures in at least two adjacent ribs.

Immobilization is achieved by applying adhesive tape (leukoplast) along the ribs, covering the entire affected area to prevent the movement of the bone segments.

In the case of fractures at this level, pay close attention to the patient's breathing and oxygen therapy.

Pelvic fractures

These fractures can often be complicated by severe hemorrhages due to the rupture of large blood vessels located in this area; therefore, they are treated as critical cases.

In such cases, the patient must remain immobile; movement is not permitted unless strictly necessary, and then only with maximum caution and for the shortest duration required.

The Pelvic Binder (Pelvic Belt) was specifically designed for the immobilization of pelvic fractures. It is the most appropriate means of stabilizing pelvic fractures when used alongside other devices (such as a vacuum mattress).

The binder applies significant compressive force to the pelvis to reduce its volume and stabilize the area to minimize bleeding. However, it does not stop arterial hemorrhage; it focuses on reducing pain, limiting movement during transport, and stabilizing the pelvis until definitive immobilization is achieved.

Absolute Indications:

Hemodynamically unstable patient with a mechanically unstable pelvic fracture or a suspected pelvic fracture.

Relative Indications:

Hemodynamically stable patient with a pelvic fracture, used for pain management and to reduce movement during transport.

Spinal fractures

If injuries at this level are suspected, the victim's mobilization must be performed only if and only as much as strictly necessary—no more!

In all situations where mobilization is required, it must be done following the rule of moving the victim as a single unit (log-roll), maintaining the permanent alignment of the head, neck, and torso. For the correct and safe execution of these maneuvers, at least 3 rescuers are required, though 4 or 5 would be ideal.

The final immobilization of the victim is performed in a supine position (on the back) on a rigid surface (backboard).

For temporary immobilization - from the extraction point to the final transport device -the victim may require the use of a Baxtrap (spine board), a scoop stretcher, or a specialized device called an extrication vest or KED (**Kendrick Extrication Device**).

This device (KED) was developed for spinal immobilization and the extraction of persons from various environments, especially where space is limited (e.g., car accidents).

In all cases, consider the setup time, which can vary from a few minutes to several dozen minutes, depending on the difficulty of the situation.

For extraction from the scene and mobilization toward the final transport devices, the following accessories may also be used:

Spine board / Backboard / Rigid board (Baxtrap)

You will encounter the same device under different names, colors, shapes, and technical specifications. It is a rigid, lightweight, highly durable, buoyant, and radiolucent board designed for the immobilization, extraction, and short-distance transport of trauma victims.

When using it, patient protection must be the absolute priority. The board should be placed under the victim using the method that requires the least amount of movement. This means either rotating the victim as a single unit (log-rolling) toward the board or lifting the victim to slide the board underneath.

If it is possible to apply a cervical collar before using the board, do so. Regardless of whether a collar is in place, the victim's head must be manually stabilized at all times until both the head and neck are fully secured with the collar and the head immobilizer (head blocks) attached to the rigid board.

Once the victim is positioned on the board, the cervical collar must be secured (if not already done), along with the head using the board's specialized immobilization device.

Finally, if the transport involves long distances or uneven terrain, the restraint straps (strapping system) must be mandatorily fastened to the board.

Scoop stretcher / Orthopedic stretcher

You may encounter this device under various names, shapes, and colors, manufactured from aluminum or carbon fiber, with either fixed or adjustable dimensions.

The most relevant feature is the ability to split the stretcher into two separate halves. This offers a significant advantage by minimizing patient movement during the loading process. In this regard, it is the least traumatic device for the victim.

Vacuum mattress

For transporting victims over long distances, across uneven terrain, or in medical emergency vehicles, the most suitable device for full-body immobilization of trauma patients is the vacuum mattress.

It is considered the gold standard for total immobilization of a traumatized person.

1.10 Primary Assessment

Primary assessment involves the search, identification, and prompt treatment of issues that threaten the person's life at that moment or within the next few minutes.

The stages of the primary assessment, in chronological order, are:

Establishing the level of consciousness;
A (Airways): Airway management;
B (Breathing): Checking for breathing;
C (Circulation): Checking for circulation;

Communication of the findings to the dispatch center or medical coordinator.

The primary assessment and first aid measures are generally performed at the location where you found the patient. Exceptions are situations where, due to imminent risks, your safety and the patient's safety are endangered. In such cases, an emergency evacuation of the person will be performed.

(A). Airway management

After establishing the level of consciousness, airway management is always the first step in patient care, as an airway obstruction leads to death very rapidly.

If a cervical spine injury is suspected, neck immobilization must be ensured immediately after airway opening maneuvers and breath checking.

Airway opening maneuvers:

- Head-tilt / chin-lift (Head hyperextension + lifting the mandible);
- In case of trauma – jaw-thrust (Mandibular subluxation);
- Oropharyngeal and nasopharyngeal suctioning.
- Manual removal of visible foreign bodies.

In the case of a trauma patient, cleaning the oral cavity using gloves, gauze, or a suction device must be performed in a lateral position (log-roll), keeping the head in a neutral position, aligned with the spine and pelvis.

If the victim is unable to maintain an open airway, the following maneuvers or adjuncts can be used to maintain an open airway:

- Placing the unconscious, breathing, and non-traumatized person in the recovery position (lateral safety position).

- Inserting an oropharyngeal or nasopharyngeal airway (e.g., Guedel airway, i-gel). Use these only on unconscious patients who lack a gag reflex; otherwise, they may induce vomiting.

(B). Breathing management

Checking for breathing: Follow the procedure previously described in Basic Life Support (BLS).

If the patient is not breathing: Initiate CPR immediately.

If the patient is breathing: Look for signs indicating immediate or life-threatening respiratory issues. Identify signs of hemothorax or pneumothorax, which may include:

Asymmetry/inequality: One side of the chest is rigid while the other is mobile.

Subcutaneous emphysema: Air trapped under the skin/between tissues (pneumothorax).

Distended jugular veins and tracheal deviation.

A sucking chest wound: Air escaping or entering through a chest wound. It must be treated immediately by applying a vented chest seal or an occlusive dressing secured on 3 out of 4 sides.

If serious respiratory problems are detected, start oxygen therapy as early you can.

If the person is breathing normally, proceed to the assessment of circulation

Devices for artificial ventilation (in Respiratory Arrest)

Ventilation using a Face shield (Pocket Shield/Barrier)

Prevents direct contact with the victim's mouth, nose, and face.

Using this shield reduces the rescuer's risk of contamination with the victim's secretions; the application instructions are clearly marked on the shield.

Ventilation via Face Mask with a One-Way Valve (Pocket Mask)

Reduces the potential for infection.

It has a triangular shape: the apex of the triangle is placed over the nose, while the base of the triangle is positioned on the victim's chin





Ventilation with Bag-Valve-Mask (BVM)

Bag-valve-masks should only be used by individuals who have received prior training.

BVMs must not be used in a toxic atmosphere.

Depending on the patient's age group, BVMs come in three sizes: for adults, children, and neonates (newborns)



Ventilation with Bag-Valve-Mask (BVM) using Ambient Air

BVM ventilation without supplemental oxygen is preferred over exhaled-air ventilation (mouth-to-mouth) due to the higher oxygen concentration (21% compared to 16–18%).

Ventilation with Bag-Valve-Mask (BVM) with supplemental oxygen

Ventilation bags can be connected to an oxygen source using a standard supply tube.

In this case, the oxygen concentration in the air delivered to the patient reaches a maximum of 60%

In the case of Bag-Valve-Mask (BVM) ventilation where an oxygen reservoir is attached alongside the oxygen source, it provides ventilation with 90% oxygen concentration or higher.

To ensure adequate ventilation, it is also recommended to simultaneously secure an oropharyngeal or nasopharyngeal airway (airway adjuncts)




The bag should never be completely squeezed of its air content. Discharge the bag at a normal pace over 1 - 1.5 seconds, compressing the bag wall between the

thumb and the other four fingers. Allow time for the bag to refill before discharging it again. Repeat the cycle as required by the situation.

(C). Circulation Management

If the patient is NOT breathing:

Initiate external chest compressions – using the compression-to-ventilation ratio appropriate for the patient's age group.

During resuscitation, monitor: the correctness of chest compressions, compression depth, full chest recoil/decompression, frequency (rate), and the hand position on the chest.

Identify and treat severe hemorrhages (primary hemostasis).

If the patient is breathing:

Check for signs of life-threatening hemorrhage and treat it immediately.

Measure the capillary refill time (CRT)

1.11 Secondary Assessment

After the primary assessment, requiring a complete clinical picture, we will perform a more detailed evaluation aimed at detecting all the medical issues the patient is facing at that moment.

Since the secondary assessment involves exposing/undressing the patient, we should conduct this activity in a controlled environment. This involves protecting the patient from cold, rain, wind, and the gaze of bystanders. The exposure can take place in a room, a suitable enclosed space, an ambulance, etc. In this regard, we will follow these aspects step-by-step:

A (Airways)

Any airway obstruction is an emergency that, if left untreated, can cause hypoxia, severe neurological damage, renal failure, cardiac arrest, and death.

While the primary assessment focused on manually opening and maintaining the airway, in the secondary assessment we introduce additional elements if necessary:

If you have not used an airway adjunct until this point, you should do so now.

Consider advanced airway management using the devices available to you and based on your specific level of competence. Options include the insertion of a Combitube, EasyTube, i-gel, laryngeal mask airway (LMA), or an endotracheal tube (ET tube), or even a Guedel airway (OPA), as appropriate.

Monitoring the airway remains a permanent task throughout the entire patient care process, as their condition can change at any moment

B (Breathing)

At this step, respiratory issues are identified and corrected, and procedures are applied to support respiratory function.

If the victim is conscious: Communicate with them to identify respiratory problems (air hunger, pain during inspiration/expiration, or the inability to speak more than 10 words between breaths). Ask them to take a deep breath and observe the chest wall movements (amplitude, symmetry), signs of discomfort, and abnormal breath sounds (wheezing, gurgling).

Determine the respiratory rate (RR): Normal values by age are:

Adult: 12–18 breaths/min.

Child: 20–30 breaths/min.

Infant/Newborn: 40–60 breaths/min.

Identify abnormal values: bradypnea, tachypnea, or polypnea; these may indicate a potential respiratory decline.

Signs of acute respiratory distress include: dyspnea, tachypnea, cyanosis of the lips and extremities, agitation, somnolence, diaphoresis (sweating), and the use of accessory muscles.

Palpate the chest wall to detect unstable or painful areas.

Observe signs of respiratory effort: intercostal retractions, nasal flaring (in infants and small children). Look for the use of accessory respiratory muscles (shrugging of shoulders during inspiration, strained neck muscles, abdominal or paradoxical breathing).

Assess skin appearance and color: mottling, sweating, pallor, or cyanosis (especially around the lips and nail beds).

Check for abdominal distension: This can limit diaphragmatic movement and worsen respiratory distress.

If the victim is unconscious: Observe chest wall movements, palpate for unstable areas, listen for breath sounds, and look for any of the signs of respiratory issues listed above.

Analyze any chest malformations: If an unstable chest wall area is detected where a flail chest is suspected, attempt to stabilize the affected area with adhesive tape to reduce the paradoxical movement of the fractured segment.

Early oxygen therapy is crucial for various patient categories (resuscitated, burned, traumatized, poisoned, drowned, etc.). Start oxygen administration as soon as possible to prevent and/or correct hypoxia.

Check oxygen saturation (SpO_2): Normal values are above 94%. To correct lower values, administer supplemental oxygen

C (Circulation) – Circulation and hemodynamics

This step covers aspects related to the state of the cardiovascular system.

Identify and treat hemorrhages.

Observe skin color and condition (appearance and coloration from a circulatory perspective).

Locate and evaluate the peripheral pulse. Observe:

Rhythm: Regular (rhythmic) or irregular (arrhythmic).

Quality: Strong (bounding – may suggest sepsis), normal, weak (thready – may suggest low cardiac output), or absent.

Rate: Tachycardic, normal, or bradycardic.

Measure capillary refill time (fingers, sternum, forehead).

Measure, if possible: Blood pressure (BP), heart rate (HR), and peripheral pulse.

Peripheral venous access maneuvers (for preventive or curative purposes).

D (Disability) – Neurological status

At this point, the patient's nervous system (central and peripheral) is evaluated.

To quantify the patient's level of consciousness, you can use at least two clinical assessment tools: the AVPU scale or the GCS (Glasgow Coma Scale). The AVPU scale is a simplified version of the GCS and is quicker and easier to apply. The acronym AVPU stands for:

A (Alert): The patient is conscious, oriented to time and place, opens eyes spontaneously, and speaks normally and coherently.

V (Verbal): The patient responds only to verbal stimuli; they speak (potentially incoherently or confused), move, or open their eyes only when spoken to

P (Pain): The patient responds only to painful stimuli; they may open their eyes, moan, or withdraw/protect the area where the painful stimulus was applied.

U (Unresponsive): The patient does not respond to any stimulus.

Blood glucose (Blood sugar): Must be measured for all unconscious patients.

Temperature.

Pupillary status and reaction: Check for size, equality, and light reactivity (PEARL), as well as visual acuity.

Peripheral innervation: Check for sensitivity (sensation), strength, and motor skills.

E (Exposure) – Patient history

In this part of the assessment, particularly for non-trauma patients, it is essential to conduct a medical history (anamnesis) to identify relevant current health issues. For this, you can use the SAMPLE mnemonic:

S (Signs and Symptoms): What is the patient experiencing? What do you observe?

A (Allergies): Are they allergic to any medications, food, or environmental factors?

M (Medications): What medications are they currently or recently taking?

P (Past Medical History): Are there any current or recent medical problems or pre-existing conditions?

L (Last Oral Intake): What liquids and food were consumed recently, how much and when?

E (Events): What events led up to the current health state or injury?

This formula can also be used for trauma patients if deemed necessary and if the patient's condition permits. In the case of trauma patients, a detailed head-to-toe (cranio-caudal) examination is of greater interest. The assessment is performed in a strict order, following the body segments while ensuring the patient's thermal protection. Heat sources (heaters, blankets) should be used to protect the patient. Occasionally, removing clothing may require cutting it if movements are painful for the patient.

Reassess vital signs – measure the temperature if it has not been done previously.

Search all body segments for signs of potential soft tissue, bone, or joint injuries (wounds, contusions, abrasions, hemorrhages, deformities, painful areas, edema, bone crepitus, etc.). The examination is performed through palpation and visual inspection.

Observe the patient's reactions and, if possible, communicate constantly, explaining each maneuver and asking for their cooperation in identifying medical issues.

Examination of the head and neck:

Identify, if applicable, specific signs of a basilar skull fracture:

Raccoon eyes (periorbital ecchymosis/bruising around the eyes).

Examine the retro-auricular area for swelling and ecchymosis (Battle's sign – bruising over the mastoid process, another sign of a skull base injury).

Check for CSF otorrhea or rhinorrhea (cerebrospinal fluid leaking from the ears or nose), both of which are clear signs of a skull base fracture.

Examination of the neck:

Observe the tracheal position and the status of the jugular veins.

Carefully palpate the cervical area.

Examine the clavicles (collarbones).

Examination of the sternum and anterior chest wall:

Palpate the chest along the entire length of the ribs, then apply gentle bilateral compression on the anterior chest (vertically) and the lateral chest (horizontally).

Observe the patient's reaction, chest wall elasticity, and any abnormal movements.

Abdominal area:

Inspect and palpate the abdomen, monitoring the elasticity and firmness of the abdominal wall, as well as the patient's reaction to palpation. A firm, rigid abdominal wall (board-like abdomen) is a sign of an emergency, potentially indicating an abnormal accumulation of fluids, inflammation, or the rupture of hollow organs.

Pelvic area

Palpate the pelvis by applying pressure to the iliac crests, alternating between the left and right sides. Then, manually press the ilium from the outside in and apply pressure to the hip joint (coxofemoral joint). The pelvis should move as a single unit. Observe any abnormal movement or pain response. In such cases, avoid any further unnecessary mobilization of the patient.

Perineal area (genital organs).

Lower extremities

Examine from top to bottom, including the joints. If the patient is cooperative, ask them to perform limb movements to assess their motor function.

Posterior thorax and pelvis (The Back)

To examine this area, the patient must be moved as a single unit into a lateral recumbent position (log-roll), maintaining the alignment of the head, neck, torso, and lower limbs.

Inspect and palpate the posterior aspect of the torso (ribs, spine, scapulae/shoulder blades, soft tissues). Exception: If a pelvic injury is suspected, the back examination is performed by palpation, sliding the rescuer's hands successively under the posterior thorax from top to bottom without turning the patient from the supine position

Upper extremities

Palpate from the shoulder toward the fingertips, following a similar procedure as with the lower extremities.

Maneuvers performed during the secondary assessment:

- Hemostasis and dressing (bleeding control and wound care).
- Immobilization of fractures, dislocations, and sprains.
- Peripheral venous access (IV access).
- Measurement of vital signs and other physiological values.
- Other maneuvers based on your acquired clinical competence.
- Deep penetrating (impaled) objects are not to be removed except in an operating room (premature extraction can cause exsanguination if the object is tamponading a major blood vessel). If the penetrating object is too bulky for transport, request assistance from specialized crews (extrication/fire department).

After completing the secondary assessment, communicate the findings and maneuvers performed to your coordinating entity (dispatch center / medical coordinator).

Reassess the patient's vital signs at least every 5 minutes

1.12 Management And Mobilization Of The Trauma Patient

The goal of emergency trauma care is to significantly increase recovery rates by providing timely, high-quality medical assistance.

The treatment of trauma victims involves following a chronological sequence of basic general stages:

- Rapid primary assessment.
- Initiation of resuscitation maneuvers, if necessary.
- Complete secondary assessment.
- Transport to a medical facility.

In emergency medicine, the concept of the "Golden Hour" is used. This represents the critical 60-minute window immediately following a severe trauma or acute medical event (such as a road accident, heart attack, or stroke). Within this timeframe, the probability of saving the victim's life and preventing irreversible complications is at its highest, provided that intervention is rapid and correct.

The concept also emphasizes that the patient must not only receive aid at the scene but must also be transported and initiated into definitive medical treatment (surgery, intensive care) within this timeframe.

In the case of trauma patients, we distinguish three periods following the injury during which fatalities may occur (The trimodal distribution of death):

Period I (Immediate deaths): This represents the interval from a few seconds to a few minutes after the trauma. These are due to lacerations of the brain tissue, the upper spinal cord, the heart, or the great vessels. Very few patients with such injuries can be saved. In these cases, the best treatment is "prevention."

Period II (Early deaths): This represents the interval from a few minutes to several hours after the trauma. These deaths are caused by issues such as: intracranial hematomas, hemothorax, pneumothorax, splenic or hepatic ruptures, pelvic fractures, or massive blood loss due to other fractures. These patients can often be saved through a well-coordinated emergency intervention.

Period III (Late deaths): This represents the interval from several days to several weeks after the injury. These are due to: severe traumatic brain injuries (TBI), infections (sepsis), or Multiple Organ Dysfunction Syndrome (MODS). Proper emergency treatment can prevent some of these deaths

There are three core principles of emergency medical care for trauma patients:

1. If the patient has multiple injuries or problems, treat the one that is immediately life-threatening first, or prioritize treatment starting with the most severe.
2. Appropriate treatments must not be delayed simply because the diagnosis is uncertain.
3. A detailed medical history (anamnesis) is not necessary to begin the assessment and treatment of a trauma patient.

Identifying Life-Threatening Injuries. Life-threatening injuries, listed in descending order of severity, are:

Airway Obstruction: Kills the fastest.

Causes: Head flexion, blood, vomitus, foreign bodies, external compression.

Absence of Breathing: Kills almost immediately.

Causes: Pneumothorax, hemothorax, lung injuries.

Absence of Circulation:

Causes: Hemorrhage (internal or external), heart injuries, arrhythmias.

Intracranial Space-Occupying Lesions (Mass Effect).

"ABCDE" in Trauma Medical Assistance

Always follow this sequence:

A – Airway: Clear the airway (with attention to the cervical spine).

B – Breathing: Assess breathing.

C – Circulation: Assess circulation (with attention to hemorrhage).

D – Disability: Assess neurological status.

E – Exposure: Expose the patient and perform a complete head-to-toe examination.

Caution: Take necessary measures to prevent hypothermia.

Medical History: Obtain a brief history regarding the mechanism of injury (MOI) and the time of the incident.

Communication between Dispatch/Field Medical Coordinator and the Medical Team. **What information should pre-hospital reports contain?**

Number of victims, their age, and sex.

Need for support crews (back-up), if applicable.

Mechanism of injury (MOI).

Vital signs.

Suspected injuries.

Treatment maneuvers performed.

Estimated Time of Arrival (ETA) at the hospital

Major changes in the patient's condition.

Special precautions for hospital staff to consider (e.g., contamination with hazardous materials, violent patient or bystanders, etc.).

There are numerous methods by which a victim can be moved. The most appropriate **method for mobilization will be chosen based on**:

The victim's location within the scene.

The injuries sustained.

The victim's height and weight.

The distance to be covered.

The number of people performing the mobilization.

The available equipment.

The available time / the moment.

General principles to observe:

Do not worsen the patient's condition.

Mobilize the victim only when necessary.

Mobilize the victim only as much as necessary.

Move the victim's body as a single unit.

Choose the most appropriate method for the situation to ensure safety.

If there are multiple rescuers, the mobilization is performed at the command of a single rescuer (generally the one at the victim's head).

Recommendations:

Delay mobilization, whenever possible, until help arrives.

Before moving the victim, perform the necessary first-aid maneuvers, except in cases of an unsafe environment.

Do not step over the victim.

Explain every maneuver to be performed to the victim.

Regardless of the chosen method, observe the following:

Know physical capabilities.

Maintain balance at all times.

Maintain firm contact with the ground at all times.

Lift or lower a patient using the strength of the legs not the back. Keep the back straight.

Keep arms as close to the body as possible.

The mobilization procedure will be carried out gradually; the victim will be moved little by little, with rescuers synchronized and coordinated by a single person (usually at the head) to prevent any rescuer from losing balance, to avoid further injuries, and to prevent worsening the victim's condition. If the situation allows and the space and terrain are favorable, the victim will be moved continuously to reach the evacuation point or ambulance as quickly as possible

Emergency Extraction of Victims

This will be performed in the following cases:

Danger of fire, explosion, or structural collapse.

Presence of hazardous materials and/or substances that may endanger the life of the victim or the rescuers, provided the rescuer can safely intervene.

The scene of the incident cannot be secured.

It is impossible to access other victims who require emergency medical assistance.

The patient is in cardiac arrest, and their current position makes it impossible to initiate resuscitation maneuvers.

Module 2 - Search and Rescue & Rescue Dog Interventions

2.1. Primary Directives

Time is the most important factor in the search for missing persons! Whether it is a case of any kind of damage or disappearance, in the optimal case, the intervention should be started within the shortest possible time! The wording is not accidental! Data collection should start immediately after receiving the alarm! We will discuss this issue in more detail later!

2.2 Missing Persons Search

From a research perspective, the search for missing persons can be divided into several parts according to their nature!

- A person missing as a result of a natural disaster (earthquake, snow, mud avalanche, flood, tsunami, etc.)
- A person who got into trouble due to a civilization problem through no fault of their own (disappearance of elderly, demented person, search for a person who went missing while hiking in nature)
- Search for a person missing due to suicidal tendencies
- Search for a victim of a crime
- Search for a person missing in water (water accidents, suicidal intention, etc.)

In order to successfully carry out the search, a suitably qualified search team must be assembled, which must include the following components:

1. reconnaissance component:

A. certified dog handler

B. certified dog

C. technical reconnaissance (drone, thermal imaging camera, night vision, sound detector, binoculars, etc.)

2. medical component: their primary task is to provide medical care to the team; their secondary task is to provide medical care to any person(s) found.

3. technical component: their primary task is to provide care to the members of the reconnaissance unit, to ensure the rescue units reach the scene of the accident, to assist and ensure access. The secondary task is to assist in the evacuation and rescue of the person(s) found, and to ensure the technical conditions for the rescue.

Composition of the technical rescue unit:

- firefighter, technical rescuer
- alpinist
- diver

I mentioned in the introduction that after receiving the alarm, the search must begin. In all cases, data collection must be continued, regarding the identity of the person(s) to be searched for, the existence and development of the natural and built infrastructure on the site, maps and the opportunities offered by the 21st century (e.g. Google map). After arriving at the scene of the accident, immediately contact

the competent commander there, ask for information on the tasks and measures carried out so far, and the information in his possession! The next step is to collect the necessary data and information from the immediate relatives! In many cases, during this task, the relative will tell you where to look for the missing person!

General questions:
- What happened?
- When did it happen?
- Who, who disappeared?
- Are there any recent photos of him/her?
- What is the reason for the disappearance?
- Was there a history of the disappearance?
- What is his/her mental state?
- What is his/her physical state?
- Is he/she taking any medication?
- If so, how does it affect him/her?
- What kind of clothes is he/she wearing?
- Who last saw him/her?
- What activities did he/she do before he/she disappeared?
- Does he/she have a phone?
- Does he/she have personal documents?
- Does he/she have money?
- When did he/she last eat or drink? And what?
- Does he/she use recreational drugs? (cigarettes, alcohol, drugs)

What factors should be taken into account in general:
- geographical features
- prevailing wind direction
- prevailing climate
- temperature at a given moment
- landmarks

Search for a living person:
The search for a living person is carried out in two major areas.
1. In the area
2. In the ruins

2.3 Area search

Searching for missing persons in a given, possibly difficult to delimit area. A drone, a helicopter, a paraglider, etc. can be a suitable tool for searching open areas. A search dog is best suited for searching dense bush or forested areas! A well-trained search dog basically uses air currents, but if it finds a fresh trace, it can also use it without any problems and find the missing person by following it!

It works independently without a leash, but in close coordination with the dog handler! Its signal is a firm, strong bark so that the dog handler can follow the direction and location of the signal, even deep into a forest! A well-trained search dog can find a person from up to 200-250 meters!

It is important to teach the dog the signal in such a way that it cannot accidentally touch it! Human search dogs need a very strong nervous system!

2.4 Reasons for disappearance

- person(s) who disappeared through no fault of their own while hiking
- disappearance of a young, elderly, or demented person
- tracing of persons who disappeared with suicidal intent
- tracing of a crime victim

Personal and material requirements for field research:
1. Personal requirements:
- appropriate professional preparation
- health condition appropriate to the task
- good physical condition
- good mental condition
- clothing appropriate to the weather
- boots
- appropriate personal equipment

We can carry out the technical implementation of the research

1. with area search dogs
2. with tracking dogs
3. with mantrailing (person following) dogs

The implementation of the research can also be helped by the modern achievements of the 21st century!

We can think of various GPS devices, drones, and devices suitable for measuring mobile phones. Modern technology can help the work of rescue teams, but basically we think of them as being able to help the work in a given case, but will never do it for us!

Tactical options for area search:

In area search tactics, obtaining and correctly evaluating information is of paramount importance!

The 18 questions described above are general questions from which we must select during reconnaissance! In area search, there are
some targeted information that we must ask in typical cases!

First, let's look at what is essential information for people who have disappeared through no fault of their own!

2.5 Disappearance Of Elderly People With Dementia

Dementia is a mental decline (foolishness) caused by the death of brain cells, which is not part of normal aging. Its main symptoms are forgetfulness, speech disorders, thinking disorders, inability to get around and personality changes. Although it is mostly irreversible (e.g. Alzheimer's disease), the symptoms can be alleviated with early diagnosis.

This is why, when obtaining primary information, the immediate environment and immediate relatives should be questioned about the missing person's childhood, youth, work, and previous residences! In the vast majority of cases, we experience that the ability to get around is limited to being able to get to his/her previous place of residence! What topics related to the past have he/she mentioned in the past
days!

In these cases, it is worth dividing the prioritized areas into sectors based on a map, approx. 100-150 m wide, 250-300 m long and searching the sectors one by one! When searching for these people, usually the elderly are either walking on the road or walking along some structure (e.g. railway tracks)!

2.6 Tracing Missing Persons With Suicidal Intent

The main warning signs are:
- talking about killing or harming oneself,
- talking or writing a lot about death and dying,
- looking for means (e.g. weapons, medication) to commit suicide.

These signs are even more dangerous if:
- the person has a mood disorder (e.g. depression or bipolar depression),
- is addicted to alcohol,
- has previously attempted suicide,
- has had a family member (friend) commit suicide.

Furthermore, he looks for dangerous means of suicide. He tries to get a weapon, medicine, a knife or other object that could be suitable for committing suicide

- He loses his hopes for the future. He is tormented by a feeling of helplessness, hopelessness, and being trapped (“There is no way out”). He sees that things will never get better, will not change.
- He feels self-loathing, self-hatred. He is tormented by worthlessness, guilt, shame, self-hatred. He feels like a burden (“Everyone would be better without me”).
- Arranges his affairs. Makes a will, sells his valuables. Arranges his affairs with his family members, as if he were going somewhere.
- Says goodbye. Makes unusual or unexpected visits, initiates phone calls. Says goodbye to acquaintances, as if he will not see them again.
- Moves away from others. Moves away from friends, family. Social alienation, isolation. Longs for solitude.
- Suddenly feels calm, reassured. Suddenly calms down, feels happy, although he was going through a severely depressive period before. This may mean that he has made the decision to commit suicide.

For this reason, when investigating a disappearance, it is not enough to listen

to the immediate family, but special attention should be paid to examining the immediate environment of the missing person.

A few examples:

- he doesn't have any personal documents with him; he left them at home in a clearly visible place
- he left his phone at home
- he didn't take any money or bank cards with him
- he leaves a container used to store life-threatening medicine or toxic substances in plain sight

A very important question in cases of suicidal intent is where there is a place where the missing person felt safe and comfortable, where there is an abandoned place where they enjoyed going! Usually, the relative will tell you where to look for the person in such cases! When determining the search tactics, it is worth considering that these missing people commit their acts along abandoned, rarely traveled roads, at a distance of about 20-50 meters from the road. The fact that suicides are committed on average at a maximum distance of 1-1.5 km from the place of disappearance is also based on observation. In these cases, we let the dog search along the given places, alternating the right and left sides of the road, searching a strip of about 50-50 meters!

During the information gathering, we create a so-called movement curve of the movement of the missing person. In order to create this, we need to locate the surveillance cameras located around the place of disappearance, and security cameras located on buildings. It is worth making a site drawing, where we record the activity and route carried out by the unit, indicate the characteristic landmarks, and indicate the north direction for orientation.

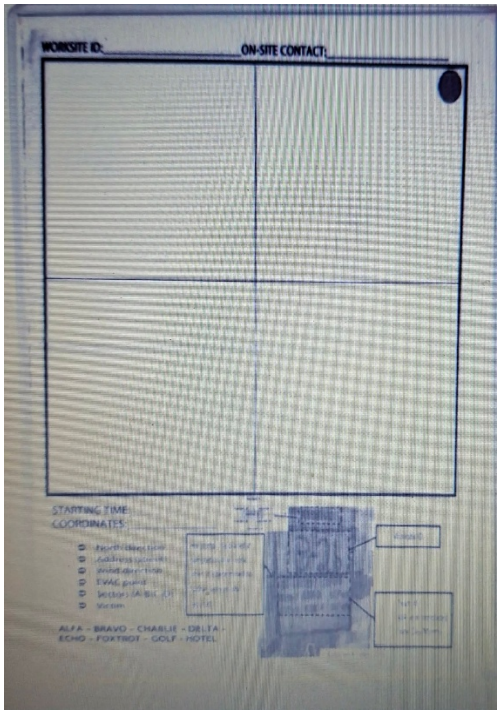
Of course, before starting the search, we create a map sketch, where we divide the area into sectors. After finding the victims, we can also indicate the coordinates and time of the location of the discovery on the map sketch. On this sheet, we can also record information about the condition of the found victim and what intervention is needed (medical care, technical rescue, diving activities, etc.). This can be of great help later when providing data to other agencies. The figure below shows a sample that can be used for such a map sketch!

2.7 Using Tracking And Personal Tracking Dogs

There are many factors that influence the successful use of tracking and personal tracking dogs!

1. Time since the disappearance
2. Temperature
3. Humidity
4. Season
5. Type of area (inhabited area, forest, field, etc.)

In many cases, we can get a good indication of the missing person's route



Source: Pest County Search and Rescue Service

2.8 Search Within Ruins

This branch is used in the event of natural and civilisational disasters.

It is easier to learn about it using the INSARAG guidelines.

INSARAG was founded in 1991 as a joint effort of countries at risk of earthquakes or disasters causing structural collapse, and countries and organizations providing international USAR assistance (UN, IFRC, other international aid providers). It is the preferred guideline of the UN to help process mass casualty incidents!

The INSARAG Guidelines aim to provide methods for countries affected by sudden-onset disasters causing large-scale structural collapse, as well as for international USAR teams responding to the request of the affected country. At the same time, they outline the role of the UN in assisting the on-site coordination provided by the affected countries.

Light-equipped USAR teams have the operational capacity to assist in surface search and rescue immediately following a disaster. These teams are usually deployed from the affected country or neighbouring countries. Light-equipped USAR teams are not recommended for international deployment in an emergency. Medium-equipped USAR teams have the operational capacity to assist in technical search and rescue in the event of structural collapse. A medium-equipped USAR team is required to search for trapped persons. Medium-equipped international USAR teams deployed to an affected country should be operational in that country within 32 hours of the disaster being reported on the virtual OSOCC. The medium-equipped team should have sufficient personnel to operate 24 hours a day, 7 days a week in one location.

Heavy-equipped USAR teams have the operational capability to perform difficult and complex technical search and rescue operations. Heavy-equipped USAR teams are required to: search for missing persons with dogs and technical equipment; plan to deploy internationally during disasters involving multi-storey structures, typically in urban environments, when national response capabilities are either overwhelmed or under-resourced. Heavy-equipped international USAR teams deployed to the affected country must be operational within 48 hours of the disaster being reported to the virtual OSOCC. The heavy team must be sufficiently manned to operate 24 hours a day, 2 locations, over a 10-day period.

The conduct of deployed USAR team members is a major issue for INSARAG, the assisting country, the affected country and local authorities. USAR teams should always strive to be seen as representing a well-organized, highly trained group of professionals, established to provide specialized assistance to communities in need.

By the time they complete their mission, USAR teams should ensure that their performance has been positive and that they will be remembered for their pro-social behavior in the environment. USAR teams deployed abroad should be self-sustaining, never becoming a burden on the already overstretched country they are trying to help.

Sensitive issues to consider

1. The value that the local community places on life;
2. Cultural awareness, including respect for racial, religious, and ethnic specificities;
3. Wearing sunglasses during a conversation may be considered inappropriate;
4. Communication barriers due to language differences;
5. Differences in work ethics and values;
6. Different local attire;
7. Local food and nutrition customs;

8. Local policing practices;
9. Local gun policies;
10. Local living conditions;
11. Local driving habits and regulations;
12. Local medication policies;
13. Alcohol and drug use;
14. Handling sensitive information;
15. Use of rescue dogs;
16. Care and treatment of the sick and/or deceased;
17. Dress codes, regulations;
18. Gender restrictions;
19. Entertainment restrictions;
20. Local communication restrictions, accepted usage;
21. Taking photographs of victims or structures, and presenting them;
22. Collecting memorabilia (building pieces, etc.);
23. Damage to property, such as using the building marking system;
24. Restricted access areas (military, religious, etc.);
25. Moral standards;
26. Consideration of the capacity and operational practices of other teams;
27. Use of rewards to promote cooperation;
28. Political problems;
29. Actions and behaviors that exacerbate stressful situations;
30. Indiscriminate smoking.

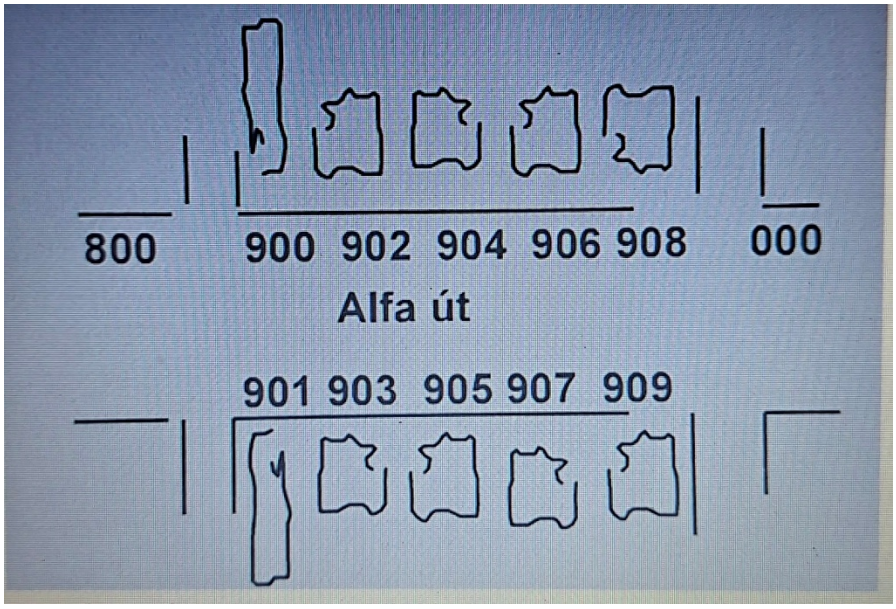
2.9 Operations

1. USAR teams must respect the disaster response policies and procedures of the affected country
the authority with overall responsibility for disaster response.
2. Collect and document information from the OSOCC and/or LEMA,
including the following:
    2.1 Chain of command;
    2.2 Points of contact;
    2.3 Up-to-date information on the current situation;
    2.4 Establish and change team tasks;
    2.5 Safety and security considerations;
    2.6 Communication plan;
3. The execution of operations is determined by the ASR
levels according to the INSARAG guidelines, which have 5 levels!
1. ASR 1:
Wide Area Survey: Preliminary survey of affected areas,
sectorization.
2. ASR 2:
Sector Survey: Rapid, large-scale area survey to identify areas suitable for searching for live persons within a designated sector.
3. ASR 3:
Primary Search and Rescue: Early intervention, rapid action in the designated work area, aiming to maximize life-saving opportunities.
4. ASR 4:
Secondary Search and Rescue: A thorough search of all survivable cavities, involving all USAR capabilities, usually in one work area.
5. ASR 5:
Comprehensive Search and Rescue: A full search of the entire work area to locate live and deceased casualties. There are two options, one is a complete demolition, the other is a room-by-room search.

The assessment of a collapsed structure includes the assessment of the following eight factors:
1) THE ORIGINAL BUILDING
• 1.1 Use, occupancy;
• 1.2 Floor plan, height;
• 1.3 Architecture, interior layout;
• 1.4 Building materials, type of construction;
2) THE COLLAPSE
• 2.1 Why did it collapse?
• 2.2 How did it collapse?
• 2.3 What stopped the collapse?
• 2.4 Distribution of debris.
3) LOCAL DAMAGE
• 3.1 Damage to columns;
• 3.2 Damage to load-bearing walls;
• 3.3 Damage to supporting beams;
• 3.4 Damage to floors;
• 3.5 Damage to connections, joints.
4) POSSIBLE VACUUMS
• 4.1 Cavities formed by structural elements and collapse pattern;

• 4.2 Cavities formed by building contents;
• 4.3 Assessment of cavity size to assess survival chances;
5) STRUCTURAL FACTORS AFFECTING OPERATIONAL PRIORITIES,
• 5.1 Potential access routes to key cavities;
• 5.2 Mitigation of structural hazards;
• 5.3 Entry and exit options;
6) STRUCTURAL FACTORS AFFECTING SEARCH, e.g.
• 6.1 Where to enter and exit;
• 6.2 Search and escape routes;
7) STRUCTURAL FACTORS AFFECTING RESCUE, e.g.
• 7.1 Where to enter and exit;
• 7.2 Search and escape routes;
8) BUMPING
Map creation

Source: BM OKF INSARAG training material



2.10 USAR First Responders

• 1. Increasing the first level of local capabilities involves training and developing responders from existing local emergency services and communities to meet the needs of the affected population when an incident occurs. They are called 'USAR first responders', and their role in the initial phase of an incident is to:
• Summarize the nature and extent of the incident
Rescue and basic casualty care in the initial
phases of a collapse
• Informing domestic decision-makers about the incident
• Requesting the appropriate resources required to successfully
conduct the rescue phase
• 2. A network of first responders would be most effective in areas where there is no organized USAR capability and where there is a delay in the USAR response from any established teams.
• 3. It is estimated that USAR first responders typically consist of
persons who work in the local community or local government
organizations and are responsible for emergency management or
response. For example: local police, EMS or fire fighters, government workers (including civil defense) or members of voluntary organizations.
• 4. USAR first responders should have access to a dedicated toolkit that will meet their needs during training and deployment. This kit should include the tools they need to work safely at their operational level.
• 5. To support the development of USAR first responders, INSARAG has developed a First Responder Training Package.

Abbreviations used in the INSARAG guidelines:
• BoO Base of Operations
• FCSS Field Coordination Support Section
• FP Focal Point
• GPS Global Positioning System
• INSARAG International Search and Rescue Advisory Group
• ISO International Organisation for Standards
• LEMA Local Emergency Management Authority
• OCHA Office for the Coordination of Humanitarian Affairs
• OSOCC On-Site Operations Coordination Centre
• PPE Personal Protective Equipment
• UNDAC (Team) United Nations Disaster Assessment and Coordination (Team)
• USAR Urban Search and Rescue
• 24/7 Available 24 hours a day, 7 days a week
• ALS Advanced Life Support
• BLS Basic Life Support
• HAZMAT Hazardous Materials
• IFRC International Federation of the Red Cross and Red Crescent Sociéties
• IHP International Humanitarian Partnership
• SOP Standard Operations Procedure
• TOR Terms of Reference
• UN United Nations
• IEC INSARAG External Classification
• RDC Reception/Departure Centre

2.11 Corpse Search

We start with the technique of searching for living persons until there is certainty. Thus, there will be no major changes in the search for this branch!
Regardless of geographical location, religious or ethnic affiliation, it is important to say goodbye, close off, and go through the mourning phase with the deceased relative! Of course, religious characteristics and disrespect should not be violated!

From a research perspective, technically, the task is always carried out with a dog! A well-trained dog will react to the smell of a human corpse. Research has proven that the smell of a decomposing human corpse is 99% the same as the smell of a decomposing white pig, and 98% the same as the smell of a decomposing fish! Therefore, these facts must be taken into account during the search, both in the case of a collapsed building and when searching for a person missing in the water!
In dogs, the signal for the deceased consists of two parts, the first will always be a biological signal, and the secondary signal will appear as a learned signal.

When training dogs, we follow the following technical steps! As a first step, we teach the dog the signal for the person! When it does this exactly, we will show it the smell of the corpse! First, when we lead the dog to the source of the smell, the dog handler must pay close attention to the dog's reactions! We must also pay attention to these first reactions in subsequent ones! Then, we must teach it the signaling method that will be a clear indication to us, the dog handler, that the dog has found a deceased person!

In general, biological signals of dogs include: licking the mouth, yawning, shaking (trying to shake off the smell of decomposition), in some individuals, avoidance of the smell, changes in barking (barking becomes uncertain), etc.
Learned signal: the dog assumes a forced body position at the source of the smell, depending on whether the body is deep, then it will lie down, if it is high, then it may lie down!

In general, the biological signals displayed by dogs include: licking their mouth, yawning, shaking themselves (an attempt to “get rid of” the smell of decomposition), avoiding the scent (in some dogs), changes in barking behavior (it becomes hesitant or uncertain), etc.
Learned signal: the dog adopts a specific body posture at the source of the scent; depending on the position of the body, if it is deep, the dog will lie down, while if it is located higher, the dog may remain in a different position.

Factors influencing the signal of a deceased person:

1. Time since death
   At least 6 hours must pass from death for decomposition to start.
2. Temperature
   The body will not start to decompose at temperatures below +5°.
3. Moisture content
4. What the person ate and drank before death

The quality and quantity of the food consumed can slow down or speed up the decomposition of the body.

These facts will also be questionable in the case of people who have disappeared in the water! The dog's work can be helped by the gassing of the body in the water. Gases in a body in water rise to the surface, which can make the dog's job easier.

Module 3 - Water Rescue And Emotional Management

INTRODUCTION

Water rescue refers to search and rescue operations conducted in aquatic environments where currents can destabilize a person, sweep them away, or create life-threatening conditions. In situations such as drowning risks or flash floods, time is of the essence; this requires not only technical skills but also rapid risk assessment and the full implementation of life-saving procedures with safety as the top priority.

In addition to technical intervention capabilities, emotional management—a crucial component of this process—ensures that the psychological state of both the rescuer and the casualty is kept under control in high-stress environments. The accuracy of decisions made in dynamic and unpredictable situations, such as a water rescue operation, depends on effective stress and panic management.

A successful operation also involves the use of an inclusive communication style during a crisis. This communication strength not only improve teamwork but also deepens understanding of human behavior.

3. Water Rescue Techniques

3.1 Situation Assessment and Risk Analysis

The first few minutes are critical in water rescue operations. Upon arrival at the scene, a quick and accurate situation assessment—conducted before any intervention begins—is critical for the team's safety, communication, and the success of the operation.

Additionally, personnel participating in the operation must be equipped with appropriate helmets, thermal protective clothing, suitable fins, gloves, and personal safety equipment appropriate for the task. Common equipment should include a throw line, spare flotation devices, rescue ropes, boat equipment, communication devices, a first aid/medical kit, and, when necessary, a rescue board or similar support equipment.

The following factors must be analyzed prior to the intervention:

3.1.1 Water Type, Dynamics, and Temperature

- **Still Water (Lakes, Ponds):** Although generally perceived as less risky, it poses dangers such as depth illusion, getting stuck in bottom mud, or entanglement in underwater vegetation.
- **Running Water (Rivers, Flowing Channels):** Water speed and flow rate are the most critical parameters to consider. Based on these parameters, rescue maneuvers are always planned by calculating the next point where the current will carry the casualty (the intercept point).
- **Floods:** This is the most unpredictable and dangerous type of water. The current is fast, and visibility in the water is completely obstructed. Open manholes, fallen power poles (risk of electric shock), drifting vehicles, and debris pose significant dangers.
- **Water Temperature:** Cold water directly affects survival time. The shock effect caused by cold water makes it difficult for the casualty to breathe and

increases panic, while in the following minutes, it may lead to the risk of hypothermia.

3.1.2 Visible and Invisible Hazards (Environmental Risk Analysis)

- **Whirlpools:** Water currents forming around bridge piers, large rocks, or artificial structures have the power to pull both the casualty and the rescuer underwater and trap them.
- **Underwater Obstacles and Strainer Effects:** These include fallen tree branches, wires, or construction debris that allow water to flow through but trap solid objects (including the human body). These elements are among the deadliest traps in river and flood rescues.
- **Contaminants (Biological and Chemical Risks):** Especially in urban floodwaters, sewage leaks, agricultural chemicals, or fuel mixtures are present. This situation creates a risk of poisoning if water is ingested and necessitates the decontamination of the team and equipment after the operation.
- **Weather Conditions:** Persistent rainfall, wind intensity, and decreasing daylight can increase risks as the operation progresses.

3.1.3 Number of Casualties, Their Location on the Water, and Level of Consciousness

- **Location and Accessibility:** How far from shore is the casualty? Are they being swept away by a current, or are they clinging to a fixed object (tree, vehicle roof)? The answers to these questions determine which of the "Reach, Throw, Paddle, Go" protocols should be applied.
- **Triage (Prioritization):** If there are multiple casualty in the water, intervention priority must be determined by quickly analyzing whose condition is more critical and who can be rescued more easily.
- **Level of Consciousness (Active/Passive Victim):**
- **Active Drowning:** The casualty is thrashing to stay afloat, is in a state of panic, and cannot think rationally. This is the most dangerous situation for the rescuer. A panicking victim may reflexively cling to the rescuer and pull them underwater. A safe approach angle and distance are essential.
- **Passive Drowning:** The casualty has lost consciousness, lies motionless on the water's surface, or has begun to sink. There is no risk of drowning due to panic, but time is a critical factor, and Basic Life Support is required immediately upon removal from the water.

3.2 Rescue Methods

The fundamental principle in water rescue operations is to reach the casualty without exposing the rescuer to unnecessary risk. Therefore, entering the water is always considered a last resort. The intervention follows the "Talk, Reach, Throw, Row, Go" hierarchy, which ranks actions from lowest to highest risk.

3.2.1 Verbal Guidance/Talk: This is the first step applied when the casualty is near the shore, conscious, and physically capable of swimming. The goal is to calm the casualty's panic and, if possible, help them rescue themselves.

How to Do: Rescue personnel stand at a safe point on the shore and make eye contact with the victim. Using a loud and confident tone of voice, they speak in clear sentences such as, "Can you hear me? Stay calm, you're safe. We're going to rescue you. Hold on tight," and give brief instructions. If necessary, they use hand signals

to indicate direction.



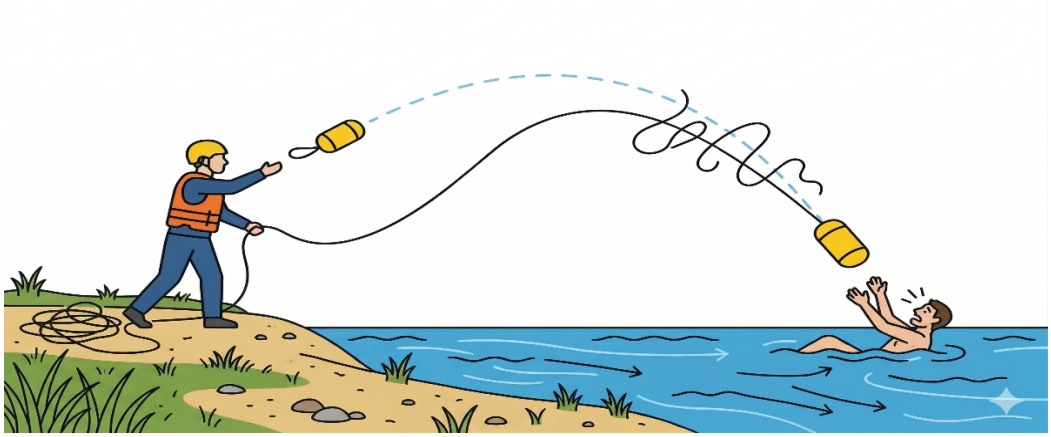
3.2.2 Reach: This is used when the casualty is within an arm's length or the length of a stick from the shore.

How to Do: Rescue personnel must lower their center of gravity to avoid falling into the water or being pulled in by the casualty. Lying face-down on the ground or kneeling is safest. An object such as a tree branch, paddle, or rescue pole is extended toward the casualty. Never reach out directly with your hand, as a panicking casualty could pull the rescuer into the water.



3.2.3 Throw: This method is used when the casualty is too far away to reach but within throwing range (typically 15–20 meters).

How to Do: A throw bag, life ring, or any other floatage object that does not sink is used. Rescue personnel calculate the point where the casualty will be carried by the current and execute the throw. When the casualty grasps the rope, instead of pulling directly, an angle is created using the current's flow to guide them toward the shore.



3.2.4 Boat Approach/Row: If the casualty is too far from shore or the current makes the throw method impossible, a boat is used for the rescue.

How to Do: Inflatable rescue boats or canoes are used. As rescue personnel approach the casualty in the boat, they must ensure the motor or oars do not harm the casualty. The approach is typically made against the current or parallel to the casualty. The boat is never driven directly toward the casualty.



3.2.5 Swim Rescue/Go: This is the riskiest step, used only when all other methods have failed or if the casualty is unconscious. For this reason, it must be performed exclusively by personnel who have received advanced water rescue training and are fully equipped with a life jacket, helmet, and fins.

A panicked casualty perceives the rescuer not as a person but as a buoy that will keep them afloat on the water's surface and reflexively attempts to climb onto them. This situation can pose a threat to the rescuer.

How to Do: The rescuer must always carry a rescue tube. Approach the casualty from behind, and when about 2–3 meters away, start verbal communication. Then, the casualty is guided to the shore while holding onto the rescue tube.



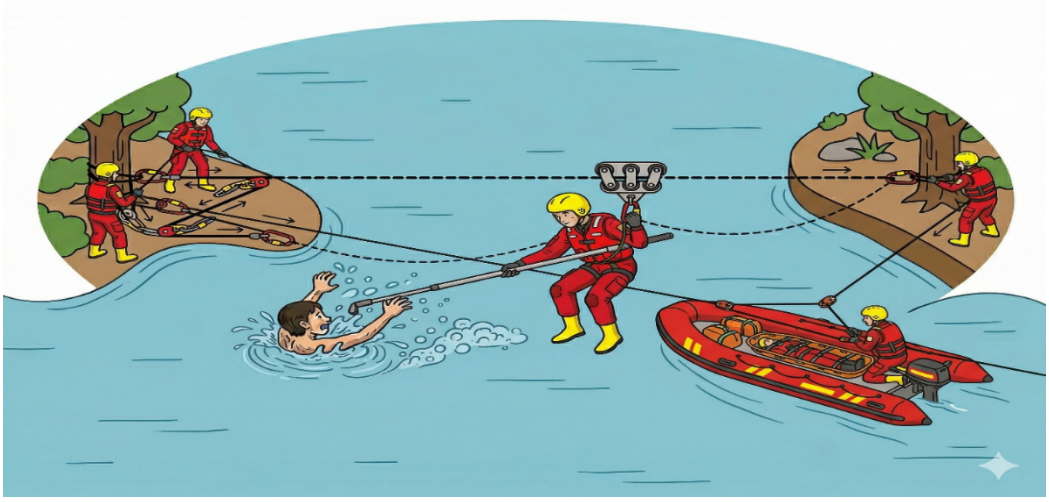
3.2.6 Other Rescue Methods

3.2.6.1 Wading Intervention: This is an additional step between the "Throw and Go" method and swimming. In situations where the water is shallow but there is a current (e.g., floodwaters), this involves rescue personnel entering the water but

not swimming. Rescuers typically move in teams of three or four, holding onto each other as they walk against the current to reach the casualty.



3.2.6.2 **Situations Requiring the Setup of an Aerial Line:** Especially in fast-moving rivers or during floods, this method involves setting up taut ropes between the two banks of the river (Z-drag systems or Tyrolean crossings) to safely transport boats, stretchers, and people across these ropes.



3.2.6.3 **Helicopter Rescue:** In situations where access by land or water is impossible, the casualty is hoisted up using a rope, ladder, or basket lowered from an aircraft.



3.2.6.4 Animal-Assisted Rescue: This method involves specially trained water rescue dogs (such as Newfoundlands) using vests to provide buoyancy for the casualty or directly pulling the casualty to shore.



3.3 Emotional Management

In search and rescue operations, the ability to make sound decisions under high stress, assess the situation without falling into the "tunnel vision" effect (focusing solely on a single point and overlooking surrounding dangers), and control panic determines the operation's success. This section focuses on both maintaining the psychological resilience of rescue personnel and properly managing the casualty.

3.4 Stress Management for Rescue Personnel

From the moment an emergency call is received, adrenaline and cortisol levels in the rescue personnel's bodies rise rapidly. While this hormonal process increases physical strength, it can impair fine motor skills and logical decision mechanisms. The following methods must be systematically applied to cope with operational stress:

3.4.1 Mental Preparation and Visualization: Before the operation, the techniques to be applied and potential "worst-case scenarios" are visualized in the mind. For example, when situations such as jumping into water, swimming against a current, or the casualty suddenly attacking are mentally rehearsed, the brain responds with "I've been through this before" during the actual event, helping to overcome the shock effect.

3.4.2 Breath Control: The fastest way to lower your heart rate and ensure sufficient oxygen reaches the brain during moments of panic or extreme excitement is through breath control. The "Box Breathing" technique is ideal:

- Breathe in deeply through your nose for 4 seconds,
- hold for 4 seconds,
- Exhale through your mouth for 4 seconds,
- hold for 4 seconds. This cycle initiates physiological calm within seconds.

3.5 Communication with the Casualty and Panic Management

A drowning casualty in the water experiences one of the most intense fears of death due to the inability to reach the water's surface and the sensation of sinking. As a result, they cannot think rationally, often cannot call for help (breathing takes priority over shouting), and flail their arms sideways to stay afloat. When communication is possible with the casualty, the following should be observed:

3.5.1 Calm and Authoritative Tone of Voice: The first voice the casualty hears should convey a sense that control has been taken and that they will be rescued. Instead of shouting, a firm, decisive, and authoritative tone of voice should be used. Panic or anxiety in the rescuer's voice will cause the casualty's panic to escalate.

3.5.2 Simple and Direct Instructions: A brain experiencing fear of death has reduced cognitive capacity; it cannot process complex or lengthy sentences. Instead of long sentences like, "I'm going to throw a yellow rope toward you now; please grab it tightly with both hands,"

- "Look at me!"
- "Stay calm!"
- "Hold the rope!"
- "Lie on your back!" must be given.

3.6 Principles of Inclusive Communication

3.6.1 Managing Cultural Diversity and Language Barriers: Rescue teams must be prepared for the demographic, physical, and cognitive diversity of the population they are assisting and adopt a flexible communication model that can be adapted to the casualty's specific situation. In multicultural environments, along migrant/refugee transit routes, or in areas with high tourist traffic, language barriers are the most common communication obstacles.

If you do not speak the language of casualty, use universal hand signals and exaggerated yet calming body language. When communicating verbally, common English terms that can be understood worldwide (STOP, LOOK, CATCH, HELP) should be repeated in a loud and clear voice.



3.6.2 Communicating with Child Victims: Children are not simply smaller versions of adults. Their reactions to fear and stress can be much more unpredictable. After pulling a child from the water or while intervening in

shallow water, the rescuer should physically lower themselves to the child's eye level and speak to them. A rescuer standing above the child can increase the child's fear. Additionally, the child's name should be learned, and they should be talk by name at all times.



3.6.3 In-Team Communication and Operational Feedback: Search and rescue is entirely a team effort. The greatest support for stress management comes from the sense of having a trusted team behind you. In this context, the buddy system is of great importance. Rescue personnel must continuously check each other's physical equipment (Buddy Check) and psychological state both before the intervention and while on-site.



The debriefing meeting held after the operation is completed and normal operations resume is crucial for the search and rescue team's professional development. During these meetings, both technical analyses are conducted to identify what was done well and where improvements are needed, and emotional sharing takes place to alleviate the stress caused by the operation.

