

# Criteria of procedures in life-threatening states

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## Summary:

In this work, after presentation of legal basis of first aid, first aid chain issues and principles of medical first aid are described. A scheme for procedure of assessment of the injured person health state, rules to follow during call for professional medical aid, as well as during transport of the patient, are presented.

**Key words:** first aid chain, health state assessment, medical first aid, transport of the injured person.

## 1. Introduction

In everyday life, one may often find themselves in a situation when it becomes necessary to administer first aid to another person. Those may include:

- sudden indisposition,
- an accident at home, an accident at work; as well as
- a random occurrence in the street.

Therefore, it is necessary that as many people as possible be trained in administering first aid to accident victims and be able to administer it in a professional way prior to the arrival of specialist rescue services.

Often it is the professionally administered first aid that is crucial to the health and even the life of an individual.

## 2. Legal basis for administering first aid

Everyone may become a witness to an accident and we are all required to – under the provisions

of the law—to render first aid, which may be decisive for the life of a victim of an accident or indisposition, for their further fate and potential disability.

The Penal Code includes relevant provisions:

**Article 162.**

*§ 1. Whoever does not render assistance to a person who is in a situation threatening an immediate danger of loss of life, serious bodily injury, or a serious impairment thereof, when he is able to so do without exposing himself or another person to the danger of loss of life or serious harm to health shall be subject to the penalty of deprivation of liberty for up to 3 years.*

*§ 2. Whoever does not render assistance necessitating the submission to a medical operation, or under conditions in which the prompt assistance of a responsible authority or person is possible, shall be deemed to have not committed an offence.*

The reason for rendering aid is the occurrence of the situation of necessity (injury, sudden health deterioration). It is insignificant whether or not the injured person is culpable of their situation (a suicide attempt, a result of neglect or carelessness).

Rescue measures are required as long as they do not pose additional risk for the rescuer's life or health; however, potential material losses should be allowed for (the use of one's own first aid kit, damage to one's clothing).

The person administering aid may not, however, neglect their own professional duties insofar as to present danger to the safety of other people. For example: a paramedic carrying a patient may not stop in order to administer aid to someone in the street; a railway gateman may not abandon a railway crossing unsupervised.

In addition, it is required of an individual qualified in first aid that their actions should be executed in the best possible way and in the most effective manner, in compliance with their knowledge.

Criminal responsibility is provided for failure to administer aid or for a conscious act to the detriment of an accident victim. Criminal responsibility is not provided for potential non-culpable complications related to the undertaken rescue measures.

In the civil law, administering aid is considered to be non-commissioned task performance, where the contractor is responsible solely for the damages resulting from a deliberate or explicitly negligent action. In addition, the provisions of civil law make it possible to claim damages or compensation both on the part of the rescuer (for material losses incurred during the action), and on the part of the victim (for potential losses resulting from deliberate or explicitly negligent task performance).

Also the health and safety regulations relating to first aid impose an obligation on employers to organize and render such aid to the employees who have become victims of an accident, poisoning or sudden indisposition in the workplace.

**The Labor Code also imposes an obligation on the employer to organize and administer first aid.**

#### **Article 224.**

*§ 1. Employers whose activities can cause a sudden hazard to health or life of employees shall be obliged to take measures to prevent such hazard arising.*

*§ 2. In the event referred to in paragraph 1 above, the employer shall be obliged to provide:*

- (1) rescue facilities and equipment suitable for a given kind of danger and a service in connection therewith by properly trained persons.*
- (2) first aid to injured persons.*

*§ 3. The provisions of paragraphs 1 and 2 above shall not prejudice the requirements specified in separate provisions in respect of disasters or other extraordinary hazards.*

#### **Article 225.**

*§ 1. Employers shall be obliged to ensure that work which can be especially hazardous to human health or life is performed by at least two persons, for the purpose of security.*

In addition, one should remember that a company is obligated to do the following:

- to secure the scene of an accident until its circumstances and causes have been established,
- to immediately establish the circumstances and causes of the accident and take relevant precautionary measures,
- to immediately notify an inspector of the State Labor Inspection and a prosecutor as well as its own superior unit about each fatal, severe or collective accident at work.

Today, as a result of joining the European Union, the role of a normative organ is performed by the European Resuscitation Council.

Its guidelines relating to medical rescue are updated every three years. An anniversary conference was held in Antwerp in 2000, where the most optimal and the most up-to-date resuscitation standards were set for Europe (in compliance with the WHO standards).

The most recent guidelines relating to the resuscitation procedures were published also by the Heart Failure Society of America and the European Resuscitation Council.

**The new guidelines for procedures in life-threatening states include:**

- cardiopulmonary resuscitation,

- the use of automatic external defibrillators; and
- the performance of ACLS and PALS procedures.

New studies are based on the analysis of the most recent research. Since 2000, when the previous recommendations were published, science has made significant advances in understanding pathophysiology of a sudden cardiac arrest, which provides greater possibilities for its effective prevention and treatment.

The Polish version of the 2005 guidelines for cardiopulmonary resuscitation of adults and children were prepared by the Polish Resuscitation Council. In the event of a sudden cardiac arrest, the current guidelines are based around easy-to-learn rules for rendering first aid, including:

- immediate, knowledgeable application of pressure to the chest; and
- performing mechanical ventilation (30 presses and 2 breaths).

Those changes make it possible to create good conditions to perform an effective defibrillation and restore normal heart action.

Once the heart action has been restored – although the victim remains unconscious – the 2005 guidelines recommend lowering the body temperature in order to create conditions to restore normal brain functions.

### 3. Ability to save life

The chances of survival of an accident victim or an individual suffering from sudden indisposition depends primarily not on the qualified rescue services but on immediately administered first aid by the witnesses present at the scene of the incident.

Even the severely wounded: with breathing difficulties, cardiac arrest, hemorrhages, and those in post-traumatic shock can be rescued if life-sustaining measures with regard to them are taken immediately.

Such procedures are not overly complicated and do not require administering drugs or special apparatuses; only the basic knowledge and good will on the part of the random rescuer are needed.

The person administering first aid may not allow for additional injuries or severe complications and must carry out a rescue operation until professional rescuers arrive at the scene.

#### The idea of the first aid chain additionally includes:

- immediate actions aiming to secure the scene of the accident,
- calling for professional help,
- administering first aid,
- transport and final medical aid.



Figure 1: First aid chain.

Even the most efficiently organized hospital care and comprehensively trained immediate aid teams will be unable to substitute the actions of random rescuers at the scene of an accident.

### 4. Victim rescue training

It is advisable that potential measures to be taken in a sudden situation should be somehow prescribed. One may prepare by means of theoretical and practical acquisition of the ability to administer first aid, as well as by preparing an effective system of communication and the necessary rescue equipment.

Depending on the conditions at the event scene and the needs—one will modify only the scope of their preparations.

The basic knowledge required for rendering pre-medical first aid can be sourced from several independent sources:

- textbooks,
- raining videos; or
- specialist courses.

Pre-medical first aid staff training is included in the obligatory curriculum of the health and safety training (Article 237 of the Labor Code).

There should be additional training courses carried out for the staff in compliance with § 41.1. of the Ordinance of the Minister of Labor and Social Policy of 26 September 1997 on general health and safety regulations (Journal of Laws, No. 129, item 844 of 23, October 1997).

The entities organizing the training courses are required to carry out exercises on training mannequins and to take into account the specificity of a given workplace.

First aid training courses are provided by numerous Rescue Schools along with the Polish Red Cross and the Training Centre of the State Labor Inspection including its subsidiaries.

When selecting textbooks it is best to be guided by the up-to-date works including tested knowledge (source material).

Textbooks published prior to 2006 and textbooks based on standards different from the guidelines of the European Resuscitation Council should not be used (*resuscitation* means the restoration of the action of circulatory and respiratory systems – reanimation).

Training videos should be complementary to practical classes and should always include the trainer's commentary.

One should also remember about the need to constantly update their knowledge and to periodically test the acquired skills.

Training courses should be run by trainers: rescuers holding European certificates, appropriately trained lecturers as well as by training centers.

Elementary training courses should be complemented by issues related to the specificity and the profile of the workplace, e.g.: chemical industry will require a separate curriculum and qualifications in chemical rescue; similarly, the mining industry will run training courses comprising mining rescue. Also the employees of companies dealing with the distribution of toxic chemical substances (such as plant protection products) are required to complete separate specialist courses.

#### **The rules for administering medical first aid. What is medical first aid?**

Medical first aid comprises all the actions performed by an individual (individuals) provi-

ding care until the arrival of professional medical aid (physician, ambulance) or until the sick person has been transported to a health care unit (hospital, ER). These actions may relate to procedures performed directly on the injured person (bandaging, immobilization, reanimation measures, etc.).

Medical first aid includes also any actions performed around the injured person (securing the scene of the accident, protection from further injuries, carrying the victim out of the danger area, disconnecting electricity, ventilating the room, etc.), although these belong rather to the category of general rescue.

The scope of medical first aid encompasses also calling for professional assistance (ambulance) and potentially organizing transport for the victim, if it is impossible (or there is not enough time) to transport the injured person by ambulance.

A very important factor when rendering first aid is to remain calm. Calm is needed both by the victim of the accident and the rescuer as well as by people surrounding them. The conversation with the victim (if they are conscious) should be calm and to the point. This will allow the accident victim or the sick person to feel more secure. During the conversation, it should be established what memories the victim has from the accident, where they can feel the pain, whether or not they have a history of chronic diseases, such as diabetes. One should also identify how and which next of kin should be advised about the situation.

## **5. Situation assessment**

The knowledge of basic first aid rules should be widespread. According to the statistics, a great proportion of deaths caused by accidents or sudden indisposition occur before the professional medical aid arrives. Often performing simple tasks such as changing the victim's body position, clearing the respiratory tract by lifting the chin or stopping a bleeding may be life-saving.

Before performing first aid procedures on an accident victim (or victims) one should swiftly assess the situation.

The following should be done:

- determine the likely cause of the accident and the victim count,
- identify whether or not the victim(s) is/are still in danger,
- ensure that the rescuer (person administering first aid) is not in danger,
- establish if there are other people who might assist in saving the accident victims if need arises,
- determine if it is possible to call for professional medical aid (ambulance), technical assistance (fire service, police, and gas and electricity emergency services).

**PLEASE NOTE: As part of first aid, note should be taken of the start time of the rescue operation – time relations of the operation might be vital for a variety of measures taken afterwards, such as the decision to begin the reanimation procedure.**

Actions taken by the rescuer (person administering first aid) have to be rapid and unhesitating, yet sensible. Hasty actions may put the rescuer at risk from injury and add delay to the provision of aid (e.g. suffering an electric shock as a result of approaching the victim without prior disconnection of electricity source or finding an appropriate isolator).

Parallel to situation assessment and accident circumstances, the health status of the victim (victims) should be identified:

- whether or not they are conscious,
- whether or not they are breathing.

If a victim of an accident or a sudden indisposition is unconscious and not breathing, reanimation procedure should be initiated immediately. Subsequently, the following should be assessed:

- injuries resulting in a hemorrhage,
- potential fractures requiring immobilization.
- Further, if there are other people who can join in helping the victims, the following rescue tasks have to be assigned:
- securing the accident scene (e.g.: placing a warning triangle; turning on the lights; signaling with a flashlight; warning flairs, etc.),
- calling for professional medical aid (ambulance); possibly police, fire service,
- providing a first aid kit – transporting the victim to a safe place (only when absolutely necessary).

Often involving third persons or those mildly injured in supervisory or care tasks prevents or diminishes the possibility of a hysterical reaction or panic breaking out.

#### **Health status assessment (action scheme)**

The basic task of a rescuer (person administering first aid) is to assess the health status of the victim of an accident or a sudden indisposition. The most important task is to determine if the processes decisive for the life of the victim are sustained:

- consciousness,
- clear airways,
- breathing.
- Listen for breathing in the injured person. Simultaneously, perform a visual check for breathing movements of the chest.
  - Injuries have caused bleeding,
  - Fractures and sprains resulting in a shock,
  - Other circumstances which may influence health status – alcohol, acetone.

A random (non-professional) rescuer does not have to look for the pulse of the victim in order to undertake resuscitation (BLS ERC 2000, 2005). Examining the injured person will enable the assessment of their health status.

## **6. Examination scheme**

The examination is carried out with both hands, simultaneously on both sides. Start from the victim's head and neck, the upper and lower limbs.

The head should be closely examined for injuries by palpating gently; look for dents – potential cranial bone fractures.

**PLEASE NOTE:** Do not perform needless movements at spine injuries.

#### **Face**

- Observe skin color – paleness or cyanosis,
- Facial features in victims in a shock become sharper,
- Sweat – in a shock the skin is covered with cold sweat.

#### **Eyes**

- Observe pupil width – are they the same size in both eyes?
- Check reactions to light, e.g. by directing a flashlight at them—the pupils should narrow.



Other reaction may indicate brain damage,

- Check for any injuries or burns to the conjunctivae.

### Ears

- Observe skin color, cyanosis may indicate hypoxemia,
- Check for a blood and serum discharge from the ears, which occurs, for example, in cranial bone fractures.

### Nose

- A blood and serum discharge from the nose may indicate cranial bone fractures,
- Check for a nosebleed (nose injury—blood running from the nose to the throat may block the airways),
- Check for unrestrained breathing, wheezing, or creaking

### Lips

- Check for foreign bodies in the mouth (such as a prosthesis which needs to be removed),
- Mouth odor,
- Bitten tongue (indicative of epilepsy),
- Lip cyanosis – an early symptom of hypoxia.

### Neck

- Palpate the neck gently, run your fingers down the spine, from the skull to the back, looking for painful spots or potential deformations which might indicate spine fracture,
- Check the pulse on the carotid artery.

### Undressing

In order to perform examination or apply bandaging it may become necessary to undress the sick person.

The following should be done:

- undress them only as far as it is necessary to render aid,
- ensure privacy for the victim if possible,
- if possible, undress them without cutting through clothing; any potential cuts should be made along the seams,
- start removing the coat, jacket or shirt from the healthy limb,
- remove the trousers having cut through them and having lifted the hips gently,
- remove the shoes while holding the leg at the ankle.

### Body

- Observe the chest movements when breathing; is the chest moving equally on both sides (if it is impossible to undress and observe the sick person, you may determine the chest movements by touching the chest with your hands on both sides—unequal chest movements may indicate rib fractures and/or pulmonary edema),
- Ensure that there are no injuries to the chest or the abdominal cavity,
- Check for painful spots, sensitive to touch, by gently palpating the chest
- Palpate the pelvic bones, hold the pelvis with both hands on both sides and check if this causes pain,
- Check whether or not the accident victim is urinating or defecating unconsciously and if there is any bleeding,
- Check by delicately moving your hand down the spine if there are any particularly painful spots or deformations which may indicate spine fractures.

### Limbs

- Palpate for particularly painful spots or limb deformations which may be indicative of fractures,
- Ask the victim to move their fingers, hands, feet – inability to do so may indicate a spine or spinal cord injury
- Check the limbs for injuries and the correct temperature,
- Check whether the limbs are in a natural position, if there are no irregular bends in limb joints.

### Calling for professional help

Alongside the rescue tasks performed while administering first aid, one should think of calling for professional aid (ambulance). Searching for a phone and notifying about a sudden indisposition is best left to a third person. Ask them to confirm the fact of calling for an ambulance. If there are no other people who could call for an ambulance, then the life functions of the victim(s) should be ensured first (breathing, circulation, appropriate positioning, stopping the bleeding, etc.). Only then professional help should be called for. When calling for an ambulance by phone, vital information should be given:

**WHERE** the accident has occurred – a fairly precise description of the address or the place where the caller will be waiting for the ambulance (Always include the following: city/town, neighborhood, street, house number, apartment number – or a company name or the road number – the name of the nearest town, mile marker); **HOW MANY** victims there are, **WHAT HAS HAPPENED:** a description of the accident, if there is still danger; if possible, advise about the victims' type of injuries. Finally the caller should identify themselves (first and last name) and the phone number used for the call.

The information should be succinct and should be given in a calm manner. The person who receives the call (a dispatcher) may request additional information which should be provided if possible.

If need arises to additionally call for the fire service (general rescue), police, technical services, gas and electricity emergency services, this should be done by the ambulance service or the Emergency Notification Center dispatcher.

### Transporting the victim

The basic rule for transporting accident victims is to avoid further, additional injuries.

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If the victim is not at risk from a direct danger, it is better to wait for the ambulance to arrive to provide professional aid. When it is impossible to leave the injured person at the accident scene or it is impossible to call for professional aid, the victim should be evacuated.



**Figure 2:** Example of the ways to transport victims

All the tasks should be performed with great care. The sick person may be carried away or pulled away from the accident scene using a blanket. Example of the ways to transport victims is shown below.

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