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Medical Education Support Center

General first aid principles

The chain of survival

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SUBJECT CONTENT

1. General first aid principles. The chain of survival.

2. Unresponsive patient. Main life saving procedures.
3. BLS – Basic Life Support I. AED (Automated external defibrillator).
4. BLS – Basic Life Support II. AED (Automated external defibrillator).
5. Life threatening traumatic events – first aid (bleeding, fractures, amputations, thermal burns, electric shock).
6. Life threatening non-traumatic events- first aid (heart stroke, stroke, anaphylaxis, asthma, intoxication, seizures).
7. Verifying of knowledge - test and evaluation of CPR.

FIRST AID

Definition: First aid is the **initial care** provided for an acute illness or injury.

First aid can be initiated **by anyone in any situation**, including self-care, **before arriving or activating** of emergency medical services.

Goals:

1. preserve life
2. prevent further injury
3. promote recovery

Any first aid is better than none!!!

Also incomplete first aid is better than none!!!

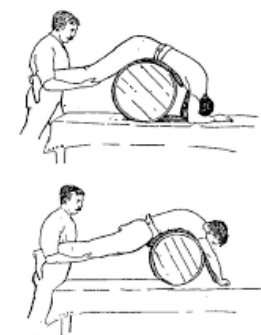
FIRST AID HISTORY I.

- First mentions of first aid from **Galen** times
- **11th century – religious knights** (Order of St. John, Maltese knights, Teutonic German knights, Military and Hospitaller Order of St.Lazarus of Jerusalem)
 - provided first aid to the pilgrims and to their knights, were trained to provide first aid when they endured battle wounds from war.
- 1767 - Society for the preservation of life from accidents in water, Amsterdam
- 1772 – Paris city facility of drowning rescue
- 1774 - Royal Human Society of London
- **1870** -Johannes Friedrich August von **Esmarch** (1823-1908) –Prussian military surgeon, first established the term „**erste hilfe**„ (**first aid**) and introduced formalized first aid to the military, trained soldiers in the Franco-Prussian War on care for wounded comrades using pre-learnt bandaging and splinting skills

FIRST AID HISTORY II.

- Jean Dominique **Larrey** (1766-1842) – Napoleon's surgeon, created ambulance corps - „[*ambulance volantes*](#)“ – „*flying ambulance*“ - included medical assistants, who provided first aid in battle.
 - The term „[*triage*](#)“ - the process, which prioritizes immediate medical care for most injured patients, and for whom benefit most from it.
- Florence **Nightingale** (1820- 1910) – founder of modern nursing
- Henry **Dunant** (1828-1910) – Swiss co-founder of **Red Cross** (1863)
 - 23.8.1864 - [*First Geneva Convention*](#), signed by 12 states
- 1961 – modern time of CPR – fathers of CPR :
 - P. Safar**- mouth-to- mouth breathing
 - Kouwenhoven** – closed-chest cardiac massage, invention of the cardiac defibrillator

History of drowning resuscitation



The "barrel" method.
Top: Expiratory phase.
Left: Commencement
of inspiratory phase.
Reproduced from
the Lancet, 1909.

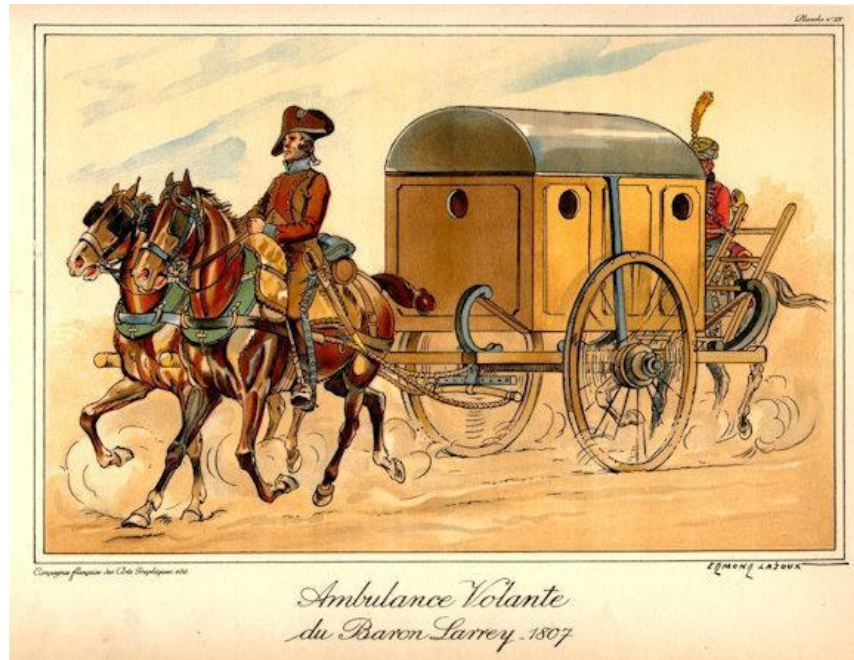
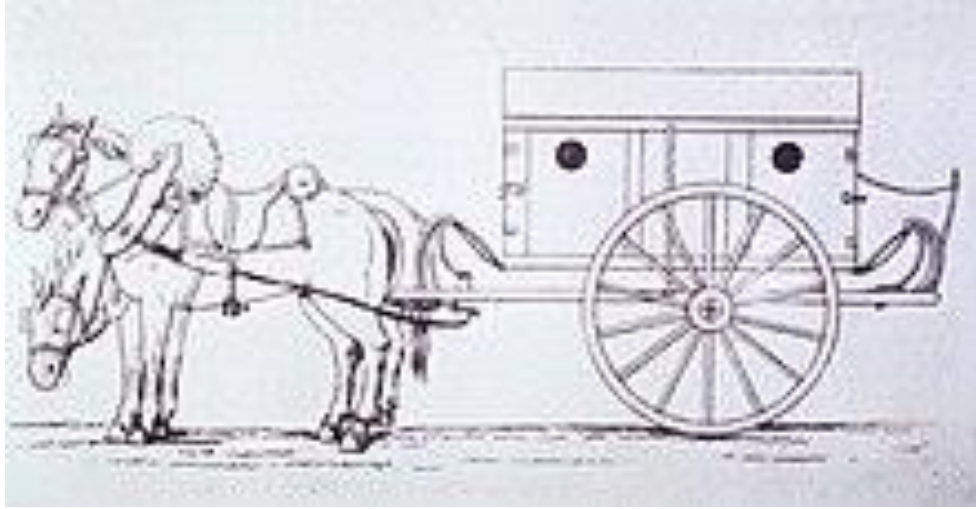


Conference Surfing Medicine EASD - Sagres 2013



alamy stock photo





1888 – Johnson & Johnson’s First Aid Kit



STAR OF LIFE – symbol of emergency medical services



- registration: 1. februar 1977, USA
- six branches: represent the six main tasks of emergency services:
 - Detection:** the first rescuers on the scene (untrained civilians, those involved in the incident), observe the scene, understand the problem, identify the dangers.
 - Reporting:** call for professional help
 - Response:** the first rescuers provide [first aid](#) and immediate care.
 - On scene care:** the EMS personnel arrive and provide immediate care
 - Care in transit:** transfer of patient to a [hospital](#) via an ambulance or helicopter for specialized care. Providing medical care during transport.
 - Transfer to definitive care:** appropriate specialized care is provided at the hospital.
- In the middle: Rod of Asclepius – an ancient symbol of medicine
- Three arms: basic life functions: consciousness - breathing - circulation
- On ambulances, medical personnel uniforms, and other objects associated with emergency medicine or first aid

Parts of the EMS Symbol - "The Star of Life"

At center, The Rod of Asclepius - ancient Greek symbol of healing

1 - Early Detection

2 - Early Reporting

3 - Early Response

4 - On Scene Care

6 - Transfer to
Definitive Care

5 - Care in Transit





- ILCOR – International Liaison Committee on Resuscitation
 - 1992 – protocols of CPR and ECC



- ERC – European Resuscitation Council
 - 1989 – ERC Guidelines á 5 years
 - ERC Guidelines 2021



- National Resuscitation Council
 - Slovak Resuscitation Council

FIRST AID

- WHO?
- WHEN?
- WHOM?
- HOW?
- WHY?



...provide first aid

WHO should provide first aid?

Every person regardless of education and profession

According his **skills and possibilities**

Not to endanger his own health and the live/health of other people

Emphasis on the **safety** of the first aid provider and rescuer

FAILURE to PROVIDE ASSISTANCE SECTION

§ 177

- (1) Any person who fails to provide the necessary assistance to a person whose life is in danger, or who shows symptoms of a serious health problem, although he can do so **without endangering himself or another**, shall be liable to a term of imprisonment of up to two years.
 - (2) Any person who fails to provide the necessary assistance to a person whose life is in danger, or who shows symptoms of a serious health problem, although he has such **obligation arising from his employment**, shall be liable to a term of imprisonment of between six months to three years
- medical employees, firemen, policemen....

FAILURE to PROVIDE ASSISTANCE SECTION

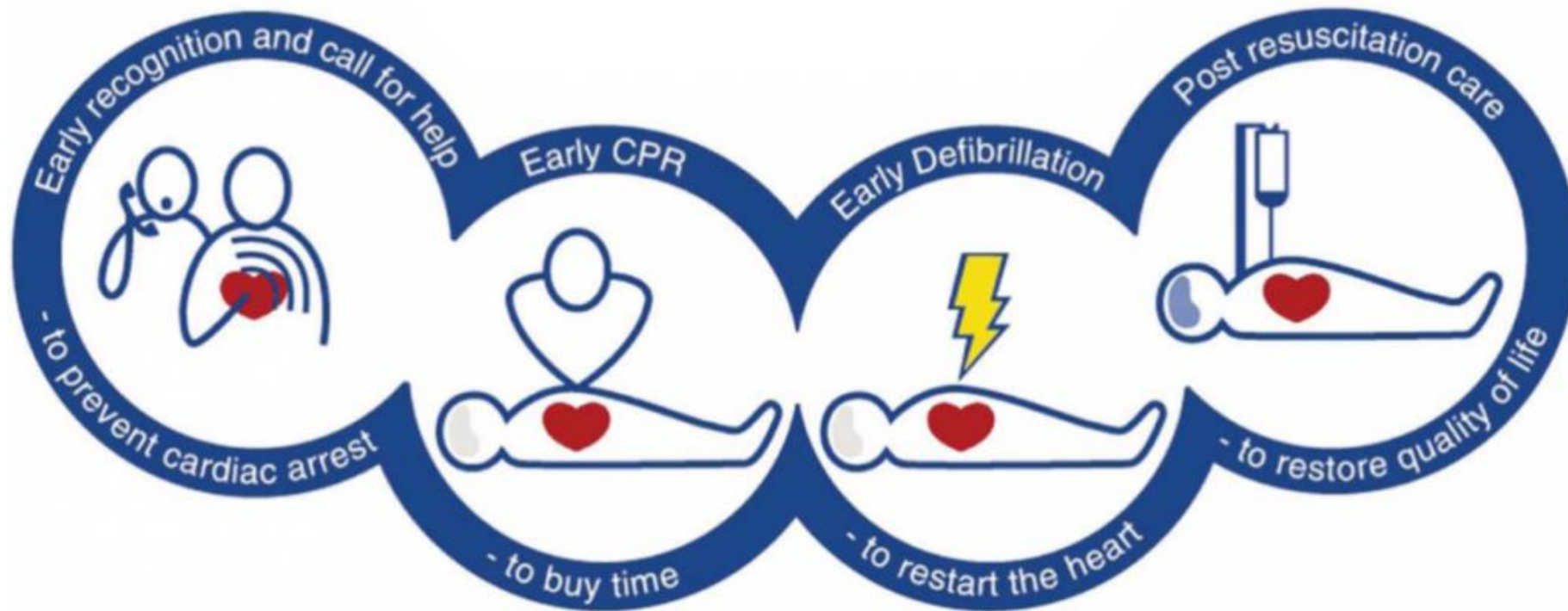
§ 178

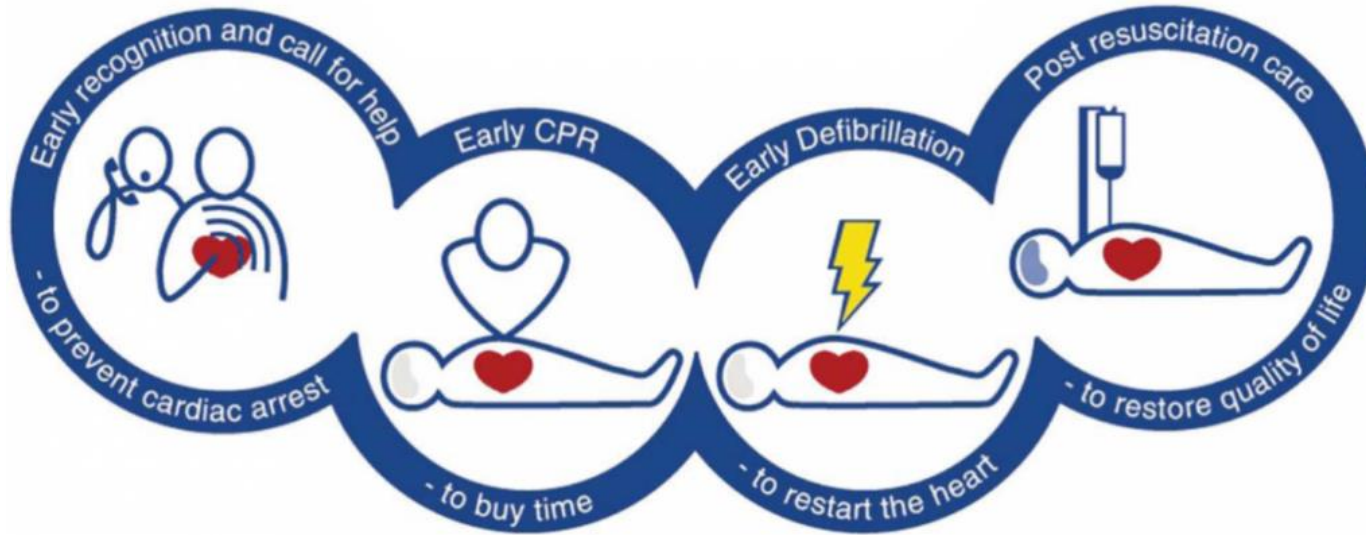
A driver who fails to provide the necessary assistance to a person injured in a traffic accident in which the driver himself was involved, although he can do so **without endangering himself or another**, shall be liable to a term of imprisonment of up to three years.

Act 300/2005 Coll. of 20 May 2005 CRIMINAL CODE

CHAIN OF SURVIVAL

- chain of events that must occur in rapid succession to maximize the chances of survival
- each link is critical and independent
- **Chain of survival is only as strong as its weakest link**





The original four links of the chain of survival comprised:

- (1) early access**—to activate the emergency medical services (EMS)
- (2) early basic life support (BLS)** - to slow the rate of deterioration of the brain and heart, and buy time to enable defibrillation
- (3) early defibrillation**—to restore a perfusing rhythm
- (4) early advanced life support (ALS)**—to stabilize the patient

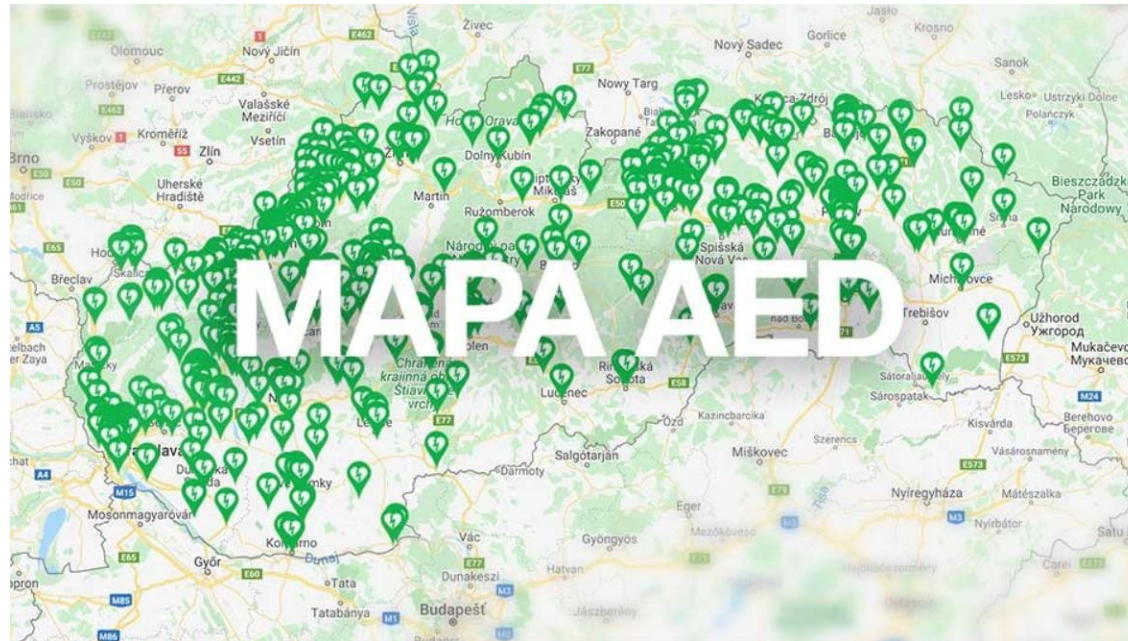


Chain of Survival - 5 links

- (1) **early access**—to recognize the emergency and decide to act, call for help
- (2) **early basic life support (BLS)** – to start CPR immediately
- (3) **early defibrillation** - as soon as an AED is available
- (4) **early advanced life support (ALS)**
- (5) **early post resuscitative care** - multidisciplinary system of care

AUTOMATED EXTERNAL DEFIBRILLATOR (AED)

AED - an electronic device, which is able automatically diagnoses the life-threatening cardiac arrhythmia and is able to treat them through [defibrillation](#) - the application of electricity which stops the arrhythmia



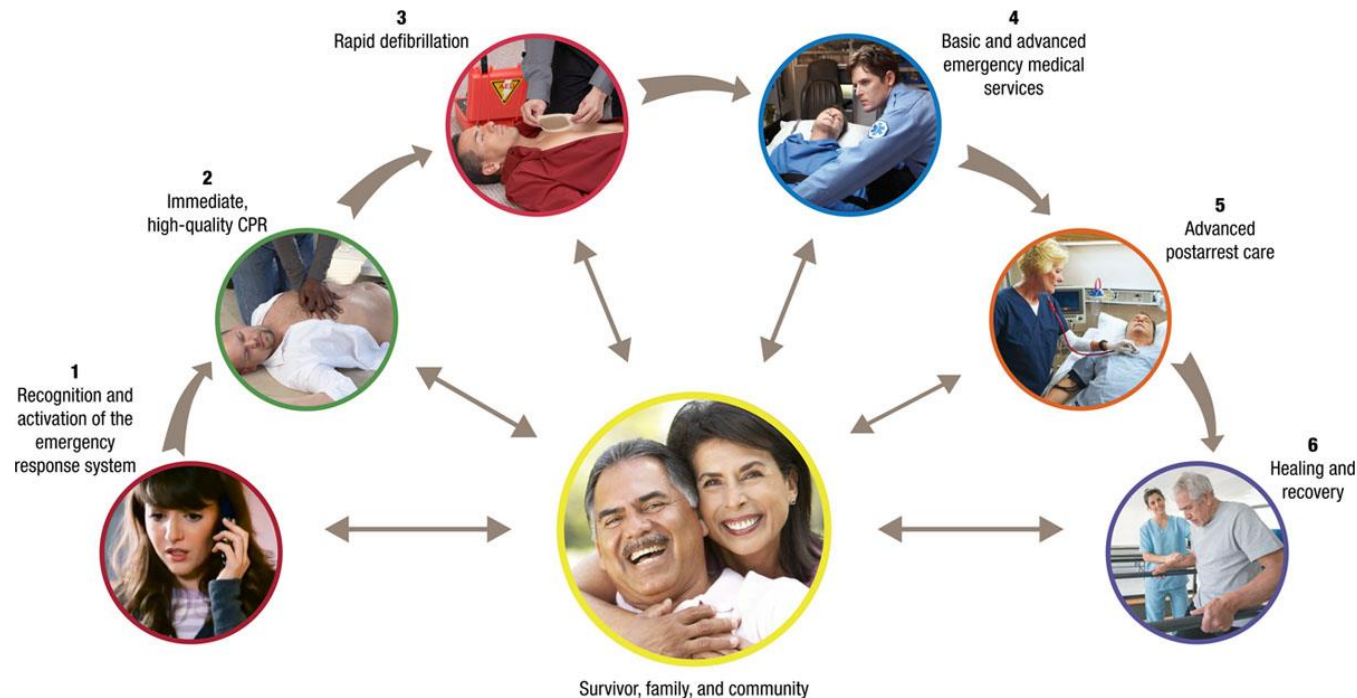
<https://155.sk/mapa-aed/>



Bystander CPR and AED use can significantly improve outcomes from cardiac arrest.

Greater than **50-70%** of Sudden Cardiac Arrest victims survive if **defibrillation occurs within the first 5 minutes.**

For every minute that passes, there is a 10% less chance of survival.



Activating the Emergency Services

- Emergency Medical Services (EMS) - Záchranná zdravotná služba 155, **112**
- Fire and Rescue Service -Hasičský a záchranný zbor 150, **112**
- Police Force 158, **112**
- Integrated Rescue System (IRS) **112**
- Power failure services, gas breakdown services, etc... in case of necessity





Integrated Rescue System (IRS)

- is determined for **co-ordination of rescue** and clean-up operations in case, where a situation **requires operation of forces and means of several bodies, e.g. firefighters, police, medical rescue service and other bodies**, or in case, where the rescue and clean-up operation is necessary to be **co-ordinated from the Ministry of Interior or by a leader of region's level**, or by mayors of municipalities with extended responsibilities.
- Goals - to provide immediate and adequate help in life/health threatening events and in situations of threat to property

Integrated Rescue System of Slovak Republic

- **Basic rescue component parts:**
 - Fire and Rescue Service (FaRS)
 - Providers of Emergency Medical Service (EMS)
 - Mountain Rescue Service
 - Mine Rescue Service
 - Control and chemical laboratories of civil protection
- **Other rescue component parts:**
 - Armed Forces of the Slovak Republic
 - Municipal or regional fire brigades
 - Plant fire units, plant fire brigades
 - Civil protection units
 - Municipal police
 - Slovak Red Cross
 - Bodies performing government supervision
 - Other legal entities and natural persons whose subject of activity is provision of aid in life, health and property protection matters.
- **Police corps**
- **Ministry of Interior of the Slovak Republic, Ministry of Health of the Slovak Republic, and regional authorities**

To WHOM first aid should be provided?

Any injured or sick person.

Rescuer has to know:

- **Assess** the situation, **not endanger** himself or others bystanders, **STAY SAFE**
- **Recognise** symptoms of injury or illness
- **Provide** first aid
- **Activate** emergency medical services and transfer affected person to EMS

In the case of several injuries to one affected person or to several injured persons, first **recognize and address to directly life-threatening injuries or conditions** and after providing assistance look for other injuries.

LIFE THREATENING CONDITIONS

- respiratory arrest
- cardiac arrest
- massive bleeding
- unconsciousness
- shock

EXAMINATION of the affected person I.

Use all your senses!!! (sight, hearing, touch, smell, taste)

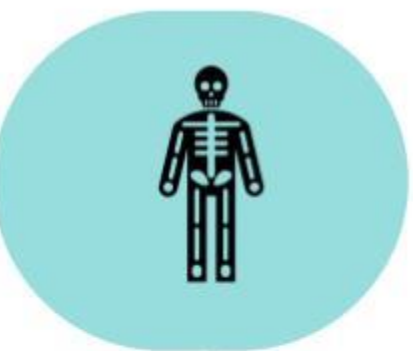
1. First examination

- goals: **identification life threatening conditions**
- in 30 sec.
- assess:
 - **consciousness**
 - **respiration**
 - **circulation**
 - **signs of bleeding**

EXAMINATION of the affected person II.

2. Second examination

- goals: detection of symptoms that do not immediately threaten the life, but can cause complications
- in 1-2 min
- How?
 - Take a history – ask for subjective symptoms
 - Examine the whole person – from head to toe – objective symptoms
 - head and neck
 - chest
 - abdomen
 - extremities
 - back and backbone
 - looking for warning symbols like bracelet, warning card, list of medications....



- Check for obstructions
- Consider C-Spine

- Check for rise and fall
- Check for work of breathing

- Check for bleeding
- Check colour, warmth, cap refill

- Check AVPU
- Check pupil
- Check BGL

- Expose & keep warm
- Inspect posterior surfaces

ABCDE chart

	EXAMINATION	INTERVENTION	GOAL
A 	• airway noises • position of head • foreign body • fluid, secretions • oedema	• open • suction • secure • O₂	Patent airway
B 	• look - listen - feel approach • respiratory rate and effort • breath and added sounds • subcutaneous emphysema • symmetry of chest movement • tracheal deviation • jugular vein distention • cyanosis SpO₂ - ETCO₂ - USG - X-ray - CT	• O₂ according to SpO₂ • pneumothorax therapy • inhalation therapy • ventilation	Sufficient oxygenation and ventilation
C 	• heart rate • blood pressure • capillary refill time • bleeding • skin colour • blood samples • diuresis ECG - USG - CT - X-ray	• I.V. / I.O. access • control of bleeding • massive haemorrhage protocol • fluids • drugs • transfusion	Stabilization of circulation
D 	• AVPU / GCS • reactivity and symmetry of pupils • blood glucose level • basic neurological examination • posture • toxicological examination	• glucose • antidotes	Evaluation of neurological state
E 	• head to toe examination • medical history • temperature • injuries • oedemas • scars • signs of drug abuse • skin changes • signs of infection/sepsis	• identified cause therapy • thermomanagement • trauma treatment • insertion of NGT, IUC	Revealing other symptoms and thermomanagement

CALL FOR HELP

- Shout „**HELP**“
- Call **112 emergency number of IRS/ 155 emergency number of operation centre of EMS**

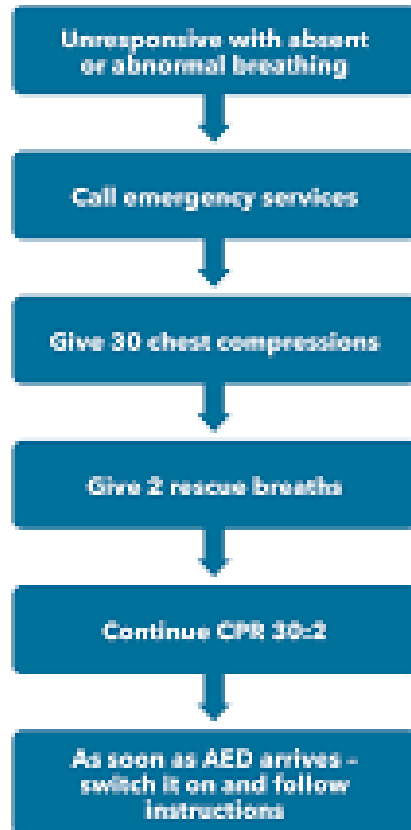
Tell:

- **Your name and phone number**
- **What's happened, main symptoms**
- **Patient's address, locality of accident, some landmarks**
- **Number, gender and approximate age of affected persons, types of injuries**
- **Some details if you know**
- **Wait for questions**

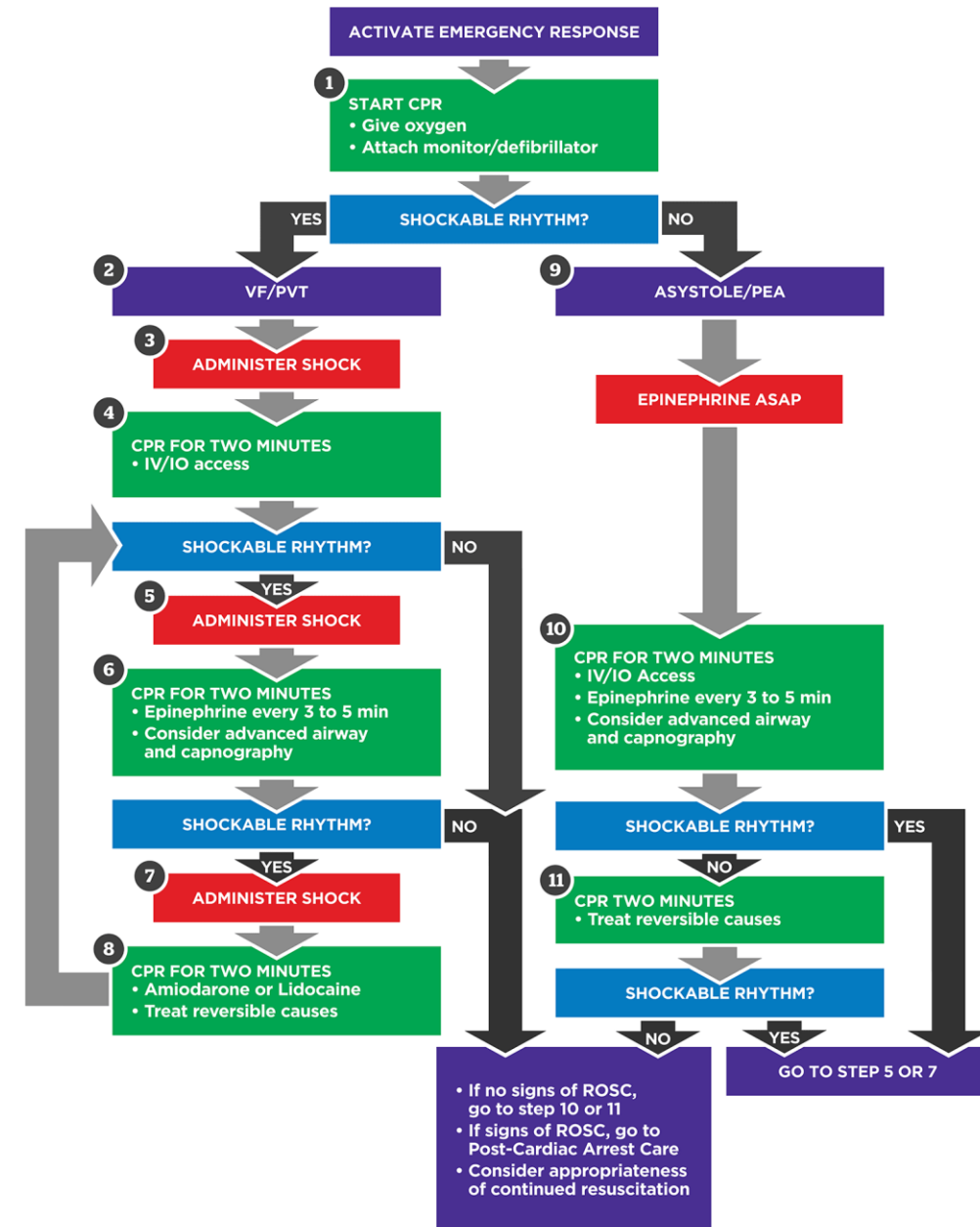
HOW to provide first aid?

It is the goal and content of this subject.

BASIC LIFE SUPPORT



Paediatric basic life support

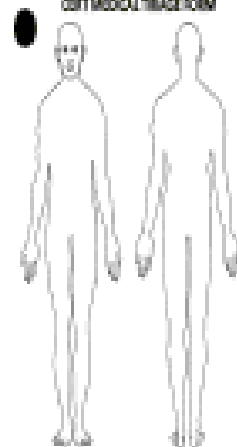


TRIAGE

- the process, which prioritizes immediate medical care for most injured patients, and for whom benefit most from it
- it is most often required on the battlefield, during a pandemic or at peacetime in a mass disasters/mass-casualty incident
- aim - to sort patients into several groups according severity of injuries and priority of medical care and transfer to hospital
- should start as soon as possible and before transportation becomes available
- usually by „first“ person from EMS in accident site, who make initial assessment
- each patient may be labelled - marked with **colored flagging tape** or with **marker pens, triage tags**

	1 Red Resuscitation (0min)	2 Orange Urgent (15min)	3 Yellow Less urgent (60min)	4 Green Not urgent (180min)
A	Obstructed airway Stridor	Threatened airway		
B	SpO ₂ < 80 RR > 35 or < 8	SpO ₂ : 80-89 RR: 31 - 35	SpO ₂ : 90-94 RR: 26 - 30	SpO ₂ ≥ 95 RR: 8 – 25
C	HR > 130 BP _{sys} < 80	HR: 121 – 130 HR < 40 BT _{sys} : 80 – 89	HR: 111 – 120 HR: 40 - 49	HR: 50 – 110
D	GCS ≤ 8	GCS: 9 – 13	GCS = 14	GCS = 15
E		Tp > 40 Tp < 32	Tp: 38.1 – 40.0 Tp: 32 – 34	Tp: 34.1 – 38.0

CERT MEDICAL TRIAGE FORM



LOCATION:

NAME (IF KNOWN):

APPROX. AGE:

GENDER:

DAY/ TIME:

DIAGNOSIS/ TREATMENT

TAG NO.

MEDIC ALERT/ SPECIAL INSTRUCTIONS

P-0 DECEASED

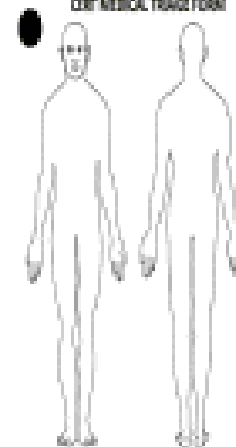
P-1 IMMEDIATE

P-2 DELAYED

P-3 HOLD

Safe Referral - CERT 8016-300

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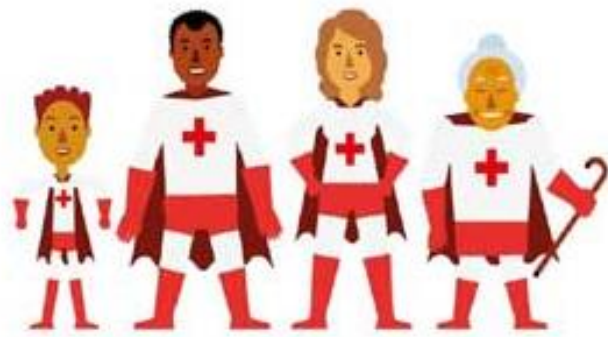
P-2 DELAYED

P-3 HOLD

Safe Referral - CERT 8016-300

CONCLUSION

- Rapid and correct assessment of situation!
- **STAY SAFE!**
- **Not be afraid to provide first aid**
- **Activate emergency medical services**



BE A HERO.
SAVE LIVES

First aid is for everyone, everywhere