

MINISTRY OF THE HEALTH CARE OF UKRAINE
LVIV DANYLO HALYTSKY NATIONAL MEDICAL
UNIVERSITY
GENERAL SURGERY UNIT

**Methodical directions
to practical lesson**

for students of III course medical faculty

MODULE II

**Introduction to Surgery. Emergency (urgent) states.
Fundamentals of Anesthesiology and Resuscitation.**

SEMANTIC MODULE

**General Anesthesiology and Resuscitation
Theme 10**

Resuscitation measures of surgical patients

Academic discipline:
GENERAL SURGERY
III course medical faculty

Amount of hours - 2

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Lviv, 2022

Methodical directions were approved on meeting of the Methodical Commission of surgical disciplines of Lviv Danylo Halytsky National Medical University № 11 for 15.04.2021 year.

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CARDIO – PULMONARY RESUSCITATION

General questions of terminology

TERMINAL STATE (CONDITION) – it is a last stage of the life (border between life and death), in which distinguish preagony, terminal pause, agony and clinical death. For terminal state (condition) is characteristic an extreme degree of oppression of the vital functions of human organism and, first of all, cardiac and respiratory. Terminal states may have a reverse and irreversible character (picture 1).

Preagonal state (Preagony) - it is initial stage of the dying process, that characterized by sharp braking of the central nervous system function, breathing and blood circulating with possible development of coma. Presented and observed by arterial hypotension and expressed disorders of microcirculation. Pulse is frequent, of the weak filling and tension. Cyanosis or paleness of the skin are determined. Breathing is superficial, frequent, sometimes – periodic.

Terminal pause – transitional period between preagony and agony, for which proper a sharp acceleration of breathing with subsequent complete and sudden stopping (arrest) with fast dying of corneal reflexes, further braking of the brain cortex layer and exclusion its from regulation of the vital functions of organism.

Agony - characterized by short – term activation of all structures of the brain. Herewith is noted a short series of breaths with increasing amplitude of respiratory movements, in act of breathing involved not only muscles of the chest, but muscles of neck, mouth also. However, reaching a maximum, the respiratory movements are reduced and stop quickly. The consciousness and eye reflexes are absent, cardiac tones are deaf, arterial pressure is not determined. Pulse on peripheral vessels is threadlike or absent; more often – transpires only on carotid arteries. Further exclusion of the brain cortex and transition of regulatory functions to bulbar and spinal centers leads to short term mobilization of all last possibilities of organism, that presented in pulsating of all central arteries and acceleration of cardiac (heart) rate. Possible a short term restoration of consciousness, but later occurs arrest of the heart and breathing.

Clinical death - transitional state between life and death, which begins from moment of stopping of function of the central nervous system, bloodstream and breathing and continues to development of irreversible changes in the vital important organs, especially in tissues of the brain. The processes of swap occur on decreased level by way of anaerobic glycolysis with accumulation of underoxidized products of metabolism. The reserve of glycogen in the brain cortex are exhausted during 4 – 5 minutes and nervous tissue dies.

Distinguish the main and additional signs of clinical death. To the main belong absence of pulse on carotid arteries (picture 2) and spontaneous breathing, dilation of the eye pupils, without their reaction on light. To additional include absence of consciousness, paleness or cyanosis of skin, areflexia, atony.

Duration of clinical death in normal conditions
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is 3 – 4 minutes!
Making of diagnosis «clinical death» must be in period of time no more than 8 – 10 seconds !

Social death - partially reverse state, in which function of the brain cortex is lost, while saving the vegetative functions.

Biological death – irreversible state (condition), for which is characteristic dying of all tissues of human organism, in connection with that a vitalization of organism, as integral system, is impossible. Characterized by appearance of the corpses spots, corpses hardening (rigor mortis), dryness of cornea, softening of the eye balls.

The main signs of terminal states (conditions)

Symptoms (signs)	PREAGONY	AGONY	CLINICAL DEATH
Breathing	+	+, -	-
Pulse	+	+, -	-
Blood (arterial) pressure	+	-	-
Condition of the eye pupils	Dilated	More dilated	Considerably dilated
Cardiac activity	+	-	-
Consciousness	+	-	-

TERMINAL STATES
(pathologic processes can have reverse character)

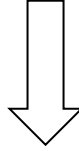
Reverse:



- **preagony**

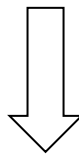
- **agony**
- **clinical death**

Partially reverse condition:



- **social death**

Irreversible condition:



- **biological death**

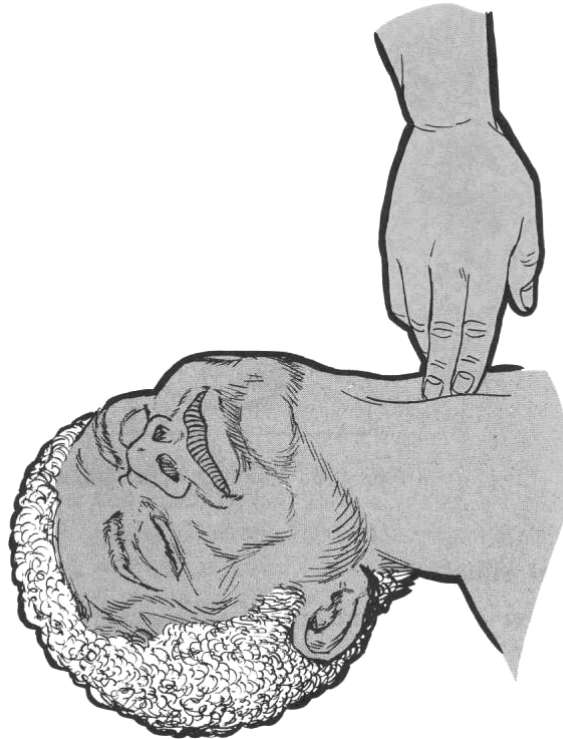
Picture 1. Reverse and irreversible character of terminal states

Spontaneous reasons of the sudden arrest of bloodstream:

1. Ischemic heart disease, in stage of deterioration, acute myocardial infarction;
2. Acute respiratory insufficiency, asphyxia;
3. Electrical trauma, drowning, damages of the heart;
4. Cases of increasing of the vagus nerve tone on background of hypoxia and hypercapnia;
5. Massive thromboembolism of the pulmonary artery;
6. Gross violations (disorders) of electrolytes balance, hypo – and hyperkaleplasmia;
7. Overdose of cardiotonic inhalation narcotics (drugs);
8. Allergic shock;
9. Intoxication by cardiac glycosides, overdose or increased sensitivity to antiarrhythmic preparations (Khinidin, Novocainamid), intravenous introduction of sympathomimetics (Adrenalin), parasympathomimetics (Proserin), fast intravenous introduction of Euphyllin;
10. Catheterization of the heart, angiography, some endoscopic manipulations (procedures);
11. Operations on the heart.

After arrest of bloodstream occurs loss of consciousness, that accompanied by short term attack of cramps and further total atony. In 15- 20 seconds after arrest

of the blood circulating stops spontaneous breathing and is coming a dilatation of the eye pupils.



Picture. 2. Determination of pulsating on carotid artery.

Cardio – pulmonary resuscitation

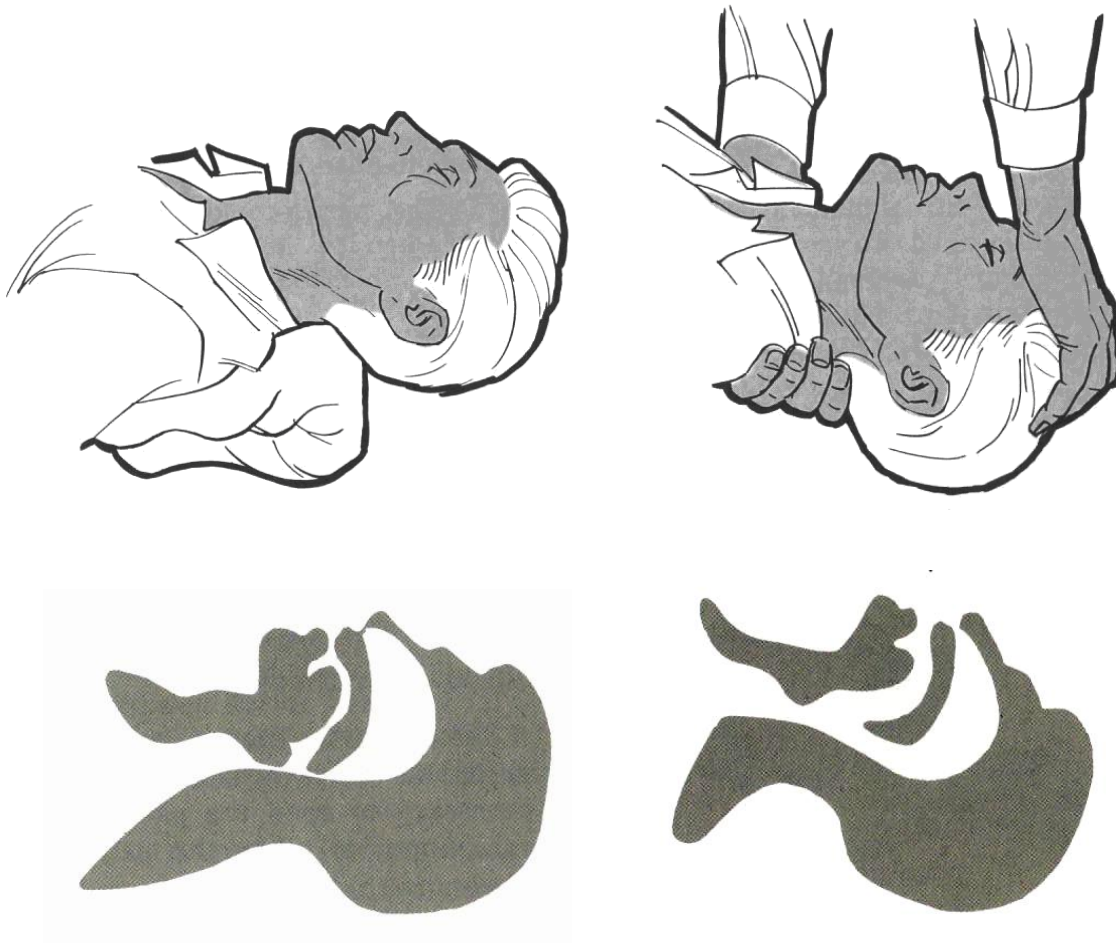
The indication to performing of cardio – pulmonary resuscitation is clinical death of patient (victim) independently of etiology, that its caused.

For effective performing of cardio – pulmonary resuscitation necessary to put a victim (patient) on the low hard base (level of rescuer knees): on the ground, shield, couch. Necessary to unbutton all clothes, that compresses chest and abdomen.

One of the main problems, that appears before beginning of cardio – pulmonary resuscitation in persons without consciousness, is obturation of respiratory paths by radix (root) of the tongue and epiglottis owing to muscular atony. Obturation of respiratory paths arises practically in all cases, independently of the victims position, in connection with that, first of all, necessary to provide a permeability of respiratory paths. The «Golden standard» of restoration of the respiratory paths passability (permeability) is triple maneuver for Peter Safar, that foresees:

1. Rejection (deviation) of the head to back maximally (I stage);
2. Movement (displacement) of the jaw ahead (II stage);
3. Opening of mouth (oral cavity) (III stage).

Rejection of the head carry out standing on the knees from the side of victim, which is provided horizontal position on the hard, straight surface. In cases, when the patient is lying on the soft bed, under the chest establish a hard shield. One hand [of the same side of body surface, near which situated rescuer] rescuer moves under patients neck, and other places on his frontal area, after than implement one - moment movements by two hands, directed on extension of the head and deviation its backward. If possible, under the neck and back is desirable to put tightly rolled towel, pillow, blanket (linen) and so on (picture 3).



Picture 3. Method of the head rejection (deviation)

Movement of the jaw carried out as follows. Standing behind the victim, ascending branch of the jaw grasp by II, III and IV fingers both hands; herewith I fingers resist to chin. The jaw withdraw ahead so, that upper and lower teeth were in the same plane (picture 4).



Picture 4. Method of the jaw withdrawal to the front

Opening of the mouth can be realized by next methods also:

a) **helping method of the crossed fingers**, which consists in follow: the rescuer is standing near the head or from the side, inserts the second finger to the angle of victim mouth and presses in direction, opposite to the upper teeth. Near the II finger introduce I finger, that moves in direction of the upper teeth, resulting – the mouth opens quickly (picture 5).

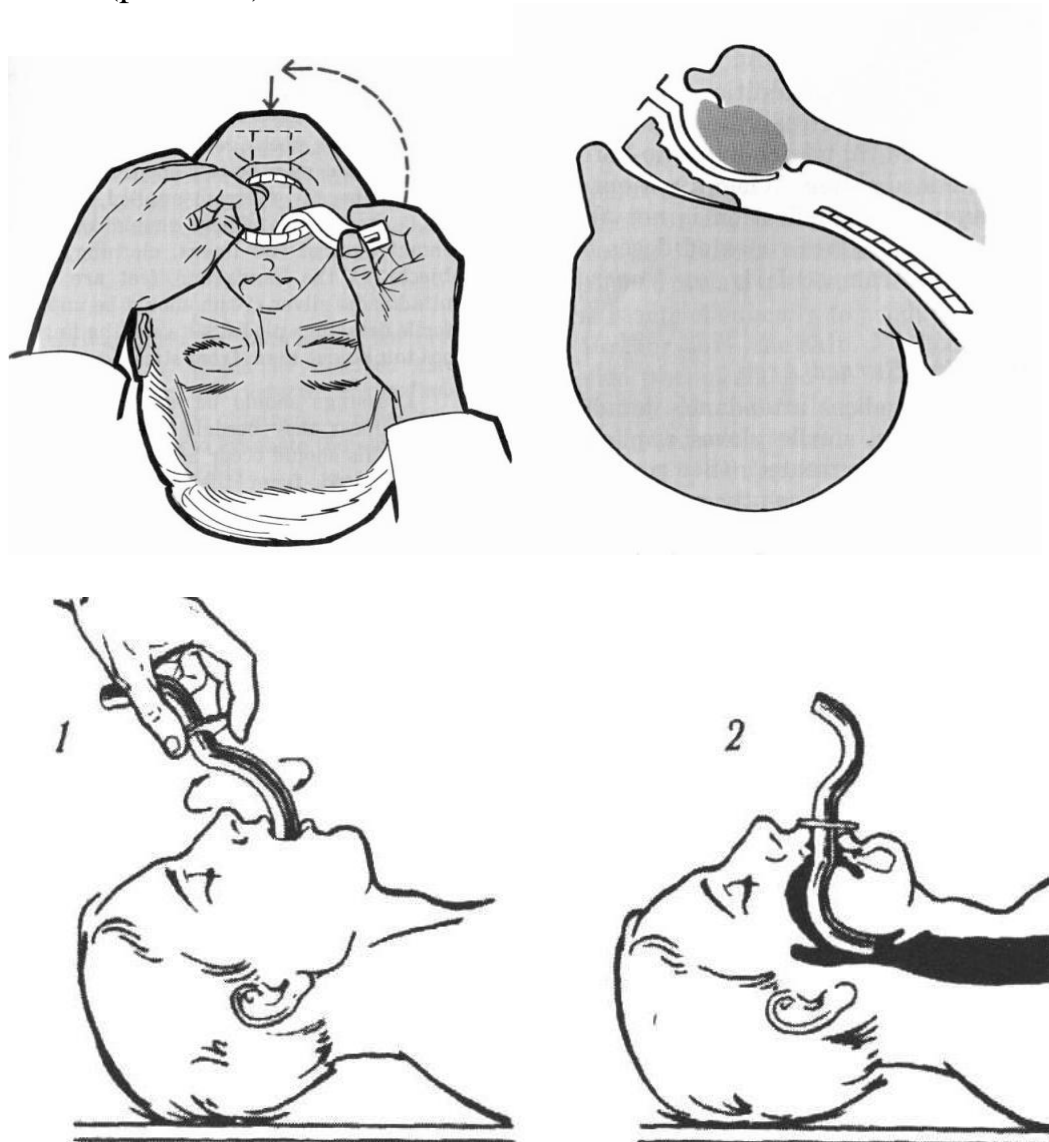


Picture 5. Method of the mouth opening

6) second method carried out by way of **elevation of the tongue and jaw**, however used less frequently. The I (first) finger introduce to the oral cavity and pharynx of patient from the right or left side and, in the same time, by its tip elevate the tongue root. The mandible grasps by other fingers in area of chin and take out its ahead.

Restoration of passability of respiratory paths is possible to provide by usage of air ducts of Huedell and Safar (S- like air duct) also.

Necessary to pick up the needed size of air duct – distance from its shield to lap of ear. After forced opening of mouth the air duct insert by convexity down, sliding along hard palate to level of shield. After then device return on 180 grades so, that its curvature coincided with curvature of the tongue back. Safars airduct used for performing of artificial ventilation of the lungs by method of «from mouth – to air duct». The Huedell and Safars air ducts can be adequate replacement of two components of the «triple maneuver» - opening of mouth and movement of the jaw ahead (picture 6).



Picture 6. Restoration of respiratory paths passability using the air ducts of Huedell (from above) and Safar (from below)

All process of cardiopulmonary resuscitation consists of three main stages :

A - control and ensuring of passability of respiratory parths;

B – artificial ventilation of the lungs (ALV);

C – indirect (closed) massage of the heart.

Stage A – control and providing of respiratory paths passability

During carrying out of resuscitation measures sometimes arises necessity of removing of the foreign bodies from the oral cavity and throat, larynx.

The firm foreign bodies remove from the oral cavity by two fingers or subsidiary means (napkin, kerchief, towel), which wrap fingers and insert theirs to the oral cavity.

Fluids, aspirated to respiratory paths, remove, mainly, helping creation of drainage position for patient. During drowning, aspiration of blood, regurgitation of the stomach content, the adult placed in this manner, that the head was below the feet on 30 – 40 cm. The head should be returned down. The victim or patient is possible to bend through knees of resuscitator.

In small children the drainage realizes by way of raising them for legs upside down.

For removing of the foreign bodies from larynx exist the next methods:

a) **impact of the back.** The meaning consists of , that rescuer few times knocks by base of the palm in interscapular zone along a spine; herewith other hand placed on the sternum.

б) **compression of the chest (Heimlikh method).** Rescuer stands behind of victim and by two hands covers his chest (the patient herewith or stands or sits) on level of the lower third of the sternum, and further make a 4 energetic compresses of the chest «on yourself» (picture 7).

Exists method of Heimlich in lying position of patient also. The rescuer is on the knees and situated from above to the victim. He puts his hand on top of each other in area of epigastrium, and after than presses sharply and rhythmically on abdomen. Submitted method used less frequently, because it exist danger of regurgitation (picture 8).



Picture 7. Heimlich maneuver in sitting or standing position of patient



Picture 8. Heimlich method in lying position of the patient

В) **compression of abdomen** in lying position of the victim. Rescuer stands from the side and one hand, squeezing in fist, moves to epigastric region in direction to diaphragm [without pressing on the spine], thereafter hits by fist of the other hand on the first. Modified variant of this method is sudden compression of the upper paths of abdomen by two hands, that wrap a victims trunk below xiphoid process. During implementation of this variant a patient remains in sitting or standing position.

After restoration of the upper respiratory paths permeability begins artificial ventilation of the lungs (ALV) and closed cardiac massage (CCM).

Stage B - artificial ventilation of the lungs (ALV)

The main and most effective methods of ALV is artificial breathing for principle «mouth - to mouth» and «mouth – to nose». The rescuer makes the deep breath, later tightly pressed by own lips to the opened mouth of victim and blows

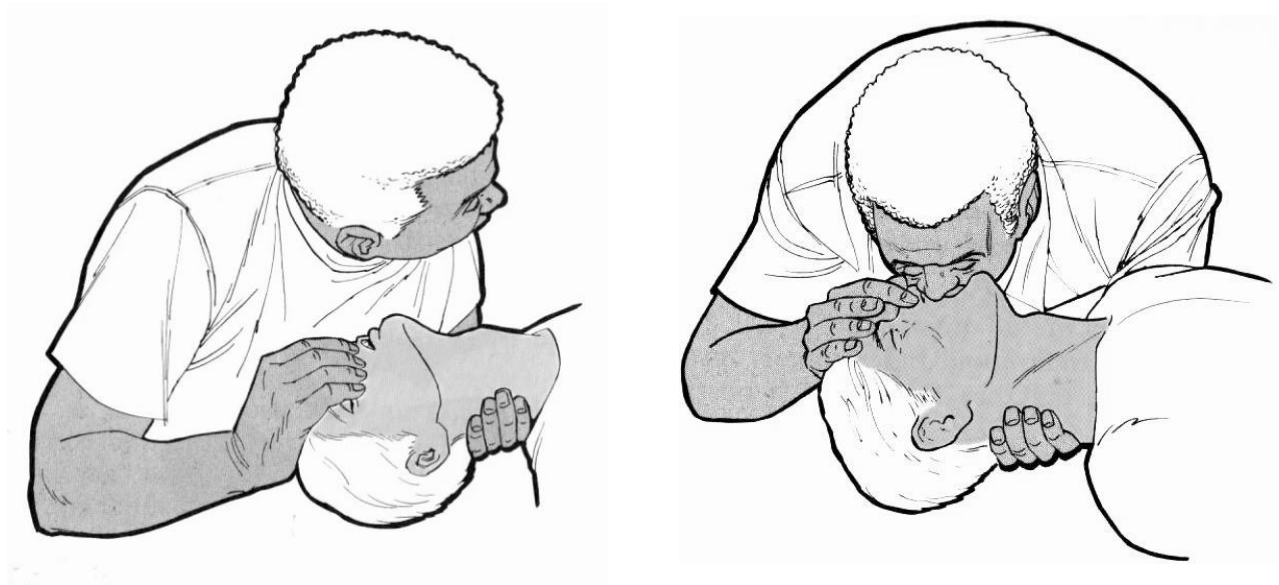
air to his or her lungs. Herewith, the nose of resuscitated closes by fingers or cheek of rescuer. In the same time a rescuer watches for movements of the chest. From hygienic point of view a nose or mouth of victim necessary to cover by hand kerchief or napkin.

For creation of positive pressure at the end of exhalation and better straightening of alveoli used method of the stepped lungs ventilation – after first several breaths the next make to the full completion of the passive exhalation of victim.

On beginning of resuscitation always carried out in sequence 3 – 5 deep breaths, and after than pass on rhythm : one breath by 5 seconds, that is 12 respiratory movements per 1 minute (pictures 9, 10).

In damages (injuries) of the jaws, face, oral cavity necessary to perform ALV blowing air into the nose of victim, covering a mouth by fingers of the hand (picture 10). For vitalization of newborns and babies artificial ventilation of the lungs carry out covering a mouth and nose simultaneously (pictures 11, 12). Herewith blow a minimal amount of air. Volume of air, necessity for adequate ALV by methods «mouth – to mouth» or «mouth - to nose»: to an adult– 1,0 - 1,5 liters, to the child of 10 – 12 years old - 0,5- 1,0 liters, to babies - 0,05 – 0,08 liters.

The main sign of artificial breathing efficiency: the movements of chest on inhalation and exhalation.



Picture 9. Artificial ventilation of the lungs for method «mouth - to mouth»



Picture 10. Artificial ventilation of the lungs for method «mouth – to nose»



Picture 11. Artificial ventilation of the lungs to newborn via nose and mouth simultaneously

Happen situations, when a victim got crushed injury of facial part of the head, including mouth and nose, in the presence of which to perform artificial breathing is impossible. In such cases, as alternative variant, can be used methods of Sylvester and Shmiden. In first method the rescuer raise the hands of victim for the head, straightening the chest, that corresponds to inhalation, after than bring his (her) hands to the chest and compresses it, that corresponds to exhalation. The patient herewith situated in lying position on the back. Second method foresees compression of the chest by two hands, providing exhalation; when releasing the hands owing to elasticity the chest straightens passively, herewith providing inhalation. The victim situated in lying position on abdomen.



Picture 12. Performing of artificial breathing to child

Stage C - indirect (closed) cardiac massage

The technique of indirect cardiac massage performing (ICM) is as follows. Initially carried out the strong hit by fist to area of middle part of the chest - from distance near 30 cm (**precordial hip**), herewith the patients legs necessary to elevate vertically (picture 13). With efficiency of submitted measure appears pulse on carotid artery. If pulsating is absent, this method is possible to repeat few times.



Picture 13. Position of victim or patient before performing of indirect cardiac massage

Rescuer (resuscitator) is located from the side to the victim, designates xiphoid – sternum joint and point, in which will carry out compresses of the sternum, namely - on 2 transverse fingers above xiphoid – sternum joint (picture 14). In this part the rescuer hands situated in this manner, that palm of the one hand presses from above a palm of other, that localized directly on the sternum. The fingers of the rescuer hands slightly elevated over surface of the sternum and situated in parallel to the ribs, herewith the hands in elbows do not bend (picture 15).

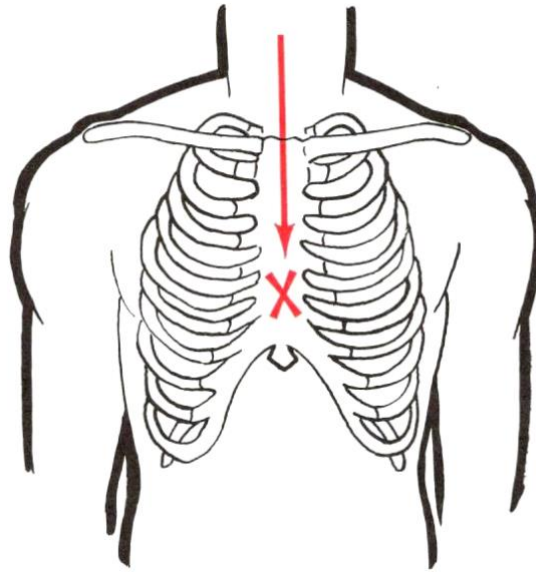
Whereas indirect cardiac massage is sufficiently intense physical load on rescuer , then, if possible, to its carrying out necessary to attract another person from surroundings and perform a massage alternately, as fatigue of rescuers.

The closed cardiac massage for teenagers carried out by one hand, for small children – by second and third (II, III) fingers of the hand, for babies, newborns – by nail phalanges of the first fingers both hands, simultaneously embracing the back by other fingers.

The sternum pressed to the spine making an effort of all body: on 4 – 5 centimeters – in adults, on 3 – 4 cm – in children and on 2 – 3 cm – in babies, newborns. The sternum fixed in this position on 0,5 seconds.

The closed cardiac massage provides near 30% of the proper cardiac output, that is sufficient for supporting of the minimal level of the blood circulation in the vital organs, namely carried out artificial blood circulation. In cases, when

resuscitation started timely and carried out correctly, and manifested by signs of its effectiveness.



Picture 14. Area of the chest, where perform compresses



Picture 15. Technique of indirect cardiac massage performing and artificial ventilation of the lungs together

Artificial ventilation of the lungs and indirect cardiac massage form a cycle of cardio – pulmonary resuscitation . It consists of 30 compresses of the chest and 2 breaths; 5 cycles of CPR continue a 2 minutes.

CORRELATION

of amount of compresses and breaths in CPR:

2 : 30

During implementation of cardiopulmonary resuscitation necessary to orientate on criteria of its effectiveness, the main from which are manifested as next:

- **the skin and visible mucous membranes acquire a pink color;**
- **victims body becomes warmer to the touch;**
- **noted a weakened pulsating on the central arteries;**
- **observed small excursion of the chest;**
- **observed reaction of the eye pupils on light, they become narrowed;**
- **arise active movements of the head, to a lesser extent – hands and legs;**

Owing to further effective resuscitation measures **restores consciousness, appear cardiac tones, gradual increasing of the arterial pressure to 70- 80 mm of Mercury.**

Artificial breathing and indirect cardiac massage should be performed at least 2 hours; is possible more than 2 hours, when they begin appear a signs of life

However, these signs confirm about initial period of vitalization only, because in human organism, who survived clinical death, for a long time remain and even deepen pathomorphological changes, that appeared in time of the blood stream arrest. Period of postresuscitation disease is coming, so patient needs long - term treatment, which is carried out in emergency department of the hospital (or ICU - intensive care unit).

Possible complications of resuscitation

At time of resuscitation measures implementation may arise a different complications, about which necessary to know with purpose their prevention. Thus, one from complications of artificial breathing is regurgitation, that is penetration of stomach contents into oral cavity with aspiration its to the respiratory paths. Can also occur dislocation of jaw, rupture of the pulmonary tissue and pneumothorax. As complications of indirect (closed) cardiac massage can be fracture of the ribs and chest, damages of internal organs (liver, stomach, spleen), pneumothorax, tamponade of the heart.

After successful performing of cardio – pulmonary resuscitation with restoration of the functions of breathing and cardiac activity on prehospital stage necessary to transport of victim as soon as possible to emergency department (or

ICU - intensive care unit) of hospital for continuation of the following measures, that marked by letters D, E, F, G, H, I.

D – it is continuation of the drug therapy (treatment);

E – electrocardiography or electrocardioscopy;

F – implementation of defibrillation;

G – evaluation of general condition, which consists in detection of reason of bloodstream arrest and its elimination, and possibility of full - fledged rescue of the victim also with evaluation of degree of the central nervous system disturbance ;

H – restoration of normal thinking;

I – intensive therapy, directed on correction of disorders of function of other organs and systems.

Happen situations, when is impossible to perform resuscitation measures on prehospital stage. In such cases necessary to send victim as quickly as possible to the medical institution for performing of the open cardiac massage, maybe for defibrillation, and for trachea intubation and controlled breathing also.

Contraindications to performing of cardiopulmonary resuscitation on prehospital stage:

1. Tamponade of the heart (hemopericardium);
2. Deformation of sternum and thoracic part of the spine;
3. Multiple fractures of the ribs;
4. Avulsions of the sternum from ribs;
5. Bilateral pneumothorax.

Control questions:

1. What means of the phrase «reverse terminal state» ?
2. What terminal state is considered as partially reverse ?
3. Which direct reasons of terminal state occurrence exist ?
4. What measures belong to the triple Safars maneuver ? How to their realize in providing of the first premedical aid ?
5. What measures belong to point A of cardio – pulmonary resuscitation ?
6. What position of victim named as drained ? How to provide its during cardio – pulmonary resuscitation (CPR) ?
7. What measures belong to the point B of cardio - pulmonary resuscitation ?
8. What measures belong to the point C of cardio – pulmonary resuscitation ?
9. Which correlation exists between amount of the chest compresses and amount of breaths in cases, when the aid provides one rescuer ?

10. What correlation exists between amount of the chest compresses and amount of breaths in cases, when cardiopulmonary resuscitation perform two rescuers ?
 11. Which peculiarities of indirect (closed) cardiac massage to newborns, older children, teenagers, adults ?
 12. In which essential of the Kheimlih method ? Which exist its variations ?
 13. What is decortication ? For what terminal state its characteristic ?
 14. Which complications can appear in performing of artificial breathing ? How to prevent these complications ?
 15. Which complications can appear in performing of indirect (closed) cardiac massage ? How to prevent these complications ?
- From what begins the indirect (closed) cardiac massage ? What TESTS to the theme “CPR”
16. peculiarities of its performing ?
 17. Which contraindications exist to performing of cardiopulmonary resuscitation on prehospital stage ?
 18. How the rescuer can open oral cavity of the victim, which is in state of clinical death ?
 19. At evidence which signs of victim you can affirm about successfully performed cardiopulmonary resuscitation ?
 20. Which should be the tactics of rescuer in case of evidence in victim of one from contraindications to performing of cardiopulmonary resuscitation ?

TESTS TO THE TOPIC “CPR”

- Practice for students of III course

1. Prehospital aid of mechanical asphyxia ?
 - a) Intramuscular introduction of Adrenalin
 - b) Intravenous injection of Mesaton
 - c) Opened cardiac massage
 - d) Artificial ventilation of the lungs and closed cardiac massage
 - e) Aid in according to ABC classification (air way open, artificial breathing, indirect cardiac massage)
2. The sign that is characteristic for clinical death ?
 - a) Suppression of consciousness
 - b) Threadlike pulse on the central vessels (arteries)
 - c) Frequent, superficial breathing
 - d) Arrhythmic, crampy, pathologic breathing
 - e) Dilated pupils without reaction on light
3. Note on order of actions of the cardio – pulmonary resuscitation

- a) Air way open, artificial breathing, closed cardiac massage
 - b) Air way open, artificial breathing, pre cardiac impact, cardiac massage
 - c) Artificial breathing, air way open, cardiac massage
 - d) Artificial breathing, cardiac massage, air way open
 - e) Any order from presented
4. The sign that is characteristic for agony ?
- a) suppression of consciousness
 - b) absence of the pulse on central vessels
 - c) frequent, superficial breathing
 - d) arrhythmic, crampy, pathologic breathing
 - e) dilated pupils of the eyes without reaction on light
5. The sign that is characteristic for preagony ?
- a) Loss of consciousness
 - b) Bradycardia, bradypnoe
 - c) Threadlike pulse on the central vessels
 - d) Arrhythmic, crampy, pathologic breathing
 - e) Dilated pupils of the eyes without reaction on light
6. Name symptom that confirms an efficiency of cardiopulmonary resuscitation
- a) Narrowing of the eye pupils
 - b) Dilation of the pupils
 - c) Accession of cyanosis
 - d) Appearance of the corpses spots
 - e) Swelling of the cervical veins
7. The true sign of biological death ?
- a) Absence of the heart beats over than 25 minutes
 - b) Absence of the corneal reflex
 - c) Corpses spots
 - d) Dilation of the pupils without reaction on light
 - e) Absence of the breathing over than 25 minutes
8. To terminal state (condition) belong
- a) Social death
 - b) Preagony state
 - c) Biological death
 - d) Coma
 - e) Loss of consciousness
9. The frequency of compressions during external (closed) cardiac massage ?
- a) 30 per 1 minute

- b) 40 per 1 minute
- c) 60 per 1 minute
- d) 90 per 1 minute
- e) 100 per 1 minute

10. Name medical preparation (drug) used for restoration of the bloodstream

- a) S. Euphyllini
- b) S. Adrenalini
- c) Heparini
- d) S. Promedoli
- e) S. Strophantini

11. In the patient with a myocardial infarction the face has suddenly got gray – green color with a cyanotic shade. On physical examination is found: a tachycardia, thread pulse which is defined only on carotid and femoral arteries; respiration is superficial, frequent. Blood pressure is 70 x 30 mm Hg; pupils are moderately narrowed and inertly react to light. How you estimate a condition of such patient ?

- a) Biological death
- b) Extremely severe condition
- c) Clinical death
- d) Average serious condition
- e) Serious condition

12. Name the signs of biological death

- a) Increasing of the blood pressure (BP) and superficial breathing
- b) Absence of reflexes and sensitivity
- c) Arrest of the breathing and heart beats
- d) The facial features pointed and cooling of the body
- e) Corpses spots

13. What condition precedes to clinical death?

- a) Agony
- b) Biological death
- c) Coma
- d) Preagony
- e) Terminal pause

14. Orthostatic collapse begins in cases of

- a) Fulfilment of work on air
- b) Fast eat period
- c) Stay in a stuffy location
- d) Transition from horizontal to vertical position
- e) Increased temperature and humidity of air

15. Note correlation between amount of inhales and amount of cardiac compresses during CPR (cardiopulmonary resuscitation)
- a) 1 : 20
 - b) 2 : 30
 - c) 3 : 40
 - d) 4 : 60
 - e) 5 : 80
16. Moment from which the cardiopulmonary resuscitation begins
- a) Providing of the upper respiratory ways passability
 - b) Connection of electrocardiographic monitor
 - c) Artificial ventilation of the lungs by mouth – to – mouth method
 - d) Preparation of system for intravenous infusion
 - e) Artificial ventilation of lungs with Ambou sac
17. Cardiac massage can be considered as effective if present all enumerated signs except
- a) Dilatation of eye pupils
 - b) Occurrence of pulse on carotid arteries
 - c) Occurrence of respiratory movements
 - d) Narrowing of eye pupils
 - e) Disappearance of cyanosis

SITUATIONAL PROBLEMS

1. A middle – aged man was washed to shore from a sunken ship. He was under water for about 1 minute. His consciousness and breathing were absent and his pulse cannot be determined. Besides you, there are 2 other adults on the shore. Determine the character and sequence of resuscitation measures to be provided for the man.
2. You are the witness of the car accident. A victim is unconsciousness, without a pulse and breathing. What, on your opinion, is terminal state of patient ? What is first aid ? What is subsequent tactics of medical care ?
3. At the patient in an outcome of electrical trauma – the loss of consciousness, stop of breathing and palpation, convulsive reduction of right forearm muscles on an electric wire is marked. How to terminate an electrical current ? What is the first aid ?

