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UZHGOROD NATIONAL UNIVERSITY
MEDICAL FACULTY
ONCOLOGY DEPARTMENT**

ANAESTHESIOLOGY AND INTENSIVE CARE

Topic 1: ACUTE RESPIRATORY INSUFFICIENCY

Topic 2: DISEASES AND LESIONS OF RESPIRATORY SYSTEM

Methodical instructions for 5 year medical student practical training

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ACUTE RESPIRATORY INSUFFICIENCY

Topic actuality.

Acute respiratory insufficiency (ARI) is the state in which the process of gas exchange between the organism and environment is disordered.

All processes of breathing are divided by the next stages: ventilation, pulmonary gas exchange, transport of gases by blood, and tissue breathing. The first two stages conditionally unite of the external breathing concept. Any of these stages can be disordered and cause the changes of blood gas composition and respiratory insufficiency.

The most part of the external breathing disturbances are severe and quickly progressed conditions, resulting in a fatal outcome. In addition, one type of respiratory insufficiency can cause more severe another. Often respiratory insufficiency can accompanied by the disorders of other organism systems functions. An estimation and correction of breathing function is one of the most main measures at all urgent states.

The study of this theme needs to the doctor for timely diagnostics, performing of the first aid and measures of intensive care.

Teaching aims.

General purpose: be able to diagnose acute respiratory insufficiency, render the first aid and determine the tactic of patients manadement with acute respiratory insufficiency.

Concrete aims	Initial level of knowledge-abilities
Be able:	
1. To collect complaints, anamnesis, perform the objective examination of patients and recognize the syndrome of acute respiratory insufficiency.	1. To interpret anamnesis and objective findings for patients with respiratory system pathology (department of internal medicine propedeutics) .
2. To define the degree of respiratory insufficiency and render the first aid.	2. To analyse the causality of pathological processes development at acute respiratory insufficiency (department of pathophysiology).
3. To distinguish the leading mechanism of acute respiratory insufficiency.	3. To interpret disorders of exchange and transport of gases (department of pathophysiology).
4. To work out a plan of examination, interpret the got results for patients with acute respiratory insufficiency.	4. To interpret the results of clinical and laboratory findings, instrumental examinations of the respiratory system (department of internal medicine propedeutics).
5. To preliminary diagnose and determine the tactic of management for patients with acute respiratory insufficiency, including children.	5. To interpret the concepts of etiotropic, nosotropic and symptomatic therapy (department of pathophysiology), mechanism of action and indication to use of pharmacological agents for patients with respiratory system diseases (department of pharmacology).

Respiratory failure

Respiratory failure is inadequate gas exchange by the respiratory system, with the result that levels of arterial oxygen, carbon dioxide or both cannot be maintained within their normal ranges. A drop in blood oxygenation is known as hypoxemia; a rise in arterial carbon dioxide levels is called hypercapnia. The normal reference values are: oxygen PaO₂ more than 80 mmHg (11 kPa), and carbon dioxide PaCO₂ lesser than 45 mmHg (6.0 kPa). Classification into type I or type II relates to the absence or presence of hypercapnia respectively.

Type 1

Type 1 respiratory failure is defined as hypoxemia without hypercapnia, and indeed the PaCO₂ may be normal or low. It is typically caused by a ventilation/perfusion (V/Q) mismatch; the volume of air flowing in and out of the lungs is not matched with the flow of blood to the lungs. The basic defect in type 1 respiratory failure is failure of oxygenation characterized by:

PaO ₂	decreased (< 60 mmHg (8.0 kPa))
PaCO ₂	normal or decreased (<50 mmHg (6.7 kPa))
PA-aO ₂	increased

This type of respiratory failure is caused by conditions that affect oxygenation such as:

- Low ambient oxygen (e.g. at high altitude)
- Ventilation-perfusion mismatch (parts of the lung receive oxygen but not enough blood to absorb it, e.g. pulmonary embolism)

- Alveolar hypoventilation (decreased minute volume due to reduced respiratory muscle activity, e.g. in acute neuromuscular disease); this form can also cause type 2 respiratory failure if severe
- Diffusion problem (oxygen cannot enter the capillaries due to parenchymal disease, e.g. in pneumonia or ARDS)
- Shunt (oxygenated blood mixes with non-oxygenated blood from the venous system, e.g. right-to-left shunt)

Type 2

Hypoxemia ($\text{PaO}_2 < 8\text{kPa}$) with hypercapnia ($\text{PaCO}_2 > 6.0\text{kPa}$).

The basic defect in type 2 respiratory failure is characterized by:

PaO_2	decreased ($< 60 \text{ mmHg (8.0 kPa)}$)
PaCO_2	increased ($> 50 \text{ mmHg (6.7 kPa)}$)
PA-aO ₂	normal
pH	decreased

Type 2 respiratory failure is caused by inadequate alveolar ventilation; both oxygen and carbon dioxide are affected. Defined as the build up of carbon dioxide levels (PaCO_2) that has been generated by the body but cannot be eliminated. The underlying causes include:

- Increased airways resistance (chronic obstructive pulmonary disease, asthma, suffocation)
- Reduced breathing effort (drug effects, brain stem lesion, extreme obesity)
- A decrease in the area of the lung available for gas exchange (such as in chronic bronchitis)

- Neuromuscular problems (Guillain-Barré syndrome, myasthenia gravis, motor neurone disease)
- Deformed (kyphoscoliosis), rigid (ankylosing spondylitis), or flail chest.

Treatment

Mechanical Ventilator. Emergency treatment follows the principles of cardiopulmonary resuscitation. Treatment of the underlying cause is required. Endotracheal intubation and mechanical ventilation is required in severe respiratory failure (PaO₂ less than 50 mmHg).

Respiratory stimulants such as doxapram are rarely used, and if the respiratory failure resulted from an overdose of sedative drugs such as opioids or benzodiazepines, then the appropriate antidote such as naloxone or flumazenil will be given.

Theoretical questions.

1. Etiology, pathogenesis and classification of acute respiratory insufficiency.
2. Hypoxia, its types, clinical, laboratory signs, data of additional methods of examinations.
3. Hypercapnia, its clinical, laboratory signs.
4. Means and methods of open airways support providing (simple manoeuvres and artificial respiratory ways).
5. Means and methods of pulmonary drainage function improvement.
6. Oxygen therapy: methods, indications, estimation of efficiency.
7. Method of the spontaneous breathing under continuous positive pressure: indications, contra-indications, complications.

8. Method of pulmonary mechanical ventilation : indications, complications.
9. A place of hyperbaric oxygenation in treatment of gas exchange disorders.
10. Features of acute respiratory insufficiency intensive care for children.

Determination and providing of initial level of knowledge-abilities.

Tasks for verification of initial level.

Task 1.

To admission department the 30 years old patient, which was found neighbours without consciousness are delivered. During examination, there are pale skin covers, mild acrocyanosis, and rhythmic spontaneous breathing. Breath rate is 20 per minute. What index can confirm the normal function of the external breathing for this patient?

- A. BP is 120/80 mm Hg
- B. Pulse 90 beats per minute
- C. A tidal volume is 7 ml/kg of body mass
- D. PaO₂ 90 mm Hg
- E. PaCO₂ 35 mm Hg

Task 2.

In 45 years old patient, which was extracted from the accident broken car, there are movements only of abdominal wall, a chest wall is practically immobile, at forcing inhalation and cough in the oment of abdominal wall rising up, a chest wall goes down. What is the level of spinal cord trauma in this patient?

- A. C1 - C2
- B. C4 - C5
- C. C7 - Th1
- D. Th5 - Th7
- E. Th12 - L1

Task 3.

The chronic dust obstructive bronchitis patient has oxygen therapy during two hours. At this period the confusion and inadequacy was developed. What is the main cause of such clinical picture?

- A. Brain vasoconstriction
- B. Hypercapnia
- C. Brain hypoxia
- D. Oxygen toxicity
- E. Bronchial obstruction

Task 4.

For 30 years old patient with right-side low lobe pneumonia breath rate is 32 per minute, respiratory minute volume, according to his sex, age and body surface area, is more than normal range in 1,5 times. What change of minute alveolar ventilation (MAV) can be supposed for this patient?

- A. MAV within the normal limits, nearer to the upper threshold
- B. MAV within the normal limits, nearer to the lower threshold
- C. MAV is increased
- D. MAV is decreased
- E. To estimate MAV is not possible

Task 5.

For 40 years old patient, which delivered by emergency team from a site of the fire, there are psychomotor excitation, confusion consciousness,

tachypnea, cyanosis, during examination. For which syndrome are these signs typical?

- A. Acute respiratory insufficiency
- B. Acute cardiovascular insufficiency
- C. Acute kidney insufficiency
- D. Ahepatic insufficiency
- E. Acute abdomen

Task 6.

For a patient with the extensive transmural myocardial infarction there are expressed cyanosis of hands, feet and legs. HR is 110 beats per minute, BP is 80/40 mm Hg, urine output slowed down. The concentration of haemoglobin is normal. The percent of oxygen haemoglobin saturation in arterial blood is moderate decreased, in venous blood - decreased considerably. For which state is this clinical symptomatology typical?

- A. Hypoxic hypoxia
- B. Circulatory hypoxia
- C. Renal oliguria
- D. Hemic hypoxia
- E. Cytotoxic hypoxia

Task 7.

A patient is delivered to admission department with complaints about sense of air shortage and uneasy. Skin covers are moist, face hyperemic. Breath rate is 32 per minute, there is mixed shortness of breath, there are distance rales on inhalation and stridor. BP is 140/90 mmHg, pulse is 104

b/min. What is the leading mechanism of this patient acute respiratory insufficiency?

- A. Central
- B. Neuromuscular
- C. Thoracoabdominal
- D. Upper obstructive - constrictive
- E. Low obstructive - constrictive

Task 8.

Patient, suffering from the shortness of breath, during 2 last hours became languid, indifferent, his skin became surplus moist, cyanosis of lips is increased, face hyperemia is appeared. A doctor considered this state as hypercapnia. What is most credible mechanism of such disorders of gas exchange?

- A. Disorders of alveolar diffusion
- B. Disorders of alveolar perfusion
- C. Hypoventilation
- D. Overventilation
- E. Disorders of systemic hemodynamics

Task 9.

In patient with right-side subtotal pneumonia there are expressed lips cyanosis and acrocyanosis, BP and HR are increased. A patient is confused, periodically is unfriendly to medical manipulations. Breath rate is 36 per minute. What measure is necessary for this patient treatment?

- A. Inhalation of oxygen-air mixture

- B. Cannulating of respiratory tracts
- C. Pulmonary mechanical ventilation with air
- D. Pulmonary mechanical ventilation with oxygen-air mixture
- E. Hyperbaric oxygenation

Task 10.

Female patient with an otopyosis is found without consciousness. She lies with the thrown back head, on a pillow there are tracks of the vomit masses. Face is hyperemic, lips are cyanotic. Breathing is spontaneous and unrhythmic, the chest movements is alternated with the pauses of different duration. BP is 130/100 mm Hg, pulse 88 beats per minute. What is the most appropriate method of respiratory support for this patient?

- A. Tracheostomy
- B. Inhalation of oxygen through a face mask
- C. Spontaneous breathing under continuous positive pressure
- D. Hyperbaric oxygenation
- E. Pulmonary mechanical ventilation

Standards of right answers.

Task 1. C Task 2. B. Task 3. B. Task 4. D. Task 5. A.
Task 6. B. Task 7. D. Task 8. C. Task 9. D. Task 10. E.

Short methodical instructions for practical study.

The initial level of students knowledge-abilities performed at the beginning of the study, using the test tasks. Students examine patients acute respiratory insufficiency, distinguish its leading mechanism, work off the methods of providing of the first aid to the patients with acute respiratory insufficiency. Form skills on determination of degree and type of respiratory insufficiency, to perform oxygen therapy and mechanical ventilation by bag-mask-system and artificial airway. Make the plan of patients examination, analyse histories of illnesses with the estimation of laboratory and additional methods of examination, perform differential diagnostics, determine a preliminary diagnosis and the plan of medical measures for patients with acute respiratory insufficiency, including. for children. Situational tasks decide in default of thematic patients. Patient examination and answers of students controlled by a teacher.

In an educational room students together with a teacher discuss the results of examination and students mistakes. After it students pass test control. In the end the students get the marks of the work on the study.

Suggested Literature

1. Clinical procedures in Emergency Medicine, 5th edition, James R. Roberts, 2010.
2. Emergency Medicine, Brown and Michael D. Cadogan, 6th edition, 2003.
3. Emergency Medicine, Eric D. Barton, 2008.
4. The atlas of Emergency Medicine, Kevin J. Knoop and others, p. 1857, 2010.

DISEASES AND LESIONS OF RESPIRATORY SYSTEM

Topic actuality.

Diseases and lesions of the breathing system are the greatest group of respiratory insufficiency causes. Its simply enough to diagnose, as in most cases there is very typical anamnesis, and at physical examination data are not scanty. The list of necessary additional methods of examination is not great: it is limited by spirometry and X ray methods of diagnostics. At the same time, these diseases can be extremely dynamic, when for choice of tactic management there is time, which limited by minutes, at the best - tens of minutes. A delay or error in a medical management tactic conduces to rapid progress of gas exchange disorders and patients death. On this basis, a doctor must be able in good time to diagnose diseases and lesion of the respiratory system, recognize the acuterespiratory insufficiency and choose the correct tactic of the first aid and intensive care.

Teaching aims.

General purpose: be able to diagnose acute respiratory insufficiency in a postsurgical period, in status asthmatic patients, in patients with pulmonary edema, drowning, pulmonary embolism, aspiration syndrome, adult and new-born respiratory distress syndrome, to render the first aid and determine the tactic of intensive care.

Concrete aims	Initial level of knowledge-abilities
Able:	
<p>1. To take the history, perform an objective examination and determine of acute respiratory insufficiency for patients in a postsurgical period, at asthmatic status, pulmonary edema, drowning, pulmonary embolism, aspiration syndrome, adult and new-born respiratory distress syndrome.</p>	<p>1. To interpret anamnesis, data of objective examination for patients with breath system pathology (department of internal medicine propedeutics) .</p>
<p>2. To render the first aid for certain respiratory system pathological states: in a postsurgical period, at asthmatic status, pulmonary edema, drowning, pulmonary embolism, aspiration syndrome, adult and new-born respiratory distress syndrome.</p>	<p>2. To perform an emergency in an internal medicine clinic (departments of internal medicine and surgery), at the new-born pneumopathy (departments of paediatrics and child's infections).</p>
<p>3. To work out a plan of examination, interpret its results for patients in a postsurgical period, at asthmatic status, pulmonary edema, drowning, pulmonary embolism, spiration syndrome, adult and new-born respiratory distress syndrome.</p>	<p>3. To interpret the results of clinical and laboratory findings, instrumental investigations of the respiratory system for adults and children (departments of paediatric and internal medicine propedeutics).</p>
<p>4. To define the intensive care tactic of acute respiratory insufficiency for patients in a postsurgical period, at asthmatic</p>	<p>4. To interpret the mechanism of action and indications of pharmacological agents application, used for patients with the diseases</p>

status, pulmonary edema, drowning, pulmonary embolism, aspiration syndrome, adult and new-born respiratory distress syndrome.	of the respiratory system (department of pharmacology), general principles of treatment, rehabilitation and prophylaxis of bronchial asthma, pneumonia, pulmonary embolism, heart failure (department of internal medicine).
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Acute Respiratory Distress Syndrome (ARDS)

1. What is ARDS?

Acute respiratory distress syndrome (ARDS) is the sudden failure of the respiratory (breathing) system. It can develop in anyone over the age of 1 who is critically ill. A person with ARDS has rapid breathing, difficulty getting enough air into the lungs and low blood oxygen levels.

ARDS usually develops in people who are already very ill with another disease or who have major injuries. They are usually already in the hospital when they develop the ARDS.

Air you breathe in travels to the air sacs in your lungs. Small blood vessels run through the walls of the air sacs. Oxygen passes from the air sacs into the blood vessels and then into the bloodstream, which distributes the oxygen to all parts of the body. In ARDS, the lung's blood vessels leak more fluid than normal into the air sacs. This prevents the lungs from filling with air and moving enough oxygen into the bloodstream. The result is the body's organs don't get enough oxygen and they may shut down.

2. How Serious is ARDS?

Approximately 190,000 Americans are affected by ARDS annually. ARDS can be life-threatening because your body's organs need oxygen-rich blood to function well. Up to 30% of ARDS cases can be fatal. That is a significant improvement from the 50%-70% death rate just 20 years ago.

Patients who develop ARDS due to trauma or a lung infection usually do better than those who develop the condition due to sepsis (infection of the blood).

If you have ARDS your lung function is likely to return to normal or near normal within several months. But some people with ARDS have lasting damage to their lungs or to areas outside the lungs.

3. What Causes ARDS?

- Causes of ARDS include:
- Sepsis (bacterial infection of the blood)
- Trauma
- Pneumonia or other lung infection
- Multiple blood transfusions
- Breathing in salt water
- Breathing in harmful smoke or fumes
- Breathing vomit into the lungs
- Narcotics
- Sedatives
- Overdoses of tricyclic antidepressants
- Shock

4. What are the Symptoms of ARDS?

Signs and symptoms of ARDS may include:

- Feeling like you can't get enough air into your lungs
- Rapid breathing
- Low oxygen levels in the blood
- Cough and fever (if your ARDS is caused by pneumonia)
- Low blood pressure
- Confusion
- Extreme tiredness

5. How is ARDS Diagnosed?

Your doctor makes a diagnosis of ARDS based on your medical history, a physical exam and medical tests. Your doctor will listen for abnormal breathing sounds, listen to your heart and look for signs that your body has too much fluid, which could mean your heart or kidneys are not working properly.

Medical tests for ARDS include:

- An arterial blood gas test, which checks the oxygen level in your blood
- Chest x-ray, which can show extra fluid in your lungs
- Other blood tests that can find an infection that may be causing ARDS
- CT scan, which can show problems in the lungs
- Heart tests to look for signs of heart failure. This can cause fluid buildup in the lungs.

ARDS is usually diagnosed in a patient who is in the hospital from a critical illness such as shock, sepsis or other trauma.

6. How is ARDS Treated?

There is no specific treatment for ARDS. A person with ARDS is treated in the intensive care unit at the hospital. Often a person with ARDS will need a machine's help to breathe (called mechanical ventilation) and oxygen therapy.

Treatments may include:

- Oxygen through tubes in your nose or through a mask
- Oxygen through a breathing tube.
- The tube is flexible and goes through your mouth or nose into your windpipe.
- The tube is connected to a ventilator, a machine that helps you breathe.
- Fluids through an IV line to improve your blood flow and to provide nutrition
- Medicine to prevent and treat infections and to relieve pain
- Teaching contents in accordance with aims.

Theoretical questions.

1. Risk factors, pathogenesis, clinical picture, intensive care of acute respiratory insufficiency in a postsurgical patients.
2. Risk factors, pathogenesis, clinical picture, intensive care for asthmatic status patients.
3. Risk factors, pathogenesis, clinical picture, intensive therapy hydrodynamic (cardiogenic) and membranogenic pulmonary edema.

4. Pathogenesis, classification of drowning, intensive care for the different types of drowning.
5. Risk factors, pathogenesis, classification, intensive care of pulmonary embolism.
6. Risk factors, classification of aspirations, pathogenesis of breathing disorders at the different types of aspirations, intensive care of aspiration syndrome.
7. Risk factors, pathogenesis of breathing disorders, intensive care at adult and new-born respiratory distress syndrome.

Determination and providing of initial level of knowledge-abilities.

Tasks for verification of initial level.

Task 1.

A 60 years old patient is delivered to the clinic by the ambulance team with a diagnosis of "syncopal drowning". On the basis of what clinical sign, is this patient diagnosis proposed?

- A. Pale skin covers, absence of foam from mouth
- B. Cyanotic skin covers, pink large-meshed foam from mouth
- C. Cyanotic skin covers, white fluffy foam from mouth
- D. Sudden stop of breathing
- E. Resistant to cure pulmonary edema

Task 2.

The elective cholecystectomy is executed for 52 years old female patient. She has a deep left-side hemiparesis after survive of acute stroke. Postoperational analgesia - parecoxib. There is clear consciousness on a 5 day of postsurgical period, body temperature is 37,5oC, Breath rate is 26 per minute, during auscultation breathing is harsh rales are not present. BP is 130/90 mmHg, pulse is 92 beats per minute. An abdomen is not swollen, soft, peristalsis is active. On the plan chest X ray film there is an area of infiltration in the bottom lobe of right lung. With what most probably is acute respiratory insufficiency for this patient related?

- A.The pulmonary hypostatic phenomena
- B.Bronchial obstruction syndrome
- C.Overventilation from pain
- D.High intra-abdominal pressure

E. Aspiration syndrome

Task 3.

In the dining room of sanatorium, during eating, a holiday-maker suddenly has a paroxysmal cough, inspiratory shortness of breath, dizziness, cyanosis, and he fell off a chair. A duty doctor suspected for the foreign body of larynx and acute stenosis in asphyxia stage. A doctor by palpation defined thyroid and cricoid cartilages and between them cut soft tissues of the neck by the scalpel single-stage transverse incision. How is an operation which was produced by a duty doctor named?

- A. Laryngotomy
- B. Upper tracheotomy
- C. Cricotomy
- D. Conicotomy
- E. Middle tracheotomy

Task 4.

A 26 years old female patient is complain about a weakness, retrosternal pain, difficulty in breathing. She is suffering from infectious endocarditis with aortic failure during 2,5 months. Objectively: lies with the upper head of a bed, lips are cyanotic, extremities are pale and cold, breath rate is 28 per minute, during auscultation in the bottom departments of lungs there are plural not sonorous moist rales. BP is 80/0 mmHg, pulse is 102 beats per minute. For patient is the noninvasive PMV by oxygen-air mixture with FiO_2 of 0,4 started. What does need to be injected to the patient immediately after venous access achievement?

- A. Dexamethasone
- B. Furosemide
- C. Morphine
- D. Alcohol
- E. Phenylephrine

Task 5.

The operation of neck phlegmon dissection was performed in 40 years old patient. After food intake in 6 day of postsurgical period, the patient has strong pain in epigastrium. Examination by surgeon was performed, and under multicomponent anaesthesia with PMV the laparotomy and ulcer suture ligation were executed. During transferring to intensive care department the mix venose oxygen saturation is 70%, there is subcutaneous emphysema in area of neck with passing to the chest. What picture was seen by a doctor on the chest X ray film?

- A. Bilateral pulmonary infiltration
- B. A presence of gas in a pleural cavity
- C. Shift of mediastinum shadow in a healthy side
- D. Increase of the pulmonary field transparency
- E. Strengthening of pulmonary picture due to a vascular component

Task 6.

For the of 33 years old patient with the severe exacerbation of bronchial asthma, and respiratory insufficiency on a background of oxygen-air mixture inhalation the SpO₂ is attained up to 95%.

Corresponding medicinal therapy is in progress. What index must be normal, to confirm the adequate breathing correction?

- A.SvO₂
- B.PaO₂
- C.PvO₂
- D.PaCO₂
- E.PvCO₂

Task 7.

For a 60 years old female patient after 6 hours of the cholecystectomy the adequate consciousness, breathing, muscle tonus was restored, and an extubation is performed. In a hour, breathing became more superficial and frequent, oxygen saturation is 94 %. However on a request a patient breathes deeply. During auscultation of lungs there is the weak and harsh breathing. What is the tactic of the patient management?

- A.Tracheal intubation and PMV
- B.Changing of antibacterial therapy
- C.Injection of anticholinesterase drugs
- D.Correction of water-electrolyte disorders
- E.Adequate analgetic therapy

Task 8.

A 38 years old patient is suffering from rheumatism, with continuously-recurrent course and mitral valve failure. He complains of difficulty in breathing and worsening of vision. He answers to the questions after some pause, monosyllabically and unconstantly.

Objectively: lies with the upper head of a bed, there is diffused cyanosis, breath rate is 30 per minute, during auscultation there is the harsh breathing from apexes to III rib, below there are plural moist not sonorous and sonorous rales. SpO₂ is 75 %. BP is 130/80 mmHg, pulse is 98 beats per minute. On ECG there is sinus tachycardia, signs of left atrial hypertrophy. What method of breath correction is it necessary to apply immediately?

- A. Inhalation of oxygen-air mixture with FiO₂ 0,4
- B. Inhalation of oxygen-air mixture with FiO₂ 0,7
- C. Inhalation of oxygen via impermeable mask with FiO₂ 1,0
- D. Noninvasive PMV with FiO₂ 0,4
- E. PMV via intratracheal tube with FiO₂ 1,0

Task 9.

In an admission department a 30 years old patient, which was found by neighbours without consciousness, was delivered. At examination a doctor defined patient breath as Cheyne-Stokes breathing. What is correct description of this patient rhythm breathing?

- A. Short inhalation and protracted exhalation
- B. Protracted inhalation and short exhalation
- C. Respiratory pauses, alternating with the frequent deep breathing
- D. Amplitude of respiratory volume is fluently changed by short pauses
- E. Provides the external gas exchange

Task 10.

On exam in a student, which suffering from bronchial asthma, the attack of difficulty in breathing developed. She is in consciousness, adequate, cyanosis is not present. What does need to be performed for this patient?

- A.To provide the inflow of fresh air
- B.Intravenous injection of sympathomimetic
- C.Dosed inhalation of sympathomimetic
- D.Inhalation of corticosteroid
- E.Intravenous injection of corticosteroid

Standards of right answers.

Task 1. A. Task 2. A. Task 3. D. Task 4. C. Task 5. B.
Task 6. D. Task 7. E Task 8. E. Task 9. D. Task 10. C.

Short methodical instructions for practical study work.

At the beginning of study the students pass control of initial level of knowledge-abilities by means of test tasks. Students in the intensive care department examine the patients with different pathology of the respiratory system (in a postsurgical period, with asthmatic status, pulmonary edema, drowning, pulmonary embolism, aspiration syndrome, adult and new-born respiratory distress syndrome).

Make the plan of patients examination, analyse histories of illnesses with the estimation of laboratory and additional methods of examination and dynamics of acute respiratory insufficiency, diagnose of the urgent state, determine the plan of medical measures. In default of thematic patients analyse the copies of hospital charts, situational tasks decide. Patient examination and answers of students controlled by a teacher.

In an educational room students together with a teacher discuss the results of examination and students mistakes. After it students pass test control. Then the students get the marks of their work on the study.

Suggested Literature

1. Intensive Care Medicine, 6th Edition. Irwin R.S., Rippe J.M. – Lippincott Williams & Wilkins. – 2008.
2. ICU Book, 3rd Edition. P. Marino. – Lippincott Williams & Wilkins. – 2007.
3. Clinical Anesthesia, 6th Edition. P.G.Barash, B.F.Cullen et al. – Lippincott Williams & Wilkins. – 2009.