



MINISTRY OF EDUCATION AND SCIENCE OF THE RUSSIAN FEDERATION  
Federal state autonomous educational institution  
of higher education  
**«Far Eastern Federal University»**  
(FEFU)

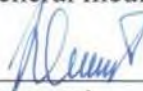
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**SCHOOL OF BIOMEDICINE**

«AGREED»

Head of education program  
«General medicine»

  
\_\_\_\_\_  
(signature) Khotimchenko Yu.S.  
(Full name)  
«09» of July 2019

«APPROVED»

Director of the Department of Clinical  
Medicine

  
  
\_\_\_\_\_  
(signature) Geltser B.I.  
(Full name)  
«09» of July 2019

**WORKING PROGRAM OF ACADEMIC DISCIPLINE (WPAD)**

**«Anesthesia, Resuscitation, Intensive Care»**

Education program

Specialty 31.05.01 «General medicine»

**Form of study: full time**

year 6, semester B  
lectures 18 hours  
practical classes 54 hours  
laboratory works not provided  
total amount of in-classroom works 72 hours  
independent self-work 72 hours  
control works ()  
pass-fail exam year 6, semester B  
exam not provided

The working program is drawn up in accordance with the requirements of the Federal state educational standard of higher education (level of training), approved by the order of the Ministry of education and science of the Russian Federation from 09.02.2016 № 95.

The working program of the discipline was discussed at the meeting of the Department of fundamental and clinical medicine. Protocol No. 8, 09 of July 2019

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## ANNOTATION

The discipline "Anesthesia, Resuscitation, Intensive Care" is purposed for students enrolled in the educational program 31.05.01 "General Medicine". Discipline is implemented on the 6th year as a basic discipline.

Development of the working program of the discipline was made in accordance with the Federal State Educational Standard of Higher Education in the specialty 31.05.01 "General Medicine" and the student training curriculum.

The total complexity of the discipline is 144 hours, 4 credits.

The course program is based on the basic knowledge gained by students:

- readiness for the use of medical devices provided by the procedures for the medical the readiness to collect and to analyze patient complaints, data of its history, the results of laboratory, instrumental, postmortem and other examinations to recognize the incidence or the absence of diseases (PC-5)

- the ability to determining the tactics of patient surveillance with different nosological entities. (PC-8)

- the willingness to assist at the delivering emergency medical care for the patients in the conditions, requiring urgent medical participation; (PC-11)

### **Goal of the course:**

Formation of students' knowledge about violations of the vital functions of the body, the principles of intensive care and resuscitation, the main methods of providing first aid for emergency conditions, as well as the principles of perioperative anesthesia, anesthetic management of surgical interventions and diagnostic manipulations, control and prosthetics of vital functions of the body

### **Objectives:**

1. Acquaintance of students with the etiology and pathogenesis of critical conditions, the pathophysiological essence of the processes occurring during the dying and restoration of the organism

2. The acquisition by students of knowledge on the diagnostics and principles of treatment of critical conditions in patients with surgical, therapeutic and other profiles;
3. Training in the complex of resuscitation measures in case of acute disorders of respiration and blood circulation, with clinical death; the use of modern methods of resuscitation and intensive care in assisting patients and victims in critical conditions of various etiologies; the formation of a sustainable algorithm of cardiopulmonary and brain resuscitation.
4. Formation of ideas about the principles of organization and possibilities of modern specialized anesthesiology and resuscitation services, modern methods of monitoring and detoxification, used in intensive care.
5. Familiarization of students with the principles of anesthetic management of surgical interventions and methods of anesthetic therapy.
6. Formation of ideas about the principles of organization and possibilities of a modern specialized anesthesiology service.

As a result of studying this discipline, students form the following general cultural and professional competences.:

<b>Competence and its code</b>	<b>Stages of competence formation</b>	
the readiness to use techniques of first aid and techniques of protection in emergency situations (GCC-7)	Knows	The use first aid techniques, methods of protection in emergency situations
	Is able to	Provide first aid, use methods of protection in emergency situations
	Possesses	Skill of the first aid, the use of methods of protection in emergency situations
the readiness to collect and to analyze patient complaints, data of its history, the results of laboratory, instrumental, postmortem and other examinations to recognize the incidence or the absence of diseases (PC-5)	Knows	Methods for examining patients for research purposes in order to recognize the condition or establish whether the disease is present or not
	Is able to	Identify, analyze and interpret patient examination data in order to recognize the condition or establish the presence or absence of the disease
	Possesses	Skill of systematic examination of the patient in order to recognize the condition or establish the fact of the presence or absence of the disease
the ability to determining the tactics of patient surveillance with different nosological entities. (PC-8);	Knows	Basics of management of patients with various nosological forms
	Is able to	Use educational and scientific literature to address the issues of determining the tactics of managing patients with various nosological forms
	Possesses	The ability to determine the tactics of managing patients with various nosological forms based on scientific and educational medical literature
the willingness to assist at the delivering emergency medical care for the patients in the conditions, requiring urgent medical participation; (PC-11)	Knows	Methods of providing emergency medical care in conditions requiring urgent medical intervention
	Is able to	Apply methods of emergency medical care in conditions requiring urgent medical intervention.
	Possesses	Skill in applying emergency medical care methods for conditions requiring urgent medical intervention
the willingness to do a medical assistance in emergency situations, as well as in medical evacuation (PC-13);	Knows	Methods of providing emergency medical care in conditions requiring urgent medical intervention
	Is able to	Apply methods of providing emergency medical care in conditions requiring urgent medical intervention.
	Possesses	Skill in applying emergency medical care methods for conditions requiring urgent medical intervention

## **I. I. STRUCTURE AND CONTENT OF THE THEORETICAL PART OF THE COURSE (36 HOURS)**

### **II. STRUCTURE AND CONTENT OF THEORETICAL PART OF THE COURSE (18 hours)**

#### **Module 1. Basics of resuscitations (4 hours)**

##### **Theme 1. General resuscitations, resuscitations and IC in cardiovascular and respiratory failure (2 hours)**

Pathophysiology of the vital functions extinction of the body (phase of the dying process, types of cardiac arrest, resuscitation methods). The structure and stages of resuscitation care. Cardiopulmonary resuscitation, methods and techniques of defibrillation, features of transportation of patients with resuscitation profile and ensuring their safety. Post-resuscitation disease (pathological processes characterizing post-resuscitation disease, methods of intensive care of post-resuscitation disease, principles of general patient care in the resuscitation profile). Resuscitation and IC in case of a sudden arrest of blood circulation. Resuscitation and IC for acute blood loss and hypovolemia. IC in disturbed blood circulation in the main vessels. Principles of IC with ARF, extracorporeal oxygenation in RF.

##### **Theme 2. Resuscitation and IC for traumatic brain injury, pathology of the nervous system, mechanical, combined, thermal and electric injury (2 hours)**

Organization of resuscitation care in case of injury (traumatic shock, multiple organ failure, principles of IC in case of polytrauma). IC in acute traumatic brain injury (TBI). IC in disorders of cerebral circulation (stroke). IC for meningoencephalitis. IC in case of burn shock (features of pathogenesis and clinic in case of burn shock, correction of hemodynamic, volemic and metabolic disorders in burn shock, methods of anesthesia in burn shock). IC with hypothermia. IC with electric shock.

#### **Module 2. Basics of Intensive Therapy (6 hours)**

**Theme 1. Basics of intensive care. Water-electrolyte balance and acid-base balance. Basics of infusion therapy (2 hours)**

The amount of water in the body, its distribution and water balance. Violations of water and electrolyte metabolism, edema. Regulation of acid-base balance, buffer systems. Violations of acid-base balance. Principles of treatment of disorders of WEB and ABB. Infusion therapy, indications for its use. Crystalloid solutions. Colloidal solutions. The concept of the modern balanced infusion therapy. Complications of infusion therapy.

**Theme 2. Intensive therapy in acute infectious diseases and septic conditions (2 hours)**

Causes of nosocomial infections, classification of nosocomial infections. The clinical picture, the treatment of nosocomial infections. Prevention of nosocomial infections. Microbiological monitoring in OARIT. Antibacterial and antifungal drugs. Complications of antibiotic therapy. The concept of sepsis, pathogenesis and principles of treatment of sepsis

**Theme 3 Acute circulatory failure. Types of shock. Intensive shock therapy (2 hours)**

Shock classification. Causes and mechanisms of the shock development. Hypovolemic shock. Cardiogenic shock. Anaphylactic shock. Septic shock. Traumatic shock. Intensive therapy for various types of shock.

**Module 3 General Anesthesiology (8 hours)**

**Theme 1. Types, stages and components of general anesthesia (2 hours)**

Introductory anesthesia, methods, medications, possible complications. Basic anesthesia, techniques, preparations for manipulation, possible complications. Exit from anesthesia. Early post-narcotic period, prevention of complications. Outing of anesthesia. Maintenance of anesthesia with inhalants. Possibilities of inhalation anesthesia using inert xenon gas. Methods of the patient monitoring. Recovery period after general anesthesia. Mistakes, dangers and complications of general anesthesia.

**Theme 2. Anesthesia in surgery of the esophagus and abdominal surgery.  
Anesthesia and intensive care in urology and nephrology (2 hours)**

Introduction to general anesthesiology. Preoperative preparation of the patient, determination of the degree of anesthetic risk for ASA and for INOAR. Anesthesia for planned and emergency surgeries. The problem of "full stomach", prevention of CAS. Features of preparation for anesthesia and surgery on the esophagus and stomach. The choice of anesthesia method for operations on the pancreas. The choice of anesthesia method for operations on the colon. The choice of anesthesia method for kidney surgery. General anesthesia for operations on the bladder and urethra. The choice of anesthesia method for radical prostatectomy. The choice of anesthesia method for kidney transplantation.

**Theme 3. Anesthesia in traumatology, orthopedics and plastic surgery.  
Anesthesia in neurosurgery (2 hours)**

Preoperative condition, preparation for surgery and anesthesia in victims with mechanical trauma, features of anesthesia for polytrauma. Anesthesia for orthopedic and plastic surgery. Anesthesia for spinal surgery. Anesthesia for operations on the limbs. Anesthesia for operations and bandages for burned patients. The choice of anesthesia method for a burn disease. Correction of water-electrolyte and protein deficiencies. Anesthesia for neurosurgical operations. Indications for tracheostomy and prolonged mechanical ventilation. Prevention of cerebral edema. Features of anesthesia during operations in the sitting position. Features of anesthesia during spinal cord surgery. Features of anesthesia during operations on peripheral nerves and brachial plexus.

**Theme 4. Anesthesia and IC in obstetrics and gynecology. Anesthesia in children (2 hours)**

Physiology of pregnant women. The state of vital organs and systems in pregnant women. Permeability of the placenta for sedatives and anesthetics. Anesthesia for planned and emergency caesarean section. Anesthesia for complicated childbirth. Resuscitations and IC for pre-eclampsia and eclampsia.

Resuscitation and IC at EOW. IC for obstetric bleeding. IC and resuscitations in critical conditions in newborns. Anesthesia for surgical interventions in gynecology. Features of anesthesia for abdominal and laparoscopic operations in gynecology. Anesthesia for small operations in gynecology and endoscopic examinations.

Anatomical and physiological peculiarities of children of different ages. General anesthesia in children. Clinical and physiological assessment of the general state of determining the degree of A-O risk. Indications for endotracheal anesthesia. Features masked anesthesia. Local anesthesia in children. Features of epidural anesthesia in children. Age dosages of local anesthetics.

## **STRUCTURE AND CONTENT OF THE PRACTICAL COURSE PART**

### **Practical classes (54 hours)**

#### **Lesson 1. Pathophysiology of the vital function extinction of the body (3 hours)**

Phase course of the dying process. Characteristics and signs of pre-agonal period, agony, clinical and biological death. Leading pathogenetic factors in various types of dying organism. Hypoxia, secondary metabolic disorders, compensation mechanisms. Systemic and organ circulation.

Pathophysiology of the central nervous system with hypoxia and dying. The extinction of the central nervous system functions when dying. Morphological changes in the brain when dying. Post-resuscitation disease: pathological processes that characterize post-resuscitation disease, methods of intensive care of post-resuscitation disease, principles of general care for a resuscitation patient

#### **Lesson 2: Cardiopulmonary resuscitation (CPR) (3 hours)**

Basic cardiopulmonary resuscitation with automatic external defibrillation. Extended cardiopulmonary resuscitation. Carrying out CPR at various types of circulatory arrest. Termination and refusal of cardiopulmonary resuscitation

#### **Lesson 3: Acute respiratory failure (ARF) (3 hours)**



Clinical anatomy of respiration. Anatomy of the lungs. The role of surfactant in respiration. Mechanisms of inhalation and exhalation. Regulation of breathing. Risk factors, etiology, pathogenesis, clinical presentation, diagnostic criteria and treatment guidelines for acute respiratory failure. Classification ARF. Mechanism of the ARF development in diseases of the respiratory system. Respiratory failure as a complication of somatic and surgical diseases. Foreign body in respiratory tract.

Examination and treatment of emergency and critical conditions accompanied by acute respiratory failure. Etiology, pathogenesis, classification of ARDS. The clinical picture, stage ARDS. Treatment of ARDS.

#### **Lesson 4: Respiratory therapy (3 hours)**

Indications for respiratory support in resuscitation. Devices for carrying out a long artificial ventilation of the lungs (ALV). Types of breathing apparatus. Safety of work with ventilators. Check the tightness of the breathing circuit. Methods and modes of mechanical ventilation. Invasive and non-invasive mechanical ventilation. High frequency ventilation. Complications of mechanical ventilation and prevention methods.

#### **Lesson 5. Water-electrolyte balance and acid-base balance (3 hours)**

The amount of water in the body, its distribution and water balance. Violations of water and electrolyte metabolism, edema. Regulation of acid-base balance, buffer systems. Violations of acid-base balance. Principles of treatment of disorders of WEB and ABB. Infusion therapy, indications for its use. Crystalloid solutions. Colloidal solutions. The concept of modern balanced infusion therapy. Complications of infusion therapy.

#### **Lesson 6: Transfusiology (3 hours)**

Blood components and rules for their preparation. Determination of blood types and Rh factor, blood phenotyping. Indications for transfusion of blood components. Complications of blood transfusions.

#### **Lesson 7. Nutritional support (3 hours)**

Metabolism in critical conditions. Indications and contraindications for nutritional support. Therapeutic enteral feeding. Parenteral feeding. Intensive therapy of intestinal failure syndrome.

### **Lesson 8. Acute circulatory failure (3 hours)**

Acute heart failure. Acute vascular insufficiency. Cardiogenic and non-cardiogenic pulmonary edema. Heart tamponade. Risk factors and clinical features of pulmonary embolism. Examination of patients with suspected pulmonary embolism, emergency care. Prevention of pulmonary thromboembolism.

### **Lesson 9. Shock (3 hours)**

Shock classification. Causes and mechanisms of the shock development. Hypovolemic shock. Cardiogenic shock. Anaphylactic shock. Septic shock. Traumatic shock. Intensive therapy for various types of shock.

### **Lesson 10. Endogenous and exogenous intoxication. Acute renal failure (ARF). Acute liver failure. Detoxification methods (3 hours)**

Endogenous intoxication syndrome. Prerenal ARF. Intrarenal ARF. Postrenal ARF. Diagnostic methods. Treatment of acute renal failure. Indications for hemodialysis. Mechanical jaundice. Cirrhosis of the liver. Toxic hepatitis.

Classification of poisons. The mechanism of action of poisons. Neurotoxic poisons. Cardiotoxic poisons. Hepatotoxic poisons. Nephrotoxic poisons. Treatment of acute exogenous poisoning.

Ways and mechanisms of detoxification. Methods of natural detoxification of the body. Sorption detoxification methods. Filtration detoxification methods. Efferent detoxification methods. Hemodialysis with ARF and CRF

### **Lesson 11. Resuscitation and IC in traumatic brain injury and CNS pathology. Coma (3 hours)**

IC in acute traumatic brain injury (TBI). IC in disorders of cerebral circulation (stroke). IC for meningoencephalitis. Etiology and developmental mechanism of coma. Features of the clinical picture lump in diabetes, metabolic disorders. Coma in infectious diseases of the central nervous system (viral

encephalitis, meningitis). Coma due to exogenous poisoning. Tactics for the coma of unknown etiology.

**Lesson 12. Intensive therapy in acute infectious diseases and septic conditions. Nosocomial infections in anesthesiology and intensive care (3 hours)**

Causes of nosocomial infections. Classification of nosocomial infections. The clinical picture, the treatment of nosocomial infections. Prevention of nosocomial infections. Microbiological monitoring in OARIT. Antibacterial and antifungal drugs. Complications of antibiotic therapy. The concept of sepsis, pathogenesis and principles of treatment of sepsis

**Lesson 13. Disseminated intravascular coagulation syndrome (DIC) (3 hours)**

Etiology, clinical presentation, prevention of DIC. Prevention of thrombosis in the ICU. Conducting thrombolytic and antiplatelet therapy. Complications of thrombolytic and antiplatelet therapy.

**Lesson 14. Resuscitation and IT for mechanical, combined, thermal and electrical injury (3 hours)**

The organization of resuscitation care in case of injury. Traumatic shock, multiple organ failure, principles of IC with polytrauma. IC in burn shock. IC in hypothermia. IC for electric shock trauma. Technical equipment of vehicles to provide resuscitation care for victims of mass trauma.

**Lesson 15. Physical status. The main pathological conditions. Respiratory system. Cardiovascular system (3 hours)**

General therapeutic examination, palpation, auscultation, percussion. Operational and anesthetic risk factors. Determination of OA risk level for ASA and for INDAR. Obstructive, restrictive lung diseases, central respiratory disorders. Study of a patient with lung diseases. Assessment of risk factors for pulmonary complications.

Cardiovascular diseases: hypertension, cardiac arrhythmias, coronary heart disease, valvular lesions, heart failure, cardiac tamponade. Examination of a

patient with circulatory system diseases. Assessment of risk factors for cardiovascular complications.

**Lesson 16. Premedication. Types, stages and components of general anesthesia. General anesthesia (3 hours)**

Types, stages and methods of sedation. Preparations for premedication. Undesirable reactions to premedication, individual reaction, side effects. Complications of sedation. Premedication in pediatrics. Introductory anesthesia, methods, preparations for, possible complications. Basic anesthesia, techniques, preparations for the event, possible complications. Outing from anesthesia. Early post-narcotic period, prevention of complications. Induction of anesthesia. Maintenance of anesthesia with inhalants. Possibilities of inhalation anesthesia using inert xenon gas. Methods of monitoring the patient. Mistakes, dangers and complications of general anesthesia.

**Lesson 17. Principles of intensive care and postoperative care (3 hours)**

Recovery period after general anesthesia. Organization of the system of intensive observation. Express diagnostics. Anesthesia. Prevention and correction of disorders of the body systems. Corrective infusion-transfusion therapy. The use of methods of enteral and parenteral nutrition.

**Lesson 18. The pain is acute and chronic. Regional anesthesia. Conductive anesthesia. Pain treatment (3 hours).**

Modern ideas about pain. Classification of the pain syndromes. Social aspects of pain. Peripheral and central mechanisms of nociception. Morphological and functional organization of the nociceptive and antinociceptive systems of the brain. Pathophysiological classification of pain syndromes: nociceptive pain, neuropathic pain, psychogenic pain. Classification of analgesics. Measurement and evaluation of pain. Principles of postoperative analgesia. Multimodal analgesia.

Regional anesthesia in various fields of medicine. Spinal anesthesia. Epidural anesthesia. Conductive anesthesia. Peripheral nerve block. Local infiltration anesthesia. Indications, methods of performing these types of anesthesia. Mechanisms of chronic pain. Examination of a patient with pain.

Headaches, back pain. Pain in cancer. Classification, developmental mechanisms. Principles of diagnosis and treatment of chronic pain syndrome.

### **III. TRAINING AND METHODOLOGICAL SUPPORT OF INDEPENDENT WORK OF STUDENTS**

The main content of the topics, evaluation tools are presented in the WPAD: terms and concepts necessary for mastering the discipline.

During the mastering the course “Anesthesiology, Resuscitations, Intensive Therapy”, the student will have to do a large amount of independent self-work, including preparation for seminars and writing an essay.

Practical classes help students to deeper learn the material, to acquire the skills of creative work on documents and primary sources.

Plans for practical classes, their topics, recommended literature, the purpose and objectives of its study are communicated by the teacher at the introductory classes or in the curriculum for the discipline.

Before starting to study the topic, it is necessary to familiarize yourself with the basic questions of the practical training plan and the list of recommended literature.

Starting the preparation for the practical lesson, first of all it is necessary to refer to the lecture notes, sections of textbooks and teaching aids in order to get a general idea of the place and significance of the topic in the course being studied. Then work with additional literature, make notes on the recommended sources.

In the process of studying the recommended material it is necessary to understand the construction of the topic being studied, highlight the main points, trace their logic and thereby get into the essence of the problem being studied.

It is necessary to keep records of the material being studied in the form of an outline, which, along with the visual, includes the motor memory and allows you to accumulate an individual fund of auxiliary materials for a quick repetition of

what you read, to mobilize accumulated knowledge. The main forms of writing: a plan (simple and detailed), extracts, theses.

In the preparation process, it is important to compare the sources, think over the material being studied and build an algorithm of actions, carefully consider your oral presentation.

At a practical lesson, each participant should be ready to speak on all the questions posed in the plan, to be as active as possible in their consideration. The speech should be convincing and reasoned, and simple reading of an essay is not allowed. It is important to show own attitude to what is being said, express your personal opinion, understanding, substantiate it and draw the right conclusions from what has been said. Student can refer to notes of references and lectures, directly to primary sources, use the knowledge of monographs and publications, facts and observations of modern life, etc.

A student who did not have time to speak at a practical lesson can present a prepared summary to the teacher for verification and, if necessary, answer the teacher's questions on the practical lesson to get a credit score on this topic.

The teaching and methodological support of students' independent work in the discipline "Anesthesiology, resuscitations, intensive therapy" is presented in Appendix 1 and includes:

- characteristics of tasks for independent self-work of students and methodological recommendations for their implementation;
- requirements for the reports and presentation of the results of independent self-work;
- criteria for assessment of execution of the independent self-work.

#### IV. CONTROL OF ACHIEVEMENT OF COURSE GOALS

Competence and its code		Stages of competence formation			
No.	Controlled sections / topics of disciplines	Codes and stages of the formation of competencies		Evaluation tools	
				Current control	Intermediate certification / exam
1	Module 1 Basics of resuscitation	willingness to use first aid techniques, methods of protection in emergency situations (GCC-7)	Knows	OA-1 Interview	Credit answers 7 semester -1-132
			Is able to	PW-1 Test	PW-1 Test
			Possesses	OA-3 Report	OA-2 Colloquium
2	Module 2 Basics of Intensive Care Module 3 General Anesthesiology	willingness to collect and analyze patient complaints, his medical history, examination results, laboratory, instrumental, autopsy and other studies in order to recognize the condition or establish whether there is a disease (PC-5)	Knows	OA-1 Interview	Credit answers 7 semester -1-132
			Is able to	OA-1 Interview	PW-1 Test
			Possesses	PW-1 Test PR-11 Case study task	OA-2 Colloquium
	Module 1 Basics of resuscitation Module 2 Basics of Intensive Care Module 3 General Anesthesiology	ability to determine the tactics of managing patients with various nosological forms (PC-8);	Knows	OA-1 Interview	Credit answers 7 semester -1-132
			Is able to	OA-1 Interview	PW-1 Test
			Possesses	PW-1 Test PR-11 Case study task	OA-2 Colloquium
	Module 1 Basics of resuscitation Module 2 Basics of Intensive Care	willingness to participate in the provision of emergency medical care in conditions requiring urgent medical intervention (PC-11)	Knows	OA-1 Interview	Credit answers 7 semester -1-132
			Is able to	OA-1 Interview	PW-1 Test
			Possesses	PW-1 Test PR-11 Case study task	OA-2 Colloquium
	Module 1 Basics of resuscitation Module 2 Basics of Intensive Care Module 3 General Anesthesiology	willingness to participate in the provision of medical care in emergency situations, including participation in medical evacuation (PC-13);	Knows	OA-1 Interview	Credit answers 7 semester -1-132
			Is able to	OA-1 Interview	PW-1 Test
			Possesses	PW-1 Test PR-11 Case study task	OA-2 Colloquium

*Approximate types of assessment tools: interview on situational tasks, written or computer testing, standard calculations, individual tasks, abstract, essay, etc.*

Control and methodological materials as well as criteria and indicators necessary for the assessment of knowledge and skills, and characterizing the stages of the formation of competencies in the process of mastering the educational program are presented in Appendix 2.

## **V. LIST OF EDUCATIONAL LITERATURE AND INFORMATION AND METHODOLOGICAL PROVISION OF DISCIPLINE**

### **Main literature**

1. Resuscitation / Antonino Gullo, Giuseppe Ristagno / Springer-Verlag Italia 2014 <https://link.springer.com/book/10.1007/978-88-470-5507-0#editorsandaffiliations>

2. Handbook of Critical and Intensive Care Medicine / Joseph Varon / Springer International Publishing Switzerland 2016 <https://link.springer.com/book/10.1007/978-3-319-31605-5#authorsandaffiliationsbook>

### **Additional literature**

1. Anesthesia Student Survival Guide / Jesse M. Ehrenfeld, Richard D. Urman, Scott Segal / Springer International Publishing Switzerland 2016 <https://link.springer.com/book/10.1007/978-3-319-11083-7#editorsandaffiliations>

### **Electronic resources**

1. Scientific and practical society anaesthesiologists and resuscitators of St. Petersburg <https://spboar.ru/>
2. All-Russian Federation of Anesthesiology Resuscitation <http://www.far.org.ru/recomendation>
3. Magazine "Intensive therapy" <http://www.icj.ru/>
4. National Resuscitation Council <https://www.rusnrc.com/links>
5. European Resuscitation Council <https://www.rusnrc.com/--2015->



## LIST OF INFORMATION TECHNOLOGIES AND SOFTWARE

The location of the computer equipment on which the software is installed, the number of jobs	List of licensed software
<p>Multimedia auditorium Vladivostok Russian island, Ayaks 10, building 25.1, RM. M723 Area of 80.3 m2 (Room for independent work)</p>	<p>Windows Seven enterprise SP3x64 Operating System Microsoft Office Professional Plus 2010 office suite that includes software for working with various types of documents (texts, spreadsheets, databases, etc.); 7Zip 9.20 - free file archiver with a high degree of data compression; ABBYY FineReader 11 - a program for optical character recognition; Adobe Acrobat XI Pro 11.0.00 - software package for creating and viewing electronic publications in PDF; WinDjView 2.0.2 - a program for recognizing and viewing files with the same format DJV and DjVu.</p>

In order to provide special conditions for the education of persons with disabilities all buildings are equipped with ramps, elevators, lifts, specialized places equipped with toilet rooms, information and navigation support signs

## **VI. METHODOICAL INSTRUCTIONS ON THE MASTERING OF DISCIPLINE**

In the process of studying the discipline "Anesthesiology, resuscitations, intensive therapy" various methods and tools for learning the educational content are offered: lecture, practical exercises, tests, testing, independent work of students.

The lecture is the main active form of performing the classroom studies, explaining the fundamental and most difficult theoretical sections of human anatomy, which involves intense mental activity of student and this is especially difficult for first-year students. A lecture should always be informative, educational, and organizing. Lecture notes help to learn the theoretical material of the discipline. Listening to a lecture it is necessary to take note of the most important and preferably by student's own formulations, which allows to memorize the material better. Synopsis is useful when it is written by a student. Student can develop his/her own word reduction scheme. The name of the paragraphs can be highlighted with colored markers or pens. In a lecture the teacher gives only a small fraction of the material on one or other topics that are given in textbooks. Therefore, when working with the lecture notes, it is always necessary to use the main textbook and additional literature that are recommended in this discipline. It is such serious work of a student with lecture material that allows him to achieve success in mastering new knowledge. For the presentation of the lecture course on the discipline "Anesthesiology, resuscitations, intensive therapy", the following forms of active learning are used: lecture-conversation, lecture-visualization, which are made on the basis of knowledge obtained by students in interdisciplinary disciplines: "Human Anatomy", "Normal Physiology" "Pathological anatomy", "Pathological physiology". Presentations, tables, charts on a blackboard are used to illustrate the verbal information. In the course of the presentation of the lecture material posed questions or questions with elements of discussion.

### **Lecture – visualization**

Lecture is accompanied by tables, slideshows, which contributes to a better perception of the material. Lecture - visualization requires certain skills - verbal presentation of the material must be accompanied and combined with visual form. The information presented in the form of diagrams on the board, tables, slides, allows you to form problematic issues, and contributes to the development of professional thinking of future specialists.

### **Lecture - conversation.**

Lecture-conversation, or it is also called in pedagogy a form of education “dialogue with the audience,” is the most common form of active learning and allows you to involve students in the learning process, as there is direct contact with the teacher audience. Such contact is achieved in the course of the lecture, when students are asked questions of a problem or informational matter, or when invite students to ask the questions themselves. Questions are offered to the entire audience, and any of the students can offer their own answer, another can complement it. At the same time, from lecture to lecture it is possible to identify more active students and try to activate students who are not participating in the work. This form of lecture allows teacher to engage students in work, increase their attention, thinking, gain collective experience, learn how to formulate questions. The advantage of the lecture-conversation is that it allows to attract the attention of students to the most important issues of the topic, to determine the content and pace of presentation of educational material.

### **Lecture - press conference**

At the beginning of the lesson, the teacher announces the topic of the lecture and invites students to ask him in writing questions on this topic. Each student must formulate the most interesting questions on the topic of the lecture within 2-3 minutes, write them on a piece of paper and pass the note to the teacher. The teacher within 3-5 minutes sorts the questions according to their semantic content and begins to give a

lecture. The presentation of the material is presented in the form of a coherent disclosure of the topic, and not as an answer to each question asked, but during the lecture the corresponding answers are formulated. At the end of the lecture, the teacher conducts a final assessment of the questions, revealing the knowledge and interests of the students.

### **Practical classes in the discipline "Anesthesiology, resuscitations, intensive therapy"**

Practical classes is a collective form of consideration of educational material. Seminars, which are also one of the main types of practical classes designed for in-depth study of the discipline, held interactively. At the workshop on the topic of the seminar, questions are sorted out and then, together with the teacher, they hold a discussion, which is aimed at consolidating the material under discussion, developing skills to debate, develop independence and critical thinking, the students' ability to navigate through large information flows, develop and defend their own position on problematic issues academic disciplines. As active learning methods are used in practical classes: a press conference, a detailed conversation, a dispute. A detailed conversation involves preparing students for each issue of the lesson plan with a uniform list of recommended and additional literature recommended for all. Reports are prepared by students on pre-proposed topics.

Dispute in the group has several advantages. The dispute may be called by the teacher during the course of the lesson or planned by him in advance. In the course of the controversy, students form resourcefulness, quick thinking reaction.

Press conference. The teacher instructs 3-4 students to prepare short reports. Then one of the participants from this group makes a report. After the report, students ask questions that are answered by the speaker and other members of the expert group. Based on the questions and answers, a creative discussion takes place along with the teacher.

## **VII. LOGISTICS DISCIPLINE**

For practical work, as well as for the organization of independent work, students have access to the following laboratory equipment and specialized classrooms that meet the current sanitary and fire regulations, as well as safety requirements during training and scientific and industrial works:

<b>Name of the equipped rooms and rooms for independent work</b>	<b>List of main equipment</b>
The computer class of the School of biomedical AUD. M723, 15 work placts	<p>Screen, electrically 236*147 cm to trim the screen; Projector DLP technology, 3000 ANSI LM, WXGA with 1280x800 resolution, 2000:1 Mitsubishi EW330U; Subsystem of specialized mounting equipment course-2007 Tuarex; Subsystem of videocommunity: matrix switch DVI and DXP 44 DVI Pro advertising; extension cable DVI over twisted pair DVI 201 TX/RX advertising; Subsystem of audiocommentary and sound; speaker system for ceiling si 3ct LP Extron on from; digital audio processor DMP 44 LC the Extron; the extension for the controller control IPL T CR48; wireless LAN for students is provided with a system based on 802.11 a/b/g/N 2x2 MIMO(2SS) access points.</p> <p>Monoblock HP Loope 400 all-in-one 19.5 in (1600x900), core i3-4150t, 4GB DDR3-1600 (1x4GB), 1TB HDD 7200 SATA, and a DVD+ / -RW, GigEth, Wi-Fi and BT, the USB port of roses/MSE, Win7Pro (64-bit)+Win8.1Pro(64-bit), 1-1-1 Wty</p>
Multimedia audience	<p>Monoblock Lenovo C360G-i34164G500UDK; projection Screen Projecta Elpro Electrol, 300x173 cm; Multimedia projector, Mitsubishi FD630U, 4000 ANSI Lumen 1920 x 1080; Flush interface with automatic retracting cables TLS TAM 201 Stan; Avervision CP355AF; lavalier Microphone system UHF band Sennheiser EW 122 G3 composed of a wireless microphone and receiver; Codec of videoconferencing LifeSizeExpress 220 - Codeconly - Non-AES; Network camera Multipix MP-HD718; Two LCD panel, 47", Full HD, LG M4716CCBA; Subsystem of audiocommentary and sound reinforcement; centralized uninterrupted power supply</p>
Reading rooms of the Scientific library of the University open access Fund (building a - 10)	<p>Monoblock HP Loope 400 All-in-One 19.5 in (1600x900), Core i3-4150T, 4GB DDR3-1600 (1x4GB), 1TB HDD 7200 SATA, DVD+/-RW,GigEth,wifi,BT,usb kbd/mse,Win7Pro (64-bit)+Win8.1Pro(64-bit),1-1-1 Wty Speed Internet access 500 Mbps. Jobs for people with disabilities equipped with displays and Braille printers.; equipped with: portable reading devices flatbed texts, scanning and reading machines videovelocity with adjustable color spectrums; increasing electronic loops and ultrasonic marker</p>
Accreditation-simulation center of the school of	

Practical training is conducted on a clinical basis..

**Clinical bases:**

Medical Center of the Federal State Autonomous Educational Institution of Higher Education "Far Eastern Federal University";

Regional State Autonomous Healthcare Institution "Vladivostok Clinical Hospital No. 2";

State budgetary health care institution "Regional Clinical Hospital No. 2", Vladivostok;

Institution of the Russian Academy of Sciences "Medical Association of the Far Eastern Branch of the Russian Academy of Sciences."

MINISTRY OF EDUCATION AND SCIENCE OF THE RUSSIAN FEDERATION  
Federal state autonomous educational institution  
of higher education  
**« Far Eastern Federal University »**  
(FEFU)

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**SCHOOL OF BIOMEDICINE**

**TRAINING AND METHODOLOGICAL SUPPORT OF INDEPENDENT  
WORK OF STUDENTS**

**on discipline «Anesthesiology, resuscitations, intensive care»**

**Direction of training (specialty) 31.05.01 General medicine**

**Form of training: full-time**

Vladivostok  
2018

Independent self-work includes:

- 1) library or homework with educational literature and lecture notes,
- 2) preparation for practical classes,
- 3) preparation for testing and control interview (credit)

The procedure for the performance of independent self-work by students is determined by the schedule for the performance of independent self-work on the discipline.

### **Schedule of independent work on the discipline**

<b>No.</b>	<b>Date / Deadline</b>	<b>Type of independent work</b>	<b>Estimated norms of time for execution (hour)</b>	<b>Form of control</b>
11 semester				
1	2-3 week	Essay	9	OR-3-Report
2	4-15 week	Presentation on the essay topic	57	POA-3-Report
3	17-18 week	Preparation for pass-fail exam	6	OA-1-Interview PW-1 - Test

### **Topics for reports and essays**

There are 72 hours of independent work within the discipline. Within the framework of these hours 2 oral reports are must be carried out on the proposed topics.

#### **Topics of reports and essays**

1. Intensive therapy of acute heart failure.
2. Acute blood loss.
3. Acute respiratory distress syndrome.
4. Nutritional support in intensive care.
5. Intensive treatment of acute disorders of water and electrolyte balance.



6. First aid for respiratory and circulatory arrest. Cardiopulmonary resuscitation.
7. Basics of infusion therapy.
8. Intensive shock therapy.
9. Methods of intensive care for postresuscitation disease.
10. DIC syndrome.
11. Treatment of pain syndromes.
12. Premedication.
13. Inhalation anesthesia. Low flow anesthesia.
14. Regional anesthesia of the upper limb.
15. Spinal and epidural anesthesia.
16. Anaphylactic shock. Emergency care, intensive care.
17. Total intravenous anesthesia.
18. Thermoregulation during anesthesia.
19. Artificial blood circulation. Anesthetic management in cardiac surgery.
20. Features of anesthetic management in children.

### **Guidelines for writing and design of an essay**

Essay is a creative activity of the student reproducing in its structure the research activities to solve theoretical and applied problems in a particular branch of scientific knowledge. That is why the course certification work is an essential component of the educational process in higher education.

The essay is a model of scientific research, independent self-work in which a student solves a problem of a theoretical or practical nature, applying the scientific principles and methods of a given branch of scientific knowledge. The result of this scientific search may have not only subjective, but also objective scientific novelty, and therefore can be presented for discussion by the scientific community in the form of a scientific report or presentation at scientific-practical conferences, as well as in a form of research article.

Essay involves the acquisition of skills for building business cooperation, based on ethical standards of scientific activity. Purposefulness, initiative, disinterested cognitive interest, responsibility for the results of their actions, conscientiousness, competence - personality traits that characterize the subject of research activities corresponding to the ideals and norms of modern science.

The essay is an independent educational and research activity of the student. The teacher assists in a consultative manner and assesses the process and the results of the activity. Teacher provides an approximate topic of the essay work, specifies the problem and topic of research with a student or intern, helps to plan and organize research activities, assigns time and a minimum number of consultations.

The teacher receives the text of the essay for verification at least ten days before the defense.

Generally there is a certain structure of the essay, the main elements of which in order of their location are the following:

1. Title page.
2. Goal.
3. Table of Contents
4. List of abbreviations, symbols and terms (if necessary).
5. Introduction.
6. Main part.
7. Conclusion.
8. Reference list.
9. Appendixes.

The title page contains educational institution, graduating department, author, teacher or supervisor, research topic, place and year of the essay.

The title of the essay should be as short as possible and fully consistent with its content.

The table of contents (content) reflects the names of the structural parts of the essay and the pages on which they are located. The table of contents should be placed at the beginning of work on one page.

The presence of a detailed introduction - a mandatory requirement for the abstract. Despite the small volume of this structural part, its preparation causes considerable difficulties. However, this is a qualitatively executed introduction that is the key to understanding the entire work, which testifies to the professionalism of the author.

Thus, the introduction is a very crucial part of the essay. The introduction should start with a justification of the relevance of the chosen topic. As applied to the essay, the concept of "relevance" has one feature. From how the author of the essay can choose a topic and how correctly he understands and evaluates this topic from the point of view of modernity and social significance, characterizes his scientific maturity and professional preparedness.

In addition, in the introduction it is necessary to isolate the methodological basis of the essay, name the authors, whose works constituted the theoretical basis of the study. A review of the literature on the topic should show the author's thorough acquaintance with special literature, his ability to systematize sources, critically examine them, highlight the essential and determine the most important in the up-to-date state of knowledge of the topic.

The introduction reflects the importance and relevance of the chosen topic, defines the object and subject, purpose and objectives, and the chronological framework of the study.

The introduction ends with a statement of the general conclusions about the scientific and practical significance of the topic, the degree of its knowledge and sources, and the hypothesis being put forward.

The main part describes the essence of the problem, reveals the topic, determines the author's position, factual material is given as an argument and for display of further provisions. The author must demonstrate the ability to

consistently present the material while analyzing it simultaneously. Preference is given to the main facts, rather than small details.

The essay ends with the final part called "conclusion". Like any conclusion, this part of the essay serves as a conclusion due to the logic of the study which is a form of synthesis accumulated in the main part of scientific information. This synthesis is a consistent, coherent presentation of the results obtained and their relation to a common goal and specific tasks set and formulated in the introduction. At this place there is a so-called "output" knowledge, which is new in relation to the original knowledge. The conclusion may include suggestions of practical matter, thereby increasing the value of theoretical materials.

So, the conclusion of the essay should contain: a) presents the conclusions of the study; b) theoretical and practical significance, novelty of the essay; c) indicated the possibility of applying the results of the study.

After conclusion it is acceptable to place the reference list of the literature used throughout. This list is one of the essential parts of the essay and reflects the independent creative work of the author of the essay.

The list of sources used is placed at the end of the work. It is made either in alphabetical order (by the name of the author or the name of the book), or in the order in which the references appear in the text of the prepared work. In all cases, the full title of the work, the names of the authors or the editor of publication are indicated if the writing team involved a group of authors, data on the number of volumes, the name of the city and publisher in which the work was published, year of publication, number of pages.

### **Methodical recommendations for the presentation preparation**

For preparation of presentation it is recommended to use: PowerPoint, MS Word, Acrobat Reader, LaTeX-bev package. The simplest program for creation of presentations is Microsoft PowerPoint. To prepare a presentation, it is necessary to process the information collected while writing the essay.

The sequence of preparation of the presentation:

1. Clearly state the purpose of the presentation.
2. Determine what the presentation format will be: live presentation (then how long it will be) or e-mail (what will be the context of the presentation).
3. Select the entire content of the presentation and build a logical chain of presentation.
4. Identify key points in the content of the text and highlight them.
5. Determine the types of visualization (pictures) to display them on slides in accordance with the logic, purpose and specificity of the material.
6. Choose the design and format the slides (the number of pictures and text, their location, color and size).
7. Check the visual perception of the presentation.

The types of visualization include illustrations, images, charts, tables. The illustration is a representation of a real-life visual. The images - as opposed to illustrations - are metaphor. Their purpose is to cause an emotion and create an attitude towards it, to influence the audience. With the help of well-designed and presented images, information can remain permanently in a person's memory. Chart is visualization of quantitative and qualitative relationships. They are used for convincing data demonstration, for spatial thinking in addition to the logical one. Table is a specific, visual and accurate data display. Its main purpose is to structure information, which sometimes facilitates the perception of data by the audience.

#### *Practical hints on preparing a presentation*

- printed text + slides + handouts are prepared separately;
- slides -visual presentation of information that should contain a minimum of text and maximum of images that bring a meaning, to look visually and simply;
- textual content of the presentation - oral speech or reading, which should include arguments, facts, evidence and emotions;
- recommended number of slides 17-22;

- mandatory information for the presentation: the subject, surname and initials of the speaker; message plan; brief conclusions from all that has been said; list of sources used;

- handout - should be provided with the same depth and coverage as the live performance: people trust more what they can carry with them than disappear images, words and slides are forgotten, and handouts remain a constant tangible reminder; handouts are important to distribute at the end of the presentation; Handouts should be different from slides, should be more informative.

### **Evaluation criteria for essays.**

The stated understanding of the essay as a holistic copyright text defines the criteria for its evaluation: the novelty of the text; the validity of the source choice; the degree of disclosure of the issue essence; compliance with the requirements for registration.

**Essay novelty:** a) the relevance of the research topic; b) novelty and independence in the problem formulation, formulation of a new aspect of the well-known problem in the establishment of new connections (interdisciplinary, intra-subject, integration); c) ability to work with research and critical literature, systematize and structure research material; d) the appearance of the author's position, independence of assessments and judgments; d) stylistic unity of the text, the unity of genre features.

**The degree of disclosure of the question essence:** a) the plan compliance with an essay; b) compliance with the content of topic and plan of an essay; c) completeness and depth of knowledge on the topic; d) the validity of the methods and techniques of work with the material; e) ability to generalize, draw conclusions, compare different points of view on one issue (problem).

**The validity of the source choice:** a) evaluation of the used literature: whether the most famous works on the research topic are involved (including recent journal publications, recent statistics, reports, references, etc.)

**Compliance with the requirements for registration:** a) How true are the references to the used literature, quotes; b) assessment of literacy and presentation culture (including spelling, punctuation, stylistic culture), knowledge of terminology; c) compliance with the requirements for the volume of essay.

**The reviewer should clearly state** the remarks and questions, preferably with references to the work (possible on specific pages of the work), to research and evidence that the author did not take into account.

**The reviewer may also indicate:** whether student has addressed the topic earlier (essays, written works, creative works, olympic works, etc.) and whether there are any preliminary results; how the graduate has conducted the work (plan, intermediate stages, consultation, revision and processing of the written or lack of a clear plan, rejection of the head recommendations).

**The student submits** an essay for review no later than a week before the defense. The reviewer is the teacher. Experience shows that it is advisable to acquaint the student with the review a few days before the defense. Opponents are appointed by the teacher from the students. For an oral presentation a student needs about 10–20 minutes (approximately as long as he answers with tasks for the exam).

**Grade 5** is given if all the requirements for writing and defending an essay are fulfilled: the problem is indicated and its relevance is justified, a brief analysis of different points of view on the problem under consideration is made and one's own position is logically presented, conclusions are formulated, the topic is fully disclosed, the volume is met, external requirements are met design, given the correct answers to additional questions.

**Grade 4** is given if the basic requirements for the essay and its defense are met, but there are some shortcomings. In particular, there are inaccuracies in the presentation of the material; or there is no logical sequence in the judgments; not sufficient volume of the essay; there are omissions in the design; additional questions for the defense are accompanied with incomplete answers.

**Grade 3** is given if there are significant deviations from the requirements for referencing. In particular: the topic is covered only partially; factual errors in the content of an essay or when answering additional questions; there is no output c.

**Grade 2** - the topic of an essay is not disclosed, a significant misunderstanding of the problem is found.

**Grade 1** - student's essay is not presented.





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**SCHOOL OF BIOMEDICINE**

**ASSESSMENT FUND**  
**on discipline «Anesthesiology, resuscitations, intensive care»**  
**Direction of training (specialty) 31.05.01 General medicine**  
**Form of training: full-time**

Vladivostok  
2018

## Passport of assessment fund

Completed in accordance with the Regulations on the Funds of Evaluation Assets of Educational Programs of Higher Education - Bachelor's Programs, Specialties, FEFU Magistrates, approved by order of the Rector No. 12-13-850 of May 12, 2015.

Competence and its code	Stages of competence formation	
the readiness to use techniques of first aid and techniques of protection in emergency situations (GCC-7)	Knows	The use first aid techniques, methods of protection in emergency situations
	Is able to	Provide first aid, use methods of protection in emergency situations
	Possesses	Skill of the first aid, the use of methods of protection in emergency situations
the readiness to collect and to analyze patient complaints, data of its history, the results of laboratory, instrumental, postmortem and other examinations to recognize the incidence or the absence of diseases (PC-5)	Knows	Methods for examining patients for research purposes in order to recognize the condition or establish whether the disease is present or not
	Is able to	Identify, analyze and interpret patient examination data in order to recognize the condition or establish the presence or absence of the disease
	Possesses	Skill of systematic examination of the patient in order to recognize the condition or establish the fact of the presence or absence of the disease
the ability to determining the tactics of patient surveillance with different nosological entities. (PC-8);	Knows	Basics of management of patients with various nosological forms
	Is able to	Use educational and scientific literature to address the issues of determining the tactics of managing patients with various nosological forms
	Possesses	The ability to determine the tactics of managing patients with various nosological forms based on scientific and educational medical literature
the willingness to assist at the delivering emergency medical care for the patients in the conditions, requiring urgent medical participation; (PC-11)	Knows	Methods of providing emergency medical care in conditions requiring urgent medical intervention
	Is able to	Apply methods of emergency medical care in conditions requiring urgent medical intervention.
	Possesses	Skill in applying emergency medical care methods for conditions requiring urgent medical intervention
the willingness to do a medical assistance in emergency situations, as well as in medical evacuation (PC-13);	Knows	Methods of providing emergency medical care in conditions requiring urgent medical intervention
	Is able to	Apply methods of providing emergency medical care in conditions requiring urgent medical intervention.
	Possesses	Skill in applying emergency medical care methods for conditions requiring urgent medical intervention

## CONTROL OF ACHIEVEMENT OF COURSE GOALS

Competence and its code		Stages of competence formation			
No.	Controlled sections / topics of disciplines	Codes and stages of the formation of competencies		Evaluation tools	
				Current control	Intermediate certification / exam
1	Module 1 Basics of resuscitation	willingness to use first aid techniques, methods of protection in emergency situations (GCC-7)	Knows	OA-1 Interview	Credit answers 7 semester -1-132
			Is able to	PW-1 Test	PW-1 Test
			Possesses	OA-3 Report	OA-2 Colloquium
2	Module 2 Basics of Intensive Care Module 3 General Anesthesiology	willingness to collect and analyze patient complaints, his medical history, examination results, laboratory, instrumental, autopsy and other studies in order to recognize the condition or establish whether there is a disease (PC-5)	Knows	OA-1 Interview	Credit answers 7 semester -1-132
			Is able to	OA-1 Interview	PW-1 Test
			Possesses	PW-1 Test PR-11 Case study task	OA-2 Colloquium
	Module 1 Basics of resuscitation Module 2 Basics of Intensive Care Module 3 General Anesthesiology	ability to determine the tactics of managing patients with various nosological forms (PC-8);	Knows	OA-1 Interview	Credit answers 7 semester -1-132
			Is able to	OA-1 Interview	PW-1 Test
			Possesses	PW-1 Test PR-11 Case study task	OA-2 Colloquium
	Module 1 Basics of resuscitation Module 2 Basics of Intensive Care	willingness to participate in the provision of emergency medical care in conditions requiring urgent medical intervention (PC-11)	Knows	OA-1 Interview	Credit answers 7 semester -1-132
			Is able to	OA-1 Interview	PW-1 Test
			Possesses	PW-1 Test PR-11 Case study task	OA-2 Colloquium
	Module 1 Basics of resuscitation Module 2 Basics of Intensive Care Module 3 General Anesthesiology	willingness to participate in the provision of medical care in emergency situations, including participation in medical evacuation (PC-13);	Knows	OA-1 Interview	Credit answers 7 semester -1-132
			Is able to	OA-1 Interview	PW-1 Test
			Possesses	PW-1 Test PR-11 Case study task	OA-2 Colloquium

## Scale of assessment of the competence formation level

Code and formulation of competence	Stages of competence formation		criteria	parameters	points
willingness to use first aid techniques, methods of protection in emergency situations (GCC-7)	Knows (threshold level)	Use the first aid techniques, methods of protection in emergency situations	Knowledge of the first aid techniques, methods of protection in emergency situations	Formed knowledge of the first aid techniques, methods of protection in emergency situations	65-71
	Able to (advanced)	Provide the first aid, use protection methods in emergency situations	Ability to provide the first aid, to use methods of protection in emergency situations	Confident first aid provision, the use of methods of protection in emergency situations	71-84
	Masters (high)	The skill of the first aid, the use of methods of protection in emergency situations	First aid skills, the use of methods of protection in emergency situations	Confident first aid provision, the use of methods of protection in emergency situations	85-100
willingness to collect and analyze patient complaints, his medical history, examination results, laboratory, instrumental, autopsy and other studies in order to recognize the condition or establish whether there is a disease (PC-5)	Knows (threshold level)	Methods of examination of patients in analysis for recognition of condition or setting of the fact of existence or absence of the disease	Knowledge of the examination method of patients in analysis for recognition of a condition or establishment of the fact of existence or absence of the disease	Formed knowledge of examination methods of patients in order to recognize the condition or establish the presence or absence of the disease	65-71
	Able to (advanced)	Identify, analyze and interpret the patient's examination data in order to recognize the condition or establish the presence or absence of the disease	The ability to identify, analyze and interpret the patient's examination data in order to recognize the condition or establish the presence or absence of the disease	Confident detection, analysis, and interpretation of the patient's examination data in order to recognize the condition or establish the fact of the presence or absence of the disease	71-84
	Masters (high)	Skill systematic examination of the patient in order to recognize the condition or set the presence or absence of the disease	Skill of systematic examination of the patient in order to recognize the condition or establish the presence or absence of the disease	Confident systematic examination of the patient in order to recognize the condition or establish the presence or absence of the disease	85-100
ability to determine the tactics of	Knows (threshold	Basics of the management tactics	Algorithm of decision-making for	The ability to use educational	65-71

managing patients with various nosological forms (PC-8);	level)	of patients with different nosological forms	surgical treatment in various pathologies	literature to determine the indications for surgical treatment for various diseases	
	Able to (advanced)	Use educational and scientific literature to address the issues of determining the tactics of management of patients with different nosological forms	Use recommendations and algorithms for decision-making on surgical treatment for various pathologies	The ability to use the guidance and algorithms of decision-making concerning surgical treatment of various pathologies	71-84
	Masters (high)	Ability to determine the tactics for patients with different nosological forms on the basis of scientific and educational medical literature	Confidently determines the tactics of patient management with different nosological forms on the basis of scientific and educational medical literature	Ability to determine the tactics of patient treatment with different nosological forms on the basis of scientific and educational medical literature	85-100
willingness to participate in the provision of emergency medical care in conditions requiring urgent medical intervention (PC-11)	Knows (threshold level)	Methods of emergency medical care in conditions requiring urgent medical intervention	Knowledge of emergency medical care methods in conditions requiring urgent medical intervention	Formed knowledge of emergency medical care methods in conditions requiring urgent medical intervention	65-71
	Able to (advanced)	Apply methods of emergency medical care in conditions requiring urgent medical intervention	Ability to apply emergency medical care methods in conditions requiring urgent medical intervention	Confident application of the emergency medical care methods in conditions requiring urgent medical intervention	71-84
	Masters (high)	Skill of application of methods for rendering emergency medical care in the conditions demanding urgent medical intervention	Skill of application of emergency medical care methods for the treatment of conditions requiring urgent medical intervention	Confident provision of emergency medical care in conditions requiring urgent medical intervention	85-100
willingness to participate in the provision of medical care in emergency situations, including participation in medical evacuation (PC-13);	Knows (threshold level)	Methods of emergency medical care in emergency situations, including participation in medical evacuation	Knowledge of the emergency medical care methods in emergency situations, including participation in medical evacuation	Formed knowledge of the emergency medical care methods in emergency situations, including participation in medical evacuation	65-71
	Able to	Apply methods of	Ability to apply	Confident	71-84

	(advanced)	emergency medical care in emergency situations, including participation in medical evacuation	emergency medical care methods in emergency situations, including participation in medical evacuation	application of the emergency medical care methods in emergency situations, including participation in medical evacuation	
	Masters (high)	Skill of application of methods for rendering emergency medical care at emergency situations, including participation in medical evacuation	Skills of application of the emergency medical care methods in emergency situations, including participation in medical evacuation	Confident provision of emergency medical care in emergency situations, including participation in medical evacuation	85-100

### Questions for assessment of preliminary competencies

1. Water-electrolyte metabolism. Acid-base state.
2. The syndrome of endogenous intoxication.
3. Resuscitation and intensive care in case of a sudden cessation of blood circulation. CPR.
4. Sepsis.
5. Acute renal failure
6. Burn shock.
7. Acute respiratory failure.
8. DIC.
9. The history of anesthesiology development.
10. Operating stress.
11. Inhalation anesthesia.
12. Intraoperative monitoring.
13. Epidural anesthesia.
14. Local and conductive anesthesia
15. Anesthetics and analgesics
16. Shock. Types of shock.
17. Microcirculation. Microcirculatory vessels.

**Control tests** are designed for students studying the course "Anesthesiology, resuscitations, intensive care". Tests are necessary for both the control of knowledge in the process of the current interim certification, and for the assessment of knowledge, the result of which can be set off.

When working with tests, the student is asked to choose one answer out of three or four proposed. At the same time, the tests vary in their complexity. There are tests among the proposed ones containing several options for correct answers. The student must provide all correct answers.

Tests are designed for both individual and collective solutions. They can be used in the process and classroom, and independent self-work. The selection of tests necessary for the control of knowledge in the process of interim certification is made by each teacher individually.

Results of performance of the test tasks are evaluated by a teacher using a five-grade scale for certification or on system "credit" - "no credit". Grade "excellent" is given if the number of correct answers is more than 90% of the tests offered by the teacher. Grade "good" is given if the number of correct answers is more than 70% of the tests. Grade "satisfactory" is given if the number of correct answers is more than 50% of the tests offered to the student.

### **Typical test tasks**

(indicate the number of one correct answer)

1. With the ineffectiveness of indirect heart massage in the surgery room it is generally typical to do a direct heart massage. In which area of the chest is it necessary to perform a thoracotomy for a direct heart massage?
  - a. in the parasternal line from II to Y on the left ribs;
  - b. on the mid-sternal line with the transition to the VI intercostal space on the left;
  - c. in the parasternal line at the level of III and IV ribs with the transition to the intercostal space to the left;

d. **in V intercostals space left from the sternum to median line;**

e. in the projection area of the heart apex along the anterior axillary line.

2. How to settle the electric defibrillator electrodes?

a. one electrode is located in the area of the heart, and the other-in the angle of the left shoulder blade;

b. the defibrillator electrodes are located exactly above the apex of the heart along the mid-muscular lines;

**C. the positively charged electrode is located exactly above the apex of the heart, and the negatively charged electrode is at the level of the second intercostal space on the right;**

d. red electrode electroepilation is level II-III intercostal space on the right midclavicular line, the black electrode below the left nipple;

e. the location of the electrodes does not matter.

3. Штвршсфey the correct order of primary measures during cardiopulmonary resuscitation: a) two deep breaths by "mouth to mouth" or "mouth to nose" methods; b) Safar's maneuver, restoration of the airway flow; c) electrode fibrillation; d) intravenous adrenaline administration; e) ECG-diagnostics of the form of heart failure; f) external heart massage in combination with artificial ventilation. Choose the right combination of answers:

a. a,b,c,d,e,f.

b. b,d,f,c,e,a

c. **b,a,f,d,e,a**

d. b,a,c,d,f,e.

e. a,f,d,b,e,c.

4. What is the maximum dose of adrenaline that can be administered intravenously with CPR for 10-15 minutes?



- a. 3 mg;
  - b. 5 mg;
  - c. **7 mg;**
  - d. 10 mg;
  - e. No limitations.
5. What is the average dose of 8.4% sodium bicarbonate solution, which is used during CPR in a person weighing 70 kg?
- a. 70 ml;
  - b. **150 ml;**
  - c. 200 ml;
  - d. 250 ml;
  - e. 300 ml.
6. Making a CPR on an adult, it is recommended that the ratio between frequency of mechanical ventilation and chest compression:
- a. 3:10;
  - b. 30:2;
  - c. 3:15;
  - d. 2:5;
  - e. 1:10.
7. Where should you place the palm for the indirect heart massage?
- a. in the middle third of the sternum;
  - b. in the xiphoid process area;
  - c. to the left of the sternum in the region of IV intercostal space;
  - d. **in the area of the lower third of the sternum with two transverse fingers above the base of the xiphoid process;**
  - e. on the border of the upper and middle third of the sternum.

8. What calculated electric charge closed electrocapillary an adult starts from?
- 100 Joules;
  - 150 Joules;**
  - 200 Joules;
  - 300 Joules;
  - 400 Joules.
9. What drug is most effective for asystole?
- adrenaline;**
  - calcium chloride;
  - dopamine;
  - atropine.;
  - sodium bicarbonate
10. Clinical manifestations of the electric shock depends on:
- electric power
  - duration of contact with electricity
  - presence of concomitant diseases
  - season of year
  - e.
11. What degree of severity of electric shock is characterized by the presence of convulsions with loss of consciousness, without ducturbances of breathing and cardiac activity:
- 1 degree
  - 2 degree**
  - 3 degree
  - 4 degree

12. The direct cause of the terminal state induced by electric shock may be:

- a. ventricular fibrillation
- b. respiratory arrest due to central block
- c. respiratory arrest caused by tetanic spasm of respiratory muscles
- d. electric shock
- e. all answers are correct

13. What degree of the electric shock severity is characterized by the development of clinical death:

- a. 1 degree
- b. 2 degree
- c. 3 gedree
- d. 4 degree**

### **Case study tasks for students for anesthesiology and intensive care**

Case study task No. 1.

Patient R. 37 years old with severe concomitant injury was admitted to the hospital. Complaints of pain in the right thigh, right shoulder, dizziness, weakness. In clinical examination: the patient is conscious, skin is pale, cold, acrocyanosis. BP-70/30 mm Hg., heart rate-132 per minute, respiration rate - 25 per minute, CVP - ( - ) 2 cm of water column. X-ray examination revealed a closed fracture of the right thigh and right shoulder as well as pelvic bones. Laboratory data: Hb - 70 g/l, Ht - 28%.

Questions:

- 1. First order necessary manipulations
- 2. Additional methods of examination
- 3. What post-syndrome disturbances are there?
- 4. Type of infusion therapy
- 5. Possible complications due to inappropriate intensive care

### Case study task No. 2.

Patient D., 28 years old has combined trauma with blood loss of about 25% of TBV. The bleeding has now been stopped. Flattened curve on the photoplethysmogram. Blood pressure is 85/40 mm Hg, Ht - 20%, acid-base balance: pH of 7.27, VE = (-)5.5 mmol/l,  $paO_2$  - 70 mm Hg.

#### Questions:

1. What types of hypoxia occurred?
2. What kind of shock does this patient have?
3. What kind of intensive therapy is necessary?
4. Is transfusion of blood products could be prescribed in this situation
5. Which infusion media are preferred?

### Case study task No. 3.

Patient K., 40 years old due to bilateral pneumonia received 1000000 units of penicillin. 5 minutes later the patient developed weakness, dizziness, cold and sticky sweat. BP-40/0 mm Hg, heart rate is 145 / min., thread-like, conscious is confused.

#### Questions:

1. Diagnose
2. What post-syndrome violation is noted?
3. Priority measures
4. The necessary complex of intensive therapy
5. Possible complication

## ANSWERS TO THE CASE STUDY TASKS

### Case study task No. 1

1. Admission into an intensive care unit. Catheterization of the main veins with infusion therapy. Oxygen therapy. Immobilization of limbs.
2. Chest radiography. Clinical and biochemical blood tests. Urine test. Study of blood gas composition. Photoplethysmography. The temperature of the skin. Laparoscopy.
3. Acute cardiovascular failure. Hypovolemia. Anemia.
4. Infusion therapy under the control of blood pressure, heart rate, CVP, diuresis. The ratio of crystalloid solutions to colloidal 1: 1. Erythrocyte mass by reducing oxygen transport below  $500 \text{ ml/m}^2$
5. Increasing hypoxia with cerebral edema. Lipid embolism, acute renal failure

#### Case study task No. 2

1. Hemic and circulatory.
2. Hypovolemic
3. To fill the BCC, respiratory support
4. Depending on the amount of oxygen transport
5. Crystalloid and colloidal solutions in a ratio of 1: 1

#### Case study task No. 3

1. Anaphylactic shock
2. Acute cardio-vascular insufficiency, hypoxic encephalopathy
3. Administration of epinephrine, mesatone, hormone drugs (desensitizing drugs)
4. Infusion detoxification therapy, respiratory support
5. Brain edema. Acute renal failure

#### **Questions for the credit on the discipline "Anesthesiology, resuscitations, intensive care" - 11 semester**

1. Types of shock (classification)
2. Hypovolemic shock (causes, diagnostic signs, intensive treatment)
3. Cardiogenic shock (causes, diagnostic signs, intensive care)

4. Septic shock (causes, diagnostic signs, intensive treatment)
5. What unites all types of shock?
6. What are the critical states?
7. The definition of “intensive care”
8. The definition of the term “intensive treatment”
9. Types of acute respiratory failure
10. Diagnosis of acute respiratory failure
11. Indications for mechanical ventilation
12. Blood gas composition
13. Types of hypoxia
14. Basic cardio-pulmonary resuscitation (prehospital phase) - algorithm
15. Advanced cardiopulmonary resuscitation (hospital stage) - algorithm
16. Causes of circulatory arrest
17. Types of circulatory arrest
18. Diagnostic signs of circulatory arrest
19. Stages of cardiopulmonary resuscitation according to Safar
20. Triple reception of Safar
21. The mechanism of closed heart massage
22. Medications used for cardiac resuscitation
23. The mechanism of the atropine action
24. Mechanism of adrenaline action
25. Ways of medicines administration
26. Types of mechanical ventilation during resuscitation
27. Intensive care for drowning
28. Intensive care in case of electric shock
29. Intensive care for acute exogenous poisoning
30. Indications for electrical defibrillation of the heart
31. Indications for open heart massage
32. Features of transportation of patients to the hospital after successful cardiopulmonary resuscitation

33. Post-resuscitation disease
34. Types of acute renal failure
35. Main types of extracorporeal detoxification methods
36. Types of general anesthesia
37. The types of conduction methods for pain relief
38. Indications for endotracheal anesthesia
39. Methods for determining cardiac output
40. Dishydria types

### **Criteria for evaluation of oral response, colloquia, credit**

"grade 5" is given to a student if he/she gives the correct answers to the discussed questions which differ in depth and completeness of disclosure of a subject, is able to draw conclusions and generalizations to give the reasoned answers which are logical and consecutive.

"grade 4" is assigned to the student if he/she is on the issues under discussion provides the right answers, is the depth and completeness of the topic, knows how to make conclusions and generalizations, but with one or two mistakes in the answers acceptable.

"grade 3" is given to a student if he/she gives answers to the discussed questions disclosing them insufficiently, there is no logical construction of the answer, several mistakes are accessible.

"grade 2" is set for a student if he/she gives answers to the discussed questions showing that student does not master the material of the topic, cannot give reasoned answers, serious errors in the content of the answer are made.

### **Evaluation tools for current certification**

**Control tests** are designed for students studying the course "Anesthesiology, resuscitations, intensive care»

Tests are necessary for both the control of knowledge in the process of the current interim certification, and for the assessment of knowledge, the result of which can be set off.

Working with the tests student is asked to choose one answer out of three or four proposed. At the same time the tests vary in their complexity. There are tests among the proposed containing several options for correct answers. The student must specify all the correct answers.

Tests are designed for both individual and collective solutions. They can be used in the process and classroom, and independent self-work. The selection of tests necessary for the control of knowledge in the process of interim certification is made by each teacher individually.

Results of performance of test tasks are estimated by the teacher on a five-grade scale for certification or on system "credit" - "no credit". Grade "excellent" is set if the number of correct answers is to more than 90% of the tests offered by the teacher. Grade "good" is set if the number of correct answers is to more than 70% of the tests. Grade "satisfactory" is set if the number of correct answers is to more than 50% of the tests offered to the student.