Federal State Budgetary Educational Institution
of Higher Education
North-Western State Medical University
named after I.I. Mechnikov
of the Ministry of Health of the Russian Federation

(North-Western State Medical University named after I.I. Mechnikov,
Ministry of Health of the Russian Federation)

COURSE SYLLABUS

«Anesthesiology, Resuscitation and Intensive Care Medicine»

Specialty: 31.05.01 General Medicine

Specialization: Organization and provision of primary health care to the adult population in medical organizations

Language of instruction: English

2021

This Syllabus for the course **Anesthesiology, Resuscitation and Intensive Care Medicine** has been developed in accordance with the Federal State Educational Standard of Higher Education for the specialist degree program in the specialty 31.05.01 General Medicine (for international students), approved by Order No. 988 of the Ministry of Science and Higher Education of the Russian Federation dated August 12, 2020, 'On approval of the Federal State Educational Standard of Higher Education for the specialist degree program in the specialty 31.05.01 General Medicine.'

Authors of the Course Syllabus

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The Course Syllabus was discussed at a meeting of the Department of Anesthesiology and Intensive Care Medicine named after V.L. Vanevsky
00 2021, Minutes № 0

Head of the Department _____ / Lebedinsky K.M./
(подпись) (Ф.И.О.)

Approved by the Methodological Committee for the specialty 31.05.01 General Medicine
May 11, 2021

Chairperson _____ / I.G. Bakulin /

Reviewed by the Methodological Council and recommended for approval by the Academic Council

May 20, 2021
Chairperson _____ / S.A. Artyushkin /

Date of revision: ___

CONTENTS

1. Aim of the course

The aim of mastering the discipline **Anesthesiology, Resuscitation and Intensive Care Medicine** is to deepen the level of competency acquisition by students, aimed at developing advanced knowledge in the fields of anesthesiology, intensive care, and critical care medicine.

2. Place of the course in the structure of the educational program

The course Anesthesiology, Resuscitation and Intensive Care Medicine is part of the compulsory component of Block 1 Courses (Modules) of the main professional educational program in the specialty 31.05.01 General Medicine (specialist degree level), specialization Organization and provision of primary health care to the adult population in medical organizations.

The course is mandatory for study.

3. Planned learning outcomes of the course correlated with the planned learning outcomes of the educational program

Code and title of the competence	Code and title of the competence achievement indicator
General Professional Competencies GPC-4. Able to use medical devices provided for by the established standards of medical care and to perform patient examinations for the purpose of establishing a diagnosis.	**Indicator 1 GPC-4.1** Applies medical devices during diagnostic procedures provided for by the established standards of medical care. **Indicator 2 GPC-4.2** Applies diagnostic methods, including instrumental methods, when examining a patient for the purpose of establishing a diagnosis.
General Professional Competencies GPC – 7 Able to prescribe treatment and monitor its effectiveness and safety.	**Indicator 2 GPC-7.2** Selects medicinal products, dosage forms, and routes of administration, and carries out rational substitution of medicinal products based on the patient's condition.
Professional Competencies PC-1 Able to organize and provide medical care to patients in urgent and emergency settings.	**Indicator 1 PC-1.1.** Recognizes and provides urgent medical care for sudden acute diseases, conditions, and exacerbations of chronic diseases without an obvious threat to the patient's life in the setting of primary health care. **Indicator 2 PC-1.2.** Provides emergency medical care for life-threatening conditions, including clinical death.

Code of the competence achievement indicator	Learning outcomes (Assessment criteria)	Assessment methods
Indicator 1 GPC-4.1	**knows** The fundamental principles of operation of medical equipment provided for by healthcare regulations and used in the Department of Anesthesiology and	Tests, cases, practical skills demonstration

	Intensive Care, including equipment for anesthesia delivery, mechanical ventilation, drug administration, and monitoring of vital functions.	
	Able to Assess the readiness of equipment for clinical use.	
	Has the skill of Operating equipment for monitoring vital functions and administering medications.	
Indicator 2 GPC-4.2	**Knows** Laboratory and instrumental (diagnostic) methods used in anesthesiology and intensive care for the diagnosis of urgent conditions and monitoring of vital functions; normal reference values of laboratory and instrumental parameters.	Tests, cases, control questions
	Able to Analyze the results of laboratory and instrumental investigations and monitoring data for the diagnosis of urgent conditions and impairment of vital functions.	
	Has the skill of Identifying urgent and life-threatening conditions based on monitoring data and laboratory/instrumental findings.	
Indicator 1 GPC-7.1	**Knows** Identifying urgent and life-threatening conditions based on monitoring data and laboratory/instrumental findings.	Tests, cases, control questions
	Able to Justify the choice of pharmacotherapy based on the pathogenesis of a critical condition; determine the route of administration and dosage of commonly used drugs in intensive care, during surgical procedures, and in the management of acute and chronic pain syndromes in accordance with current clinical guidelines and standards of care.	
	Has the skill of Selecting appropriate pharmacotherapy, route of administration, and dosage when providing urgent medical care, during surgical interventions, and in the management of acute and chronic pain syndromes, taking into account the patient's condition.	
Indicator 1 PC-1.1.	**Knows** electing appropriate pharmacotherapy, route of administration, and dosage when providing urgent medical care, during surgical interventions, and in the management of acute and chronic pain syndromes, taking into account the patient's condition.	Tests, cases, control questions, practical skills demonstration
	Able to Assess the patient's condition in order to determine the scope of urgent medical care for sudden acute diseases and conditions; navigate current approaches in intensive care, anesthetic techniques, and pain management strategies.	

	Has the skill of Providing urgent medical care for sudden acute diseases and conditions without an immediate threat to life; selecting appropriate anesthetic management and analgesic techniques.	
Indicator 2 PC-1.2.	**Knows** Etiology, pathogenesis, clinical presentation, and diagnostic criteria of major critical conditions; protocols and algorithms for providing emergency medical care in life-threatening situations.	Tests, cases, control questions, practical skills demonstration
	Able to Assess the patient's condition in order to determine the scope of emergency medical care in life-threatening conditions; navigate current treatment strategies.	
	Has the skill of Providing emergency medical care in life-threatening conditions; performing basic life support (BLS) combined with electrical therapy (defibrillation).	

4. Scope of the course and types of learning activities

Type of learning activity	Workload	Semester
		8
Contact hours (student–instructor interaction)	**72**	**72**
Classroom based work:	**70**	**70**
Lectures (L)	24	24
Practical classes (PC)	46	46
Self-study:	**36**	**36**
During the period of theoretical instruction	32	32
Preparation for the examination	**4**	4
Interim assessment: exam, including passing and group consultations	**2**	**2**
Total Workload academic hours	**108**	
Credit units	**3**	

5. Content of the course structured by sections (topics), indicating the number of academic hours and types of classes

5.1.Content of course sections

№	Title of the course section	Annotated content of the course section	Competencies formed
1	Modern Monitoring and Diagnostic Methods in Anesthesiology and Intensive Care Medicine.	Current standards of monitoring and diagnostics; principles for the use of laboratory and instrumental (diagnostic) methods in anesthesiology and intensive care medicine to ensure and assess patient safety.	GPC-4
2	Modern methods of	Current trends and advances in intensive	GPC -7

	intensive care in the management of patients with critical conditions of various etiologies. Modern methods of analgesia and anesthesia for surgical procedures and painful interventions; management of acute and chronic pain syndromes.	care medicine. Modern capabilities, methods of correction, and organ support technologies for maintaining vital functions in patients with critical conditions of various etiologies. Modern technologies and advances in anesthesiology; contemporary strategies for protecting the body from surgical stress and trauma during operative interventions. Current approaches to pain management. Recent advances in clinical pharmacology within anesthesiology and intensive care medicine.	PC-1

5.2. Lecture plan

№	Title of the course section	Lecture topics	Active learning methods	Workload (academic hours)
1	Modern Monitoring and Diagnostic Methods in Anesthesiology and Intensive Care Medicine.	L.1 Anesthesiology and Resuscitation as a Medical Specialty and Field of Medicine. Legal and regulatory aspects of anesthesiology and intensive care practice. Healthcare regulations and clinical guidelines (treatment protocols) for the provision of urgent medical care.	Interactive lecture	2
		L.2 Anatomy and Physiology of Major Organs and Systems from the Perspective of Anesthesiology and Resuscitation. Monitoring during anesthesia, resuscitation, and intensive care.	Interactive lecture	2
2	Modern methods of intensive care in the management of patients with critical conditions of various etiologies. Modern methods of analgesia and anesthesia for surgical procedures and painful interventions; management of acute and	L.1 Cardiac Arrest. Cardiopulmonary Resuscitation (CPR).	Interactive lecture	2
		L.2 Cardiac Arrest. Cardiopulmonary Resuscitation (CPR).	Discussion lecture	2
		L.3 Acute Kidney Injury.	Discussion lecture	2
		L.4 Shock: Definition and Fundamental	Discussion lecture	2

	chronic pain syndromes.	Principles of Intensive Care. Acute Blood Loss.		
		L.5 Sepsis and Septic Shock. Multiple Organ Dysfunction Syndrome (MODS).	Discussion lecture	2
		L.6 Cardiogenic Shock. Anaphylactic Shock.	Discussion lecture	2
		L.7 Acute Failure of Abdominal Organs (Liver, Pancreas, Gastrointestinal Tract).	Discussion lecture	2
		L.8. Comatose state	Discussion lecture	2
		L.9 Polytrauma	Interactive lecture	2
		L.10 Fundamentals of Clinical Algesiologie (Pain Medicine).	Interactive lecture	2
		Total		24

5.3. Practical classes plan

№	Title of the course section	Practical class topic	Active learning methods	Assessment	Workload (academic hours)
1	Modern Monitoring and Diagnostic Methods in Anesthesiology and Intensive Care Medicine.	PC.1 Monitoring during anesthesia, resuscitation, and intensive care.	Case analysis	Tests, assessment of practical skills demonstration	4
		PC.2 Fluid, electrolyte, and acid–base disorders in anesthesiology and intensive care patients.	Group discussion	Tests	4
		PC.3 Preoperative patient assessment and evaluation in the Intensive Care Unit (ICU). Laboratory and instrumental diagnostic methods used in anesthesiology and intensive care medicine.	Case analysis	Tests	4
2	Modern methods of intensive care in the management of	PC.1Definition and types of anesthesia. Anesthesia risk assessment criteria and prediction of possible	Group discussion	Tests, assessment of practical skills demonstrati	4

	patients with critical conditions of various etiologies. Modern methods of analgesia and anesthesia for surgical procedures and painful interventions; management of acute and chronic pain syndromes.	complications. Equipment used for inhalational anesthesia and mechanical ventilation.		on	
		PC.2 Cardiac arrest. Legal and regulatory aspects of cardiopulmonary resuscitation (CPR).	Case analysis	Tests, assessment of practical skills demonstration	4
		PC.3 Pain in anesthesiology and intensive care practice. Selection of pharmacologic therapy for the management of acute and chronic pain syndromes.	Case analysis	Tests	4
		PC.4 Acute respiratory failure (pathogenesis, clinical presentation, treatment). Acute respiratory failure in ARDS, pneumonia, and bronchial asthma.	Case analysis	Tests	4
		PC.5 Hypovolemic shock. Acute massive blood loss. Infusion therapy and blood transfusion therapy.	Case analysis	Tests	4
		PC.6 Sepsis and septic shock. Multiple organ dysfunction syndrome (MODS).	Case analysis	Tests	4
		PC.7 Anaphylactic shock. Cardiogenic shock.	Case analysis	Tests	4
		PC.8 Cerebral and metabolic coma.	Case analysis	Tests	4
		PC.9 Clinical pharmacology of drugs used in anesthesia, resuscitation, and intensive care.	Group discussion	Tests	2
				Total:	46

5.4.Seminars are not included in the course

5.5. Laboratory classes are not included in the course

5.6. Self-study

№	Title of the course section	Types of self-study	Assessment	Workload (academic hours)
1	Modern Monitoring and Diagnostic Methods in Anesthesiology and Intensive Care Medicine.	Preparation for In-Class Ongoing Assessment Review and study of lecture materials Study of required and recommended literature Preparation of written reports (short academic papers) Independent Study of Selected Sections or Topics of the Discipline	tests	12
2	Modern methods of intensive care in the management of patients with critical conditions of various etiologies. Modern methods of analgesia and anesthesia for surgical procedures and painful interventions; management of acute and chronic pain syndromes.	Preparation for In-Class Ongoing Assessment Review and study of lecture materials Study of required and recommended literature Preparation of written reports (short academic papers) Independent Study of Selected Sections or Topics of the Discipline	tests	20
			Preparation for pass/fail assessment	4
			Total:	36

6. Methodological guidelines for students on mastering the course

An essential condition for successful completion of the discipline is the development of an effective system of work organization that allows students to distribute their academic workload evenly in accordance with the academic schedule.
The university educational system is based on a rational combination of several types of academic activities (primarily lectures and practical classes), each of which has its own specific features.

Preparation for Lectures
Familiarization with the discipline begins at the first lecture, where students are expected not only to listen attentively but also to take structured and independent lecture notes.
When working with lecture notes, it is important to consider that some lectures provide direct answers to specific topic-related questions, while others focus on identifying relationships between phenomena, helping students understand the underlying mechanisms and developmental processes of the subject, both historically and in contemporary practice.
While reviewing lecture materials, students should use not only the core textbook but also additional literature recommended by the lecturer. Such thorough and systematic work with lecture materials enables deep mastery of theoretical knowledge.

Preparation for Practical Classes
Careful analysis and study of the practical class outline should be based on reviewing the relevant lecture material, followed by studying the required and recommended literature for the topic.
The result of this preparation should be demonstrated in the student's ability to:
confidently answer theoretical questions during practical sessions,
participate in discussions,
actively engage in group work,
correctly perform practical tasks.
During preparation for practical classes, special attention should be given to independent study of recommended literature. Independent work with textbooks, study guides, scientific and reference materials, periodicals, and online resources is one of the most effective ways of acquiring additional knowledge. It significantly enhances information processing, promotes deeper understanding of the subject matter, and fosters a professional approach to clinical problems.

Ongoing assessment is carried out in the form of:
testing,
preparation of written reports (short academic papers),
evaluation of practical skills demonstration.
Intermediate assessment is conducted in the form of case-based problem solving.
For preparation for the pass/fail assessment, students are recommended to use scientific literature (in Russian and English), online resources, and distance learning materials available in the MOODLE learning management system.

7. Assessment materials

Assessment materials for the course used for ongoing assessment and interim assessment of students include examples of assessment methods (Annex A to the Course Syllabus), as well as the assessment procedure and evaluation criteria.

8. List of academic literature and Internet resources required for mastering the course

8.1. Academic literature:

1. Anesthesiology and Resuscitation [Electronic resource]: textbook for medical universities / ed. by O.A. Dolina. 4th ed., revised and expanded. Moscow: GEOTAR-Media; 2009. Available at: http://www.studmedlib.ru ; http://www.studmedlib.ru/book/ISBN9785970410332.html. Student Consultant Electronic Library.
2. Gelfand BR, ed. Intensive Care [Electronic resource] / ed. by B.R. Gelfand, I.B. Zabolotskikh. Moscow: GEOTAR-Media; 2017. 928 p. ISBN 978-5-9704-4161-9. Available at: http://www.rosmedlib.ru/book/ISBN9785970441619.html. Physician Consultant Electronic Library.
3. Grinshtein YuI, ed. Emergency Care in Internal Medicine and Cardiology [Electronic resource]. Moscow: GEOTAR-Media; 2009. Available at: http://www.studmedlib.ru/book/ISBN9785970411629.html. Student Consultant Electronic Library.

4. Stuklov NI, ed. Physiology and Pathology of Hemostasis [Electronic resource]: учебное пособие (study guide). Moscow: GEOTAR-Media; 2016. (Physician Specialist Library Series). Available at: http://www.rosmedlib.ru/book/ISBN9785970436257.html. Physician Consultant Electronic Library.
5. Dolina OA, ed. Anesthesiology and Resuscitation: textbook. 4th ed., revised and expanded. Moscow: GEOTAR-Media; 2021. 576 p. ISBN 978-5-9704-6114-3. Available at: https://www.studentlibrary.ru/book/ISBN9785970461143.html. Student Consultant Electronic Library.

8.2.Internet resources

Name	Available at
Student Consultant: Electronic Medical University Library Platform.	http://www.studmedlib.ru/
Physician Consultant: Information and Educational Platform for Practicing Physicians.	http://www.rosmedlib.ru
Russian medical portal	http://www.rosmedportal.com
World Health Organization	http://www.who.int
Federation of Anesthesiologists and Resuscitators of Russia	http://www.far.org.ru/ -

9. List of information technologies used for mastering the discipline, including a list of software, professional databases and information reference systems

9.1. List of information technologies applied in the course delivery:

№	Title of the course section	Information Technologies
1	Modern Monitoring and Diagnostic Methods in Anesthesiology and Intensive Care Medicine.	course materials in the Electronic Information and Educational Environment of the North-Western State Medical University named after I.I. Mechnikov of the Ministry of Health of the Russian https://moodle.szgmu.ru/course/view.php?id=284
2	Modern methods of intensive care i the management of patients with critical conditions of various etiologies. Modern methods of analgesia and anesthesia for surgica procedures and painful interventions; management of acute and chronic pain syndromes.	

9.2. List of software used for course delivery (licensed and freely distributed software, including domestically produced software):

№	Software name	License term	Documents confirming the right to use software products
Licensed software			
1.	ESET NOD 32	1 year	State contract № 07/2020
2.	MS Windows 8	Unlimited	State contract

	MS Windows 8.1 MS Windows 10 MS Windows Server 2012 Datacenter - 2 Proc MS Windows Server 2012 R2 Datacenter - 2 Proc MS Windows Server 2016 Datacenter Core		№ 30/2013-O; State contract № 399/2013-OA; State contract № 07/2017-ЭА.
3.	MS Office 2010 MS Office 2013	Unlimited	State contract № 30/2013-OA; State contract № 399/2013-OA.
4.	Academic LabVIEW Premium Suite (1 User)	Unlimited	State contract № 02/2015
Licensed domestically produced software			
1.	Antiplagiat	1 year	State contract № 2409
2.	«WEBINAR» Version 3.0	1 year	Contract № 347/2020-M
3.	« E-learning environment 3KL»	1 year	Contract № 348/2020-M
4.	TrueConf Enterprise	1 year	Contract № 396/2020-ЭА
Freely distributed software			
1.	Google Chrome	Unlimited	Open License Agreement GNU GeneralPublicLicense
2.	NVDA	Unlimited	Open License Agreement GNU GeneralPublicLicense
Freely distributed software of domestic production			
1.	Moodle	Unlimited	Open License Agreement GNU GeneralPublicLicense

9.3. List of professional databases and information reference systems

№	Software name	License term	Documents confirming the right to use software products	Accessibility for students with disabilities and individuals with limited health capabilities
1.	Consultant Plus	1 year	Contract № 655/2020-ЭА	-
2.	ELS «Konsultant studenta»	1 year	Contract № 307/2020-ЭА	http://www.studmedlib.ru/
3.	EMD «Konsultant vracha»	1 year	Contract № 281/2020-ЭА	http://www.rosmedlib.ru/
4.	ELS «ibooks.ru»	1 year	Contract № 06/2020	https://ibooks.ru
5.	ELS «IPRBooks»	1 year	Contract № 08/2020-ЗК	http://www.iprbookshop.ru/special
6.	ELS «Bookup»	1 year	Contract № 05/2020	https://www.books-up.ru/
7.	ELS «Lan' Publishing»	1 year	Contract № 395/2020-ЭА	https://e.lanbook.com/

10. Material and Technical Support for the Course

Classrooms for lecture-type classes, group and individual consultations, ongoing progress monitoring, and midterm assessments, equipped with the necessary equipment and teaching aids: St. Petersburg, Piskarevsky Prospekt, 47, Building 25, Room 1

Equipment: chalkboard; teacher's desk, two-seater student desk;
Teaching aids: multimedia projector, teacher's laptop, system unit, monitor.
Specialized teaching aids: Roger Pen (Roger Pen-shaped wireless transmitter), Roger MyLink (Roger Pen system signal receiver) (for students with hearing impairments); IntelliKeys (wired keyboard with Russian Braille and a matte black finish), (St. Petersburg, Piskarevsky Prospekt, 47, Building R (Bldg. 9), Rooms 18 and 19, Mechnikov North-Western State Medical University, Ministry of Health of the Russian Federation).
Classrooms for seminar-type classes, group and individual consultations, ongoing progress monitoring, and midterm assessments, equipped with equipment and technical teaching aids: St. Petersburg, Piskarevsky Prospekt, 47, Building U (Bldg. 25). Classroom 1, Classroom 2, Classroom 3.
Equipment: chalkboard; teacher's desk, two-seater student desk;
Technical teaching aids: multimedia projector, teacher's laptop, system unit, monitor.
Specialized teaching aids: Roger Pen (Roger Pen-shaped wireless transmitter), Roger MyLink (Roger Pen receiver) (for students with hearing impairments); IntelliKeys (wired keyboard with Russian Braille and a matte black finish), (St. Petersburg, Piskarevsky Prospekt, 47, Lit R (Bldg. 9), Rooms 18 and 19, Mechnikov North-Western State Medical University, Ministry of Health of the Russian Federation).
Accreditation and Simulation Center equipped with equipment for practical skills training: St. Petersburg, Piskarevsky Prospekt, 47, lit AL (Bldg. 26).
Equipment for practical skills training: Adult CPR training manikin, Laerdal Medical, Norway; Anna Resuscitation manikin for CPR skills training; PowerHeart AED training defibrillator; LM-085 Advanced Emergency Care Simulator, Type III (complete with resuscitation kit); RoDam CPR training manikin with computerized results recording; Apollon male patient robot simulator; iStan autonomous universal robot simulator, CEA Healthcare, USA; Intraosseous infusion training simulator; Intubation phantom head; Skills training simulator The Heimlich maneuver (Heimlich maneuver)
The following virtual analogs are used in the educational process: a virtual simulator of a bedside and fetal monitor, and an on-screen simulator of a virtual patient for practicing clinical reasoning with a set of preset scenarios.
Student study spaces equipped with computers and internet access and access to the University's online information and educational environment are located at 47 Piskarevsky Prospekt, Building AE (Building 32), St. Petersburg,
Room 1, Building R (Building 9), Rooms 18 and 19, North-Western State Medical University named after I.I. Mechnikov, Ministry of Healthcare of the Russian Federation.

Annex A

Ministry of Health of the Russian Federation

Federal State Budgetary Educational Institution
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ASSESSMENT MATERIALS
(for ongoing assessment and interim assessment of students)

Specialty: 31.05.01 General Medicine

Specialization: Organization and provision of primary health care to the adult population in medical organizations

Language of instruction: Russian, English

Name if the course: Anesthesiology, Resuscitation and Intensive Care Medicine

Saint Petersburg – 2021

1. List of planned learning outcomes

Code of the competence achievement indicator	Learning outcomes (Assessment criteria)	Assessment methods
Indicator 1 GPC-4.1	**knows** The fundamental principles of operation of medical equipment provided for by healthcare regulations and used in the Department of Anesthesiology and Intensive Care, including equipment for anesthesia delivery, mechanical ventilation, drug administration, and monitoring of vital functions.	Tests, cases, practical skills demonstration
	Able to Assess the readiness of equipment for clinical use.	
	Has the skill of Operating equipment for monitoring vital functions and administering medications.	
Indicator 2 GPC-4.2	**Knows** Laboratory and instrumental (diagnostic) methods used in anesthesiology and intensive care for the diagnosis of urgent conditions and monitoring of vital functions; normal reference values of laboratory and instrumental parameters.	Tests, cases, control questions
	Able to Analyze the results of laboratory and instrumental investigations and monitoring data for the diagnosis of urgent conditions and impairment of vital functions.	
	Has the skill of Identifying urgent and life-threatening conditions based on monitoring data and laboratory/instrumental findings.	
Indicator 1 GPC-7.1	**Knows** Identifying urgent and life-threatening conditions based on monitoring data and laboratory/instrumental findings.	Tests, cases, control questions
	Able to Justify the choice of pharmacotherapy based on the pathogenesis of a critical condition; determine the route of administration and dosage of commonly used drugs in intensive care, during surgical procedures, and in the management of acute and chronic pain syndromes in accordance with current clinical guidelines and standards of care.	
	Has the skill of Selecting appropriate pharmacotherapy, route of administration, and dosage when providing urgent medical care, during surgical interventions, and in the management of acute and chronic pain syndromes, taking into account the patient's condition.	
Indicator 1 PC-1.1.	**Knows** electing appropriate pharmacotherapy, route of	Tests, cases, control

	administration, and dosage when providing urgent medical care, during surgical interventions, and in the management of acute and chronic pain syndromes, taking into account the patient's condition.	questions, practical skills demonstration
	Able to Assess the patient's condition in order to determine the scope of urgent medical care for sudden acute diseases and conditions; navigate current approaches in intensive care, anesthetic techniques, and pain management strategies.	
	Has the skill of Providing urgent medical care for sudden acute diseases and conditions without an immediate threat to life; selecting appropriate anesthetic management and analgesic techniques.	
Indicator 2 PC-1.2.	**Knows** Etiology, pathogenesis, clinical presentation, and diagnostic criteria of major critical conditions; protocols and algorithms for providing emergency medical care in life-threatening situations.	Tests, cases, control questions, practical skills demonstration
	Able to Assess the patient's condition in order to determine the scope of emergency medical care in life-threatening conditions; navigate current treatment strategies.	
	Has the skill of Providing emergency medical care in life-threatening conditions; performing basic life support (BLS) combined with electrical therapy (defibrillation).	

2. Examples of assessment methods and evaluation criteria for conducting ongoing assessment

2.1. Examples of input test

Questions

1. Where is the majority of circulating blood volume concentrated?
2. What are the components of the external respiratory system?
3. What is most characteristic of decompensated metabolic acidosis?
4. What non-respiratory functions of the lungs are non-respiratory?
5. How many ATP molecules are produced during aerobic glycolysis in the mitochondria per 1 glucose molecule?

Evaluation criteria, Pass/Fail grading system

Grade	Description
pass	Full understanding of the problem; all assignment requirements met.
fail	Lack of understanding of the problem; many assignment requirements not met; no response.

2.2. Test examples:

Indicator 1 GPC-4.1

Question Title: Question 1
The patient inhales a gas anesthetic mixture from the apparatus, breathing partly into the apparatus and partly into the atmosphere. What is the breathing circuit?

1) open
2) semi-open
3) closed
4) semi-closed

Question Title: Question 2
An electrocardiogram (ECG) allows us to assess:
1) the pumping function of the heart
2) the electrical activity of the myocardium
3) the presence of myocardial ischemia
4) the degree of coronary blood flow impairment

Indicator 2 GPC-4.2

Question Title: Question 3
The normal PaO_2 value is approximately:
1) 40 mmHg
2) 75 mmHg
3) 100 mmHg
4) 80 mmHg

Question Title: Question 4
Central venous pressure (CVP) reflects:
1) right ventricular preload
2) circulating blood volume
3) right ventricular contractility
4) peripheral venous valve function

Indicator 1 GPC-7.1

Question Title: Question 5
Crystalloid solutions include:
1) Ringer's solution
2) Gelofusine
3) Hydroxyethyl starch
4) Albumin

Question Title: Question 6
The vasopressor effect of catecholamines is due to the stimulation of:
1) α1-adrenergic receptors
2) DA1-adrenergic receptors
3) β2-adrenergic receptors
4) α2-adrenergic receptors

Indicator 1, PC-1.1

Question Title: Question 7

After stopping nitrous oxide administration, 100% oxygenation is necessary, as there is a real risk of:

1) hypoxia

2) bronchospasm

3) laryngospasm

4) awakening

Question Title: Question 8

Conversion of persistent atrial fibrillation to sinus rhythm is fraught with:

1) thromboembolism in the systemic circulation

2) pulmonary embolism

3) ventricular fibrillation

4) the development of heart failure

Indicator-1 PC-1.2.

Question Title: Question 9

When performing cardiopulmonary resuscitation, the first-line drug is:

1) lidocaine

2) atropine

3) epinephrine

4) amiodarone

Question Title: Question 10

The main signs of circulatory arrest are:

1) unconsciousness and convulsions; Kussmaul-type or Cheyne-Stokes-type respiratory distress; pale skin, cyanosis of the mucous membranes, small pupils, and no photoreactivity.

2) unconsciousness; no pulsation in the major vessels; respiratory distress leading to respiratory arrest.

3) unconsciousness; shallow breathing; dilated pupils, no reaction to light; pale skin, cyanosis of the mucous membranes.

4) unconsciousness, no ocular and other reflexes, decreased body temperature, and no peripheral pulse.

Evaluation criteria, test assessment scale

Grade		Description
«excellent»	5	completed in full – 90%-100%
«good»	4	not completed in full – 80%-89%
«satisfactory»	3	completed with deviation – 70%-79%
«unsatisfactory»	2	Partially completed – 69% or less correct answers

2.3. Examples of algorithms for demonstrating practical skills

Indicator 1 GP 4.1

1. Preparing the anesthesiologist's workstation for anesthesia (checking the ventilator, availability of all medications, connecting monitoring equipment)

2. Using medication administration equipment – a syringe pump (selecting a mode, calculating volume, dose, and rate of administration)

Indicator 1 GP 1.1
1. Providing emergency medical care for hypertensive crisis (diagnosis, assessment of severity, prescription of additional examination methods, monitoring, and drug treatment)
2. Providing emergency medical care for anaphylactic shock (diagnosis, assessment of severity, prescription of additional examination methods, monitoring, and drug treatment)

Indicator 1 PC 1.2
1. Diagnosis of cardiac arrest (assessment of consciousness, respiration, and circulation)
2. CPR measures for asystole (compressions, mechanical ventilation, drug therapy)
3. CPR measures for ventricular fibrillation (compressions, mechanical ventilation, defibrillation, drug therapy)
4. CPR measures for foreign body inhalation (correct patient positioning, application of the Heimlich maneuver)

Assessment criteria, assessment scale for demonstration of practical skills

Grade		**Description**
Excellent	5	Knows the methodology for performing practical skills, indications and contraindications, possible complications, standards, etc., and independently demonstrates the performance of practical skills without errors.
Good	4	Knows the methodology for performing practical skills, indications and contraindications, possible complications, standards, etc., and independently demonstrates the performance of practical skills, making some inaccuracies (minor errors), which he/she independently identifies and quickly corrects.
Satisfactory	3	Knows the basic principles of the methodology for performing practical skills, indications and contraindications, possible complications, standards, etc., and demonstrates the performance of practical skills, making some errors that can be corrected with correction by the instructor.
Unsatisfactory	2	Does not know the methodology for performing practical skills, indications and contraindications, possible complications, standards, etc., and is unable to independently demonstrate practical skills or performs them with serious errors.

3. Ongoing assessment

Ongoing assessment includes: tests, practical skills demonstration assessment.

4. Examples of assessment methods and evaluation criteria for conducting interim assessment

4.1. Sample list of cases:

Indicator 1 GPC 4.1
Case №1
You decided to cardiovert a patient with unstable tachycardia. You set the defibrillator to synchronization mode and administered sedation. Suddenly, the patient lost consciousness, the pulse was absent, and the ECG showed ventricular fibrillation. When you attempted to deliver a shock, nothing happened: no shock was delivered, and the defibrillator remained charged.
Question: How can you explain the defibrillator failure?

1. Battery failure.
2. The SYNC switch failed.
3. Because the patient developed VF, the defibrillator was unable to synchronize the shock with the R-wave and automatically disabled the ‘shock’ option.
4. The monitor cannot synchronize the cardioversion shock because the lead is not identified.

Indicator 2 GPC 4.2.

Case №2

A 20-year-old man was admitted to the emergency room of the surgical department with a diagnosis of acute abdomen. On admission, his condition was serious. He was conscious. The skin was dry, and tissue turgor was decreased. Vomiting of food was noted several times. The smell of acetone came from the mouth. Thirst was expressed. Heart rate was 100 bpm, blood pressure 110/60. The abdomen was not distended, moderately painful on palpation, symptoms of peritoneal irritation were negative. There was a stool. He urinated, and the urine was concentrated. Blood tests showed Hb 160 g/l, Ht 55%, Na+ 130 mmol/l, K+ 2.5 mmol/l, sugar 22.0 mmol/l. Blood gas and acid-base balance: pH 7.20; PCO2 22 mmHg; PO2 80 mmHg; HCO3- 5 mmol/l; BE = -18.

Questions:

1. What is your preliminary diagnosis?
2. Evaluate the patient's history, physical examination, and physical examination data.
3. Evaluate the laboratory data.
4. Based on the laboratory data, explain the life-threatening condition that has developed.
5. What are the areas of intensive care?

Indicator 1 GPC 7.1.

Задача №3

A patient hospitalized for right-sided pneumonia experienced a progressive deterioration over the course of two days. His temperature is 39-40°C, accompanied by chills. He is confused, and periodic muscle twitching of the face and extremities is observed. The skin is pale, marbled, and has an earthy tint, with acrocyanosis. Dyspnea is present at 30 beats per minute, with flaring of the alae nasi and involvement of the accessory muscles. Tachycardia is up to 140 beats per minute, and the pulse is weak and tense. Blood pressure is 60/40 mmHg, central venous pressure is +2 cmH2O, and oliguria is present. Gastrointestinal paresis and repeated vomiting are observed. Blood tests reveal leukocytosis with a marked neutrophilic and band shift, thrombocytopenia, toxic blood changes, and anemia. Acid-base balance (ABS): pH = 7.22, PCO2 -33 mmHg, BE = -18 mmol/L.

Questions:

1. What is your preliminary diagnosis? What complication has developed?
2. Evaluate the medical history, physical examination, and physical examination data.
3. Evaluate the laboratory data.
4. What are the directions for intensive care?
5. Justify the choice of medication, taking into account the pathogenesis of the critical condition. Determine the route of administration and dosage.

Indicator 1 PC 1.1

Case №4

A patient being treated in a general hospital for right-sided infiltrative pneumonia suddenly experienced a deterioration in condition, including restlessness, tachypnea, shallow breathing, and severe cyanosis and acrocyanosis. Percussion revealed tympanitis on the right side, left mediastinal shift, and no breath sounds on auscultation.

Questions:

1. What is your preliminary diagnosis?

2. What complication has developed?
3. What tests are needed to diagnose the complication?
4. What are the signs of the disease on the chest X-ray?
5. What emergency treatment is indicated for the patient?

Case №5
A 40-year-old man was admitted to the hospital complaining of recurrent attacks of suffocation accompanied by a painful cough. The attacks occur suddenly. During an attack, the patient sits in a forced position, supporting himself on his palms, and uses accessory muscles to breathe. His breathing is wheezy and audible from a distance. Exhalation is particularly difficult. Percussion of the lungs reveals a box-like sound, and auscultation reveals numerous dry rales. At the end of the attack, scanty sputum is produced. Between attacks, percussion and auscultation reveal no changes in the lungs.
Questions:
1. What disease is this characteristic of?
2. What is the name of the patient's dyspnea (breathing) during an attack?
3. What cause of respiratory distress indicates the presence of this type of breathing in the patient?
4. Why does the patient primarily have difficulty exhaling?
5. Intensive care options

Indicator 1 PC 1.2.
Case №6
The patient's condition deteriorated sharply 2 minutes after intravenous administration of radiocontrast agent. Consciousness was absent, pupils were dilated and unreactive to light. The skin was markedly pale. The pulse was thready. Heart sounds were extremely muffled. Blood pressure was undetectable, and breathing was shallow, arrhythmic, alternating with apnea.
Questions:
1. What critical condition developed?
2. What is the primary pathophysiological mechanism of this complication?
3. Describe the hemodynamic profile?
4. What is the emergency care requirement?
5. Explain the emergency care protocol.

Evaluation criteria, case assessment scale

Grade		**Description**
«excellent»	5	The explanation of the case solution is detailed, consistent, and accurate; includes theoretical justification; includes the required schematic diagrams and visual demonstrations; terminology is used correctly and fluently. Answers to additional questions are correct and clear.
«good»	4	The explanation of the case solution is detailed, but not sufficiently logical; contains isolated minor errors in details; includes some difficulties in theoretical justification, schematic diagrams, and visual demonstrations. Answers to additional questions are correct, but not sufficiently clear.
«satisfactory»	3	The explanation of the case solution is insufficiently complete and inconsistent; contains errors and weak theoretical justification; shows significant difficulties and errors in schematic diagrams and visual demonstrations. Answers to additional questions are insufficiently clear and include errors in details.
«unsatisfactory»	2	The explanation of the case solution is incomplete and

		inconsistent; contains major errors; lacks theoretical justification; does not demonstrate the ability to provide schematic diagrams and visual demonstrations, or includes numerous errors. Answers to additional questions are incorrect or absent.

4.2. An approximate list of control questions to prepare for the pass/fail test:

Indicator1 GPC 4.2, Indicator 1 GPC -7.2, Indicator 1 PC-1.1, Indicator 1 PC-1.2.

1. Operating room safety rules and procedures.
2. Legal aspects of cardiopulmonary resuscitation. The concept of brain death.
3. Understanding the risks of surgery and anesthesia.
4. Indications for hospitalization and transfer of patients to the intensive care unit.
5. Terminal states. Definition, pathophysiology, and diagnosis.
6. Types and methods of anesthesia.
7. Comparative characteristics of inhalational anesthetics.
8. Comparative characteristics of intravenous anesthetics.
9. Types of circulatory arrest.
10. Compression technique. Technical devices for improving indirect cardiac massage.
11. Indications for electrical defibrillation. Methodology for its implementation.
12. Methods for ensuring patency of the upper airway during cardiopulmonary resuscitation.
13. Medications used during circulatory arrest and routes of administration.
14. Principles of treating hemorrhagic shock. Principles of blood loss replacement. Modern approaches to blood transfusion in acute blood loss.
15. Anaphylactic shock. Classification of anaphylactic shock variants. Intensive care.
16. Cardiogenic shock. Pathogenesis, clinical presentation, diagnosis, intensive care.
17. Septic shock. Pathogenesis, clinical presentation, diagnosis, intensive care.
18. Metabolic coma, causes. Uremic and hepatic coma: etiology, pathogenesis, clinical presentation, intensive care. Ketoacidotic hyperglycemic coma: etiology, pathogenesis, clinical presentation, intensive care.
19. Lactic acidotic hyperglycemic coma: etiology, pathogenesis, clinical presentation, intensive care.
20. Hyperosmolar hyperglycemic coma: etiology, pathogenesis, clinical features, and intensive care.
21. Hypoglycemic coma: etiology, pathogenesis, clinical features, and intensive care.
22. Cerebral coma: etiology, pathogenesis, clinical features, and intensive care.
23. Infusion therapy agents.
24. Principles of pain syndrome treatment.
25. Polytrauma. Classification, rules of first aid, and complications.
26. Etiology and pathogenesis of acute respiratory failure.
27. Objective patient monitoring methods used in anesthesiology and resuscitation.
28. Principles of clinical assessment of the patient's preoperative condition and choice of anesthesia method.
29. General principles of preparing patients for general anesthesia.
30. Premedication: objectives and medications used.
31. Endotracheal general anesthesia. Indications, contraindications. Risks, complications, their prevention and treatment. Advantages and disadvantages.
32. Non-inhalation general anesthesia. Types and methods. Indications, contraindications. Risks, complications, their prevention and treatment.
33. Combined general anesthesia. Indications, contraindications, advantages and disadvantages.
34. Epidural anesthesia: indications for use, contraindications, complications, their prevention and treatment.
35. Spinal anesthesia: indications for use, contraindications, complications, their prevention and treatment.

36. Methods for restoring and maintaining airway patency.
37. Main forms of acid-base balance disorders, clinical manifestations. Principles of correction.
38. Main types of water-electrolyte imbalance, clinical manifestations. Principles of Correction
39. Infusion Therapy – Indications, Solutions Used, Methods for Calculating Required Volumes
40. Enteral Nutrition in the Intensive Care Unit
41. Parenteral Nutrition in the Intensive Care Unit
42. Key Parameters of Central Hemodynamics
43. Shock – Definition and Classification
44. Principles of Intensive Care for Hypovolemic Shock
45. Intensive Care for Pulmonary Edema
46. Pulmonary Embolism – Diagnosis, Intensive Care

Evaluation criteria, control question assessment scale

Grade		**Description**
«excellent»	5	Knows all the course material, understands it well, and has firmly mastered it. Provides correct, informed, and confident answers to questions (within the syllabus). Uses correct language in oral responses and makes no mistakes**.**
«good»	4	Knows all required course material, understands it well, and has firmly mastered it. Answers questions (within the syllabus) without difficulty. Uses literary language in oral responses and does not make serious errors.
«satisfactory»	3	Knows the basic curriculum material. Difficulty answering questions (within the curriculum). In oral responses, makes errors in presenting the material and in structuring the speech.
«unsatisfactory»	2	Unversed in most of the course material, typically only responds to the teacher's leading questions with uncertainty. Frequent errors in oral responses.

Evaluation criteria, final assessment scale *(pass/fail test)*

Grade	**Description**
pass	Demonstrates a complete understanding of the problem. Knows the key concepts within the topic under discussion, the methods of study and their interrelationships, and the practical problems involved, and has an understanding of promising areas for developing the issue under consideration.
fail	Demonstrates a lack of understanding of the problem. Does not know the key concepts or methods of study, and has no understanding of the key practical problems within the topic under discussion.

6. Procedure for conducting interim assessment

Interim assessment for the course is conducted in the form of a pass/fail test.
The test includes: oral interview (control questions) and solving cases.