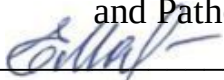


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Информация о владельце:
ФИО: Стегний Кирилл Владимирович
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Federal State Budget Educational Institution
of Higher Education
Pacific State Medical University
of the Ministry of Health of the Russian Federation

APPROVED BY
Head of the Department of Human Physiology
and Pathophysiology
 / Markelova E.V./
“17th” of April 2026

COLLECTION OF ASSESSMENT TOOLS
B1.C.42 Human physiology – Physiology of maxillofacial area
of the basic educational program
of Higher Education

Specialty	31.05.03 Dentistry for foreign students (English-language program) (code, name)
Degree	Specialist's degree
Profile	02 "Healthcare" (in the field of providing health care in patients with dental pathology)
Mode of study	Full-time
Period of mastering the BEP	5 years (nominal length of study)
Department	of Human Physiology and Pathophysiology

Vladivostok, 2026

1. INTRODUCTION

1.1. Collection of Assessment Tools is a document that regulates the format, content, and types of assessment tools for continuous assessment, interim examination and final (state final) examination, and graded criteria for each type of assessment tools.

1.2. Assessment tools allows to evaluate the development of universal, general professional, and professional competencies (UCs, GPCs and PCs respectively) outlined in Federal State Educational Standard of Higher Education and defined in the basic educational program of higher education for the specialty 31.05.03 Dentistry for foreign students (English-language program), profile 02 "Healthcare" (in the field of providing health care in patients with dental pathology).

([BEP HE for the 31.05.03 Dentistry for foreign students \(English-language program\)](#) specialty, section 3 Learning Outcomes Requirements of the Basic Educational Program of Higher Education)

2. DOCUMENT BODY

2.1. Types of Assessment, Formats of Assessment Tools

No.	Types of assessment	Assessment Tools Format
1	Continuous assessment	Tests
		Interview Questions
		Mini-Case Studies
2	Interim assessment	Tests
		Interview Questions
		Mini-Case Studies

3. The contents of assessment tools for continuous and interim examination are prepared by the teacher of the course

Tests for continuous and interim assessment

	Code	Competence description / name of labor function / name of work activity / text
S	31.05.03	Dentistry for foreign students (English-language program)
C	GPC-9	Able to evaluate morphofunctional and physiological conditions as well as pathological processes in the human body to solve professional problems
I		ANSWER LEVEL 1 TEST QUESTIONS (ONE CORRECT ANSWER)
		Module 1. Basic physiology of excitable tissues and control systems of the body 01 The inner surface of the cell membrane of an excitable cell in a state of physiological rest is charged 1) positively; 2) the same as the outer membrane; 3) not charged; +4) negatively.

02 In the phase of rapid depolarization of the action potential membrane permeability increases for ions of

- +1) potassium
- 2) sodium
- 3) chlorine
- 4) calcium

03 Muscle contraction is triggered by ions

- 1) potassium
- 2) sodium
- 3) chlorine
- +4) calcium

04 The excitatory postsynaptic potential develops as a result of movement of _____ ions into the cell

- +1) sodium
- 2) potassium
- 3) chlorine
- 4) magnesium

05 A motor neuron and the muscle fibers innervated by that neuron are called

- +1) motor unit
- 2) sarcomere
- 3) myofibrils
- 4) actin and myosin

Module II. Blood and circulation

06 Red blood cells to plasma ratio is called

- 1) anemia
- 2) color index
- 3) hemoglobin
- 4) hemolysis
- +5) hematocrit
- 6) thrombocrit

07 Increase in total amount of leukocytes in blood is called

- 1) thrombocytopenia
- +2) leukocytosis
- 3) erythropenia
- 4) erythrocytosis
- 5) anemia
- 6) leucopenia

08 The percentage of lymphocytes for healthy adult person is

- +1) 19-38%
- 2) 1-5%
- 3) 60-70%
- 4) 14-18%
- 5) 3-8%
- 6) 0-1%

09 Repolarization of the ventricles is displayed on the ECG as

- +1) T wave
- 2) QRS complex
- 3) P wave
- 4) R wave
- 5) U wave

10 Normal resting systolic pressure in an adult is approximately

- +1) 110 – 120 mm Hg
- 2) 70 – 80 mm Hg
- 3) 40 mm Hg
- 4) 100 mm Hg
- 5) 20 mm Hg

Module III. Respiration, digestion, metabolism, excretion

11 Volume of air moved into or out of the lungs in a minute is called

- 1) tidal volume
- +2) respiratory minute volume
- 3) inspiratory reserve volume
- 4) expiratory reserve volume
- 5) residual volume

12 Pepsin of gastric juice hydrolyzes

- 1) fats;
- 2) carbohydrates;
- 3) nucleic acids;
- 4) mucopolysaccharides;
- +5) proteins.

13 A digestive enzyme that hydrolyzed carbohydrates is called

- 1) pepsin
- 2) trypsin
- 3) lipase
- +4) amylase
- 5) enterokinase

14 Saliva, which is produced in small quantities, is

- 1) slightly alkaline;
- +2) slightly acid;
- 3) neutral;
- 4) strongly acid;
- 5) strongly alkaline.

15 Staying in the cold is often lead to an increase in urine excretion because of

- 1) an increased secretion of antidiuretic hormone (ADH);
- 2) an inhibition of the secretion of antidiuretic hormone (ADH);
- +3) an increase in the glomerular filtration rate;

		4) an increased secretion of aldosterone; 5) a release of renin into the blood. Module IV. Physiology of sensory systems and higher nervous activity 16 Impairment of speech hearing is associated with the damage mainly to +1) the left temporal cortex 2) the right temporal cortex 3) the frontal cortex; 4) occipital cortex. 17 Choose the types of sensations that are perceived only by taste buds 1) sour, bitter, sweet, salty 2) sour, bitter, sweet, salty, “umami” (glutamate, protein) 3) sour, bitter, sweet, salty, “umami”, fatty +4) sour, bitter, sweet, salty, “umami”, fatty, mint, spicy 18 Articulation System does not include 1) pharynx 2) nasal cavity 3) oral cavity +4) larynx
		ANSWER LEVEL 2 TEST QUESTIONS (MULTIPLE CORRECT ANSWERS)
		Module 1. Basic physiology of excitable tissues and control systems of the body 01 The main criteria for assessing excitability are +1) Threshold stimulus strength 2) Subthreshold stimulus strength +3) Suprathreshold stimulus strength 4) Chronaxie 5) Useful time 02 The main features of smooth muscle contraction are 1) rapid reaction to stimuli +2) slow reaction to stimuli +3) automatism 4) full dependence of contractions on nerve affects +5) low energy consumption and fatigue 03 The properties of nerve centers depend on +1) properties of nerve cells 2) properties of nerve fibers 3) properties of glia cells +4) properties of chemical synapses +5) neural network structure 04 The development of the program of the movement involves 1) spinal cord 2) medulla oblongata, pons

- +3) cerebellum
- 4) midbrain
- 5) hypothalamus
- 6) thalamus
- +7) striatopallidal system
- +8) cerebral cortex

05 Effects of sympathetic stimulation are

- +1) decreased intestinal motor activity
- 2) stimulated intestinal motor activity
- +3) dilated pupil
- 4) constricted pupil
- +5) stimulated heart activity
- 6) inhibited heart activity
- +7) constricted bronchial lumen
- 8) delayed bronchial lumen

Module II. Blood and circulation

06 Basal vascular tone is caused by

- 1) parasympathetic stimulation
- 2) sympathetic stimulation
- +3) automaticity of smooth muscle of the vascular wall
- 4) metasymphathetic influence
- +5) properties of the vascular wall
- 6) influence of biologically active substances

07 Vasodilators include

- +1) bradykinin
- +2) histamine
- 3) renin-angiotensin II
- +4) adenosine
- +5) acetylcholine

08 The influence of sympathetic nerves on the heart includes

- +1) increased heart rate
- 2) decreased heart rate
- +3) increased force of contractions
- 4) decreased force of contractions
- +5) increased excitability
- 6) decreased excitability
- +7) increased conductivity
- 8) decreased conductivity

09 Stimulation of the aortic arch baroreceptors leads to

- 1) Decreased vagal tone
- +2) Increased vagal tone
- +3) Inhibition of heart activity
- 4) Stimulation of heart activity
- 5) Increased blood pressure
- +6) Decreased blood pressure

10 During the period of blood expulsion

- +1) semilunar valves are open
- 2) semilunar valves are closed
- 3) atrioventricular valves are open
- +4) atrioventricular valves are closed

Module III. Respiration, digestion, metabolism, excretion

11 Methods used to determine vital capacity of the lungs include

- +1) Spirography
- +2) Body plethysmography
- +3) Spirometry
- 4) Pneumotachometry
- 5) Peak flow test
- 6) Pulse oximetry

12 Saliva contains digestive enzymes such as

- 1) muramidase
- 2) protease
- +3) alpha-amylase
- +4) alpha-glucosidase
- 5) lipase

13 The phases of gastric secretion according to I.P. Pavlov include

- +1) reflex (cephalic) phase
- +2) gastric phase
- +3) intestinal phase
- 4) anabolic phase
- 5) catabolic phase

14 Biological effects of aldosterone in kidneys includes

- +1) increased excretion of potassium ions from the body
- 2) increased excretion of sodium ions from the body
- 3) increased excretion of chloride ions from the body
- 4) reduced excretion of potassium ions from the body
- +5) reduced excretion of sodium ions from the body
- +6) reduced excretion of chloride ions from the body

15 Saliva, which is produced under sympathetic stimulation, is

- +1) rich in enzymes
- 2) poor in enzymes
- +3) thick
- 4) liquid
- 5) large in volume
- +6) small in volume

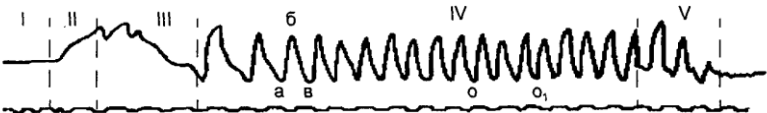
Module IV. Physiology of sensory systems and higher nervous activity

16 The parts of a sensory system include

- +1) peripheral
- +2) conductive
- 3) efferent

		+4) central 5) afferent 6) additional 17 Types of internal inhibition in higher nervous activity are 1) unconditioned 2) protective +3) “conditioned inhibitor” +4) delayed +5) differentiating (discriminative) +6) extinctive 18 Types of attention include +1) involuntary (passive) +2) voluntary +3) post-voluntary 4) inborn/native 5) acquired 19 The perception of food involves +1) taste receptors 2) visual receptors 3) auditory receptors +4) tactile receptors +5) temperature receptors 6) vestibular receptors 20 The receptors in the oral cavity trigger +1) swallowing, sucking 2) coughing, sneezing +3) vomiting reflex 4) righting reflexes +5) reflexes from oral cavity receptors to the stomach +6) reflexes from oral cavity receptors to the heart 7) blinking reflex +8) taste perception												
		ANSWER LEVEL 3 TEST QUESTIONS (MATCHING QUESTIONS)												
		01 <table><tr><th>Action potential period</th><th>Excitability</th></tr><tr><td>1. Rest</td><td>A) excitability above normal</td></tr><tr><td>2. Latent period</td><td>B) normal excitability</td></tr><tr><td>3. Spike</td><td>C) relative refractory phase</td></tr><tr><td>4. Afterpotential hyperpolarization</td><td>D) absolute refractory phase</td></tr></table> Correct answers: 1 – B; 2 – A; 3 – D; 4 – C 02 <table><tr><th>Parabiosis period</th><th>Description</th></tr></table>	Action potential period	Excitability	1. Rest	A) excitability above normal	2. Latent period	B) normal excitability	3. Spike	C) relative refractory phase	4. Afterpotential hyperpolarization	D) absolute refractory phase	Parabiosis period	Description
Action potential period	Excitability													
1. Rest	A) excitability above normal													
2. Latent period	B) normal excitability													
3. Spike	C) relative refractory phase													
4. Afterpotential hyperpolarization	D) absolute refractory phase													
Parabiosis period	Description													

		1. Rest	A) The cell reproduces its maximum stimulation frequency without changes
		2. Transformational phase	B) The cell does not respond to stimuli of any strength
		3. Paradoxical phase	C) The cell responds equally to strong and weak stimuli, and its maximum response frequency is lower than normal
		4. Inhibitory phase	D) The reaction is stronger to weak and rare stimuli than to strong and frequent ones
		03	
		Type of leukocytes	Main functions
		1. neutrophils	A) fight against parasites
		2. eosinophils	B) fight against bacteria
		3. basophils	C) adaptive immunity, fight against viruses
		4. monocytes	D) vascular trophism, restructuring of the vascular bed
		5. lymphocytes	E) transformed into macrophages, tissue remodeling and protection
		Correct answers: 1 – B; 2 – A; 3 – D; 4 – E; 5 – C	
		04	
		Term	Definition
		1. acidosis	A) a solution whose osmotic pressure is the same as that of blood plasma
		2. alkalosis	B) shift in blood plasma pH to the sour side
		3. physiological solution	C) shift in blood plasma pH to the base side
		4. hematocrit	D) plasma to red blood cell ratio
		Correct answers: 1 – B; 2 – C; 3 – A; 4 – D	
		05	

		Term		Definition
		1. bathmotropy		A) change in the force of heart contractions
		2. dromothropy		B) change in heart rate
		3. inothropy		C) change in excitability
		4. chrinotropy		D) change in conductivity
		Correct answers: 1 – C; 2 – D; 3 – A; 4 – B		
		06		
		Blood pressure parameter		Value
		1. systolic pressure		A) 40 mm Hg
		2. diastolic pressure		B) 70 – 80 mm Hg
		3. pulse pressure		C) 110 – 130 mm Hg
		4. average dynamic pressure		D) 100 mm Hg
		Correct answers: 1 – C; 2 – B; 3 – A; 4 – D		
		07		
		The level of the nuclei of the respiratory center in the central nervous system		Functions
		1. Spinal cord		A) Automaticity of breathing
		2. Medulla oblongata		B) Voluntary control of breathing rate and depth
		3. Pons		C) Adaptation of respiration to changes in environmental temperature
		4. Hypothalamus		D) Innervation of the respiratory muscles
		5. Cerebral cortex		E) Regulation of the duration of inhalation and exhalation
		Correct answers: 1-D; 2-A; 3-E; 4-C; 5-B;		
		08		
				
		Designation		Phases of mastication
		I		A) crushing phase
		II		B) grinding phase
		III		C) rest
		IV		D) incision phase

		V	E) formation and swallowing of the bolus
		Correct answers: I – C; II – D; III – A; IV – B; V – E	

Assessment criteria

"**Very good**" – over 90% correct answers of questions of every level

"**Good**" – 77-89% correct answers of questions of every level

"**Satisfactory**" – 60-76% correct answers of questions of every level

"**Unsatisfactory**" – less than 60% correct answers of questions of every level

Interview questions

	Code	Competence description / name of labor function / name of work activity / text
S	31.05.03	Dentistry for foreign students (English-language program)
C	GPC-9	Able to evaluate morphofunctional and physiological conditions as well as pathological processes in the human body to solve professional problems
I		ANSWER THE QUESTIONS Module 1. Basic physiology of excitable tissues and control systems of the body 1. Structure and functions of cell membrane. Membrane potentials. 2. Action potential, its phases and mechanisms. 3. Excitability, methods of its evaluation. Correlation between excitability phases and action potential phases. 4. Rules of excitable tissues reactions. Relationship between force and time. 5. Parabiosis by N. Vvedensky. 6. Maintains calcium and phosphorus homeostasis Module II. Blood and circulation 7. Internal environment of an organism. The blood system, its properties and functions. Basic constants of blood, pathways of regulation the constants. 8. Protective functions of blood. Immunity. 9. Leukocytes, their types, ratio and their functions. 10. Regulation of cardiac activity, its levels, pathways and effects. 11. Functional system for maintains of general blood pressure, its central and peripheral components. Module III. Respiration, digestion, metabolism, excretion 12. Breathing and its stages. Biomechanics of inhalation and exhalation. 13. Regulation of respiration by reflexes. Change of respiratory phases. 14. Regulation of respiration by concentration of carbon dioxide, blood pH and oxygen concentration. 15. Digestion in oral cavity. Composition and physiological properties of saliva. Salivation, its regulation. 16. Metabolism. Assimilation and dissimilation. Nutrients and their purpose.

	17. Pathways of thermoregulation. Thermoregulation during physical work and temperature fluctuations of environment. Physiological base for hardening the body. 18. Excretory system in maintaining of homeostasis. Kidney functions. Nephron. Module IV. Physiology of sensory systems and higher nervous activity 19. Pain, its biological significance. Nociceptors and pathway of pain. Antinociceptive system. 20. Motivation. Their classification and pathways. 21. Emotions, its biological significance. Motor and autonomic components of emotions. 22. Memory, its purpose and adaptive properties. Types of memory. Pathway of memory. 23. Speech, its functions. Functional asymmetry of the cerebral cortex associated with speech in humans.
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Assessment criteria

"Very good" – over 85% correct answers of questions of every level

"Good" – 72-84% correct answers of questions of every level

"Satisfactory" – 56-70% correct answers of questions of every level

"Unsatisfactory" – less than 55% correct answers of questions of every level

Standardized case studies and checklists for the **B1.C.42 Human physiology – Physiology of maxillofacial area** course

Case Study No.1

	Code	Competence description / name of labor function / name of work activity / text
S	31.05.03	Dentistry for foreign students (English-language program)
C	GPC-9	Able to evaluate morphofunctional and physiological conditions as well as pathological processes in the human body to solve professional problems
I		READ THE PROVIDED CASE DESCRIPTION AND GIVE DETAILED ANSWERS TO THE QUESTIONS Some types of toxins (<i>Amanita phalloides</i> (death-cap mushroom) poison) significantly reduce the absolute refractory period in the heart. Can ingestion of such poisons be fatal? Describe the mechanism.
Q	1	Question: What is the absolute refractory period of an excitable cell?
Q	2	Question: What is the duration of absolute refractory period of the ventricular myocardium?
Q	3	Question: What main modes of functioning in muscle tissue do you know?
Q	4	Question: How the function of the heart changes due to prolonged absolute refractory period?
Q	5	Question: How the function of the heart changes if the phase of absolute refractory period is shortened significantly?
Q	6	Question: What are changes in hemodynamics in this situation?

Case Study No.1 Checklist

	Code	Competence description / name of labor function / name of work activity / text
S	31.05.03	Dentistry for foreign students (English-language program)
C	GPC-9	Able to evaluate morphofunctional and physiological conditions as well as pathological processes in the human body to solve professional problems
I		READ THE PROVIDED CASE DESCRIPTION AND GIVE DETAILED ANSWERS TO THE QUESTIONS Some types of toxins (Amanita phalloides (death-cap mushroom) poison) significantly reduce the absolute refractory period in the heart. Can ingestion of such poisons be fatal? Describe the mechanism.
R2	Very good	Correct answers to all questions are provided
R1	Good	Correct and complete answers are provided to the questions 1, 2, 3, and 4
	Satisfactory	Correct and complete answers are provided to the questions 1, 2, and 3
R0	Fail	No correct answers given
Q	1	Question: What is the absolute refractory period of an excitable cell?
A		Correct answer: The absolute refractory period is the time when a cell cannot respond to a repeated stimulus of any strength, even a very strong one since all potential-gated sodium channels after the action potential are not available for re-exposure for some time.
R2	Very good	Correct answer is given
R0	Fail	No answer, incorrect or irrelevant answer is given
Q	2	Question: What is the duration of absolute refractory period of the ventricular myocardium?
A		Correct answer: Normally, the absolute refractory period of the ventricular myocardium lasts 0.25 - 0.3 seconds and almost coincides with the duration of the plateau phase of the action potential.
R2	Very good	Correct answer is given
R0	Fail	No answer, incorrect or irrelevant answer is given
Q	3	Question: What main modes of functioning in muscle tissue do you know?
A		Correct answer: The main modes of functioning in muscle tissue are single contraction and contraction summation (single contraction, contraction summation, tetanus contraction).
R2	Very good	Correct answer is given
R0	Fail	No answer, incorrect or irrelevant answer is given
Q	4	Question: How the function of the heart changes due to prolonged absolute refractory period?

A		Correct answer: Due to prolonged absolute refractory period, the heart can only produce single contractions, the myocardium contracts synchronously, as a whole. As a result, the contraction and relaxation of the heart follow one after the other
R2	Very good	Correct answer is given
R0	Fail	No answer, incorrect or irrelevant answer is given
Q	5	Question: How the function of the heart changes if the phase of absolute refractory period is shortened significantly?
A		Correct answer: If the absolute refractory period is shortened significantly, the heart may enter a state of tetanus contraction, which will lead to cardiac arrest in the systole phase. In addition, the likelihood of asynchronous myocardial work increases.
R2	Very good	Correct answer is given
R0	Fail	No answer, incorrect or irrelevant answer is given
Q	6	Question: What are changes in hemodynamics in this situation?
A		Correct answer: These disorders of the heart function will lead to disrupted hemodynamics. This condition is life-threatening and requires emergency medical intervention. Impaired blood supply, in particular of the brain, manifests primarily as loss of consciousness
R2	Very good	Correct answer is given
R0	Fail	No answer, incorrect or irrelevant answer is given

4. Assessment criteria for learning outcomes

"Very good" grade is given to a student who possesses knowledge of the subject in full scope outlined in the curriculum, has a sufficiently deep insight into the subject; is able to answer all questions clearly, exhaustively, and with no outside help; structures their answers logically, with emphasis on the most important information; is able to analyze, compare, classify, summarize, refine, and structure the course content, giving particular attention to cause-and-effect relationships.

Test results: over 91% correct answers of questions of every level

"Good" is given to a student whose knowledge of the subject is almost in full scope outlined in the curriculum (gaps are only present in the knowledge of some especially complex aspects); is able to answer questions exhaustively with little to no outside help; does not always put emphasis on the most important information, but does not make significant mistakes.

Test results: 81-90% correct answers of questions of every level

"Satisfactory" is given to a student who possesses the bulk of knowledge on the subject; has difficulties answering questions with no outside help, uses imprecise wording; makes mistakes in substantial number of their answers.

Test results: 71-80% correct answers of questions of every level

"Unsatisfactory" is given to a student who does not have the mandatory minimum of knowledge on the subject, is not able to give an answer even with additional guiding questions.

Test results: less than 71% correct answers of questions of every level

Practical Skills Assessment Checklist
 Practical Skill Name “Radial pulse assessment”

C	GPC-9	Able to evaluate morphofunctional and physiological conditions as well as pathological processes in the human body to solve professional problems	
F	A/01.7	Patient examination. Making a diagnosis	
WA	1. Primary examination of patients 2. Re-examination of patients 3. Planning laboratory and instrumental patient examination 4. Interpretation of the results of initial and repeated laboratory and instrumental studies		
	Action	Performed	Not Performed
1.	The patient is seated facing the one conducting the examination	1 point	-1 point
2.	One’s fingers are placed above the patient’s wrist joint so that the 2nd and 3rd fingers are above the radial arteries; the pulse is assessed by changing the pressure applied by the fingers	1 point	-1 point
3.	Heart rate is evaluated: the number of beats per minute is counted; the results are evaluated (normocardia, bradycardia, tachycardia)	1 point	-1 point
4.	The rhythm (the duration of time intervals between beats) is assessed as either rhythmic or arrhythmic	1 point	-1 point
5.	The pulse strength (the force that must be applied to compress the artery until the pulse completely disappears) is assessed	1 point	-1 point
6.	The pulse volume (the change in the volume of the arteries, determined by the strength of the pulse beat) is assessed	1 point	-1 point
7.	An overall assessment of the pulse is made	1 point	-1 point
	Total	7 points	

Assessment criteria:

“Pass” –75% or more of actions performed correctly

“Fail” – 74% and less