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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
Director of the Institute of
Fundamentals and Information
Technologies in Medicine
_____ / Bagryantsev V.N./
"4th" of April 2025

COLLECTION OF ASSESSMENT TOOLS
Б1.О.08 Biochemistry
of the basic educational program of Higher Education

Specialty	**31.05.01 General Medicine for international students (in English)** (code, name)
Degree	Specialist's degree
Profile	02 "Healthcare" (in the field of providing primary health care to the population in medical organizations: polyclinics, outpatient clinics, inpatient/outpatient facilities of the municipal health care system)
Mode of study	**Full-time**
Period of mastering the BEP	**6 years** (nominal length of study)
Institute	of Fundamentals and Information Technologies in Medicine

Vladivostok, 2025

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 31.05.01 General Medicine for international students (in English), profile 02 "Healthcare" (in the field of providing primary health care to the population in medical organizations: polyclinics, outpatient clinics, inpatient/outpatient facilities of the municipal health care system).

(BEP HE for the 31.05.01 General Medicine for international students (in English) specialty, section 3.2.3 General professional competencies of graduates and indicators of achieving them)

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

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

Tests for continuous assessment

	Code	Competence description / name of labor function / name of work activity / text
S	31.05.01	General Medicine for international students (in English)
C	GPC-5	Is able to assess morphofunctional status, physiological states, and pathological processes in the human body when working to achieve objectives of professional activity
C	PC-3	Ability and readiness to collect and analyze complaints that a patient presents with, anamnestic data, examination results, results of laboratory and instrumental tests, biopsy and other studies in order to identify patient's condition or establish the presence or absence of a disease
I		**ANSWER LEVEL 1 TEST QUESTIONS (ONE CORRECT ANSWER)**
		1. Daily protein requirement for an average human is **a) 50g** b) 300g c) 100g d) 20-30g e) 200g

		2. The coenzyme of transaminases is a derivative of a) Vitamin C b) Vitamin B_1 c) Vitamin B_{12} d) Vitamin PP **e) Vitamin B_6** 3. Decarboxylation of glutamic acid produces a) tyramine **b) GABA** c) putrescine d) histamine e) serotonin

Assessment criteria
"Very good" – over 90% correct answers of questions of every level
"Good" – 75-89% correct answers of questions of every level
"Satisfactory" – 60-74% 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	31.05.01	General Medicine for international students (in English)
C	GPC-5	Is able to assess morphofunctional status, physiological states, and pathological processes in the human body when working to achieve objectives of professional activity
C	PC-3	Ability and readiness to collect and analyze complaints that a patient presents with, anamnestic data, examination results, results of laboratory and instrumental tests, biopsy and other studies in order to identify patient's condition or establish the presence or absence of a disease
I		**ANSWER THE QUESTIONS** 1. What are the primary, secondary, tertiary, and quaternary structures of a protein? What types of bonds are characteristic of the primary, secondary, and tertiary structures of a protein? 2. Explain the mechanism of pathology development in sickle cell anemia. 3. What significance does the change in protein composition during ontogenesis have for the development of the organism.

Standardized case studies and checklists for the **Б1.О.08 Biochemistry** course

Case Study No.1

	Code	**Competence description / name of labor function / name of work activity / text**
S	31.05.03	Dentistry for international students (in English)
C	GPC-5	Is able to assess morphofunctional status, physiological states, and pathological processes in the human body when working to achieve objectives of professional activity
C	PC-3	Ability and readiness to collect and analyze complaints that a

		patient presents with, anamnestic data, examination results, results of laboratory and instrumental tests, biopsy and other studies in order to identify patient's condition or establish the presence or absence of a disease
I		**READ THE PROVIDED CASE DESCRIPTION AND GIVE DETAILED ANSWERS TO THE QUESTIONS**
		Patient S., 44 years old, after sustaining an injury (leg fracture), was recommended by the attending physician to take vitamin-mineral complexes containing calcium and vitamins D3 and C.
Q	1	Question: Justify these doctor's recommendations from a biochemical perspective

Case Study No.2

	Code	**Competence description / name of labor function / name of work activity / text**
S	31.05.03	Dentistry for international students (in English)
C	GPC-5	Is able to assess morphofunctional status, physiological states, and pathological processes in the human body when working to achieve objectives of professional activity
C	PC-3	Ability and readiness to collect and analyze complaints that a patient presents with, anamnestic data, examination results, results of laboratory and instrumental tests, biopsy and other studies in order to identify patient's condition or establish the presence or absence of a disease
I		**READ THE PROVIDED CASE DESCRIPTION AND GIVE DETAILED ANSWERS TO THE QUESTIONS**
		Blood and urine test results: blood glucose – 11 mmol/l, pH – 7.35; glucose and ketone bodies detected in urine.
Q	1	Question: Assess the patient's condition based on the provided laboratory test results

Case Study No.3

	Code	**Competence description / name of labor function / name of work activity / text**
S	31.05.03	Dentistry for international students (in English)
C	GPC-5	Is able to assess morphofunctional status, physiological states, and pathological processes in the human body when working to achieve objectives of professional activity
C	PC-3	Ability and readiness to collect and analyze complaints that a patient presents with, anamnestic data, examination results, results of laboratory and instrumental tests, biopsy and other studies in order to identify patient's condition or establish the presence or absence of a disease
I		**READ THE PROVIDED CASE DESCRIPTION AND GIVE DETAILED ANSWERS TO THE QUESTIONS**
		During the examination of a patient, atherosclerotic lesions of the cerebral vessels were detected. In addition to pharmacological treatment, the doctor recommended the patient to limit the consumption of saturated fats and increase

		the proportion of ω-3 PUFAs.
Q	1	Question: What is the mechanism of participation of ω-3 PUFAs in metabolic processes?
Q	2	Question: What products can be considered recognized sources of ω-3 PUFAs?

Assessment criteria:

"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.

"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.

"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.

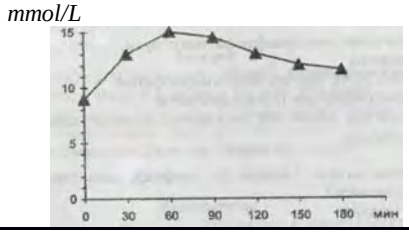
"Unsatisfactory" is given to a student who does not have the mandatory minimum of knowledge on the subject, is not able to give an answer even with additional guiding questions.

Examples of repot topics:

1. Application of enzymes as analytical reagents in biochemical research.
2. Use of immobilized enzymes in medicine and industrial production.
3. Trace elements – antioxidants (selenium, zinc, copper).
4. Biochemical criteria for assessing the pre-pathology state under the membrane-destructive action of negative environmental factors.
5. Hereditary and acquired disorders of protein and amino acid metabolism.
6. Matrix metalloproteinases: the role of enzymes in physiological and pathological processes

Tests for interim assessment

	Code	**Competence description / name of labor function / name of work activity / text**
S	31.05.01	General Medicine for international students (in English)
C	GPC-5	Is able to assess morphofunctional status, physiological states, and pathological processes in the human body when working to achieve objectives of professional activity
C	PC-3	Ability and readiness to collect and analyze complaints that a patient presents with, anamnestic data, examination results, results of laboratory and instrumental tests, biopsy and other studies in order to identify patient's condition or establish the presence or absence of a disease
I		**ANSWER TEST QUESTIONS**
		1. Indicator enzymes are a) enzymes synthesized primarily in the liver normally, released into the blood and performing a specific function b) enzymes synthesized in the liver and excreted in bile **c) enzymes synthesized in cells and entering the blood upon tissue damage** d) enzymes synthesized in any tissue 2. Organ-specific enzymes of the liver include

		a) LDH b) CPK c) ALP **d) ALT, AST** 3. The main blood plasma proteins are synthesized **a) in the liver** b) in the intestinal wall c) in bone tissue d) in the spleen 4. In case of insufficient protein nutrition and associated "hunger" edema a) renal excretory function is impaired **b) albumin formation in the liver is impaired** **c) concentration of total protein in the blood is decreased** d) protein is excreted in urine 5. What conclusion can be drawn from the graph characterizing the glucose tolerance test ("Glucose curve")? a) normal glucose curve **b) impaired glucose tolerance** c) excessive insulin secretion 

4. Assessment criteria for learning outcomes

For graded test:

"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.

"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.

"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.

"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.