

**Thematic plan of student's independent work in the discipline "Clinical Biochemistry"
for students of 2023 admission under the educational program 31.05.01 General Medicine,
(specialty),
full-time education 2024-2025 academic year**

№	Theme of independent work	Reporting forms
1	Stages of laboratory analysis, their importance. Concept of analyte, purpose of laboratory research.	Abstract, presentation
2	Preanalytical stage of laboratory research. Non-laboratory factors influencing the results of laboratory research.	Abstract, presentation
3	Preparing the patient for laboratory testing. Biological variations of laboratory parameters, their significance.	Abstract, presentation
4	The influence of the method of collection, transportation and storage of samples on the results of laboratory tests. Typical errors at the pre-analytical stage of laboratory research	Abstract, presentation
5	Conditions and equipment necessary for performing the preanalytical stage of laboratory research. Procedure for performing the preanalytical stage.	Abstract, presentation
6	Iatrogenic factors influencing the results of laboratory tests, their significance.	Abstract, presentation
7	Organization of the analytical stage of the study. Possible errors.	Abstract, presentation
8	Organization of quality control of laboratory research. Sources of errors in laboratory research. Their classification. Ways to overcome them.	Abstract, presentation
9	Main forms of quality control (intra-laboratory, inter-laboratory).	Abstract, presentation
10	Quality control methods (reproducibility control, accuracy control). Basic statistical criteria in quality control of laboratory studies. Construction of control charts. Criteria for evaluating work using a control chart.	Abstract, presentation
11	Biochemical studies in liver diseases. Liver functions. Laboratory tests for the diagnosis of liver diseases.	Abstract, presentation
12	Clinical significance of determination of intracellular and secretory enzymes, intracellular proteins in the blood in liver diseases.	Abstract, presentation
13	Hemolytic jaundice. Etiology. Pathogenesis. Clinical and laboratory markers.	Abstract, presentation
14	Parenchymatous jaundice. Etiology. Pathogenesis. Clinical and laboratory markers.	Abstract, presentation

15	Obstructive jaundice. Etiology. Pathogenesis. Clinical and laboratory markers.	Abstract, presentation
16	Blood plasma proteins: total content, protein fractions, functions of individual proteins. Hypo- and hyperproteinemia	Abstract, presentation
17	Albumin, biological role, reference values of content in blood plasma.	Abstract, presentation
18	Disorders of metabolism of individual amino acids (phenylketonuria, cystinosis and cystinuria, alkaptonuria, homocystinuria, carcinoidosis). Pathogenesis, laboratory and clinical manifestations of disorders.	Abstract, presentation
19	Nitrogen balance. Nitrogen balance disorders in diseases and pathological conditions. Methods of nitrogen balance assessment.	Abstract, presentation
20	Clinical significance of determination of intracellular and secretory enzymes, intracellular proteins in the blood in diseases of the pancreas.	Abstract, presentation
21	Laboratory diagnostics of pancreatic diseases. Study of pancreatic secretion indices.	Abstract, presentation
22	Diabetes mellitus. Classification and pathogenesis. Laboratory diagnostics.	Abstract, presentation
23	Late complications of diabetes mellitus. Diabetic nephropathy: stages of microalbuminuria and proteinuria. Diabetic ketoacidosis.	Abstract, presentation
24	Glycated protein, control of diabetes mellitus compensation. Glucose tolerance test. Performance and interpretation of results.	Abstract, presentation
25	Triglycerides, Lipoproteins, composition, properties. Types of hyperlipoproteinemia. Dyslipidemia. Modified lipoproteins, products of limited proteolysis of lipoproteins.	Abstract, presentation
26	Lipid metabolism disorders in atherosclerosis. Laboratory diagnostics.	Abstract, presentation
27	Clinical significance of determining intracellular and secretory enzymes, intracellular proteins in the blood in diseases of the cardiovascular system.	Abstract, presentation
28	Main metabolic disturbances in acute myocardial infarction. Conditions of reversibility of myocardial changes. Irreversible changes in the heart muscle. Laboratory diagnostics.	Abstract, presentation
29	Nephron as a structural and functional unit of the kidney. Mechanism of urine formation. Hormonal regulation of urine formation.	Abstract, presentation
30	Methods of studying kidney function. Study of nitrogen excretory function. Concept of clearance. Reberg-Tareev test.	Abstract, presentation
31	Laboratory studies in diagnostics of kidney diseases. Clinical and laboratory syndromes of kidney diseases.	Abstract, presentation
32	Laboratory diagnostics of proteinuria. Clinical significance of detection of microalbuminuria. Clinical and diagnostic	

	significance of research in urine of glucose, metabolites of pigment metabolism (bilirubin, urobilin). Principles of laboratory diagnostics of pyuria (leukocyturia, bacteriuria).	
33	Acute and chronic renal failure. Etiology, classification, laboratory diagnostics.	Abstract, presentation
34	Water and electrolyte metabolism. Distribution of water in the body. Composition and content of intra- and extracellular fluid. Functions of water in the body.	Abstract, presentation
35	Laboratory research methods and indicators of water and electrolyte (ion) exchange in norm and pathology. The concept of critical values of laboratory tests.	Abstract, presentation
36	Sodium and potassium exchange. The role of these ions in maintaining the body's homeostasis: content inside and outside the cell.	Abstract, presentation
37	Calcium metabolism. Regulation of calcium metabolism. Hyper- and hypocalcemia	Abstract, presentation
38	Potassium metabolism. Regulation of potassium metabolism. Hyper- and hypokalemia.	Abstract, presentation
39	Phosphorus and its functions in the human body. Clinical values and diagnostics of phosphorus level disorders.	Abstract, presentation
40	Acid-base balance: blood buffer systems, role of lungs and kidneys. Acidosis and alkalosis: metabolic and respiratory, compensated and decompensated.	Abstract, presentation
41	Laboratory diagnostics of acid-base balance disorders.	Abstract, presentation
42	Diagnostics of emergency conditions in anesthesiology and resuscitation.	Abstract, presentation

Reviewed at the meeting of the Department of Clinical Laboratory Diagnostics on May 30, 2024, Protocol № 14.

Department head  B.V. Zavodovsky