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**Federal State Budgetary Educational Institution**  
**higher education "North Ossetian State Medical Academy"**  
**Ministry of Health of the Russian Federation**  
(FGBOU VO SOGMA of the Ministry of Health of Russia)

Department of Biological Chemistry

**METHODOLOGICAL INSTRUCTIONS FOR PERFORMANCE OF INDEPENDENT**  
**(OUTSIDE) WORK**

by Clinical Biochemistry (program partly delivered in English)  
the main professional educational program of higher education -  
Specialist programs in the specialty 31.05.01 General Medicine  
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Methodological materials are intended for extracurricular work of students 6  
course (12 semester) of the medical faculty of the Federal State Budgetary Educational  
Institution of Higher Education SOGMA of the Ministry of Health of Russia  
in the discipline Clinical Biochemistry

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METHODOLOGICAL RECOMMENDATIONS FOR PERFORMANCE

## INDEPENDENT WORK TO CLASS

on the topic: "Pathobiochemistry of the liver."

Initial level of knowledge.

- Structural and functional levels of studying a diseased organism
- The role of the liver in the regulation and maintenance of homeostasis
- Hypoxia and ischemia as trigger factors for the development of any pathological process
- Methods of laboratory diagnostics of hepatic pathology

The student must know:

1. Histoarchitecture of the liver;
2. Liver functions;
3. Main symptoms and disease syndromes liver;
4. Characterization of enzymes and their subcellular localization;
5. Basic diagnostic biochemical tests hepatic pathology

The student must be able to:

1. solve situational problems

2. write tests

3. explain the meaning

enzymatic diagnosis

with pathology of visceral

bodies

Task number 1. Fill the table.

Main literature:

1 "BIOCHEMISTRY" Textbook for universities

under the editorship of E.S. Severin.- M.GEOTAR MED, 2003, p. -616-636

2. Berezov T.T., Korovkin B.F.

Biological chemistry, Moscow,

1998.- p. - 427-438.

3. Biochemical basis

pathological processes (under

edited by E.S. Severin). M. Medicine,

2000, 304 p.

4. Clinical biochemistry (under

ed. acad. V.A.Tkachuk), M.GEOTAR MED, 2002, p.116-122.

Additional literature:

1. Mac Murray W. Exchange

substances in humans. Moscow, 1980.

2. Veltishev Yu.V., Knyazev Yu.A.

"Children's Metabolism". Moscow,

1983.

Types of enzymes Names

excretory

Secretory

Indicator:

Cytoplasmic

Mitochondrial

Mitochondrial-cytoplasmic

1 Task number 2. Fill in the table "Diagnostics of cholestasis".

Form Indicators

cholestasis without jaundice

Cholestasis without jaundice, but with

damage to hepatocytes

cholestasis with jaundice

cholestasis with jaundice and

damage to hepatocytes

Task number 3. Fill in the table: "Diagnosis of liver diseases

by enzymes.

Feature of the method Enzymes

Base Enzyme

Triple test

4 enzyme test

6 enzyme test

Task number 4

1. Choose the correct answers.

In hem synthesis:

A Substrates are succinyl-CoA and glycine

B The first heme synthesis reaction takes place in the mitochondrial matrix

C Two molecules of 5-aminolevulinic acid condense with  
formation of porphobilinogen

D Ferrochelatase attaches iron to porphobilinogen

E 5-aminolevulinate synthase is a regulatory enzyme for the synthesis of heme

2. Choose the correct answers.

Porphyria:

A Cause neuropsychiatric disorders

B Accompanied by photosensitivity

C May appear during treatment with drugs - synthesis inducers of 5-aminolevulinate synthase

D Occur with beriberi B6

E Develop with genetic defects in heme synthesis enzymes.

23. Set the order of events.

In the process of assimilation of exogenous iron:

A In the intestinal cavity, iron is released from organic salts of food acids

B From the intestinal cells, iron enters the blood

C In the cells of the intestinal mucosa, iron is incorporated into ferritin

D Ascorbic acid restores iron

E Transferrin transports iron in the bloodstream

4. Match:

A Contains copper ion

B Interacts with cell membrane receptors

C Stores iron in cells

D Is a heme-containing protein

E Localized in erythrocytes

1) Transferrin

2) Ferritin

3) Ferroxidase

5. Choose the correct answers.

Causes of iron deficiency anemia can be:

A Recurrent bleeding

B Pregnancy

C Increased blood clotting

D Operations on the organs of the gastrointestinal tract

E Frequent births

6. Complete the missing words.

Excess iron accumulates in cells as part of protein ... and this leads to accumulation of granules. accompanied in the liver. , in the pancreas

.,

in the myocardium - ... .

7. Set match:

A Associated with blood albumin

•5 \_ \_

B Contains Fe

C Conjugated with glucuronic acid

D Excreted in the urine

3E Formed in RES cells

1) Direct bilirubin

2) Indirect bilirubin

3) Urobilin

Task number 5. Solve situational problems.

Situational task number 1.

Two newborns who were diagnosed with jaundice, the doctor